3.0 AGING MANAGEMENT REVIEW RESULTS

This section provides the results of the aging management review for those structures and components identified in Section 2.0 as being subject to aging management review.

Descriptions of the internal and external service environments that were used in the aging management review to determine aging effects requiring management are included in Table 3.0-1, Three Mile Island Unit 1 Internal Service Environments and Table 3.0-2, Three Mile Island Unit 1 External Service Environments. The environments used in the aging management reviews are listed in the Environment column.

Most of the Aging Management Review (AMR) results information in Section 3 is presented in the following two tables:

- **Table 3.x.1** - where '3' indicates the LRA section number, 'x' indicates the subsection number from NUREG 1801, Volume 1, and '1' indicates that this is the first table type in Section 3. For example, in the Reactor Vessel, Internals, and Reactor Coolant System subsection, this table would be number 3.1.1, in the Engineered Safety Features subsection, this table would be 3.2.1, and so on. For ease of discussion, this table will hereafter be referred to in this Section as "Table 1."
- **Table 3.x.2-y** - where '3' indicates the LRA section number, 'x' indicates the subsection number from NUREG 1801, Volume 1, and '2' indicates that this is the second table type in Section 3; and 'y' indicates the system table number. For example, for the Reactor Coolant System, within the Reactor Vessel, Internals, and Reactor Coolant System subsection, this table would be 3.1.2-1 and for the Reactor Vessel, it would be table 3.1.2-2. For the Core Flooding System, within the Engineered Safety Features subsection, this table would be 3.2.2-1. For the next system within the ESF subsection, it would be table 3.2.2-2. For ease of discussion, this table will hereafter be referred to in this section as "Table 2."

<u>TABLE DESCRIPTION</u>

NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," contains the 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, within the scope of license renewal, without change. The report also contains recommendations on 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 two tables.

Table 1

The purpose of Table 1 is to provide a summary comparison of how the facility aligns with the corresponding tables of NUREG-1801, Volume 1. The table is essentially the same as Tables 1 through 6 provided in NUREG-1801, Volume 1, except that the "ID" and "Type" columns have been replaced by an "Item Number" column, and, the "Related Generic Item" and “Unique Item” columns have 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 by the applicant to provide clarifying/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 that may not be intuitively obvious
- A discussion of how the item is different than 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, Volume 1)

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

Table 2 provides the detailed results of the aging management reviews for those components identified in LRA Section 2 as being subject to aging management review. There will be a Table 2 for each of the systems within a "system" grouping. For example, for TMI-1, the Engineered Safety Features System Group contains tables specific to Decay Heat Removal System, Makeup and Purification System (High Pressure Injection), Core Flooding System, Reactor Building Spray System, Reactor Building Sump and Drain System, and Primary Containment Heating and Ventilation System.

Table 2 consists of the following nine columns:

- Component Type
- Intended Function
- Material
- Environment
- Aging Effect Requiring Management
- Aging Management Programs
- NUREG-1801 Volume 2 Item
- Table 1 Item
- Notes

Component Type – The first column identifies all of the component types from Section 2 of the LRA that are subject to aging management review. They are listed in alphabetical order.

Intended Function – The second column contains the license renewal intended functions (including abbreviations where applicable) for the listed component types. Definitions and abbreviations of intended functions are contained in Table 2.1-1.

Material – The third column lists the particular materials of construction for the component type.

Environment – The fourth column lists the environment to which the component types are exposed. Internal and external service environments are indicated and a list of these environments is provided in Tables 3.0-1 and 3.0-2, respectively.

Aging Effect Requiring Management – As part of the aging management review process, aging effects/mechanisms requiring management are identified for the material and environment combination in order to maintain the intended function of the component type. These aging effects/mechanisms requiring management are listed in the fifth column.

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

NUREG-1801, Vol. 2 Item – Each combination of component type, material, environment, aging effect/mechanism requiring management, 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 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 – Each combination of component, material, environment, aging effect/mechanism requiring management, and aging management program that has an identified NUREG-1801, Volume 2 item number must also have a Table 3.x.1 line item reference number. The corresponding line item from Table 1 is listed in the eighth column of Table 2. If there is no corresponding item in NUREG-1801, Volume 1, this row in column eight is left blank. That way, the information from the two tables can be correlated.

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, etc., provide generic information regarding comparison of Three Mile Island Unit 1 aging management strategy with the NUREG-1801, Volume 2 Aging Management Table line item identified in the seventh column.

TABLE USAGE

Table 1

The reviewer evaluates each row in Table 1 by moving from left to right across the table. Since the Component, Aging Effect, Aging Management Programs and Further Evaluation Recommended information is taken directly from NUREG-1801, Volume 1, no further analysis of those columns is required. The information intended to help the reviewer the most in this table is contained within the Discussion column. Here the reviewer will be given information necessary to determine, in summary, how the applicant's evaluations and programs align with NUREG-1801, Volume 1. This may be in the form of descriptive information within the Discussion column or the reviewer may be referred to other locations within the LRA for further information.

Table 2

Table 2 contains all of the Aging Management Review information for the plant, whether or not it aligns with NUREG-1801. For a given row within the table, the reviewer is able to see the intended function, material, environment, aging effect/mechanism requiring management and aging management program combination for a particular component type within a system. In addition, if there is a correlation between the combination in Table 2 and a combination in NUREG-1801, Volume 2, this will be identified by a referenced item number in column seven, NUREG-1801, Volume 2 Item. The reviewer can refer to the item number in NUREG-1801, Volume 2, if desired, to verify the correlation. If the column is blank, the applicant was unable to locate an appropriately corresponding combination in NUREG-1801, Volume 2. As the reviewer continues across the table from left to right, within a given row, the next column is labeled Table 1 Item. If there is a reference number in this column, the reviewer is able to use that reference number to locate the corresponding row in Table 1 and see how the aging management program for this particular combination aligns with NUREG-1801. There may be a hyperlink directly to the corresponding row in Table 1 as well.

Table 2 provides the reviewer with a means to navigate from the components subject to Aging Management Review (AMR) in LRA Section 2 all the way through the evaluation of the programs that will be used to manage the effects of aging of those components.

A listing of the abbreviations used in this section is provided in Section 1.6.

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:

For all pressure retaining components in a system that are subject to the aging effects of cumulative fatigue, a TLAA is applied for the component type of piping and fittings.

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 these instances, 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 – Three Mile Island Unit 1 Internal Service Environments

TMI-1 Environment	Description	Equivalent NUREG-1801 Environments
Air/Gas-Dry (Internal)	Air/Gas-Dry (Internal) includes air with a very limited percentage of moisture present that has been treated to reduce the dew point well below the system operating temperature. This includes air downstream of dryers in air systems and includes the air inside systems with temperatures higher than the dew point that have surfaces that are normally dry. It also includes commercial grade gases (such as nitrogen, Freon, etc.) that are provided as a high quality product with little if any external contaminants.	Gas Dried Air
Air/Gas-Wetted (Internal)	Air/Gas-Wetted (Internal) includes air/gas environments containing significant amounts of moisture where condensation or water pooling may occur. This environment includes air with enough moisture to facilitate loss of material in steel caused by general, pitting, and crevice corrosion. Any internal air environment that does not meet the definition of Air/Gas – Dry (Internal) is to be categorized as Air/Gas – Wetted (Internal) which includes outdoor air drawn inside ventilation systems.	Air – Indoor uncontrolled Air – Indoor uncontrolled >95 °F (internal) Condensation Condensation (Internal) Moist air or condensation (internal)
Closed Cycle Cooling Water	Closed Cycle Cooling Water includes treated water subject to the Closed-Cycle Cooling Water System Program, which is Aging Management Program XI.M21 in NUREG-1801. The Closed-Cycle Cooling Water System Program relies on maintenance of system corrosion inhibitor concentrations within specified limits of Electric Power Research Institute TR-107396 to minimize corrosion. Demineralized water is treated with corrosion inhibitors, pH control agents, or biocides, as needed.	Closed cycle cooling water Closed cycle cooling water >140 °F
Closed Cycle Cooling Water >140°F	Closed Cycle Cooling Water >140 °F is Closed Cycle Cooling Water that has a temperature greater than 140 °F. Refer to the aforementioned Closed Cycle Cooling Water environment for further details.	Closed cycle cooling water >140 °F
Diesel Exhaust	Diesel Exhaust represents the exhaust from diesel engines. It is considered to have the potential to concentrate contaminants and be subject to wetting through condensation.	Diesel Exhaust

TMI-1 Environment	Description	Equivalent NUREG-1801 Environments
Fuel Oil	Fuel Oil includes fuel oil for the Emergency Diesel Generators, Diesel-driven Fire Pump, and the Security Diesel Generator. Water contamination of fuel oil is assumed.	Fuel Oil
Lubricating Oil	Lubricating oils are low to medium viscosity hydrocarbons used for bearing, gear, and engine lubrication. Water contamination of lubricating oil is assumed.	Lubricating Oil
Raw Water	The Susquehanna River and ground water from wells provide the sources of raw water utilized by TMI-1. Raw water is also rain or ground water. Raw water is water that has not been demineralized or chemically treated to any significant extent. For use in systems, the water has been rough filtered to remove large particles and may contain a biocide additive for control of micro- and macro-organisms. Raw water that may contain contaminants including oil and boric acid depending on the location. Floor drains and reactor building and auxiliary building sumps may be exposed to a variety of untreated water that is thus classified as raw water for the determination of aging effects.	Any Raw water Water – standing Various
Raw Water >140°F	Raw Water >140 °F is Raw Water that has a temperature greater than 140 °F. Refer to the aforementioned Raw Water environment for further details.	None
Reactor Coolant	Reactor coolant is demineralized water used within the Reactor Coolant System to transfer heat from the fuel inside the Reactor Vessel core to the Once-Through Steam Generators. The Reactor Coolant environment also includes steam inside the pressurizer. The temperature of the Reactor Coolant environment is assumed to be >482 °F. Components in other systems that form a portion of the reactor coolant pressure boundary may use the Treated Water environment, which is functionally equivalent to the Reactor Coolant environment.	Reactor coolant Reactor coolant >250 °C (>482 °F) Reactor coolant/steam

TMI-1 Environment	Description	Equivalent NUREG-1801 Environments
Reactor Coolant and Neutron Flux	The Reactor Coolant and Neutron Flux environment consists of Reactor Coolant that is exposed to neutron fluence projected to exceed 1.0 x 10^{17} n/cm^2 (E >0.1 MeV) within 60 years. Refer to the aforementioned Reactor Coolant environment for further details.	Reactor coolant and neutron flux Reactor coolant >250 °C (>482°F) and neutron flux
Steam	The Steam environment consists of dry steam that is subject to chemistry controls set by the Water Chemistry Program.	Steam
Treated Water	Treated water is demineralized water or chemically purified water and is the base water for all clean systems. Depending on the system, treated water may require further processing. Treated water may be deaerated and include corrosion inhibitors, biocides, or some combination of these treatments. This treated water environment includes wet steam applications which are referenced as steam or secondary feedwater / steam in NUREG-1801.	Treated water Treated borated water Secondary feedwater Treated water >140 °F Treated borated water >140 °F Treated water >482 °F Treated borated water >482 °F Steam Secondary feedwater / steam
Treated Water >140°F	Treated Water >140 °F is Treated Water that has a temperature greater than 140 °F. Refer to the aforementioned Treated Water environment for further details. This treated water environment includes wet steam applications which are referenced as steam or secondary feedwater / steam in NUREG-1801.	Treated water >140 °F Treated borated water >140 °F Steam Secondary feedwater / steam
Treated Water >482°F	Treated Water >482 °F is Treated Water that has a temperature greater than 482 °F. Refer to the aforementioned Treated Water environment for further details. This treated water environment includes wet steam applications which are referenced as steam or secondary feedwater / steam in NUREG-1801.	Treated water >482 °F Treated borated water >482 °F Steam Secondary feedwater / steam

Table 3.0-2 – Three Mile Island Unit 1 External Service Environments

TMI-1 Environment	Description	Equivalent NUREG-1801 Environments
Adverse Local Environment	The Adverse Local Environment represents conditions with excessive heat, radiation, moisture, or voltage, sometimes in the presence of oxygen. The effect can be concentrated or applicable to a general plant area.	Adverse Localized Environment
Air – Indoor (External)	Air - Indoor (External) consists of air environments that are in indoor locations and are sheltered/protected from weather. Humidity levels up to 100 percent are assumed and the surfaces of components in this environment might be wet. Additionally, this environment might contain aggressive chemical species including oxygen, halides, sulfates, or other aggressive corrosive substances that can influence the nature, rate, and severity of corrosion effects. It is assumed that these contaminants can concentrate to levels that will promote corrosive effects because of factors such as cyclic (wet-dry) condensation, contaminated insulation, accidental contamination, or leakage areas.	Air - indoor controlled Air – indoor uncontrolled Air – indoor uncontrolled (>95 °F) (Internal/External) Air with steam or water leakage Air with leaking secondary-side water and/or steam
Air with Borated Water Leakage (External)	Air with Borated Water Leakage (External) is Air – Indoor (External) that has the potential for borated water leakage. It is applicable to components located in the vicinity of systems containing borated water, including reactor coolant. The borated water from leakage is considered to be untreated due to the potential for water contamination at the surface. Refer to the aforementioned Air – Indoor (External) environment for further details.	Air with borated water leakage Air with reactor coolant leakage
Air – Outdoor (External)	Air – Outdoor (External) is atmospheric air with a temperature range of -9 °F to 107 °F and a relative humidity range of 10% to 100%. This environment is subject to periodic wetting and wind.	Air - indoor and outdoor Air - indoor uncontrolled or air - outdoor Air - indoor uncontrolled or air outdoor Air - outdoor Air - outdoor (External) Any Various

TMI-1 Environment	Description	Equivalent NUREG-1801 Environments
Concrete (Embedded)	Concrete (Embedded) is used for components that are embedded in concrete. It is considered aggressive when the concrete pH <11.5 or chlorides concentration >500 ppm.	Concrete
Groundwater/soil	Groundwater is the water beneath the surface that can be collected with wells, tunnels, or drainage galleries, or that flows naturally to the earth's surface via seeps or springs. Soil is a mixture of inorganic materials produced by the weathering of rocks and clays, and organic material produced by the decomposition of vegetation. Voids containing air and moisture occupy ~50% of the soil volume. Concrete subjected to a groundwater/soil environment can be vulnerable to Increase in porosity and permeability, cracking, loss of material (spalling, scaling)/ aggressive chemical attack.	Groundwater/soil Soil Any
Soil	Soil is used for components that are buried in soil.	Soil Groundwater/soil Any
Water-flowing	Water that is refreshed, thus having larger impact on leaching; this can be rainwater, raw water, groundwater, or flowing water under a foundation.	Water-flowing Soil Any
Water-standing	Water that is stagnant and unrefreshed, thus possibly resulting in an increased ionic strength of solution up to saturation.	Water-standing

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

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 System, 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.

- Reactor Coolant System (2.3.1.1)
- Reactor Vessel (2.3.1.2)
- Reactor Vessel Internals (2.3.1.3)
- Steam Generator (2.3.1.4)

3.1.2 RESULTS

The following tables summarize the results of the aging management review for Reactor Vessel, Internals and Reactor Coolant System:

Table 3.1.2-1 Summary of Aging Management Evaluation – Reactor Coolant System

Table 3.1.2-2 Summary of Aging Management Evaluation – Reactor Vessel

Table 3.1.2-3 Summary of Aging Management Evaluation – Reactor Vessel Internals

Table 3.1.2-4 Summary of Aging Management Evaluation – Steam Generator

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

3.1.2.1.1 Reactor Coolant System

Materials

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

- Carbon and Low Alloy Steel Bolting
- Carbon or Low Alloy Steel with Nickel Alloy Cladding
- Carbon or Low Alloy Steel with Stainless Steel Cladding
- Carbon Steel
- Cast Austenitic Stainless Steel (CASS)
- Gray Cast Iron
- Lexan
- Low Alloy Steel

- Nickel Alloy
- Rubber
- Stainless Steel
- Stainless Steel Bolting

Environments

The Reactor Coolant System components are exposed to the following environments:

- Air with Borated Water Leakage
- Air/Gas - Dry
- Lubricating Oil
- Reactor Coolant
- Treated Water > 140 F

Aging Effects Requiring Management

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

- Cracking/Cyclic Loading
- Cracking/Stress Corrosion Cracking
- Cumulative Fatigue Damage/Fatigue
- Hardening and Loss of Strength/Elastomer Degradation
- Loss of Fracture Toughness/Thermal Aging Embrittlement
- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting, Crevice and Microbiologically Influenced Corrosion
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

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

- ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)
- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- External Surfaces Monitoring (B.2.1.21)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)

- Lubricating Oil Analysis (B.2.1.23)
- Nickel Alloy Aging Management Program (B.2.2.1)
- One-Time Inspection (B.2.1.18)
- TLAA
- Water Chemistry (B.2.1.2)

Table 3.1.2-1, Summary of Aging Management Evaluation – Reactor Coolant System summarizes the results of the aging management review for the Reactor Coolant System.

3.1.2.1.2 Reactor Vessel

Materials

The materials of construction for the Reactor Vessel components are:

- Carbon and Low Alloy Steel Bolting
- Carbon or Low Alloy Steel with Nickel Alloy Cladding
- Carbon or Low Alloy Steel with Stainless Steel Cladding
- Carbon Steel
- High Strength Low Alloy Steel Bolting with Yield Strength of 150 ksi or Greater
- Nickel Alloy
- SA508, Class 2 forgings with Stainless Steel using a high heat input welding process
- Stainless Steel
- Stainless Steel Bolting

Environments

The Reactor Vessel components are exposed to the following environments:

- Air with Borated Water Leakage
- Reactor Coolant
- Reactor Coolant and Neutron Flux

Aging Effects Requiring Management

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

- Crack Growth/Cyclic Loading
- Cracking/Stress Corrosion Cracking
- Cracking/Stress Corrosion Cracking, Thermal and Mechanical Loading

- Cumulative Fatigue Damage/Fatigue
- Loss of Fracture Toughness/Neutron Irradiation Embrittlement
- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting and Crevice Corrosion
- Loss of Material/Wear
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

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

- ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)
- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- External Surfaces Monitoring (B.2.1.21)
- Nickel Alloy Aging Management Program (B.2.2.1)
- Nickel-Alloy Penetration Nozzles Welded to the Upper Reactor Vessel Closure Heads of Pressurized Water Reactors (B.2.1.5)
- Reactor Head Closure Studs (B.2.1.3)
- Reactor Vessel Surveillance (B.2.1.17)
- TLAA
- Water Chemistry (B.2.1.2)

Table 3.1.2-2, Summary of Aging Management Evaluation – Reactor Vessel summarizes the results of the aging management review for the Reactor Vessel.

3.1.2.1.3 Reactor Vessel Internals

Materials

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

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

Environments

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

- Reactor Coolant
- Reactor Coolant and Neutron Flux

Aging Effects Requiring Management

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

- Changes in Dimensions/Void Swelling
- Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking
- Cumulative Fatigue Damage/Fatigue
- Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling
- Loss of Fracture Toughness/Thermal Aging Embrittlement
- Loss of Material/Pitting and Crevice Corrosion
- Loss of Preload/Stress Relaxation

Aging Management Programs

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

- TLAA
- Water Chemistry (B.2.1.2)

Table 3.1.2-3, Summary of Aging Management Evaluation – Reactor Vessel Internals summarizes the results of the aging management review for the Reactor Vessel Internals.

3.1.2.1.4 Steam Generator

Materials

The materials of construction for the Steam Generator components are:

- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Low Alloy Steel
- Low Alloy Steel with Stainless Steel and Nickel-base Alloy Cladding
- Low Alloy Steel with Stainless Steel Cladding
- Nickel Alloy

- Stainless Steel

Environments

The Steam Generator components are exposed to the following environments:

- Air with Borated Water Leakage
- Reactor Coolant
- Treated Water

Aging Effects Requiring Management

The following aging effects associated with the Steam Generator components require management:

- Cracking/Stress Corrosion Cracking
- Cumulative Fatigue Damage/Fatigue
- Denting/Corrosion of Carbon Steel Tubesheet
- Loss of Material/Boric Acid Corrosion
- Loss of Material/Fretting and Wear
- Loss of Material/General, Pitting and Crevice Corrosion
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

The following aging management programs manage the aging effects for the Steam Generator components:

- ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)
- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- External Surfaces Monitoring (B.2.1.21)
- Nickel Alloy Aging Management Program (B.2.2.1)
- One-Time Inspection (B.2.1.18)
- Steam Generator Tube Integrity (B.2.1.8)
- TLAA
- Water Chemistry (B.2.1.2)

Table 3.1.2-4, Summary of Aging Management Evaluation – Steam Generator summarizes the results of the aging management review for the Steam Generator. The aging management review was performed for the new OTSGs.

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

NUREG-1801 provides the basis for identifying those programs that warrant further evaluation by the reviewer in the license renewal application. 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

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 metal fatigue as a TLAA for the Feedwater System, Reactor Coolant System, Reactor Vessel, Reactor Vessel Internals, and Steam Generator is discussed in Section 4.3.

Item Numbers 3.1.1-2, 3.1.1-3, 3.1.1-4 are applicable to BWRs only and are not used for TMI-1.

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

1. *Loss of material due to general, pitting, and crevice corrosion could occur in the steel PWR steam generator shell assembly exposed to secondary feedwater and steam. Loss of material due to general, pitting, and crevice corrosion could also occur for the steel top head enclosure (without cladding) top head nozzles [vent, top head spray or reactor core isolation cooling (RCIC), and spare] exposed to reactor coolant. The existing program relies on control of reactor water chemistry to mitigate corrosion. However, control of water chemistry does not preclude loss of material due to 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.*

   TMI-1 will implement a One-Time Inspection program, B.2.1.18, for susceptible locations to verify the effectiveness of the Water Chemistry program, B.2.1.2, to manage the loss of material due to general, pitting and crevice corrosion in steel steam generator shell assembly, steam generator level sensing and drain connections, main steam nozzle and safe ends, primary manway and inspection port covers, secondary manway and hand hole covers, and upper and lower tubesheets exposed to treated water and reactor coolant in the Steam Generator. The One-Time Inspection and Water Chemistry programs are described in Appendix B.

Item Number 3.1.1-11 is applicable to BWRs only and is not used for TMI-1.

2. Item Number 3.1.1-13 is applicable to BWRs only and is not used for TMI-1.

3. Item Number 3.1.1-14 and 3.1.1-15 are applicable to BWRs only and are not used for TMI-1.

4. *Loss of material due to general, pitting, and crevice corrosion could occur in the steel PWR steam generator upper and lower shell and transition cone exposed to secondary feedwater and steam. The existing program relies on control of chemistry to mitigate corrosion and In-service Inspection (ISI) to detect loss of material. The extent and schedule of the existing steam generator inspections are designed to ensure that flaws cannot attain a depth sufficient to threaten the integrity of the welds. However, according to NRC Information Notice (IN) 90-04, the program may not be sufficient to detect pitting and crevice corrosion, if general and pitting corrosion of the shell is known to exist. The GALL Report recommends augmented inspection to manage this aging effect. Furthermore, the GALL Report clarifies that this issue is limited to Westinghouse Model 44 and 51 Steam Generators where a high stress region exists at the shell to transition cone weld. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1 of this SRP-LR).*

   Item Number 3.1.1-16 is not applicable to TMI-1. This component, material, environment, and aging effect/mechanism does not apply to the Reactor Vessel, Internals and Reactor Coolant System.

3.1.2.2.3 Loss of Fracture Toughness due to Neutron Irradiation Embrittlement

1. *Neutron irradiation embrittlement is a 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). This TLAA is addressed separately in Section 4.2, "Reactor Vessel Neutron Embrittlement Analysis," of this SRP-LR.*

   Neutron irradiation embrittlement is a 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 neutron irradiation embrittlement as a TLAA for the Reactor Vessel is discussed in Section 4.2.

2. *Loss of fracture toughness due to neutron irradiation embrittlement could occur in BWR and PWR reactor vessel beltline shell, nozzle, and welds exposed to reactor coolant and neutron flux. A reactor vessel materials surveillance program monitors neutron irradiation embrittlement of the reactor vessel. Reactor vessel surveillance program is 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. Untested capsules placed in storage must be maintained for future insertion. Thus, further staff evaluation is required for license renewal. Specific recommendations for an acceptable AMP are provided in Chapter XI, Section M31 of the GALL Report.

TMI-1 will implement a Reactor Vessel Surveillance program, B.2.1.17, to manage the loss of fracture toughness due to neutron irradiation embrittlement in the steel with stainless steel cladding reactor vessel shell exposed to reactor coolant and neutron flux. The Reactor Vessel Surveillance program provides sufficient material data and dosimetry to monitor irradiation embrittlement at the end of the period of extended operation and to determine the need for operating restrictions on the inlet temperature, neutron spectrum, and neutron flux. The Reactor Vessel Surveillance program is described in Appendix B.

3.1.2.2.4 Cracking due to Stress Corrosion Cracking (SCC) and Intergranular Stress Corrosion Cracking (IGSCC)

1. Item Number 3.1.1-19 is applicable to BWRs only and is not used for TMI-1.

2. Item Number 3.1.1-20 is applicable to BWRs only and is not used for TMI-1.

3.1.2.2.5 Crack Growth due to Cyclic Loading

Crack growth due to cyclic loading could occur in reactor vessel shell forgings clad with stainless steel using a high-heat-input welding process. Growth of intergranular separations (underclad cracks) in the heat affected zone under austenitic stainless steel cladding is a TLAA to be evaluated for the period of extended operation for all the SA 508-Cl 2 forgings where the cladding was deposited with a high heat input welding process. The methodology for evaluating the underclad flaw should be consistent with the current well-established flaw evaluation procedure and criterion in the ASME Section XI Code. See the SRP-LR, Section 4.7, “Other Plant-Specific Time-Limited Aging Analysis,” for generic guidance for meeting the requirements of 10 CFR 54.21(c).

Crack growth due to cyclic loading (underclad cracking) is a 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 crack growth due to cyclic loading as a TLAA for the Reactor Vessel is discussed in Section 4.3.6.

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

Loss of fracture toughness due to neutron irradiation embrittlement and void swelling could occur in stainless steel and nickel alloy reactor vessel internals *components exposed to reactor coolant and neutron flux. The GALL Report recommends no further aging management review if the applicant provides a commitment in the FSAR Supplement to (1) participate in the industry programs for investigating and managing aging effects on reactor internals; (2) evaluate and implement the results of the industry programs as applicable to the reactor internals; and (3) upon completion of these programs, but not less than 24 months before entering the period of extended operation, submit an inspection plan for reactor internals to the NRC for review and approval.*

TMI-1 will implement the commitment in the UFSAR Supplement for PWR Vessel Internals to manage the aging effects of loss of fracture toughness due to neutron irradiation embrittlement and void swelling in stainless steel and nickel alloy reactor vessel components exposed to reactor coolant and neutron flux. TMI-1 provides in the UFSAR Supplement a commitment to: (1) participate in the industry programs for investigating and managing aging effects on reactor internals; (2) evaluate and implement the results of the industry programs as applicable to the reactor internals; and (3) upon completion of these programs, but not less than 24 months before entering the period of extended operation, submit an inspection plan for reactor internals to the NRC for review and approval. The UFSAR Supplement Commitment for PWR Vessel Internals is described in Appendix A.

3.1.2.2.7 Cracking due to Stress Corrosion Cracking

1. Item Number 3.1.1-23 is not applicable to TMI-1. This component, material, environment, and aging effect/mechanism does not apply to the Reactor Vessel, Internals, and Reactor Coolant System.

2. Item Number 3.1.1-24 is not applicable to TMI-1. This component, material, environment, and aging effect/mechanism does not apply to the Reactor Vessel, Internals, and Reactor Coolant System.

3.1.2.2.8 Cracking due to Cyclic Loading

1. Item Number 3.1.1-25 is applicable to BWRs only and is not used for TMI-1.

2. Item Number 3.1.1-26 is applicable to BWRs only and is not used for TMI-1.

3.1.2.2.9 Loss of Preload due to Stress Relaxation

Loss of preload due to stress relaxation could occur in stainless steel and nickel alloy PWR reactor vessel internals screws, bolts, tie rods, and hold-down springs exposed to reactor coolant. The GALL Report recommends no further aging management review if the applicant provides a commitment in the FSAR Supplement to (1) participate in the industry programs for investigating and managing aging effects on reactor internals; (2) evaluate and implement the results of the industry programs as applicable to the reactor internals; and (3) upon completion of these programs, but not less *than 24 months before entering the period of extended operation, submit an inspection plan for reactor internals to the NRC for review and approval.*

TMI-1 will implement the commitment in the UFSAR Supplement for PWR Vessel Internals to manage the aging effects of loss of preload due to stress relaxation in stainless steel and nickel alloy reactor vessel internals screws and bolts exposed to reactor coolant and neutron flux. TMI-1 provides in the UFSAR Supplement a commitment to: (1) participate in the industry programs for investigating and managing aging effects on reactor internals; (2) evaluate and implement the results of the industry programs as applicable to the reactor internals; and (3) upon completion of these programs, but not less than 24 months before entering the period of extended operation, submit an inspection plan for reactor internals to the NRC for review and approval. The UFSAR Supplement Commitment for PWR Vessel Internals is described in Appendix A.

3.1.2.2.10 Loss of Material due to Erosion

Loss of material due to erosion could occur in steel steam generator feedwater impingement plates and supports exposed to secondary feedwater. The GALL Report recommends further evaluation of a plant-specific AMP to ensure that this aging effect is adequately managed. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1 of this SRP-LR).

Item Number 3.1.1-28 is not applicable to TMI-1. This component, material, environment, and aging effect/mechanism does not apply to the Reactor Vessel, Internals and Reactor Coolant System.

3.1.2.2.11 Cracking due to Flow-Induced Vibration

Item Number 3.1.1-29 is applicable to BWRs only and is not used for TMI-1.

3.1.2.2.12 Cracking due to Stress Corrosion Cracking and Irradiation-Assisted Stress Corrosion Cracking (IASCC)

Cracking due to SCC and IASCC could occur in PWR stainless steel reactor internals exposed to reactor coolant. The existing program relies on control of water chemistry to mitigate these effects. The GALL Report recommends no further aging management review if the applicant provides a commitment in the FSAR Supplement to (1) participate in the industry programs for investigating and managing aging effects on reactor internals; (2) evaluate and implement the results of the industry programs as applicable to the reactor internals; and (3) upon completion of these programs, but not less than 24 months before entering the period of extended operation, submit an inspection plan for reactor internals to the NRC for review and approval.

TMI-1 will implement the commitment in the UFSAR Supplement for PWR Vessel Internals and the Water Chemistry program, B.2.1.2, to manage the aging effects of cracking due to stress corrosion cracking, and irradiation-assisted stress corrosion cracking in stainless steel reactor vessel internals components exposed to reactor coolant and neutron flux. TMI-1 provides in the UFSAR Supplement a commitment to: (1) participate in the industry programs for investigating and managing aging effects on reactor internals; (2) evaluate and implement the results of the industry programs as applicable to the reactor internals; and (3) upon completion of these programs, but not less than 24 months before entering the period of extended operation, submit an inspection plan for reactor internals to the NRC for review and approval. The UFSAR Supplement Commitment for PWR Vessel Internals and the Water Chemistry program are described in Appendix A and Appendix B.

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

Cracking due to PWSCC could occur in PWR components made of nickel alloy and steel with nickel alloy cladding, including reactor coolant pressure boundary components and penetrations inside the RCS such as pressurizer heater sheathes and sleeves, nozzles, and other internal components. With the exception of reactor vessel upper head nozzles and penetrations, the GALL Report recommends ASME Section XI ISI (for Class 1 components) and control of water chemistry. For nickel alloy components, no further aging management review is necessary if the applicant complies with applicable NRC Orders and provides a commitment in the FSAR supplement to implement applicable (1) Bulletins and Generic Letters and (2) staff-accepted industry guidelines.

TMI-1 will implement the ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, the Nickel Alloy Aging Management program, B.2.2.1, and the Water Chemistry program, B.2.1.2, to manage the aging effects of cracking due to primary water stress corrosion cracking in nickel alloy and steel with nickel-alloy cladding piping components, piping elements, penetrations, nozzles, safe ends, and welds; pressurizer sleeves, diaphragm plate exposed to reactor coolant and treated water in the Core Flooding System, Reactor Coolant System, Reactor Vessel, and Steam Generator. TMI-1 complies with applicable NRC Orders and provides a commitment in the UFSAR Supplement to implement applicable (1) Bulletins and Generic Letters and (2) staff-accepted industry guidelines. The ASME Section XI Inservice Inspection, Subsections IWB, IWC and IWD, Nickel Alloy Aging Management and Water Chemistry programs are described in Appendix B.

3.1.2.2.14 Wall Thinning due to Flow-Accelerated Corrosion

Not Applicable. Wall thinning due to flow-accelerated corrosion in the steel feedwater inlet ring is discussed in Item Number 3.4.1-29.

3.1.2.2.15 Changes in Dimensions due to Void Swelling

Changes in dimensions due to void swelling could occur in stainless steel and nickel alloy PWR reactor internal components exposed to reactor coolant. The GALL Report recommends no further aging management review if the applicant provides a commitment in the FSAR Supplement to (1) participate in the industry programs for investigating and managing aging effects on *reactor internals; (2) evaluate and implement the results of the industry programs as applicable to the reactor internals; and (3) upon completion of these programs, but not less than 24 months before entering the period of extended operation, submit an inspection plan for reactor internals to the NRC for review and approval.*

TMI-1 will implement the commitment in the UFSAR Supplement for PWR Vessel Internals to manage the aging effects of changes in dimensions due to void swelling in stainless steel and nickel alloy reactor vessel internals components exposed to reactor coolant and neutron flux. TMI-1 provides in the UFSAR Supplement a commitment to: (1) participate in the industry programs for investigating and managing aging effects on reactor internals; (2) evaluate and implement the results of the industry programs as applicable to the reactor internals; and (3) upon completion of these programs, but not less than 24 months before entering the period of extended operation, submit an inspection plan for reactor internals to the NRC for review and approval. The UFSAR Supplement Commitment for PWR Vessel Internals is described in Appendix A.

3.1.2.2.16 Cracking due to Stress Corrosion Cracking and Primary Water Stress Corrosion Cracking

1. *Cracking due to SCC could occur on the primary coolant side of PWR steel steam generator upper and lower heads, tubesheets, and tube-to-tube sheet welds made or clad with stainless steel. Cracking due to PWSCC could occur on the primary coolant side of PWR steel steam generator upper and lower heads, tubesheets, and tube-to-tube sheet welds made or clad with nickel alloy. The GALL Report recommends ASME Section XI ISI and control of water chemistry to manage this aging and recommends no further aging management review for PWSCC of nickel alloy if the applicant complies with applicable NRC Orders and provides a commitment in the FSAR supplement to implement applicable (1) Bulletins and Generic Letters and (2) staff-accepted industry guidelines.*

   TMI-1 will implement the ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, and the Water Chemistry program, B.2.1.2, to manage cracking due to stress corrosion cracking in stainless steel reactor control rod drive head penetration pressure housings.

   TMI-1 will implement the ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, the Nickel Alloy Aging Management Program, B.2.2.1, and the Water Chemistry program, B.2.1.2, to manage cracking due to primary water stress corrosion cracking in nickel alloy and steel with nickel-alloy cladding reactor control rod drive head penetration pressure housings.

   TMI-1 will implement the ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, and the Water Chemistry program, B.2.1.2, to manage the aging effects of cracking due to stress corrosion cracking in steel with stainless steel cladding primary side components, steam generator upper and lower heads, and stainless steel tube support plates. The ASME Section XI Inservice Inspection program, Subsections IWB, IWC and IWD and Water Chemistry programs are described in Appendix B.

TMI-1 will implement the ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, and the Nickel Alloy Aging Management program, B.2.2.1, and the Water Chemistry program, B.2.1.2, to manage the aging effects of cracking due to primary water stress corrosion cracking in steel with nickel-alloy cladding steam generator tubesheets. TMI-1 complies with applicable NRC Orders and provides a commitment in the UFSAR Supplement to implement applicable (1) Bulletins and Generic Letters and (2) staff-accepted industry guidelines. The ASME Section XI Inservice Inspection program, Subsections IWB, IWC and IWD, Nickel Alloy Aging Management and Water Chemistry programs are described in Appendix B.

2. *Cracking due to SCC could occur on stainless steel pressurizer spray heads. Cracking due to PWSCC could occur on nickel-alloy pressurizer spray heads. The existing program relies on control of water chemistry to mitigate this aging effect. The GALL Report recommends one-time inspection to confirm that cracking is not occurring. For nickel alloy welded spray heads, the GALL Report recommends no further aging management review if the applicant complies with applicable NRC Orders and provide a commitment in the FSAR supplement to implement applicable (1) Bulletins and Generic Letters and (2) staff-accepted industry guidelines.*

   Item Number 3.1.1-36 is not applicable to TMI-1. The spray head does not perform an intended function and is not in the scope of the Reactor Vessel, Internals and Reactor Coolant System.

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

Cracking due to stress corrosion cracking (SCC), primary water stress corrosion cracking (PWSCC), and irradiation assisted stress corrosion cracking (IASCC) could occur in PWR stainless steel and nickel alloy reactor vessel internals components. The existing program relies on control of water chemistry to mitigate these effects. However, the existing program should be augmented to manage these aging effects for reactor vessel internals components. The GALL Report recommends no further aging management review if the applicant provides a commitment in the FSAR Supplement to (1) participate in the industry programs for investigating and managing aging effects on reactor internals; (2) evaluate and implement the results of the industry programs as applicable to the reactor internals; and (3) upon completion of these programs, but not less than 24 months before entering the period of extended operation, submit an inspection plan for reactor internals to the NRC for review and approval.

TMI-1 will implement the commitment in the UFSAR Supplement for PWR Vessel Internals, and the Water Chemistry program, B.2.1.2, to manage the aging effects of cracking due to stress corrosion cracking, primary water stress corrosion cracking and irradiation-assisted stress corrosion cracking in stainless steel and nickel alloy reactor vessel internals components exposed to reactor coolant and neutron flux. TMI-1 provides in the UFSAR Supplement a commitment to: (1) participate in the industry programs for investigating and managing aging effects on reactor internals; (2) evaluate and implement the results of the industry programs as applicable to the reactor internals; and (3) upon completion of these programs, but not less than 24 months before entering the period of extended operation, submit an inspection plan for reactor internals to the NRC for review and approval. The UFSAR Supplement Commitment for PWR Vessel Internals and the Water Chemistry program are described in Appendix A and Appendix B.

3.1.2.2.18 Quality Assurance for Aging Management of Nonsafety-Related Components

QA provisions applicable to License Renewal are discussed in Section B.1.3.

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 of Piping and Components
- Section 4.4, Leak-Before-Break Analysis of Primary System Piping

3.1.3 CONCLUSION

The Reactor Vessel, Internals and Reactor Coolant System 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	Steel pressure vessel support skirt and attachment welds	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	BWR Only				
3.1.1-3	BWR Only				
3.1.1-4	BWR Only				
3.1.1-5	Stainless steel and nickel alloy reactor vessel internals components	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.
3.1.1-6	Nickel Alloy tubes and sleeves in a reactor coolant and secondary feedwater/steam environment	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.
3.1.1-7	Steel and stainless steel reactor coolant pressure boundary closure bolting, head closure studs, support skirts and attachment welds, pressurizer relief tank components, steam generator components, piping and components external surfaces and bolting	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.

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
3.1.1-8	Steel; stainless steel; and nickel-alloy reactor coolant pressure boundary piping, piping components, piping elements; flanges; nozzles and safe ends; pressurizer vessel shell heads and welds; heater sheaths and sleeves; penetrations; and thermal sleeves	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.
3.1.1-9	Steel; stainless steel; steel with nickel-alloy or stainless steel cladding; nickel-alloy reactor vessel components: flanges; nozzles; penetrations; pressure housings; safe ends; thermal sleeves; vessel shells, heads and welds	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.
3.1.1-10	Steel; stainless steel; steel with nickel-alloy or stainless steel cladding; nickel-alloy steam generator components (flanges; penetrations; nozzles; safe ends, lower heads and welds)	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.
3.1.1-11	BWR 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
3.1.1-12	Steel steam generator shell assembly exposed to secondary feedwater and steam	Loss of material due to general, pitting and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801 with exceptions. The One-Time Inspection Program, B.2.1.18, will be used to verify the effectiveness of the Water Chemistry program, B.2.1.2, to manage the loss of material due to general, pitting and crevice corrosion in the steel steam generator shell assembly and steam generator components exposed to treated water and reactor coolant. Exceptions apply to the NUREG-1801 recommendations for One-Time Inspection Program implementation. See Subsection 3.1.2.2.2.1.
3.1.1-13	BWR Only				
3.1.1-14	BWR Only				
3.1.1-15	BWR 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
3.1.1-16	Steel steam generator upper and lower shell and transition cone exposed to secondary feedwater and steam	Loss of material due to general, pitting and crevice corrosion	Inservice Inspection (IWB, IWC, and IWD), and Water Chemistry and, for Westinghouse Model 44 and 51 S/G, if general and pitting corrosion of the shell is known to exist, additional inspection procedures are to be developed.	Yes, detection of aging effects is to be evaluated	Not applicable. See subsection 3.1.2.2.2.4.
3.1.1-17	Steel (with or without stainless steel cladding) 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 Part 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	Loss of fracture toughness due to neutron irradiation embrittlement is a TLAA; further evaluation is documented in Subsection 3.1.2.2.3.1.
3.1.1-18	Steel (with or without stainless steel cladding) 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	The Reactor Vessel Surveillance program, B.2.1.17, will be used to manage the loss of fracture toughness due to neutron irradiation embrittlement in the steel with stainless steel cladding reactor vessel shell exposed to reactor coolant and neutron flux. See Subsection 3.1.2.2.3.2.

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
3.1.1-19	BWR Only				
3.1.1-20	BWR Only				
3.1.1-21	Reactor vessel shell fabricated of SA508-Cl 2 forgings clad with stainless steel using a high-heat-input welding process	Crack growth due to cyclic loading	TLAA	Yes, TLAA	Crack growth due to cyclic loading (underclad cracking) is a TLAA; further evaluation is documented in Subsection 3.1.2.2.5.
3.1.1-22	Stainless steel and nickel alloy reactor vessel internals components exposed to reactor coolant and neutron flux	Loss of fracture toughness due to neutron irradiation embrittlement, void swelling	FSAR supplement commitment to (1) participate in industry RVI aging programs (2) implement applicable results (3) submit for NRC approval > 24 months before the extended period an RVI inspection plan based on industry recommendation.	No, but licensee commitment to be confirmed	The UFSAR Supplement Commitment for PWR Vessel Internals will be used to manage the loss of fracture toughness due to neutron irradiation embrittlement, void swelling in stainless steel and nickel alloy reactor vessel components exposed to reactor coolant and neutron flux. See Subsection 3.1.2.2.6.
3.1.1-23	Stainless steel reactor vessel closure head flange leak detection line and bottom-mounted instrument guide tubes	Cracking due to stress corrosion cracking	A plant-specific aging management program is to be evaluated.	Yes, plant specific	Not applicable. See Subsection 3.1.2.2.7.

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
3.1.1-24	Class 1 cast austenitic stainless steel piping, piping components, and piping elements exposed to reactor coolant	Cracking due to stress corrosion cracking	Water Chemistry and, for CASS components that do not meet the NUREG-0313 guidelines, a plant specific aging management program	Yes, plant specific	Not applicable. See Subsection 3.1.2.2.7.
3.1.1-25	BWR Only				
3.1.1-26	BWR Only				
3.1.1-27	Stainless steel and nickel alloy reactor vessel internals screws, bolts, tie rods, and hold-down springs	Loss of preload due to stress relaxation	FSAR supplement commitment to (1) participate in industry RVI aging programs (2) implement applicable results (3) submit for NRC approval > 24 months before the extended period an RVI inspection plan based on industry recommendation.	No, but licensee commitment to be confirmed	The UFSAR Supplement Commitment for PWR Vessel Internals will be used to manage the loss of preload due to stress relaxation in stainless steel and nickel alloy reactor vessel internals screws and bolts exposed to reactor coolant and neutron flux. See Subsection 3.1.2.2.9.
3.1.1-28	Steel steam generator feedwater impingement plate and support exposed to secondary feedwater	Loss of material due to erosion	A plant-specific aging management program is to be evaluated.	Yes, plant specific	Not applicable. See Subsection 3.1.2.2.10.
3.1.1-29	BWR 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	Stainless steel reactor vessel internals components (e.g., Upper internals assembly, RCCA guide tube assemblies, Baffle/former assembly, Lower internal assembly, shroud assemblies, Plenum cover and plenum cylinder, Upper grid assembly, Control rod guide tube (CRGT) assembly, Core support shield assembly, Core barrel assembly, Lower grid assembly, Flow distributor assembly, Thermal shield, Instrumentation support structures)	Cracking due to stress corrosion cracking, irradiation-assisted stress corrosion cracking	Water Chemistry and FSAR supplement commitment to (1) participate in industry RVI aging programs (2) implement applicable results (3) submit for NRC approval > 24 months before the extended period an RVI inspection plan based on industry recommendation.	No, but licensee commitment needs to be confirmed	The UFSAR Supplement Commitment for PWR Vessel Internals and the Water Chemistry program, B.2.1.2, will be used to manage cracking due to stress corrosion cracking, irradiation-assisted stress corrosion cracking in stainless steel reactor vessel internals components exposed to reactor coolant and neutron flux. See Subsection 3.1.2.2.12.

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
3.1.1-31	Nickel alloy and steel with nickel-alloy cladding piping, piping component, piping elements, penetrations, nozzles, safe ends, and welds (other than reactor vessel head); pressurizer heater sheaths, sleeves, diaphragm plate, manways and flanges; core support pads/core guide lugs	Cracking due to primary water stress corrosion cracking	Inservice Inspection (IWB, IWC, and IWD) and Water Chemistry and for nickel alloy, comply with applicable NRC Orders and provide a commitment in the FSAR supplement to implement applicable (1) Bulletins and Generic Letters and (2) staff-accepted industry guidelines.	No, but licensee commitment needs to be confirmed	Consistent with NUREG-1801 with exceptions. The ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, the Nickel Alloy Aging Management Program, B.2.2.1, and the Water Chemistry program, B.2.1.2, will be used to manage cracking due to primary water stress corrosion cracking in nickel alloy and steel with nickel-alloy cladding piping components, piping elements, penetrations, nozzles, safe ends, and welds; pressurizer sleeves, diaphragm plate exposed to reactor coolant and treated water in the Core Flooding System, Reactor Coolant System, Reactor Vessel, and Steam Generator. Exceptions apply to the NUREG-1801 recommendations for ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD implementation. See Subsection 3.1.2.2.13.
3.1.1-32	Steel steam generator feedwater inlet ring and supports	Wall thinning due to flow-accelerated corrosion	A plant-specific aging management program is to be evaluated.	Yes, plant specific	Not applicable. Wall thinning due to flow-accelerated corrosion in the steel feedwater inlet ring is discussed in Item Number 3.4.1-29. See Subsection 3.1.2.2.14.

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 and nickel alloy reactor vessel internals components	Changes in dimensions due to void swelling	FSAR supplement commitment to (1) participate in industry RVI aging programs (2) implement applicable results (3) submit for NRC approval > 24 months before the extended period an RVI inspection plan based on industry recommendation.	No, but licensee commitment to be confirmed	The UFSAR Supplement Commitment for PWR Vessel Internals will be used to manage changes in dimensions due to void swelling in stainless steel and nickel alloy reactor vessel internals components exposed to reactor coolant and neutron flux. See Subsection 3.1.2.2.15.

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
3.1.1-34	Stainless steel and nickel alloy reactor control rod drive head penetration pressure housings	Cracking due to stress corrosion cracking and primary water stress corrosion cracking	Inservice Inspection (IWB, IWC, and IWD) and Water Chemistry and for nickel alloy, comply with applicable NRC Orders and provide a commitment in the FSAR supplement to implement applicable (1) Bulletins and Generic Letters and (2) staff-accepted industry guidelines.	No, but licensee commitment needs to be confirmed	Consistent with NUREG-1801 with exceptions. The ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, and the Water Chemistry program, B.2.1.2, will be used to manage cracking due to stress corrosion cracking in stainless steel reactor control rod drive head penetration pressure housings and nozzles exposed to reactor coolant. The ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, the Nickel Alloy Aging Management Program, B.2.2.1, and the Water Chemistry program, B.2.1.2, will be used to manage cracking due to primary water stress corrosion cracking in nickel alloy and steel with nickel-alloy cladding reactor control rod drive head penetration pressure housings exposed to reactor coolant. Exceptions apply to the NUREG-1801 recommendations for ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD implementation. See Subsection 3.1.2.2.16.1.

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
3.1.1-35	Steel with stainless steel or nickel alloy cladding primary side components; steam generator upper and lower heads, tubesheets and tube-to-tube sheet welds	Cracking due to stress corrosion cracking and primary water stress corrosion cracking	Inservice Inspection (IWB, IWC, and IWD) and Water Chemistry and for nickel alloy, comply with applicable NRC Orders and provide a commitment in the FSAR supplement to implement applicable (1) Bulletins and Generic Letters and (2) staff-accepted industry guidelines.	No, but licensee commitment needs to be confirmed	Consistent with NUREG-1801 with exceptions. The ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, and the Water Chemistry program, B.2.1.2, will be used to manage cracking due to stress corrosion cracking in stainless steel and steel with stainless steel cladding primary side components, steam generator upper and lower heads, and stainless steel tube support plates exposed to reactor coolant and treated water. The ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, the Nickel Alloy Aging Management Program, B.2.2.1, and the Water Chemistry program, B.2.1.2, will be used to manage cracking due to primary water stress corrosion cracking in steel with nickel-alloy cladding steam generator tubesheets. Exceptions apply to the NUREG-1801 recommendations for ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD implementation. See Subsection 3.1.2.2.16.1.

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
3.1.1-36	Nickel alloy, stainless steel pressurizer spray head	Cracking due to stress corrosion cracking and primary water stress corrosion cracking	Water Chemistry and One-Time Inspection and, for nickel alloy welded spray heads, comply with applicable NRC Orders and provide a commitment in the FSAR supplement to implement applicable (1) Bulletins and Generic Letters and (2) staff-accepted industry guidelines.	No, unless licensee commitment needs to be confirmed	Not applicable. See Subsection 3.1.2.2.16.2.
3.1.1-37	Stainless steel and nickel alloy reactor vessel internals components (e.g., Upper internals assembly, RCCA guide tube assemblies, Lower internal assembly, CEA shroud assemblies, Core shroud assembly, Core support shield assembly, Core barrel assembly, Lower grid assembly, Flow distributor assembly)	Cracking due to stress corrosion cracking, primary water stress corrosion cracking, irradiation-assisted stress corrosion cracking	Water Chemistry and FSAR supplement commitment to (1) participate in industry RVI aging programs (2) implement applicable results (3) submit for NRC approval > 24 months before the extended period an RVI inspection plan based on industry recommendation.	No, but licensee commitment needs to be confirmed	The UFSAR Supplement Commitment for PWR Vessel Internals and the Water Chemistry program, B.2.1.2, will be used to manage cracking due to stress corrosion cracking, primary water stress corrosion cracking, irradiation-assisted stress corrosion cracking in stainless steel and nickel alloy reactor vessel internals components exposed to reactor coolant and neutron flux. See Subsection 3.1.2.2.17.
3.1.1-38	BWR Only				
3.1.1-39	BWR 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
3.1.1-40	BWR Only				
3.1.1-41	BWR Only				
3.1.1-42	BWR Only				
3.1.1-43	BWR Only				
3.1.1-44	BWR Only				
3.1.1-45	BWR Only				
3.1.1-46	BWR Only				
3.1.1-47	BWR Only				
3.1.1-48	BWR Only				
3.1.1-49	BWR Only				
3.1.1-50	BWR Only				
3.1.1-51	BWR 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	Steel and stainless steel reactor coolant pressure boundary (RCPB) pump and valve closure bolting, manway and holding bolting, flange 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 thermal effects, gasket creep, and self-loosening	Bolting Integrity	No	Consistent with NUREG-1801. The Bolting Integrity program, B.2.1.7, will be used to manage the loss of preload due to thermal effects, gasket creep, and self-loosening in steel and stainless steel bolting exposed to indoor air or air with borated water leakage in the Fire Protection System, Makeup and Purification System (High Pressure Injection), Radwaste System, Reactor Building Spray System, Reactor Building Sump and Drain System, Reactor Coolant System, Reactor Vessel, and Steam Generator.
3.1.1-53	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	No	Not applicable. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and Reactor Coolant System.
3.1.1-54	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	No	Not applicable. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and 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
3.1.1-55	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 (IWB, IWC, and IWD). 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 program, Subsections IWB, IWC, and IWD, B.2.1.1, will be used to manage the loss of fracture toughness due to thermal aging embrittlement in cast austenitic stainless steel Class 1 pump casings and valve bodies exposed to treated water and reactor coolant in the Decay Heat Removal System and Reactor Coolant System. Exceptions apply to the NUREG-1801 recommendations for ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD.
3.1.1-56	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. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and Reactor Coolant System.
3.1.1-57	Cast austenitic stainless steel Class 1 piping, piping component, and piping elements and control rod drive pressure housings exposed to reactor coolant >250°C (>482°F)	Loss of fracture toughness due to thermal aging embrittlement	Thermal Aging Embrittlement of CASS	No	Not applicable. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and 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
3.1.1-58	Steel reactor coolant pressure boundary external surfaces exposed to air with borated water leakage	Loss of material due to Boric acid corrosion	Boric Acid Corrosion	No	Consistent with NUREG-1801. The Boric Acid Corrosion program, B.2.1.4, will be used to manage the loss of material due to boric acid corrosion on steel reactor coolant pressure boundary external surfaces exposed to air with borated water leakage in the Reactor Coolant System, Reactor Vessel, and Steam Generator.
3.1.1-59	Steel steam generator steam nozzle and safe end, feedwater nozzle and safe end, AFW nozzles and safe ends exposed to secondary feedwater/steam	Wall thinning due to flow-accelerated corrosion	Flow-Accelerated Corrosion	No	Not applicable. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and Reactor Coolant Systems.
3.1.1-60	Stainless steel flux thimble tubes (with or without chrome plating)	Loss of material due to Wear	Flux Thimble Tube Inspection	No	Not applicable. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and Reactor Coolant Systems.
3.1.1-61	Stainless steel, steel pressurizer integral support exposed to air with metal temperature up to 288°C (550°F)	Cracking due to cyclic loading	Inservice Inspection (IWB, IWC, and IWD)	No	Consistent with NUREG-1801 with exceptions. The ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, will be used to manage cracking due to cyclic loading in the steel pressurizer support exposed to air with borated water leakage in the Reactor Coolant System. Exceptions apply to the NUREG-1801 recommendations for ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD 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
3.1.1-62	Stainless steel, steel with stainless steel cladding reactor coolant system cold leg, hot leg, surge line, and spray line piping and fittings exposed to reactor coolant	Cracking due to cyclic loading	Inservice Inspection (IWB, IWC, and IWD)	No	Consistent with NUREG-1801 with exceptions. The ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, will be used to manage cracking due to cyclic loading in stainless steel, steel with stainless steel cladding reactor coolant system cold leg, hot leg, surge line, and spray line piping and fittings exposed to reactor coolant in the Reactor Coolant System. Exceptions apply to the NUREG-1801 recommendations for ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD implementation.
3.1.1-63	Steel reactor vessel flange, stainless steel and nickel alloy reactor vessel internals exposed to reactor coolant (e.g., upper and lower internals assembly, CEA shroud assembly, core support barrel, upper grid assembly, core support shield assembly, lower grid assembly)	Loss of material due to Wear	Inservice Inspection (IWB, IWC, and IWD)	No	Not applicable. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and Reactor Coolant Systems.

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	Stainless steel and steel with stainless steel or nickel alloy cladding pressurizer components	Cracking due to stress corrosion cracking, primary water stress corrosion cracking	Inservice Inspection (IWB, IWC, and IWD) and Water Chemistry	No	Consistent with NUREG-1801 with exceptions. The ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, and the Water Chemistry program, B.2.1.2, will be used to manage cracking due to stress corrosion cracking in the stainless steel and steel with stainless steel cladding pressurizer components exposed to reactor coolant in the Reactor Coolant System. Exceptions apply to the NUREG-1801 recommendations for ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD implementation.
3.1.1-65	Nickel alloy reactor vessel upper head and control rod drive penetration nozzles, instrument tubes, head vent pipe (top head), and welds	Cracking due to primary water stress corrosion cracking	Inservice Inspection (IWB, IWC, and IWD) and Water Chemistry and Nickel-Alloy Penetration Nozzles Welded to the Upper Reactor Vessel Closure Heads of Pressurized Water Reactors	No	Consistent with NUREG-1801 with exceptions. The ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, the Nickel-Alloy Penetration Nozzles Welded to the Upper Reactor Vessel Closure Heads of Pressurized Water Reactors program, B.2.1.5, and the Water Chemistry program, B.2.1.2, will be used to manage cracking due to primary water stress corrosion cracking in nickel-alloy reactor vessel upper head nozzles exposed to reactor coolant in the Reactor Vessel. Exceptions apply to the NUREG-1801 recommendations for ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD 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
3.1.1-66	Steel steam generator secondary manways and handholds (cover only) exposed to air with leaking secondary-side water and/or steam	Loss of material due to erosion	Inservice Inspection (IWB, IWC, and IWD) for Class 2 components	No	Not applicable. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and Reactor Coolant Systems.
3.1.1-67	Steel with stainless steel or nickel alloy cladding; or stainless steel pressurizer components exposed to reactor coolant	Cracking due to cyclic loading	Inservice Inspection (IWB, IWC, and IWD), and Water Chemistry	No	Not applicable. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and Reactor Coolant Systems.
3.1.1-68	Stainless steel, steel with stainless steel cladding Class 1 piping, fittings, pump casings, valve bodies, nozzles, safe ends, manways, flanges, CRD housing; pressurizer heater sheaths, sleeves, diaphragm plate; pressurizer relief tank components, reactor coolant system cold leg, hot leg, surge line, and spray line piping and fittings	Cracking due to stress corrosion cracking	Inservice Inspection (IWB, IWC, and IWD), and Water Chemistry	No	Consistent with NUREG-1801 with exceptions. The ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, and the Water Chemistry program, B.2.1.2, will be used to manage cracking due to stress corrosion cracking in the stainless steel, steel with stainless steel cladding Class 1 piping, fittings, pump casings, valve bodies, nozzles, manways, flanges, diaphragm plate; reactor coolant system cold leg, hot leg, surge line, and spray line piping and fittings exposed to reactor coolant and treated water in the Core Flooding System, Decay Heat Removal System, Makeup and Purification System (High Pressure Injection), Reactor Coolant System and the Reactor Vessel. Exceptions apply to the NUREG-1801 recommendations for ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD 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
3.1.1-69	Stainless steel, nickel alloy safety injection nozzles, safe ends, and associated welds and buttering exposed to reactor coolant	Cracking due to stress corrosion cracking, primary water stress corrosion cracking	Inservice Inspection (IWB, IWC, and IWD), and Water Chemistry	No	Consistent with NUREG-1801 with exceptions. The ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, and the Water Chemistry program, B.2.1.2, will be used to manage cracking due to stress corrosion cracking, primary water stress corrosion cracking in the stainless steel, nickel alloy, and steel with stainless steel or nickel alloy cladding reactor vessel nozzles, safe ends, and reactor vessel shell exposed to reactor coolant in the Reactor Vessel. Exceptions apply to the NUREG-1801 recommendations for ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD 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
3.1.1-70	Stainless steel; steel with stainless steel cladding Class 1 piping, fittings and branch connections < NPS 4 exposed to reactor coolant	Cracking due to stress corrosion cracking, thermal and mechanical loading	Inservice Inspection (IWB, IWC, and IWD), Water chemistry, and One-Time Inspection of ASME Code Class 1 Small-bore Piping	No	Consistent with NUREG-1801 with exceptions. The ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, and the Water Chemistry program, B.2.1.2, will be used to manage cracking due to stress corrosion cracking in the stainless steel Class 1 piping, fittings, and branch connections < NPS 4 exposed to reactor coolant and treated water in the Core Flooding System, Decay Heat Removal System, Makeup and Purification System (High Pressure Injection), and Reactor Vessel. TMI-1 has experienced an occurrence of cracking of ASME Code Class 1 small-bore piping resulting from thermal and mechanical cyclic loading. Because of this, the periodic examination activities of ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, are credited with aging management of Class 1 small-bore piping in lieu of the NUREG-1801 program XI.M35, “One Time Inspection of ASME Code Class 1 Small-Bore Piping.” Exceptions apply to the NUREG-1801 recommendations for ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD 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
3.1.1-71	High-strength low alloy steel closure head stud assembly exposed to air with reactor coolant leakage	Cracking due to stress corrosion cracking; loss of material due to wear	Reactor Head Closure Studs	No	Consistent with NUREG-1801 with exceptions. The Reactor Head Closure Studs program, B.2.1.3, will be used to manage cracking due to stress corrosion cracking, loss of material due to wear in the high-strength low alloy steel closure head stud assembly exposed to air with borated water leakage in the Reactor Vessel. Exceptions apply to the NUREG-1801 recommendations for Reactor Head Closure Studs program implementation.
3.1.1-72	Nickel alloy steam generator tubes and sleeves exposed to secondary feedwater/ steam	Cracking due to OD stress corrosion cracking and intergranular attack, loss of material due to fretting and wear	Steam Generator Tube Integrity and Water Chemistry	No	Consistent with NUREG-1801. The Steam Generator Tube Integrity program, B.2.1.8, and the Water Chemistry program, B.2.1.2, will be used to manage cracking due to stress corrosion cracking and intergranular attack, loss of material due to fretting and wear in the nickel alloy steam generator tubes exposed to treated water in the Steam Generator.
3.1.1-73	Nickel alloy steam generator tubes, repair sleeves, and tube plugs exposed to reactor coolant	Cracking due to primary water stress corrosion cracking	Steam Generator Tube Integrity and Water Chemistry	No	Consistent with NUREG-1801. The Steam Generator Tube Integrity program, B.2.1.8, and the Water Chemistry program, B.2.1.2, will be used to manage cracking due to stress corrosion cracking in the nickel alloy steam generator tubes exposed to reactor coolant in the Steam Generator.

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
3.1.1-74	Chrome plated steel, stainless steel, nickel alloy steam generator anti-vibration bars exposed to secondary feedwater/ steam	Cracking due to stress corrosion cracking, loss of material due to crevice corrosion and fretting	Steam Generator Tube Integrity and Water Chemistry	No	Not applicable. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and Reactor Coolant Systems.
3.1.1-75	Nickel alloy once-through steam generator tubes exposed to secondary feedwater/ steam	Denting due to corrosion of carbon steel tube support plate	Steam Generator Tube Integrity and Water Chemistry	No	Consistent with NUREG-1801. The Steam Generator Tube Integrity program, B.2.1.8, and the Water Chemistry program, B.2.1.2, will be used to manage denting due to corrosion of carbon steel tubesheet in the nickel alloy steam generator tubes exposed to treated water.
3.1.1-76	Steel steam generator tube support plate, tube bundle wrapper exposed to secondary feedwater/steam	Loss of material due to erosion, general, pitting, and crevice corrosion, ligament cracking due to corrosion	Steam Generator Tube Integrity and Water Chemistry	No	Not applicable. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and Reactor Coolant Systems.
3.1.1-77	Nickel alloy steam generator tubes and sleeves exposed to phosphate chemistry in secondary feedwater/ steam	Loss of material due to wastage and pitting corrosion	Steam Generator Tube Integrity and Water Chemistry	No	Not applicable. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and Reactor Coolant Systems.
3.1.1-78	Steel steam generator tube support lattice bars exposed to secondary feedwater/ steam	Wall thinning due to flow-accelerated corrosion	Steam Generator Tube Integrity and Water Chemistry	No	Not applicable. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and Reactor Coolant Systems.

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
3.1.1-79	Nickel alloy steam generator tubes exposed to secondary feedwater/ steam	Denting due to corrosion of steel tube support plate	Steam Generator Tube Integrity; Water Chemistry and, for plants that could experience denting at the upper support plates, evaluate potential for rapidly propagating cracks and then develop and take corrective actions consistent with Bulletin 88-02.	No	Not applicable. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and Reactor Coolant Systems.
3.1.1-80	Cast austenitic stainless steel reactor vessel internals (e.g., upper internals assembly, lower internal assembly, CEA shroud assemblies, control rod guide tube assembly, core support shield assembly, lower grid assembly)	Loss of fracture toughness due to thermal aging and neutron irradiation embrittlement	Thermal Aging and Neutron Irradiation Embrittlement of CASS	No	The UFSAR Supplement Commitment for PWR Vessel Internals has been substituted and will be used to manage loss of fracture toughness due to thermal aging and neutron irradiation embrittlement of cast austentic stainless steel reactor vessel internals exposed to reactor coolant and neutron flux.
3.1.1-81	Nickel alloy or nickel-alloy clad steam generator divider plate exposed to reactor coolant	Cracking due to primary water stress corrosion cracking	Water Chemistry	No	Not applicable. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and Reactor Coolant Systems.
3.1.1-82	Stainless steel steam generator primary side divider plate exposed to reactor coolant	Cracking due to stress corrosion cracking	Water Chemistry	No	Not applicable. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and Reactor Coolant Systems.

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
3.1.1-83	Stainless steel; steel with nickel-alloy or stainless steel cladding; and nickel-alloy reactor vessel internals and reactor coolant pressure boundary components exposed to reactor coolant	Loss of material due to pitting and crevice corrosion	Water Chemistry	No	Consistent with NUREG-1801. The Water Chemistry program, B.2.1.2, will be used to manage loss of material due to pitting and crevice corrosion in stainless steel, steel with nickel-alloy or stainless steel cladding, and nickel-alloy reactor vessel internals and reactor coolant pressure boundary components exposed to reactor coolant, reactor coolant and neutron flux, and treated water in the Reactor Coolant System, Reactor Vessel, Reactor Vessel Internals, and Steam Generator.

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
3.1.1-84	Nickel alloy steam generator components such as, secondary side nozzles (vent, drain, and instrumentation) exposed to secondary feedwater/ steam	Cracking due to stress corrosion cracking	Water Chemistry and One-Time Inspection or Inservice Inspection (IWB, IWC, and IWD).	No	Consistent with NUREG-1801 with exceptions. The ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD, B.2.1.1, and the Water Chemistry program, B.2.1.2, will be used to manage cracking due to stress corrosion cracking in the Main Feedwater and Emergency Feedwater nickel alloy steam generator nozzles attached to the Steam Generator. The One-Time Inspection Program, B.2.1.18, will be used to verify the effectiveness of the Water Chemistry program, B.2.1.2, to manage cracking due to stress corrosion cracking in the nickel alloy components in the Emergency Feedwater System and Feedwater System. The Steam Generator Tube Integrity program, B.2.1.8, has been substituted and the Water Chemistry program, B.2.1.2, will be used to manage cracking due to stress corrosion cracking in the nickel alloy components in the Steam Generator. Exceptions apply to the NUREG-1801 recommendations for ASME Section XI Inservice Inspection program, Subsections IWB, IWC, and IWD implementation and the One-Time Inspection program implementation.
3.1.1-85	Nickel alloy piping, piping components, and piping elements exposed to air – indoor uncontrolled (external)	None	None	NA - No AEM or AMP	Not applicable. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and Reactor Coolant Systems.

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
3.1.1-86	Stainless steel piping, piping components, and piping elements exposed to air – indoor uncontrolled (External); air with borated water leakage; concrete; gas	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.
3.1.1-87	Steel piping, piping components, and piping elements in concrete	None	None	NA - No AEM or AMP	Not applicable. This component, material, environment, and aging effect/mechanism does not apply to Reactor Vessel, Internals, and Reactor Coolant Systems.

Table 3.1.2-1
Reactor Coolant System
Summary of Aging Management Evaluation

Table 3.1.2-1 Reactor Coolant System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-10	3.1.1-7	A, 4
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-2	3.2.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	V.E-4	3.2.1-23	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	IV.C2-8	3.1.1-52	A
Bolting	Mechanical Closure	Stainless Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	IV.C2-8	3.1.1-52	A
Class 1 piping, fittings and branch connections < NPS 4"	Direct Flow (Thermal Sleeve)	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-2	3.1.1-68	B
Class 1 piping, fittings and branch connections < NPS 4"	Direct Flow (Thermal Sleeve)	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-2	3.1.1-68	A

Table 3.1.2-1 Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Class 1 piping, fittings and branch connections < NPS 4"	Direct Flow (Thermal Sleeve)	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Class 1 piping, fittings and branch connections < NPS 4"	Direct Flow (Thermal Sleeve)	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.C2-9	3.1.1-58	A
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 2
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-2	3.1.1-68	B
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-2	3.1.1-68	A
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A

Table 3.1.2-1 Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Nickel Alloy	Air with Borated Water Leakage (External)	None	None			G, 3
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-13	3.1.1-31	B
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Nickel Alloy Aging Management Program (B.2.2.1)	IV.C2-13	3.1.1-31	A, 1
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-13	3.1.1-31	A
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Nickel Alloy	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A

Table 3.1.2-1 Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Cyclic Loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-26	3.1.1-62	B
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-2	3.1.1-68	B
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-2	3.1.1-68	A
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Flow Venturi	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.C2-9	3.1.1-58	A

Table 3.1.2-1 Reactor Coolant 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 Venturi	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 2
Flow Venturi	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-13	3.1.1-31	B
Flow Venturi	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Nickel Alloy Aging Management Program (B.2.2.1)	IV.C2-13	3.1.1-31	A, 1
Flow Venturi	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-13	3.1.1-31	A
Flow Venturi	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Flow Venturi	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Flow Venturi	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.C2-9	3.1.1-58	A
Flow Venturi	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 2
Flow Venturi	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-2	3.1.1-68	B

Table 3.1.2-1 Reactor Coolant 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 Venturi	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-2	3.1.1-68	A
Flow Venturi	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Flow Venturi	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Flow Venturi	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Flow Venturi	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-2	3.1.1-68	B
Flow Venturi	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-2	3.1.1-68	A
Flow Venturi	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Flow Venturi	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Flow Venturi	Throttle	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-13	3.1.1-31	B
Flow Venturi	Throttle	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Nickel Alloy Aging Management Program (B.2.2.1)	IV.C2-13	3.1.1-31	A, 1

Table 3.1.2-1 Reactor Coolant 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 Venturi	Throttle	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-13	3.1.1-31	A
Flow Venturi	Throttle	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Flow Venturi	Throttle	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Flow Venturi	Throttle	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-2	3.1.1-68	B
Flow Venturi	Throttle	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-2	3.1.1-68	A
Flow Venturi	Throttle	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Flow Venturi	Throttle	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Flow Venturi	Throttle	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-2	3.1.1-68	B
Flow Venturi	Throttle	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-2	3.1.1-68	A

Table 3.1.2-1 Reactor Coolant 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 Venturi	Throttle	Stainless Steel	Treated Water (Internal) > 140 F	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Flow Venturi	Throttle	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Hoses	Leakage Boundary	Rubber	Air with Borated Water Leakage (External)	Hardening and Loss of Strength/Elastomer Degradation	External Surfaces Monitoring (B.2.1.21)	VII.F1-7	3.3.1-11	E, 6
Hoses	Leakage Boundary	Rubber	Lubricating Oil (Internal)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Piping and fittings	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.C2-9	3.1.1-58	A
Piping and fittings	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 2
Piping and fittings	Leakage Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Piping and fittings	Leakage Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Piping and fittings	Leakage Boundary	Lexan	Air with Borated Water Leakage (External)	None	None			F, 5
Piping and fittings	Leakage Boundary	Lexan	Lubricating Oil (Internal)	None	None			F, 5
Piping and fittings	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A

Table 3.1.2-1 Reactor Coolant 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	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.C1-14	3.3.1-33	B
Piping and fittings	Leakage Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.C1-14	3.3.1-33	B
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Piping and fittings	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-2	3.1.1-68	B
Piping and fittings	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-2	3.1.1-68	A
Piping and fittings	Pressure Boundary	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Pressurizer	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.C2-9	3.1.1-58	A
Pressurizer	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 2
Pressurizer	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-19	3.1.1-64	B
Pressurizer	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-19	3.1.1-64	A

Table 3.1.2-1 Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pressurizer	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Pressurizer	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Pressurizer	Pressure Boundary	Low Alloy Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.C2-9	3.1.1-58	A
Pressurizer	Pressure Boundary	Low Alloy Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 2
Pressurizer (Integral Support)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Cracking/Cyclic Loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-16	3.1.1-61	B
Pressurizer (Integral Support)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Cumulative Fatigue Damage/Fatigue	TLAA	IV.A2-20	3.1.1-1	C
Pressurizer (Integral Support)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.C2-9	3.1.1-58	A
Pressurizer (Integral Support)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 2
Pressurizer (Surge Diffuser)	Direct Flow	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-19	3.1.1-64	B
Pressurizer (Surge Diffuser)	Direct Flow	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-19	3.1.1-64	A
Pressurizer (Surge Diffuser)	Direct Flow	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A

Table 3.1.2-1 Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.C2-9	3.1.1-58	A
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 2
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-19	3.1.1-64	B
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-19	3.1.1-64	A

Table 3.1.2-1 Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.C2-9	3.1.1-58	A
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 2
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-20	3.1.1-68	B

Table 3.1.2-1 Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-20	3.1.1-68	A
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges	Pressure Boundary	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges. (Heater Bundle Diaphragm & Instrumentation Nozzle Safe Ends)	Pressure Boundary	Nickel Alloy	Air with Borated Water Leakage (External)	None	None			G, 3

Table 3.1.2-1 Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges. (Heater Bundle Diaphragm & Instrumentation Nozzle Safe Ends)	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-21	3.1.1-31	B
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges. (Heater Bundle Diaphragm & Instrumentation Nozzle Safe Ends)	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Nickel Alloy Aging Management Program (B.2.2.1)	IV.C2-21	3.1.1-31	A, 1

Table 3.1.2-1 Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges. (Heater Bundle Diaphragm & Instrumentation Nozzle Safe Ends)	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-21	3.1.1-31	A
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges. (Heater Bundle Diaphragm & Instrumentation Nozzle Safe Ends)	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A

Table 3.1.2-1 Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges. (Heater Bundle Diaphragm & Instrumentation Nozzle Safe Ends)	Pressure Boundary	Nickel Alloy	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges. (Heater Sleeve)	Pressure Boundary	Nickel Alloy	Air with Borated Water Leakage (External)	None	None			G, 3
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges. (Heater Sleeve)	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-21	3.1.1-31	B

Table 3.1.2-1 Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges. (Heater Sleeve)	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Nickel Alloy Aging Management Program (B.2.2.1)	IV.C2-21	3.1.1-31	A, 1
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges. (Heater Sleeve)	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-21	3.1.1-31	A
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges. (Heater Sleeve)	Pressure Boundary	Nickel Alloy	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A

Table 3.1.2-1 Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges. (Lower Heater Bundle Diaphragm)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges. (Lower Heater Bundle Diaphragm)	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-20	3.1.1-68	B
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges. (Lower Heater Bundle Diaphragm)	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-20	3.1.1-68	A

Table 3.1.2-1 Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges. (Lower Heater Bundle Diaphragm)	Pressure Boundary	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Pressurizer instrumentation penetrations, heater sheaths and sleeves, heater bundle diaphragm plate, and manways and flanges. (Lower Heater Bundle Diaphragm)	Pressure Boundary	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Pressurizer surge and steam space nozzles, and welds	Direct Flow (Thermal Sleeve)	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-19	3.1.1-64	B
Pressurizer surge and steam space nozzles, and welds	Direct Flow (Thermal Sleeve)	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-19	3.1.1-64	A
Pressurizer surge and steam space nozzles, and welds	Direct Flow (Thermal Sleeve)	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A

Table 3.1.2-1 Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pressurizer surge and steam space nozzles, and welds	Direct Flow (Thermal Sleeve)	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Pressurizer surge and steam space nozzles, and welds	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.C2-9	3.1.1-58	A
Pressurizer surge and steam space nozzles, and welds	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 2
Pressurizer surge and steam space nozzles, and welds	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-19	3.1.1-64	B
Pressurizer surge and steam space nozzles, and welds	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-19	3.1.1-64	A
Pressurizer surge and steam space nozzles, and welds	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Pressurizer surge and steam space nozzles, and welds	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Pressurizer surge and steam space nozzles, and welds	Pressure Boundary	Nickel Alloy	Air with Borated Water Leakage (External)	None	None			G, 3
Pressurizer surge and steam space nozzles, and welds	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-24	3.1.1-31	B

Table 3.1.2-1 Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pressurizer surge and steam space nozzles, and welds	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Nickel Alloy Aging Management Program (B.2.2.1)	IV.C2-24	3.1.1-31	A, 1
Pressurizer surge and steam space nozzles, and welds	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-24	3.1.1-31	A
Pressurizer surge and steam space nozzles, and welds	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Pressurizer surge and steam space nozzles, and welds	Pressure Boundary	Nickel Alloy	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Pressurizer surge and steam space nozzles, and welds	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Pressurizer surge and steam space nozzles, and welds	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-19	3.1.1-64	B
Pressurizer surge and steam space nozzles, and welds	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-19	3.1.1-64	A
Pressurizer surge and steam space nozzles, and welds	Pressure Boundary	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Pressurizer surge and steam space nozzles, and welds	Pressure Boundary	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A

Table 3.1.2-1 Reactor Coolant 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 (RCP Backstop Lube Oil Pump)	Leakage Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.C2-9	3.1.1-58	A
Pump Casing (RCP Backstop Lube Oil Pump)	Leakage Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 2
Pump Casing (RCP Backstop Lube Oil Pump)	Leakage Boundary	Gray Cast Iron	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.H2-5	3.3.1-21	I, 7
Pump Casing (RCP Backstop Lube Oil Pump)	Leakage Boundary	Gray Cast Iron	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.H2-5	3.3.1-21	I, 7
Pump Casing (Reactor Coolant Pump)	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Pump Casing (Reactor Coolant Pump)	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-5	3.1.1-68	B
Pump Casing (Reactor Coolant Pump)	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-5	3.1.1-68	A
Pump Casing (Reactor Coolant Pump)	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant	Loss of Fracture Toughness/Thermal Aging Embrittlement	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-6	3.1.1-55	B
Pump Casing (Reactor Coolant Pump)	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A

Table 3.1.2-1 Reactor Coolant 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 (Reactor Coolant Pump)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.C2-9	3.1.1-58	A
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 2
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Cyclic Loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-26	3.1.1-62	B
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-27	3.1.1-68	B
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-27	3.1.1-68	A
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Nickel Alloy	Air with Borated Water Leakage (External)	None	None			G, 3

Table 3.1.2-1 Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-13	3.1.1-31	B
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Nickel Alloy Aging Management Program (B.2.2.1)	IV.C2-13	3.1.1-31	A, 1
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-13	3.1.1-31	A
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Nickel Alloy	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Cyclic Loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-26	3.1.1-62	B
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-27	3.1.1-68	B
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-27	3.1.1-68	A

Table 3.1.2-1 Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Reactor Coolant Pressure Boundary Components	Pressure Boundary	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-2	3.1.1-68	B
Restricting Orifices	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-2	3.1.1-68	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Restricting Orifices	Throttle	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Restricting Orifices	Throttle	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-2	3.1.1-68	B
Restricting Orifices	Throttle	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-2	3.1.1-68	A
Restricting Orifices	Throttle	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Tanks (RCP Lube Oil Fill Tanks)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Tanks (RCP Lube Oil Fill Tanks)	Leakage Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.C1-14	3.3.1-33	B

Table 3.1.2-1 Reactor Coolant 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 (RCP Lube Oil Fill Tanks)	Leakage Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.C1-14	3.3.1-33	B
Thermowell	Pressure Boundary	Nickel Alloy	Air with Borated Water Leakage (External)	None	None			G, 3
Thermowell	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-21	3.1.1-31	B
Thermowell	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Nickel Alloy Aging Management Program (B.2.2.1)	IV.C2-21	3.1.1-31	A, 1
Thermowell	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-21	3.1.1-31	A
Thermowell	Pressure Boundary	Nickel Alloy	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Thermowell	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-27	3.1.1-68	B
Thermowell	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-27	3.1.1-68	A
Thermowell	Pressure Boundary	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Valve Body	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.C2-9	3.1.1-58	A
Valve Body	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 2
Valve Body	Leakage Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.H2-5	3.3.1-21	I, 7

Table 3.1.2-1 Reactor Coolant 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 Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.H2-5	3.3.1-21	I, 7
Valve Body	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Valve Body	Leakage Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.C1-14	3.3.1-33	B
Valve Body	Leakage Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.C1-14	3.3.1-33	B
Valve Body	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Valve Body	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-5	3.1.1-68	B
Valve Body	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-5	3.1.1-68	A
Valve Body	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant	Loss of Fracture Toughness/Thermal Aging Embrittlement	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-6	3.1.1-55	B
Valve Body	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A

Table 3.1.2-1 Reactor Coolant 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 Austenitic Stainless Steel (CASS)	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-5	3.1.1-68	B
Valve Body	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-5	3.1.1-68	A
Valve Body	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Valve Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Valve Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Valve Body	Pressure Boundary	Stainless Steel	Air/Gas - Dry (Internal)	None	None	V.F-15	3.2.1-56	A
Valve Body	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-5	3.1.1-68	B
Valve Body	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-5	3.1.1-68	A
Valve Body	Pressure Boundary	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	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. NUREG-1801 specifies a plant-specific program. The Nickel Alloy Aging Management program is used to manage the aging effects applicable to this component type, material and environment combination. The Nickel Alloy Aging Management program will include a commitment in the UFSAR to comply with applicable NRC Orders and to implement applicable (1) Bulletins and Generic Letters and (2) staff-accepted industry guidelines. Components include the Pressurizer thermowell, Hot Leg Vent Nozzle Safe End, RTE Mounting Boss, Pressurizer Heater Sleeve, Pressurizer Heater Bundle Diaphragm, Pressurizer Level Sensing and Sampling Nozzle Safe Ends, Pressurizer Spray Nozzle Pin, High Pressure Injection Nozzle Safe End, Surge Line Drain Nozzle Safe End, Flowmeter Nozzle Safe End, Drain Line Safe End, Pressure Tap Nozzle Safe End, Surge Line Nozzle Weld, Pressurizer Surge Nozzle to Surge Line Weld Overlay, PZR Spray Nozzle Safe End, Pressurizer Vent Nozzle and Safe End, Hot Leg RC14AFE, RC14BFE claddding.
2. The aging effects/mechanisms of carbon and low alloy steel in an air with borated water leakage environment include loss of material due to general, pitting, and crevice corrosion. These aging effects/mechanisms are managed by the External Surfaces Monitoring Program.
3. Nickel alloy in an air with borated water leakage environment has no aging effects.

4. The bolting included in the RCS that has design fatigue calculations has an aging effect of Cumulative Fatigue Damage. The GALL item that matches, IV.C2-10, has a different environment, however the selection criteria of the aging effect and Aging Management program (TLAA) results in the same aging effect and Aging Management Program as the GALL line item selected.
5. There are no aging effects/mechanisms for polymer materials in an Air with Borated Water Leakage environment and Lubricating Oil. NUREG-1801 has no listing for polymer piping components.
6. NUREG-1801 specifies a plant specific program for this material, environment and aging effect/mechanism. The External Surfaces Monitoring Program will be used to manage this aging effect.
7. Fouling is not predicted for this combination. The Lubricating Oil Analysis and One-Time Inspection Programs are used to manage the aging effects.

Table 3.1.2-2
Reactor Vessel
Summary of Aging Management Evaluation

Table 3.1.2-2 Reactor Vessel

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-10	3.1.1-7	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-2	3.2.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	V.E-4	3.2.1-23	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	IV.C2-8	3.1.1-52	A
Bolting	Mechanical Closure	High Strength Low Alloy Steel Bolting with Yield Strength of 150 ksi or Greater	Air with Borated Water Leakage (External)	Cracking/Stress Corrosion Cracking	Reactor Head Closure Studs (B.2.1.3)	IV.A2-2	3.1.1-71	B
Bolting	Mechanical Closure	High Strength Low Alloy Steel Bolting with Yield Strength of 150 ksi or Greater	Air with Borated Water Leakage (External)	Cumulative Fatigue Damage/Fatigue	TLAA	IV.A2-4	3.1.1-7	A

Table 3.1.2-2 Reactor Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	High Strength Low Alloy Steel Bolting with Yield Strength of 150 ksi or Greater	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-2	3.2.1-45	A
Bolting	Mechanical Closure	High Strength Low Alloy Steel Bolting with Yield Strength of 150 ksi or Greater	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Reactor Head Closure Studs (B.2.1.3)	V.E-4	3.2.1-23	E, 3
Bolting	Mechanical Closure	High Strength Low Alloy Steel Bolting with Yield Strength of 150 ksi or Greater	Air with Borated Water Leakage (External)	Loss of Material/Wear	Reactor Head Closure Studs (B.2.1.3)	IV.A2-3	3.1.1-71	B
Bolting	Mechanical Closure	Stainless Steel Bolting	Air with Borated Water Leakage (External)	Cumulative Fatigue Damage/Fatigue	TLAA	IV.A2-21	3.1.1-9	C
Bolting	Mechanical Closure	Stainless Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	IV.C2-8	3.1.1-52	A
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Thermal and Mechanical Loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-1	3.1.1-70	E, 4

Table 3.1.2-2 Reactor Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Thermal and Mechanical Loading	Water Chemistry (B.2.1.2)	IV.C2-1	3.1.1-70	E, 4
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.C2-25	3.1.1-8	A
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Equipment supports and foundations (Control Rod Drive Service Structure)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Cumulative Fatigue Damage/Fatigue	TLAA	IV.A2-20	3.1.1-1	C
Equipment supports and foundations (Control Rod Drive Service Structure)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.A2-13	3.1.1-58	A
Equipment supports and foundations (Control Rod Drive Service Structure)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Flow Venturi	Throttle	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	V.D1-31	3.2.1-48	C

Table 3.1.2-2 Reactor Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow Venturi	Throttle	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.A2-21	3.1.1-9	C
Flow Venturi	Throttle	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.A2-14	3.1.1-83	C
Nozzle	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.A2-13	3.1.1-58	C
Nozzle	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Nozzle	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.A2-15	3.1.1-69	D
Nozzle	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.A2-15	3.1.1-69	C
Nozzle	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.A2-21	3.1.1-9	A
Nozzle	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.A2-14	3.1.1-83	A
Nozzle	Pressure Boundary	Nickel Alloy	Air with Borated Water Leakage (External)	None	None			G, 6
Nozzle	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.A2-18	3.1.1-65	B

Table 3.1.2-2 Reactor 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	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.A2-19	3.1.1-31	B
Nozzle	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Nickel Alloy Aging Management Program (B.2.2.1)	IV.A2-19	3.1.1-31	A, 2
Nozzle	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Nickel-Alloy Penetration Nozzles Welded to the Upper Reactor Vessel Closure Heads of Pressurized Water Reactors (B.2.1.5)	IV.A2-18	3.1.1-65	A
Nozzle	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.A2-18	3.1.1-65	A
Nozzle	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.A2-19	3.1.1-31	A
Nozzle	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.A2-21	3.1.1-9	A
Nozzle	Pressure Boundary	Nickel Alloy	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.A2-14	3.1.1-83	A
Nozzle	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Nozzle	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.A2-11	3.1.1-34	D
Nozzle	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.A2-11	3.1.1-34	C
Nozzle	Pressure Boundary	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.A2-21	3.1.1-9	A
Nozzle	Pressure Boundary	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.A2-14	3.1.1-83	A

Table 3.1.2-2 Reactor 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 and Welds	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.A2-15	3.1.1-69	B
Nozzle Safe Ends and Welds	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.A2-15	3.1.1-69	A
Nozzle Safe Ends and Welds	Pressure Boundary	Nickel Alloy	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.A2-14	3.1.1-83	A
Nozzle Safe Ends and Welds	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Nozzle Safe Ends and Welds	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.A2-15	3.1.1-69	B
Nozzle Safe Ends and Welds	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.A2-15	3.1.1-69	A
Nozzle Safe Ends and Welds	Pressure Boundary	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.A2-21	3.1.1-9	A
Nozzle Safe Ends and Welds	Pressure Boundary	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.A2-14	3.1.1-83	A
Pressure housings	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.A2-13	3.1.1-58	C
Pressure housings	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Pressure housings	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.A2-11	3.1.1-34	B

Table 3.1.2-2 Reactor Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pressure housings	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Nickel Alloy Aging Management Program (B.2.2.1)	IV.A2-11	3.1.1-34	A, 2
Pressure housings	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.A2-11	3.1.1-34	A
Pressure housings	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.A2-21	3.1.1-9	A
Pressure housings	Pressure Boundary	Carbon or Low Alloy Steel with Nickel Alloy Cladding	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.A2-14	3.1.1-83	A
Pressure housings	Pressure Boundary	Nickel Alloy	Air with Borated Water Leakage (External)	None	None			G, 6
Pressure housings	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.A2-11	3.1.1-34	B
Pressure housings	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Nickel Alloy Aging Management Program (B.2.2.1)	IV.A2-11	3.1.1-34	A, 2
Pressure housings	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.A2-11	3.1.1-34	A
Pressure housings	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.A2-21	3.1.1-9	A
Pressure housings	Pressure Boundary	Nickel Alloy	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.A2-14	3.1.1-83	A
Pressure housings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	C

Table 3.1.2-2 Reactor Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pressure housings	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.A2-11	3.1.1-34	B
Pressure housings	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.A2-11	3.1.1-34	A
Pressure housings	Pressure Boundary	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.A2-21	3.1.1-9	A
Pressure housings	Pressure Boundary	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.A2-14	3.1.1-83	A
Reactor Vessel (Closure Head)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.A2-13	3.1.1-58	C
Reactor Vessel (Closure Head)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Reactor Vessel (Closure Head)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.A2-15	3.1.1-69	D
Reactor Vessel (Closure Head)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.A2-15	3.1.1-69	C
Reactor Vessel (Closure Head)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.A2-21	3.1.1-9	A
Reactor Vessel (Closure Head)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.A2-14	3.1.1-83	A

Table 3.1.2-2 Reactor Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Reactor Vessel (Shell and Lower Head)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.A2-13	3.1.1-58	C
Reactor Vessel (Shell and Lower Head)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Reactor Vessel (Shell and Lower Head)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.A2-15	3.1.1-69	D
Reactor Vessel (Shell and Lower Head)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.A2-15	3.1.1-69	C
Reactor Vessel (Shell and Lower Head)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.A2-21	3.1.1-9	A
Reactor Vessel (Shell and Lower Head)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement	Reactor Vessel Surveillance (B.2.1.17)	IV.A2-24	3.1.1-18	A
Reactor Vessel (Shell and Lower Head)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement	TLAA	IV.A2-23	3.1.1-17	A
Reactor Vessel (Shell and Lower Head)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.A2-14	3.1.1-83	A
Reactor Vessel (Support Skirt and attachment welds)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Cumulative Fatigue Damage/Fatigue	TLAA	IV.A2-20	3.1.1-1	A

Table 3.1.2-2 Reactor Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Reactor Vessel (Support Skirt and attachment welds)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.A2-13	3.1.1-58	C
Reactor Vessel (Support Skirt and attachment welds)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Reactor Vessel (Upper Shell Flange, Nozzle Shell Course)	Pressure Boundary	SA508, Class 2 forgings clad with Stainless Steel using a high heat input welding process	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.A2-13	3.1.1-58	C
Reactor Vessel (Upper Shell Flange, Nozzle Shell Course)	Pressure Boundary	SA508, Class 2 forgings clad with Stainless Steel using a high heat input welding process	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Reactor Vessel (Upper Shell Flange, Nozzle Shell Course)	Pressure Boundary	SA508, Class 2 forgings clad with Stainless Steel using a high heat input welding process	Reactor Coolant	Crack Growth/Cyclic Loading	TLAA	IV.A2-22	3.1.1-21	A
Reactor Vessel (Upper Shell Flange, Nozzle Shell Course)	Pressure Boundary	SA508, Class 2 forgings clad with Stainless Steel using a high heat input welding process	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.A2-15	3.1.1-69	D

Table 3.1.2-2 Reactor Vessel (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Reactor Vessel (Upper Shell Flange, Nozzle Shell Course)	Pressure Boundary	SA508, Class 2 forgings clad with Stainless Steel using a high heat input welding process	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.A2-15	3.1.1-69	C
Reactor Vessel (Upper Shell Flange, Nozzle Shell Course)	Pressure Boundary	SA508, Class 2 forgings clad with Stainless Steel using a high heat input welding process	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.A2-21	3.1.1-9	A
Reactor Vessel (Upper Shell Flange, Nozzle Shell Course)	Pressure Boundary	SA508, Class 2 forgings clad with Stainless Steel using a high heat input welding process	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.A2-14	3.1.1-83	A
Valve Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	IV.E-3	3.1.1-86	A
Valve Body	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-5	3.1.1-68	B
Valve Body	Pressure Boundary	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-5	3.1.1-68	A
Valve Body	Pressure Boundary	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	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/mechanism of carbon and low alloy steel in an air with borated water leakage environment include loss of material due to general, pitting, and crevice corrosion. These aging effects/mechanisms are managed by the External Surfaces Monitoring program.
2. NUREG-1801 specifies a plant-specific program. The Nickel Alloy Aging Management program is used to manage the aging effects applicable to this component type, material and environment combination. The Nickel Alloy Aging Management program will include a commitment in the UFSAR to comply with applicable NRC Orders and to implement applicable (1) Bulletins and Generic Letters and (2) staff-accepted industry guidelines.
3. Reactor Head Closure Stud program will be used to manage the aging effect/mechanism of Loss of Material/General, Pitting and Crevice Corrosion.
4. NUREG-1801 program XI.M35, "One-Time inspection of ASME Code Class 1 Small-Bore Piping" does not apply due to previous operating experience with cracking due to thermal and mechanical loading of small-bore piping at TMI-1. The inspection of Code Class 1 small-bore piping for cracking due to stress corrosion cracking and thermal and mechanical loading is performed periodically under the XI.M1, "ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD" aging management program. In accordance with NUREG-1801, the XI.M2 Water Chemistry program

also applies.

5. Nickel alloy in an air with borated water leakage environment has no aging effects.

Table 3.1.2-3
Reactor Vessel Internals
Summary of Aging Management Evaluation

Table 3.1.2-3 Reactor Vessel 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 Assembly	None - Short Lived	N/A	N/A	None	None			2
Control rod guide tube assembly; CRGT pipe and flange	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-3	3.1.1-33	A, 1
Control rod guide tube assembly; CRGT pipe and flange	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-2	3.1.1-30	A, 1
Control rod guide tube assembly; CRGT pipe and flange	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-2	3.1.1-30	A
Control rod guide tube assembly; CRGT pipe and flange	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Control rod guide tube assembly; CRGT pipe and flange	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-46	3.1.1-22	A, 1
Control rod guide tube assembly; CRGT pipe and flange	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A

Table 3.1.2-3 Reactor Vessel 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 guide tube assembly; CRGT rod guide sectors	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-3	3.1.1-33	A, 1
Control rod guide tube assembly; CRGT rod guide sectors	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-2	3.1.1-30	A, 1
Control rod guide tube assembly; CRGT rod guide sectors	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-2	3.1.1-30	A
Control rod guide tube assembly; CRGT rod guide sectors	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Control rod guide tube assembly; CRGT rod guide sectors	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-46	3.1.1-22	A, 1
Control rod guide tube assembly; CRGT rod guide sectors	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Control rod guide tube assembly; CRGT rod guide tubes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-3	3.1.1-33	A, 1
Control rod guide tube assembly; CRGT rod guide tubes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-2	3.1.1-30	A, 1

Table 3.1.2-3 Reactor Vessel 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 guide tube assembly; CRGT rod guide tubes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-2	3.1.1-30	A
Control rod guide tube assembly; CRGT rod guide tubes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Control rod guide tube assembly; CRGT rod guide tubes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-46	3.1.1-22	A, 1
Control rod guide tube assembly; CRGT rod guide tubes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Control rod guide tube assembly; CRGT spacer casting	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-3	3.1.1-33	A, 1
Control rod guide tube assembly; CRGT spacer casting	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-2	3.1.1-30	A, 1
Control rod guide tube assembly; CRGT spacer casting	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-2	3.1.1-30	A
Control rod guide tube assembly; CRGT spacer casting	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A

Table 3.1.2-3 Reactor Vessel 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 guide tube assembly; CRGT spacer casting	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-46	3.1.1-22	A, 1
Control rod guide tube assembly; CRGT spacer casting	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Thermal Aging Embrittlement	See Note 1	IV.B4-4	3.1.1-80	A, 3
Control rod guide tube assembly; CRGT spacer casting	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Control rod guide tube assembly; CRGT spacer screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-3	3.1.1-33	A, 1
Control rod guide tube assembly; CRGT spacer screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-5	3.1.1-30	A, 1
Control rod guide tube assembly; CRGT spacer screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-5	3.1.1-30	A
Control rod guide tube assembly; CRGT spacer screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Control rod guide tube assembly; CRGT spacer screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-1	3.1.1-22	A, 1

Table 3.1.2-3 Reactor Vessel 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 guide tube assembly; CRGT spacer screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Loss of Preload/Stress Relaxation	See Note 1	IV.B4-6	3.1.1-27	A, 1
Control rod guide tube assembly; Flange-to-upper grid screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-3	3.1.1-33	A, 1
Control rod guide tube assembly; Flange-to-upper grid screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-5	3.1.1-30	A, 1
Control rod guide tube assembly; Flange-to-upper grid screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-5	3.1.1-30	A
Control rod guide tube assembly; Flange-to-upper grid screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Control rod guide tube assembly; Flange-to-upper grid screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-1	3.1.1-22	A, 1
Control rod guide tube assembly; Flange-to-upper grid screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Loss of Preload/Stress Relaxation	See Note 1	IV.B4-6	3.1.1-27	A, 1
Core Barrel Assembly; Baffle/former assembly	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-11	3.1.1-33	A, 1

Table 3.1.2-3 Reactor Vessel 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 Barrel Assembly; Baffle/former assembly	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-10	3.1.1-30	A, 1
Core Barrel Assembly; Baffle/former assembly	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-10	3.1.1-30	A
Core Barrel Assembly; Baffle/former assembly	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Core Barrel Assembly; Baffle/former assembly	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-12	3.1.1-22	A, 1
Core Barrel Assembly; Baffle/former assembly	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Core Barrel Assembly; Baffle/former bolts and screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-8	3.1.1-33	A, 1
Core Barrel Assembly; Baffle/former bolts and screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-7	3.1.1-30	A, 1

Table 3.1.2-3 Reactor Vessel 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 Barrel Assembly; Baffle/former bolts and screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-7	3.1.1-30	A
Core Barrel Assembly; Baffle/former bolts and screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Core Barrel Assembly; Baffle/former bolts and screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-12	3.1.1-22	A, 1
Core Barrel Assembly; Baffle/former bolts and screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Loss of Preload/Stress Relaxation	See Note 1	IV.B4-9	3.1.1-27	A, 1
Core Barrel Assembly; Core barrel cylinder (top and bottom flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-17	3.1.1-33	A, 1
Core Barrel Assembly; Core barrel cylinder (top and bottom flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-18	3.1.1-30	A, 1
Core Barrel Assembly; Core barrel cylinder (top and bottom flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-18	3.1.1-30	A

Table 3.1.2-3 Reactor Vessel 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 Barrel Assembly; Core barrel cylinder (top and bottom flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Core Barrel Assembly; Core barrel cylinder (top and bottom flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-16	3.1.1-22	A, 1
Core Barrel Assembly; Core barrel cylinder (top and bottom flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Core Barrel Assembly; Core barrel-to-thermal shield bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-11	3.1.1-33	A, 1
Core Barrel Assembly; Core barrel-to-thermal shield bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-13	3.1.1-37	A, 1
Core Barrel Assembly; Core barrel-to-thermal shield bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-13	3.1.1-37	A
Core Barrel Assembly; Core barrel-to-thermal shield bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A

Table 3.1.2-3 Reactor Vessel 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 Barrel Assembly; Core barrel-to-thermal shield bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-12	3.1.1-22	A, 1
Core Barrel Assembly; Core barrel-to-thermal shield bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Loss of Preload/Stress Relaxation	See Note 1	IV.B4-14	3.1.1-27	A, 1
Core Barrel Assembly; Lower Internals assembly-to-core barrel bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-11	3.1.1-33	A, 1
Core Barrel Assembly; Lower Internals assembly-to-core barrel bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-13	3.1.1-37	A, 1
Core Barrel Assembly; Lower Internals assembly-to-core barrel bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-13	3.1.1-37	A
Core Barrel Assembly; Lower Internals assembly-to-core barrel bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Core Barrel Assembly; Lower Internals assembly-to-core barrel bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-12	3.1.1-22	A, 1

Table 3.1.2-3 Reactor Vessel 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 Barrel Assembly; Lower Internals assembly-to-core barrel bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Loss of Preload/Stress Relaxation	See Note 1	IV.B4-14	3.1.1-27	A, 1
Core support shield assembly; Core support shield cylinder (top and bottom flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-17	3.1.1-33	A, 1
Core support shield assembly; Core support shield cylinder (top and bottom flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-18	3.1.1-30	A, 1
Core support shield assembly; Core support shield cylinder (top and bottom flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-18	3.1.1-30	A
Core support shield assembly; Core support shield cylinder (top and bottom flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Core support shield assembly; Core support shield cylinder (top and bottom flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-16	3.1.1-22	A, 1

Table 3.1.2-3 Reactor Vessel 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 support shield assembly; Core support shield cylinder (top and bottom flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Core support shield assembly; Core support shield cylinder (top flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-17	3.1.1-33	A, 1
Core support shield assembly; Core support shield cylinder (top flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-18	3.1.1-30	A, 1
Core support shield assembly; Core support shield cylinder (top flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-18	3.1.1-30	A
Core support shield assembly; Core support shield cylinder (top flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Core support shield assembly; Core support shield cylinder (top flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-16	3.1.1-22	A, 1
Core support shield assembly; Core support shield cylinder (top flange)	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A

Table 3.1.2-3 Reactor Vessel 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 support shield assembly; Core support shield-to-core barrel bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-17	3.1.1-33	A, 1
Core support shield assembly; Core support shield-to-core barrel bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-20	3.1.1-37	A, 1
Core support shield assembly; Core support shield-to-core barrel bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-20	3.1.1-37	A
Core support shield assembly; Core support shield-to-core barrel bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Core support shield assembly; Core support shield-to-core barrel bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-16	3.1.1-22	A, 1
Core support shield assembly; Core support shield-to-core barrel bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Loss of Preload/Stress Relaxation	See Note 1	IV.B4-19	3.1.1-27	A, 1
Core support shield assembly; Outlet and vent valve nozzles	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-17	3.1.1-33	A, 1

Table 3.1.2-3 Reactor Vessel 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 support shield assembly; Outlet and vent valve nozzles	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-18	3.1.1-30	A, 1
Core support shield assembly; Outlet and vent valve nozzles	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-18	3.1.1-30	A
Core support shield assembly; Outlet and vent valve nozzles	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Core support shield assembly; Outlet and vent valve nozzles	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-16	3.1.1-22	A, 1
Core support shield assembly; Outlet and vent valve nozzles	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Core support shield assembly; Vent valve assembly locking device	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-17	3.1.1-33	A, 1
Core support shield assembly; Vent valve assembly locking device	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-20	3.1.1-37	A, 1

Table 3.1.2-3 Reactor Vessel 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 support shield assembly; Vent valve assembly locking device	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-20	3.1.1-37	A
Core support shield assembly; Vent valve assembly locking device	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Core support shield assembly; Vent valve assembly locking device	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-16	3.1.1-22	A, 1
Core support shield assembly; Vent valve assembly locking device	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Core support shield assembly; Vent valve body	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-17	3.1.1-33	A, 1
Core support shield assembly; Vent valve body	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-18	3.1.1-30	A, 1
Core support shield assembly; Vent valve body	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-18	3.1.1-30	A

Table 3.1.2-3 Reactor Vessel 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 support shield assembly; Vent valve body	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Core support shield assembly; Vent valve body	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-16	3.1.1-22	A, 1
Core support shield assembly; Vent valve body	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Thermal Aging Embrittlement	See Note 1	IV.B4-21	3.1.1-80	A, 3
Core support shield assembly; Vent valve body	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Core support shield assembly; Vent valve retaining ring	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-17	3.1.1-33	A, 1
Core support shield assembly; Vent valve retaining ring	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-18	3.1.1-30	A, 1
Core support shield assembly; Vent valve retaining ring	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-18	3.1.1-30	A
Core support shield assembly; Vent valve retaining ring	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A

Table 3.1.2-3 Reactor Vessel 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 support shield assembly; Vent valve retaining ring	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-16	3.1.1-22	A, 1
Core support shield assembly; Vent valve retaining ring	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Flow distributor assembly; Clamping ring	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-23	3.1.1-33	A, 1
Flow distributor assembly; Clamping ring	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-22	3.1.1-30	A, 1
Flow distributor assembly; Clamping ring	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-22	3.1.1-30	A
Flow distributor assembly; Clamping ring	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Flow distributor assembly; Clamping ring	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-24	3.1.1-22	A, 1
Flow distributor assembly; Clamping ring	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow distributor assembly; Flow distributor head and flange	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-23	3.1.1-33	A, 1
Flow distributor assembly; Flow distributor head and flange	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-22	3.1.1-30	A, 1
Flow distributor assembly; Flow distributor head and flange	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-22	3.1.1-30	A
Flow distributor assembly; Flow distributor head and flange	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Flow distributor assembly; Flow distributor head and flange	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-24	3.1.1-22	A, 1
Flow distributor assembly; Flow distributor head and flange	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Flow distributor assembly; Incore guide support plate	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-23	3.1.1-33	A, 1
Flow distributor assembly; Incore guide support plate	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-22	3.1.1-30	A, 1

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow distributor assembly; Incore guide support plate	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-22	3.1.1-30	A
Flow distributor assembly; Incore guide support plate	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Flow distributor assembly; Incore guide support plate	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-24	3.1.1-22	A, 1
Flow distributor assembly; Incore guide support plate	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Flow distributor assembly; Shell forging-to-flow distributor bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-23	3.1.1-33	A, 1
Flow distributor assembly; Shell forging-to-flow distributor bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-25	3.1.1-37	A, 1
Flow distributor assembly; Shell forging-to-flow distributor bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-25	3.1.1-37	A
Flow distributor assembly; Shell forging-to-flow distributor bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow distributor assembly; Shell forging-to-flow distributor bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-24	3.1.1-22	A, 1
Flow distributor assembly; Shell forging-to-flow distributor bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Loss of Preload/Stress Relaxation	See Note 1	IV.B4-26	3.1.1-27	A, 1
Fuel Assembly	None - Short Lived	N/A	N/A	None	None			2
Lower grid assembly; Fuel assembly support pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-30	3.1.1-33	A, 1
Lower grid assembly; Fuel assembly support pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-29	3.1.1-30	A, 1
Lower grid assembly; Fuel assembly support pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-29	3.1.1-30	A
Lower grid assembly; Fuel assembly support pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Lower grid assembly; Fuel assembly support pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-31	3.1.1-22	A, 1

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Lower grid assembly; Fuel assembly support pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Lower grid assembly; Guide blocks	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-30	3.1.1-33	A, 1
Lower grid assembly; Guide blocks	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-29	3.1.1-30	A, 1
Lower grid assembly; Guide blocks	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-29	3.1.1-30	A
Lower grid assembly; Guide blocks	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Lower grid assembly; Guide blocks	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-31	3.1.1-22	A, 1
Lower grid assembly; Guide blocks	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Lower grid assembly; Guide blocks bolts	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-30	3.1.1-33	A, 1

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Lower grid assembly; Guide blocks bolts	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-32	3.1.1-37	A, 1
Lower grid assembly; Guide blocks bolts	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-32	3.1.1-37	A
Lower grid assembly; Guide blocks bolts	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Lower grid assembly; Guide blocks bolts	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-31	3.1.1-22	A, 1
Lower grid assembly; Guide blocks bolts	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Loss of Preload/Stress Relaxation	See Note 1	IV.B4-33	3.1.1-27	A, 1
Lower grid assembly; Incore guide tube spider castings	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-30	3.1.1-33	A, 1
Lower grid assembly; Incore guide tube spider castings	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-29	3.1.1-30	A, 1

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Lower grid assembly; Incore guide tube spider castings	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-29	3.1.1-30	A
Lower grid assembly; Incore guide tube spider castings	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Lower grid assembly; Incore guide tube spider castings	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-31	3.1.1-22	A, 1
Lower grid assembly; Incore guide tube spider castings	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Thermal Aging Embrittlement	See Note 1	IV.B4-28	3.1.1-80	A, 3
Lower grid assembly; Incore guide tube spider castings	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Lower grid assembly; Lower grid and shell forgings	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-30	3.1.1-33	A, 1
Lower grid assembly; Lower grid and shell forgings	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-29	3.1.1-30	A, 1
Lower grid assembly; Lower grid and shell forgings	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-29	3.1.1-30	A

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Lower grid assembly; Lower grid and shell forgings	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Lower grid assembly; Lower grid and shell forgings	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-31	3.1.1-22	A, 1
Lower grid assembly; Lower grid and shell forgings	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Lower grid assembly; Lower grid flow distributor plate	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-30	3.1.1-33	A, 1
Lower grid assembly; Lower grid flow distributor plate	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-29	3.1.1-30	A, 1
Lower grid assembly; Lower grid flow distributor plate	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-29	3.1.1-30	A
Lower grid assembly; Lower grid flow distributor plate	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Lower grid assembly; Lower grid flow distributor plate	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-31	3.1.1-22	A, 1

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Lower grid assembly; Lower grid flow distributor plate	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Lower grid assembly; Lower grid rib section	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-30	3.1.1-33	A, 1
Lower grid assembly; Lower grid rib section	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-29	3.1.1-30	A, 1
Lower grid assembly; Lower grid rib section	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-29	3.1.1-30	A
Lower grid assembly; Lower grid rib section	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Lower grid assembly; Lower grid rib section	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-31	3.1.1-22	A, 1
Lower grid assembly; Lower grid rib section	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Lower grid assembly; Lower grid rib-to-shell forging screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-30	3.1.1-33	A, 1

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Lower grid assembly; Lower grid rib-to-shell forging screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-32	3.1.1-37	A, 1
Lower grid assembly; Lower grid rib-to-shell forging screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-32	3.1.1-37	A
Lower grid assembly; Lower grid rib-to-shell forging screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Lower grid assembly; Lower grid rib-to-shell forging screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-31	3.1.1-22	A, 1
Lower grid assembly; Lower grid rib-to-shell forging screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant and Neutron Flux	Loss of Preload/Stress Relaxation	See Note 1	IV.B4-33	3.1.1-27	A, 1
Lower grid assembly; Lower internals assembly-to-thermal shield bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-30	3.1.1-33	A, 1
Lower grid assembly; Lower internals assembly-to-thermal shield bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-32	3.1.1-37	A, 1

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Lower grid assembly; Lower internals assembly-to-thermal shield bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-32	3.1.1-37	A
Lower grid assembly; Lower internals assembly-to-thermal shield bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Lower grid assembly; Lower internals assembly-to-thermal shield bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-31	3.1.1-22	A, 1
Lower grid assembly; Lower internals assembly-to-thermal shield bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Loss of Preload/Stress Relaxation	See Note 1	IV.B4-33	3.1.1-27	A, 1
Lower grid assembly; Orifice plugs	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-30	3.1.1-33	A, 1
Lower grid assembly; Orifice plugs	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-29	3.1.1-30	A, 1

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Lower grid assembly; Orifice plugs	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-29	3.1.1-30	A
Lower grid assembly; Orifice plugs	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Lower grid assembly; Orifice plugs	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-31	3.1.1-22	A, 1
Lower grid assembly; Orifice plugs	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Lower grid assembly; Shock pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-30	3.1.1-33	A, 1
Lower grid assembly; Shock pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-29	3.1.1-30	A, 1
Lower grid assembly; Shock pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-29	3.1.1-30	A
Lower grid assembly; Shock pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Lower grid assembly; Shock pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-31	3.1.1-22	A, 1
Lower grid assembly; Shock pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Lower grid assembly; Shock pads bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-30	3.1.1-33	A, 1
Lower grid assembly; Shock pads bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-32	3.1.1-37	A, 1
Lower grid assembly; Shock pads bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-32	3.1.1-37	A
Lower grid assembly; Shock pads bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Lower grid assembly; Shock pads bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-31	3.1.1-22	A, 1
Lower grid assembly; Shock pads bolts	Structural Support to maintain core configuration and flow distribution	Nickel Alloy	Reactor Coolant and Neutron Flux	Loss of Preload/Stress Relaxation	See Note 1	IV.B4-33	3.1.1-27	A, 1

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Lower grid assembly; Support post pipes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-30	3.1.1-33	A, 1
Lower grid assembly; Support post pipes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-29	3.1.1-30	A, 1
Lower grid assembly; Support post pipes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-29	3.1.1-30	A
Lower grid assembly; Support post pipes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Lower grid assembly; Support post pipes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-31	3.1.1-22	A, 1
Lower grid assembly; Support post pipes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Plenum cover and plenum cylinder; Bottom flange-to-upper grid screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-35	3.1.1-33	A, 1

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Plenum cover and plenum cylinder; Bottom flange-to-upper grid screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-36	3.1.1-30	A, 1
Plenum cover and plenum cylinder; Bottom flange-to-upper grid screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-36	3.1.1-30	A
Plenum cover and plenum cylinder; Bottom flange-to-upper grid screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Plenum cover and plenum cylinder; Bottom flange-to-upper grid screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-1	3.1.1-22	A, 1
Plenum cover and plenum cylinder; Bottom flange-to-upper grid screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Loss of Preload/Stress Relaxation	See Note 1	IV.B4-33	3.1.1-27	A, 1
Plenum cover and plenum cylinder; Plenum cover assembly	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-35	3.1.1-33	A, 1
Plenum cover and plenum cylinder; Plenum cover assembly	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-34	3.1.1-30	A, 1

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Plenum cover and plenum cylinder; Plenum cover assembly	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-34	3.1.1-30	A
Plenum cover and plenum cylinder; Plenum cover assembly	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Plenum cover and plenum cylinder; Plenum cover assembly	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-46	3.1.1-22	A, 1
Plenum cover and plenum cylinder; Plenum cover assembly	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Plenum cover and plenum cylinder; Plenum cylinder	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-35	3.1.1-33	A, 1
Plenum cover and plenum cylinder; Plenum cylinder	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-34	3.1.1-30	A, 1
Plenum cover and plenum cylinder; Plenum cylinder	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-34	3.1.1-30	A
Plenum cover and plenum cylinder; Plenum cylinder	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Plenum cover and plenum cylinder; Plenum cylinder	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-46	3.1.1-22	A, 1
Plenum cover and plenum cylinder; Plenum cylinder	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Plenum cover and plenum cylinder; Reinforcing plates	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-35	3.1.1-33	A, 1
Plenum cover and plenum cylinder; Reinforcing plates	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-34	3.1.1-30	A, 1
Plenum cover and plenum cylinder; Reinforcing plates	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-34	3.1.1-30	A
Plenum cover and plenum cylinder; Reinforcing plates	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Plenum cover and plenum cylinder; Reinforcing plates	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-46	3.1.1-22	A, 1
Plenum cover and plenum cylinder; Reinforcing plates	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Plenum cover and plenum cylinder; Rib Pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-35	3.1.1-33	A, 1
Plenum cover and plenum cylinder; Rib Pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-34	3.1.1-30	A, 1
Plenum cover and plenum cylinder; Rib Pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-34	3.1.1-30	A
Plenum cover and plenum cylinder; Rib Pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Plenum cover and plenum cylinder; Rib Pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-46	3.1.1-22	A, 1
Plenum cover and plenum cylinder; Rib Pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Plenum cover and plenum cylinder; Top flange-to-cover bolts	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-35	3.1.1-33	A, 1

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Plenum cover and plenum cylinder; Top flange-to-cover bolts	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-36	3.1.1-30	A, 1
Plenum cover and plenum cylinder; Top flange-to-cover bolts	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-36	3.1.1-30	A
Plenum cover and plenum cylinder; Top flange-to-cover bolts	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Plenum cover and plenum cylinder; Top flange-to-cover bolts	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-46	3.1.1-22	A, 1
Plenum cover and plenum cylinder; Top flange-to-cover bolts	Structural Support to maintain core configuration and flow distribution	Stainless Steel Bolting	Reactor Coolant	Loss of Preload/Stress Relaxation	See Note 1	IV.B4-33	3.1.1-27	A, 1
Reactor Vessel Internals; Incore Guide Tube Gussets	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-30	3.1.1-33	A, 1
Reactor Vessel Internals; Incore Guide Tube Gussets	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-32	3.1.1-37	A, 1

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Reactor Vessel Internals; Incore Guide Tube Gussets	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-32	3.1.1-37	C
Reactor Vessel Internals; Incore Guide Tube Gussets	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Reactor Vessel Internals; Incore Guide Tube Gussets	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-31	3.1.1-22	A, 1
Reactor Vessel Internals; Incore Guide Tube Gussets	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Reactor Vessel Internals; Incore Guide Tube Nuts	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-30	3.1.1-33	A, 1
Reactor Vessel Internals; Incore Guide Tube Nuts	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-32	3.1.1-37	A, 1
Reactor Vessel Internals; Incore Guide Tube Nuts	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-32	3.1.1-37	C
Reactor Vessel Internals; Incore Guide Tube Nuts	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Reactor Vessel Internals; Incore Guide Tube Nuts	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-31	3.1.1-22	A, 1
Reactor Vessel Internals; Incore Guide Tube Nuts	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Reactor Vessel Internals; Incore Guide Tube Spiders	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-30	3.1.1-33	A, 1
Reactor Vessel Internals; Incore Guide Tube Spiders	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-29	3.1.1-30	A, 1
Reactor Vessel Internals; Incore Guide Tube Spiders	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-29	3.1.1-30	A
Reactor Vessel Internals; Incore Guide Tube Spiders	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Reactor Vessel Internals; Incore Guide Tube Spiders	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-46	3.1.1-22	A, 1
Reactor Vessel Internals; Incore Guide Tube Spiders	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant	Loss of Fracture Toughness/Thermal Aging Embrittlement	See Note 1	IV.B4-28	3.1.1-80	A, 3

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Reactor Vessel Internals; Incore Guide Tube Spiders	Structural Support to maintain core configuration and flow distribution	Cast Austenitic Stainless Steel (CASS)	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Reactor Vessel Internals; Incore Guide Tubes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-30	3.1.1-33	A, 1
Reactor Vessel Internals; Incore Guide Tubes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-29	3.1.1-30	A, 1
Reactor Vessel Internals; Incore Guide Tubes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-29	3.1.1-30	C
Reactor Vessel Internals; Incore Guide Tubes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Reactor Vessel Internals; Incore Guide Tubes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-31	3.1.1-22	A, 1
Reactor Vessel Internals; Incore Guide Tubes	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Thermal Shield	Shielding	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-39	3.1.1-33	A, 1

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Thermal Shield	Shielding	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-40	3.1.1-30	A, 1
Thermal Shield	Shielding	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-40	3.1.1-30	A
Thermal Shield	Shielding	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Thermal Shield	Shielding	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-41	3.1.1-22	A, 1
Thermal Shield	Shielding	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Upper grid assembly; Fuel assembly support pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-45	3.1.1-33	A, 1
Upper grid assembly; Fuel assembly support pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-44	3.1.1-30	A, 1
Upper grid assembly; Fuel assembly support pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-44	3.1.1-30	A

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Upper grid assembly; Fuel assembly support pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Upper grid assembly; Fuel assembly support pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-46	3.1.1-22	A, 1
Upper grid assembly; Fuel assembly support pads	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Upper grid assembly; Rib-to-ring screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-45	3.1.1-33	A, 1
Upper grid assembly; Rib-to-ring screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-43	3.1.1-30	A, 1
Upper grid assembly; Rib-to-ring screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-43	3.1.1-30	A
Upper grid assembly; Rib-to-ring screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Upper grid assembly; Rib-to-ring screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-46	3.1.1-22	A, 1

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Upper grid assembly; Rib-to-ring screws	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Upper grid assembly; Upper grid rib section	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-45	3.1.1-33	A, 1
Upper grid assembly; Upper grid rib section	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-44	3.1.1-30	A, 1
Upper grid assembly; Upper grid rib section	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-44	3.1.1-30	A
Upper grid assembly; Upper grid rib section	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Upper grid assembly; Upper grid rib section	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-46	3.1.1-22	A, 1
Upper grid assembly; Upper grid rib section	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	A
Upper grid assembly; Upper grid ring forging	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Changes in Dimensions/Void Swelling	See Note 1	IV.B4-45	3.1.1-33	A, 1

Table 3.1.2-3 Reactor Vessel Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Upper grid assembly; Upper grid ring forging	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	See Note 1	IV.B4-44	3.1.1-30	A, 1
Upper grid assembly; Upper grid ring forging	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cracking/Stress Corrosion Cracking, Irradiation-Assisted Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.B4-44	3.1.1-30	A
Upper grid assembly; Upper grid ring forging	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Cumulative Fatigue Damage/Fatigue	TLAA	IV.B4-37	3.1.1-5	A
Upper grid assembly; Upper grid ring forging	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Fracture Toughness/Neutron Irradiation Embrittlement, Void Swelling	See Note 1	IV.B4-46	3.1.1-22	A, 1
Upper grid assembly; Upper grid ring forging	Structural Support to maintain core configuration and flow distribution	Stainless Steel	Reactor Coolant and Neutron Flux	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.B4-38	3.1.1-83	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. A commitment will be made in the UFSAR supplement to (1) participate in the industry programs for investigating and managing aging effects on reactor internals; (2) evaluate and implement the results of the industry programs as applicable to the reactor internals; and (3) upon completion of these programs, but not less than 24 months before entering the period of extended operation, submit an inspection plan for reactor internals to the NRC for review and approval.
2. Control Rod and Fuel Assemblies are subject to replacement in accordance with the Reload Control Process. As such, they are short-lived components and not subject to aging management.
3. NUREG-1801 specifies the Thermal Aging and Neutron Embrittlement of Cast Austenitic Stainless Steel aging management program to manage Loss of Fracture Toughness/Thermal Aging and Neutron Irradiation Embrittlement. The UFSAR Supplement commitment for Reactor Vessel Internals (see Note 1) will be used to manage Loss of Fracture Toughness/Thermal Aging and Neutron Irradiation Embrittlement for the cast austenitic stainless steel vessel internals.

Table 3.1.2-4
Steam Generator
Summary of Aging Management Evaluation

Table 3.1.2-4 Steam Generator

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Cumulative Fatigue Damage/Fatigue	TLAA	IV.A2-4	3.1.1-7	C
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	IV.D2-6	3.1.1-52	A
Flow Venturi - Steam Outlet Nozzle Flow Restrictor	Throttle	Nickel Alloy	Treated Water (Internal)	Cracking/Stress Corrosion Cracking	Steam Generator Tube Integrity (B.2.1.8)	IV.D2-2	3.1.1-31	E, 3
Flow Venturi - Steam Outlet Nozzle Flow Restrictor	Throttle	Nickel Alloy	Treated Water (Internal)	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.D2-2	3.1.1-31	C
Flow Venturi - Steam Outlet Nozzle Flow Restrictor	Throttle	Nickel Alloy	Treated Water (Internal)	Cumulative Fatigue Damage/Fatigue	TLAA	IV.D2-3	3.1.1-10	C
Flow Venturi - Steam Outlet Nozzle Flow Restrictor	Throttle	Nickel Alloy	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.A2-14	3.1.1-83	C

Table 3.1.2-4 Steam Generator (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Spray Nozzles - Main Feedwater	Direct Flow	Nickel Alloy	Treated Water (External)	Cracking/Stress Corrosion Cracking	Steam Generator Tube Integrity (B.2.1.8)	IV.D2-9	3.1.1-84	E, 3
Spray Nozzles - Main Feedwater	Direct Flow	Nickel Alloy	Treated Water (External)	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.D2-9	3.1.1-84	A
Spray Nozzles - Main Feedwater	Direct Flow	Nickel Alloy	Treated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Spray Nozzles - Main Feedwater	Direct Flow	Nickel Alloy	Treated Water (Internal)	Cracking/Stress Corrosion Cracking	Steam Generator Tube Integrity (B.2.1.8)	IV.D2-9	3.1.1-84	E, 3
Spray Nozzles - Main Feedwater	Direct Flow	Nickel Alloy	Treated Water (Internal)	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.D2-9	3.1.1-84	A
Spray Nozzles - Main Feedwater	Direct Flow	Nickel Alloy	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Steam Generators - EFW Inlet Piping	Pressure Boundary	Nickel Alloy	Treated Water (External)	Cracking/Stress Corrosion Cracking	Steam Generator Tube Integrity (B.2.1.8)	IV.D2-2	3.1.1-31	E, 3
Steam Generators - EFW Inlet Piping	Pressure Boundary	Nickel Alloy	Treated Water (External)	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.D2-2	3.1.1-31	C
Steam Generators - EFW Inlet Piping	Pressure Boundary	Nickel Alloy	Treated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Steam Generators - EFW Inlet Piping	Pressure Boundary	Nickel Alloy	Treated Water (Internal)	Cracking/Stress Corrosion Cracking	Steam Generator Tube Integrity (B.2.1.8)	IV.D2-2	3.1.1-31	E, 2
Steam Generators - EFW Inlet Piping	Pressure Boundary	Nickel Alloy	Treated Water (Internal)	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.D2-2	3.1.1-31	C
Steam Generators - EFW Inlet Piping	Pressure Boundary	Nickel Alloy	Treated Water (Internal)	Cumulative Fatigue Damage/Fatigue	TLAA	IV.D2-15	3.1.1-6	C
Steam Generators - EFW Inlet Piping	Pressure Boundary	Nickel Alloy	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A

Table 3.1.2-4 Steam Generator (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Steam Generators - Intermediate Shell, Lower Shell	Pressure Boundary	Low Alloy Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.D2-1	3.1.1-58	A
Steam Generators - Intermediate Shell, Lower Shell	Pressure Boundary	Low Alloy Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Steam Generators - Intermediate Shell, Lower Shell	Pressure Boundary	Low Alloy Steel	Treated Water (Internal)	Cumulative Fatigue Damage/Fatigue	TLAA	IV.D2-10	3.1.1-7	A
Steam Generators - Intermediate Shell, Lower Shell	Pressure Boundary	Low Alloy Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	IV.D2-8	3.1.1-12	B
Steam Generators - Intermediate Shell, Lower Shell	Pressure Boundary	Low Alloy Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.D2-8	3.1.1-12	A
Steam Generators - Level Sensing and Drain Connections	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.D2-1	3.1.1-58	A
Steam Generators - Level Sensing and Drain Connections	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Steam Generators - Level Sensing and Drain Connections	Pressure Boundary	Carbon Steel	Treated Water (External)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	IV.D2-8	3.1.1-12	D

Table 3.1.2-4 Steam Generator (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Steam Generators - Level Sensing and Drain Connections	Pressure Boundary	Carbon Steel	Treated Water (External)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.D2-8	3.1.1-12	C
Steam Generators - Level Sensing and Drain Connections	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Cumulative Fatigue Damage/Fatigue	TLAA	IV.D2-3	3.1.1-10	C
Steam Generators - Level Sensing and Drain Connections	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	IV.D2-8	3.1.1-12	D
Steam Generators - Level Sensing and Drain Connections	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.D2-8	3.1.1-12	C
Steam Generators - Main Steam Nozzle Safe Ends	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.D2-1	3.1.1-58	A
Steam Generators - Main Steam Nozzle Safe Ends	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Steam Generators - Main Steam Nozzle Safe Ends	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Cumulative Fatigue Damage/Fatigue	TLAA	IV.D2-10	3.1.1-7	A
Steam Generators - Main Steam Nozzle Safe Ends	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	IV.D2-8	3.1.1-12	D

Table 3.1.2-4 Steam Generator (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Steam Generators - Main Steam Nozzle Safe Ends	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.D2-8	3.1.1-12	C
Steam Generators - MFW and EFW Nozzle	Pressure Boundary	Nickel Alloy	Air with Borated Water Leakage (External)	None	None			G, 4
Steam Generators - MFW and EFW Nozzle	Pressure Boundary	Nickel Alloy	Treated Water (Internal)	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.D2-9	3.1.1-84	B
Steam Generators - MFW and EFW Nozzle	Pressure Boundary	Nickel Alloy	Treated Water (Internal)	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.D2-9	3.1.1-84	A
Steam Generators - MFW and EFW Nozzle	Pressure Boundary	Nickel Alloy	Treated Water (Internal)	Cumulative Fatigue Damage/Fatigue	TLAA	IV.D2-15	3.1.1-6	C
Steam Generators - MFW and EFW Nozzle	Pressure Boundary	Nickel Alloy	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Steam Generators - MFW and EFW Nozzle Reducer	Direct Flow	Nickel Alloy	Treated Water (External)	Cracking/Stress Corrosion Cracking	Steam Generator Tube Integrity (B.2.1.8)	IV.D2-9	3.1.1-84	E, 3
Steam Generators - MFW and EFW Nozzle Reducer	Direct Flow	Nickel Alloy	Treated Water (External)	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.D2-9	3.1.1-84	A
Steam Generators - MFW and EFW Nozzle Reducer	Direct Flow	Nickel Alloy	Treated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A

Table 3.1.2-4 Steam Generator (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Steam Generators - MFW and EFW Nozzle Reducer	Direct Flow	Nickel Alloy	Treated Water (Internal)	Cracking/Stress Corrosion Cracking	Steam Generator Tube Integrity (B.2.1.8)	IV.D2-9	3.1.1-84	E, 3
Steam Generators - MFW and EFW Nozzle Reducer	Direct Flow	Nickel Alloy	Treated Water (Internal)	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.D2-9	3.1.1-84	A
Steam Generators - MFW and EFW Nozzle Reducer	Direct Flow	Nickel Alloy	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Steam Generators - Primary Manway Cover, Primary Inspection Port Cover	Pressure Boundary	Low Alloy Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.D2-1	3.1.1-58	A
Steam Generators - Primary Manway Cover, Primary Inspection Port Cover	Pressure Boundary	Low Alloy Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Steam Generators - Primary Manway Cover, Primary Inspection Port Cover	Pressure Boundary	Low Alloy Steel	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.D2-3	3.1.1-10	C
Steam Generators - Primary Manway Cover, Primary Inspection Port Cover	Pressure Boundary	Low Alloy Steel	Reactor Coolant	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	IV.D2-8	3.1.1-12	D

Table 3.1.2-4 Steam Generator (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Steam Generators - Primary Manway Cover, Primary Inspection Port Cover	Pressure Boundary	Low Alloy Steel	Reactor Coolant	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.D2-8	3.1.1-12	C
Steam Generators - Secondary Manway Cover, Secondary Hand Hole Cover	Pressure Boundary	Low Alloy Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.D2-1	3.1.1-58	A
Steam Generators - Secondary Manway Cover, Secondary Hand Hole Cover	Pressure Boundary	Low Alloy Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Steam Generators - Secondary Manway Cover, Secondary Hand Hole Cover	Pressure Boundary	Low Alloy Steel	Treated Water (Internal)	Cumulative Fatigue Damage/Fatigue	TLAA	IV.D2-10	3.1.1-7	C
Steam Generators - Secondary Manway Cover, Secondary Hand Hole Cover	Pressure Boundary	Low Alloy Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	IV.D2-8	3.1.1-12	D
Steam Generators - Secondary Manway Cover, Secondary Hand Hole Cover	Pressure Boundary	Low Alloy Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.D2-8	3.1.1-12	C

Table 3.1.2-4 Steam Generator (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Steam Generators - Tube Support Plate	Structural Support	Stainless Steel	Treated Water (External)	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.D2-4	3.1.1-35	D
Steam Generators - Tube Support Plate	Structural Support	Stainless Steel	Treated Water (External)	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.D2-4	3.1.1-35	C
Steam Generators - Tube Support Plate	Structural Support	Stainless Steel	Treated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	C
Steam Generators - Tubes	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Steam Generator Tube Integrity (B.2.1.8)	IV.D2-14	3.1.1-73	A
Steam Generators - Tubes	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.D2-14	3.1.1-73	A
Steam Generators - Tubes	Pressure Boundary	Nickel Alloy	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.D2-15	3.1.1-6	A
Steam Generators - Tubes	Pressure Boundary	Nickel Alloy	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	C
Steam Generators - Tubes	Pressure Boundary	Nickel Alloy	Treated Water (External)	Cracking/Stress Corrosion Cracking	Steam Generator Tube Integrity (B.2.1.8)	IV.D2-17	3.1.1-72	A
Steam Generators - Tubes	Pressure Boundary	Nickel Alloy	Treated Water (External)	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.D2-17	3.1.1-72	A
Steam Generators - Tubes	Pressure Boundary	Nickel Alloy	Treated Water (External)	Denting/Corrosion of Carbon Steel Tubesheet	Steam Generator Tube Integrity (B.2.1.8)	IV.D2-13	3.1.1-75	A

Table 3.1.2-4 Steam Generator (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Steam Generators - Tubes	Pressure Boundary	Nickel Alloy	Treated Water (External)	Denting/Corrosion of Carbon Steel Tubesheet	Water Chemistry (B.2.1.2)	IV.D2-13	3.1.1-75	A
Steam Generators - Tubes	Pressure Boundary	Nickel Alloy	Treated Water (External)	Loss of Material/Fretting and Wear	Steam Generator Tube Integrity (B.2.1.8)	IV.D2-18	3.1.1-72	A
Steam Generators - Tubes	Pressure Boundary	Nickel Alloy	Treated Water (External)	Loss of Material/Fretting and Wear	Water Chemistry (B.2.1.2)	IV.D2-18	3.1.1-72	A
Steam Generators - Tubes	Pressure Boundary	Nickel Alloy	Treated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	C
Steam Generators - Upper and Lower Head, RCS Inlet Nozzle, RCS Outlet Nozzle	Pressure Boundary	Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.D2-1	3.1.1-58	A
Steam Generators - Upper and Lower Head, RCS Inlet Nozzle, RCS Outlet Nozzle	Pressure Boundary	Low Alloy Steel with Stainless Steel Cladding	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Steam Generators - Upper and Lower Head, RCS Inlet Nozzle, RCS Outlet Nozzle	Pressure Boundary	Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.D2-4	3.1.1-35	B
Steam Generators - Upper and Lower Head, RCS Inlet Nozzle, RCS Outlet Nozzle	Pressure Boundary	Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.D2-4	3.1.1-35	A

Table 3.1.2-4 Steam Generator (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Steam Generators - Upper and Lower Head, RCS Inlet Nozzle, RCS Outlet Nozzle	Pressure Boundary	Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.D2-3	3.1.1-10	A
Steam Generators - Upper and Lower Head, RCS Inlet Nozzle, RCS Outlet Nozzle	Pressure Boundary	Low Alloy Steel with Stainless Steel Cladding	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	C
Steam Generators - Upper and Lower Tubesheets	Pressure Boundary	Low Alloy Steel	Treated Water (External)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	IV.D2-8	3.1.1-12	D
Steam Generators - Upper and Lower Tubesheets	Pressure Boundary	Low Alloy Steel	Treated Water (External)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.D2-8	3.1.1-12	C
Steam Generators - Upper and Lower Tubesheets	Pressure Boundary	Low Alloy Steel with Stainless Steel and Nickel-base Alloy Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.D2-4	3.1.1-35	B
Steam Generators - Upper and Lower Tubesheets	Pressure Boundary	Low Alloy Steel with Stainless Steel and Nickel-base Alloy Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Nickel Alloy Aging Management Program (B.2.2.1)	IV.D2-4	3.1.1-35	A, 2
Steam Generators - Upper and Lower Tubesheets	Pressure Boundary	Low Alloy Steel with Stainless Steel and Nickel-base Alloy Cladding	Reactor Coolant	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.D2-4	3.1.1-35	A

Table 3.1.2-4 Steam Generator (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Steam Generators - Upper and Lower Tubesheets	Pressure Boundary	Low Alloy Steel with Stainless Steel and Nickel-base Alloy Cladding	Reactor Coolant	Cumulative Fatigue Damage/Fatigue	TLAA	IV.D2-3	3.1.1-10	C
Steam Generators - Upper and Lower Tubesheets	Pressure Boundary	Low Alloy Steel with Stainless Steel and Nickel-base Alloy Cladding	Reactor Coolant	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	C
Steam Generators - Upper Shell, Nozzle Shell, Main Steam Nozzle	Pressure Boundary	Low Alloy Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	IV.D2-1	3.1.1-58	A
Steam Generators - Upper Shell, Nozzle Shell, Main Steam Nozzle	Pressure Boundary	Low Alloy Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Steam Generators - Upper Shell, Nozzle Shell, Main Steam Nozzle	Pressure Boundary	Low Alloy Steel	Treated Water (Internal)	Cumulative Fatigue Damage/Fatigue	TLAA	IV.D2-10	3.1.1-7	A
Steam Generators - Upper Shell, Nozzle Shell, Main Steam Nozzle	Pressure Boundary	Low Alloy Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	IV.D2-8	3.1.1-12	B

Table 3.1.2-4 Steam Generator (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Steam Generators - Upper Shell, Nozzle Shell, Main Steam Nozzle	Pressure Boundary	Low Alloy Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.D2-8	3.1.1-12	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/mechanisms of carbon and low alloy steel in an air with borated water leakage environment include loss of material due to general, pitting, and crevice corrosion. These aging effects/mechanisms are managed by the External Surfaces Monitoring Program.
2. NUREG-1801 specifies a plant-specific program. The Nickel Alloy Aging Management Program is used to mange the aging effect(s) applicable to this component type, material, and environment combination. This program will comply with applicable NRC Orders, Bulletins and Generic Letters, and Staff-Accepted Industry Guidelines. The UFSAR supplement will include a commitment to implement the Nickel Alloy Aging Management Program.
3. The Steam Generator Tube Integrity program will be used to manage the aging effects of cracking for the MFW and EFW Nozzle reducers, the MFW spray nozzles, and the EFW piping internal to the steam generator. The Steam Generator Tube Integrity program will also be used to manage the aging effects of cracking for the steam nozzle flow venturis.
4. Nickel alloy in an air with borated water leakage environment has no aging effects.

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.

- Core Flooding System (2.3.2.1)
- Decay Heat Removal System (2.3.2.2)
- Makeup and Purification System (High Pressure Injection) (2.3.2.3)
- Primary Containment Heating and Ventilation System (2.3.2.4)
- Reactor Building Spray System (2.3.2.5)
- Reactor Building Sump and Drain System (2.3.2.6)

3.2.2 RESULTS

The following tables summarize the results of the aging management review for Engineered Safety Features.

Table 3.2.2-1 Summary of Aging Management Evaluation – Core Flooding System

Table 3.2.2-2 Summary of Aging Management Evaluation – Decay Heat Removal System

Table 3.2.2-3 Summary of Aging Management Evaluation – Makeup and Purification System (High Pressure Injection)

Table 3.2.2-4 Summary of Aging Management Evaluation – Primary Containment Heating and Ventilation System

Table 3.2.2-5 Summary of Aging Management – Reactor Building Spray System

Table 3.2.2-6 Summary of Aging Management Evaluation – Reactor Building Sump and Drain System

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

3.2.2.1.1 Core Flooding System

Materials

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

- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Nickel Alloy

- Stainless Steel

Environments

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

- Air with Borated Water Leakage
- Air/Gas - Wetted
- Treated Water
- Treated Water > 140 F

Aging Effects Requiring Management

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

- Cracking/Stress Corrosion Cracking, Thermal and Mechanical Loading
- Cumulative Fatigue Damage/Fatigue
- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting and Crevice Corrosion
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

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

- ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)
- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- External Surfaces Monitoring (B.2.1.21)
- Nickel Alloy Aging Management Program (B.2.2.1)
- One-Time Inspection (B.2.1.18)
- TLAA
- Water Chemistry (B.2.1.2)

Table 3.2.2-1, Summary of Aging Management Evaluation – Core Flooding System summarizes the results of the aging management review for the Core Flooding System.

3.2.2.1.2 Decay Heat Removal System

Materials

The materials of construction for the Decay Heat Removal System components are:

- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Cast Austenitic Stainless Steel (CASS)
- Copper Alloy with less than 15% Zinc
- Stainless Steel

Environments

The Decay Heat Removal System components are exposed to the following environments:

- Air - Outdoor
- Air with Borated Water Leakage
- Air/Gas - Wetted
- Concrete
- Lubricating Oil
- Treated Water
- Treated Water > 140 F
- Treated Water > 482 F

Aging Effects Requiring Management

The following aging effects associated with the Decay Heat Removal System components require management:

- Cracking/Stress Corrosion Cracking, Thermal and Mechanical Loading
- Cumulative Fatigue Damage/Fatigue
- Loss of Fracture Toughness/Thermal Aging Embrittlement
- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

The following aging management programs manage the aging effects for the Decay Heat Removal System components:

- ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)
- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- External Surfaces Monitoring (B.2.1.21)
- Lubricating Oil Analysis (B.2.1.23)
- One-Time Inspection (B.2.1.18)
- TLAA
- Water Chemistry (B.2.1.2)

Table 3.2.2-2, Summary of Aging Management Evaluation – Decay Heat Removal System summarizes the results of the aging management review for the Decay Heat Removal System.

3.2.2.1.3 Makeup and Purification System (High Pressure Injection)

Materials

The materials of construction for the Makeup and Purification System (High Pressure Injection) components are:

- Aluminum Alloy
- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Carbon Steel with phenoline lining
- Copper Alloy with 15% Zinc or More
- Copper Alloy with less than 15% Zinc
- Ductile Cast Iron
- Glass
- PVC
- Stainless Steel
- Stainless Steel Bolting

Environments

The Makeup and Purification System (High Pressure Injection) components are exposed to the following environments:

- Air with Borated Water Leakage
- Lubricating Oil
- Treated Water
- Treated Water > 140 F

Aging Effects Requiring Management

The following aging effects associated with the Makeup and Purification System (High Pressure Injection) components require management:

- Cracking/Stress Corrosion Cracking, Thermal and Mechanical Loading
- Cumulative Fatigue Damage/Fatigue
- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting, Crevice, Microbiologically Influenced Corrosion, and Erosion
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

The following aging management programs manage the aging effects for the Makeup and Purification System (High Pressure Injection) components:

- ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)
- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- External Surfaces Monitoring (B.2.1.21)
- Lubricating Oil Analysis (B.2.1.23)
- One-Time Inspection (B.2.1.18)
- TLAA
- Water Chemistry (B.2.1.2)

Table 3.2.2-3, Summary of Aging Management Evaluation – Makeup and Purification System (High Pressure Injection) summarizes the results of the aging management review for the Makeup and Purification System (High Pressure Injection).

3.2.2.1.4 Primary Containment Heating and Ventilation System

Materials

The materials of construction for the Primary Containment Heating and Ventilation System components are:

- Asbestos
- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Carbon Steel (Concrete coated, lined)
- Copper Alloy with 15% Zinc or More
- Copper Alloy with less than 15% Zinc
- Galvanized Steel
- Gray Cast Iron
- Neoprene
- Rubber
- Stainless Steel

Environments

The Primary Containment Heating and Ventilation System components are exposed to the following environments:

- Air - Indoor
- Air with Borated Water Leakage
- Air/Gas - Wetted
- Raw Water
- Soil

Aging Effects Requiring Management

The following aging effects associated with the Primary Containment Heating and Ventilation System components require management:

- Hardening and Loss of Strength/Elastomer Degradation
- Loss of Material/Boric Acid Corrosion
- Loss of Material/Cracking, General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling
- Loss of Material/Selective Leaching
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening
- Reduction of Heat Transfer/Fouling

Aging Management Programs

The following aging management programs manage the aging effects for the Primary Containment Heating and Ventilation System components:

- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- Buried Piping and Tanks Inspection (B.2.1.20)
- External Surfaces Monitoring (B.2.1.21)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)
- Open-Cycle Cooling Water System (B.2.1.9)
- Selective Leaching of Materials (B.2.1.19)

Table 3.2.2-4, Summary of Aging Management Evaluation – Primary Containment Heating and Ventilation System summarizes the results of the aging management review for the Primary Containment Heating and Ventilation System.

3.2.2.1.5 Reactor Building Spray System

Materials

The materials of construction for the Reactor Building Spray System components are:

- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Copper Alloy with 15% Zinc or More
- Copper Alloy with less than 15% Zinc
- Stainless Steel
- Stainless Steel Bolting

Environments

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

- Air - Outdoor
- Air with Borated Water Leakage
- Air/Gas – Wetted
- Concrete
- Treated Water

Aging Effects Requiring Management

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

- Cumulative Fatigue Damage/Fatigue
- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting and Crevice Corrosion
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

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

- Aboveground Steel Tanks (B.2.1.15)
- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- External Surfaces Monitoring (B.2.1.21)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)
- One-Time Inspection (B.2.1.18)
- TLAA
- Water Chemistry (B.2.1.2)

Table 3.2.2-5, Summary of Aging Management Evaluation – Reactor Building Spray System summarizes the results of the aging management review for the Reactor Building Spray System.

3.2.2.1.6 Reactor Building Sump and Drain System

Materials

The materials of construction for the Reactor Building Sump and Drain System components are:

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

Environments

The Reactor Building Sump and Drain System components are exposed to the following environments:

- Air with Borated Water Leakage
- Air/Gas - Wetted
- Concrete
- Raw Water
- Treated Water

Aging Effects Requiring Management

The following aging effects associated with the Reactor Building Sump and Drain System components require management:

- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

The following aging management programs manage the aging effects for the Reactor Building Sump and Drain System components:

- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- External Surfaces Monitoring (B.2.1.21)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)
- One-Time Inspection (B.2.1.18)
- Water Chemistry (B.2.1.2)

Table 3.2.2-6, Summary of Aging Management Evaluation – Reactor Building Sump and Drain System summarizes the results of the aging management review for the Reactor Building Sump and Drain System.

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

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

3.2.2.2.1 Cumulative Fatigue Damage

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 Core Flooding, Decay Heat, Makeup and Purification (High Pressure Injection), and Reactor Building Spray Systems is discussed in Section 4.3.3.

3.2.2.2.2 Loss of Material due to Cladding Breach

Loss of material due to cladding breach could occur for PWR steel pump casings with stainless steel cladding exposed to treated borated water. The GALL Report references NRC Information Notice 94-63, Boric Acid Corrosion of Charging Pump Casings Caused by Cladding Cracks, and recommends further evaluation of a plant-specific AMP to ensure that the aging effect is adequately managed. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1 of this SRP-LR).

Item Number 3.2.1-2 is not applicable to TMI-1. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.

3.2.2.2.3 Loss of Material due to Pitting and Crevice Corrosion

1. *Loss of material due to pitting and crevice corrosion could occur for internal surfaces of stainless steel containment isolation piping, piping components, and piping elements exposed to treated water. The existing AMP relies on monitoring and control of water chemistry to mitigate degradation. However, control of water chemistry does not preclude loss of material due to 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.*

   Item Number 3.2.1-3 is not applicable to TMI-1. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.

2. *Loss of material from pitting and crevice corrosion could occur for stainless steel piping, piping components, and piping elements exposed to soil. The GALL Report recommends further evaluation of a plant-specific AMP to ensure that the aging effect is adequately managed. Acceptance criteria are described in Branch Technical Position RSLB-1 (Appendix A.1 of this SRP-LR).*

Item Number 3.2.1-4 is not applicable to TMI-1. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.

3. *Loss of material from pitting and crevice corrosion could occur for BWR stainless steel and aluminum piping, piping components, and piping elements exposed to treated water. The existing AMP relies on monitoring and control of water chemistry for BWRs to mitigate degradation. However, control of water chemistry does not preclude loss of material due to 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 water 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.*

   TMI-1 will implement a One-Time Inspection program, B.2.1.18, for susceptible locations to verify the effectiveness of the Water Chemistry program, B.2.1.2, to manage the loss of material due to pitting and crevice corrosion in aluminum piping, piping components, and piping elements and tanks exposed to treated water in the Makeup and Purification System (High Pressure Injection). The Water Chemistry and One-Time Inspection programs are described in Appendix B.

4. *Loss of material from pitting and crevice corrosion could occur for stainless steel and copper alloy piping, piping components, and piping elements exposed to lubricating oil. The existing program relies on the periodic sampling and analysis of lubricating oil to maintain contaminants within acceptable limits, thereby preserving an environment that is not conducive to corrosion. However, control of lube oil contaminants may not always have been adequate to preclude corrosion. Therefore, the effectiveness of lubricating oil control should be verified to ensure that corrosion is not occurring. The GALL Report recommends further evaluation to verify the effectiveness of the lubricating oil 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.*

   TMI-1 will implement a One-Time Inspection program, B.2.1.18, for susceptible locations to verify the effectiveness of the Lubricating Oil Analysis program, B.2.1.23, to manage the loss of material due to pitting and crevice corrosion in stainless steel and copper alloy piping, piping components, and piping elements exposed to lubricating oil in the Decay Heat Removal System and Makeup and Purification System (High Pressure Injection). The Lubricating Oil Analysis and One-Time Inspection programs are described in Appendix B.

5. *Loss of material from pitting and crevice corrosion could occur for of partially encased stainless steel tanks exposed to raw water due to cracking of the perimeter seal from weathering. The GALL Report recommends further evaluation to ensure that the aging effect is adequately managed. The GALL Report recommends that a plant-specific AMP be evaluated because moisture and water can egress under the tank if the perimeter seal is degraded. Acceptance criteria are described in Branch Technical Position RSLB-1 (Appendix A.1 of this SRP-LR).*

   Item Number 3.2.1-7 is not applicable to TMI-1. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.

6. *Loss of material from pitting and crevice corrosion could occur for stainless steel piping, piping components, piping elements, and tanks exposed to internal condensation. The GALL Report recommends further evaluation of a plant-specific AMP to ensure that the aging effect is adequately managed. Acceptance criteria are described in Branch Technical Position RSLB-1 (Appendix A.1 of this SRP-LR).*

   TMI-1 will implement the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, (B.2.1.22), to manage the loss of material due to pitting and crevice corrosion in stainless steel piping, piping components, piping elements, and tanks exposed to a wetted gas internal environment in the Auxiliary and Fuel Handling Building Ventilation Systems, and Reactor Building Sump and Drain System. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program consists of inspections of the internal surfaces of steel components that are not covered by other aging management programs. These internal inspections are performed during the periodic system and component surveillances or during the performance of maintenance activities when the surfaces are made accessible for visual inspection. The program includes visual inspections to assure that existing environmental conditions are not causing material degradation that could result in a loss of component intended functions. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is described in Appendix B.

   TMI-1 will implement the One-Time Inspection program, B.2.1.18, to manage the loss of material due to pitting and crevice corrosion in stainless steel piping, piping components, piping elements, pump casings, and tanks exposed to a wetted gas internal environment in the Containment Isolation System, Core Flooding System, Emergency Feedwater System, Radiation Monitoring System, and Reactor Building Spray System. The program is credited for cases where either (a) an aging effect is not expected to occur but there is insufficient data to completely rule it out, (b) an aging effect is expected to progress very slowly in the specified environment, but the local environment may be more adverse than that generally expected, or (c) the characteristics of the aging effect include a long incubation period.

3.2.2.2.4 Reduction of Heat Transfer due to Fouling

1. *Reduction of heat transfer due to fouling could occur for steel, stainless steel, and copper alloy heat exchanger tubes exposed to lubricating oil. The existing AMP relies on monitoring and control of lube oil chemistry to mitigate reduction of heat transfer due to fouling. However, control of lube oil chemistry may not always have been adequate to preclude fouling. Therefore, the effectiveness of lube oil chemistry control should be verified to ensure that fouling is not occurring. The GALL Report recommends further evaluation of programs to verify the effectiveness of lube oil chemistry control. 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.*

   TMI-1 will implement a One-Time Inspection program, B.2.1.18, for susceptible locations to verify the effectiveness of the Lubricating Oil Analysis program, B.2.1.23, to manage the reduction of heat transfer due to fouling in copper alloy heat exchanger components exposed to lubricating oil in the Circulating Water System. The Lubricating Oil Analysis and One-Time Inspection programs are described in Appendix B.

2. *Reduction of heat transfer due to fouling could occur for stainless steel heat exchanger tubes exposed to treated water. The existing program relies on control of water chemistry to manage reduction of heat transfer due to fouling. However, control of water chemistry may have been inadequate. Therefore, the GALL report recommends that the effectiveness of the chemistry control program should be verified to ensure that reduction of heat transfer due to fouling is not occurring. A one-time inspection is an acceptable method to ensure that reduction of heat transfer is not occurring and that the component's intended function will be maintained during the period of extended operation.*

   Item Number 3.2.1-10 is not applicable to TMI-1. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.

3.2.2.2.5 Hardening and Loss of Strength due to Elastomer Degradation

Item Number 3.2.1-11 is applicable to BWRs only and is not used for TMI-1.

3.2.2.2.6 Loss of Material due to Erosion

Loss of material due to erosion could occur in the stainless steel high pressure safety injection (HPSI) pump miniflow recirculation orifice exposed to treated borated water. The GALL Report recommends a plant-specific AMP be evaluated for erosion of the orifice due to extended use of the centrifugal HPSI pump for normal charging. The GALL Report references Licensee Event Report (LER) 50-275/94-023 for evidence of erosion. Further evaluation is recommended to ensure that the aging effect is adequately *managed. Acceptance criteria are described in Branch Technical Position RSLB-1 (Appendix A.1 of this SRP-LR).*

TMI-1 will implement the Water Chemistry program, B.2.1.2, to manage the loss of material due to erosion in the stainless steel high-pressure injection pump recirculation flow orifices. As further assurance, plant Technical Specifications require periodic surveillance testing of the pumps which would give early indication of orifice degradation. The Water Chemistry program is described in Appendix B.

3.2.2.2.7 Loss of Material due to General Corrosion and Fouling

Item Number 3.2.1-13 is applicable to BWRs only and is not used for TMI-1.

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

1. Item Number 3.2.1-14 is applicable to BWRs only and is not used for TMI-1.

2. *Loss of material due to general, pitting and crevice corrosion could occur for the internal surfaces of steel containment isolation piping, piping components, and piping elements exposed to treated water. The existing AMP relies on monitoring and control of water chemistry 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 water 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.*

   TMI-1 will implement a One-Time Inspection program, B.2.1.18, for susceptible locations to verify the effectiveness of the Water Chemistry program, B.2.1.2, to manage the loss of material due to general, pitting and crevice corrosion in steel piping, piping components, and piping elements, heat exchanger components, and tanks exposed to treated water in the Decay Heat Removal System, Makeup and Purification System (High Pressure Injection), Radwaste System, Reactor Building Spray System, and Reactor Building Sump and Drain System. The Water Chemistry and One-Time Inspection programs are described in Appendix B.

3. *Loss of material due to general, pitting and crevice corrosion could occur for steel piping, piping components, and piping elements exposed to lubricating oil. The existing program relies on the periodic sampling and analysis of lubricating oil to maintain contaminants within acceptable limits, thereby preserving an environment that is not conducive to*

corrosion. However, control of lube oil contaminants may not always have been adequate to preclude corrosion. Therefore, the effectiveness of lubricating oil control should be verified to ensure that corrosion is not occurring. The GALL Report recommends further evaluation to verify the effectiveness of the lubricating oil 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.

Item Number 3.2.1-16 is not applicable to TMI-1. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.

3.2.2.2.9 Loss of Material due to General, Pitting, Crevice, and Microbiologically-Influenced Corrosion (MIC)

Loss of material due to general, pitting, crevice, and MIC could occur for steel (with or without coating or wrapping) 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 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.

Item Number 3.2.1-17 is not applicable to TMI-1. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.

3.2.2.2.10 Quality Assurance for Aging Management of Nonsafety-Related Components

QA provisions applicable to License Renewal are discussed in Section B.1.3.

3.2.2.3 Time-Limited Aging Analysis

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

- Section 4.3, Metal Fatigue of Piping and Components

3.2.3 CONCLUSION

The Engineered Safety Features piping, piping components, piping elements, heat exchangers, pump casings, and tanks 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 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 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	Steel and stainless steel 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 with stainless steel cladding pump casing exposed to treated borated water	Loss of material due to cladding breach	A plant-specific aging management program is to be evaluated. Reference NRC Information Notice 94-63, "Boric Acid Corrosion of Charging Pump Casings Caused by Cladding Cracks"	Yes, verify that plant-specific program addresses cladding breach	Not Applicable. See Subsection 3.2.2.2.2.
3.2.1-3	Stainless steel containment isolation piping and components internal surfaces exposed to treated water	Loss of material due to pitting and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Not Applicable. See Subsection 3.2.2.2.3.1.
3.2.1-4	Stainless steel piping, piping components, and piping elements exposed to soil	Loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	Yes, plant-specific	Not Applicable. See Subsection 3.2.2.2.3.2.

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
3.2.1-5	Stainless steel and aluminum piping, piping components, and piping elements exposed to treated water	Loss of material due to pitting and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801 with exceptions. The One-Time Inspection program, B.2.1.18, will be used to verify the effectiveness of the Water Chemistry program, B.2.1.2, to manage the loss of material due to pitting and crevice corrosion in aluminum piping, piping components, and piping elements and tanks exposed to treated water. Exceptions apply to the NUREG-1801 recommendations for One-Time Inspection program implementation. See Subsection 3.2.2.2.3.3.
3.2.1-6	Stainless steel and copper alloy piping, piping components, and piping elements exposed to lubricating oil	Loss of material due to pitting and crevice corrosion	Lubricating Oil Analysis and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801 with exceptions. The One-Time Inspection program, B.2.1.18, will be used to verify the effectiveness of the Lubricating Oil Analysis program, B.2.1.23, to manage the loss of material due to pitting and crevice corrosion in stainless steel and copper alloy piping, piping components, and piping elements exposed to lubricating oil. Exceptions apply to the NUREG-1801 recommendations for One-Time Inspection and Lubricating Oil Analysis program implementation. See Subsection 3.2.2.2.3.4.

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	Partially encased stainless steel tanks with breached moisture barrier exposed to raw water	Loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated for pitting and crevice corrosion of tank bottoms because moisture and water can egress under the tank due to cracking of the perimeter seal from weathering.	Yes, plant-specific	Not Applicable. See Subsection 3.2.2.2.3.5.
3.2.1-8	Stainless steel piping, piping components, piping elements, and tank internal surfaces exposed to condensation (internal)	Loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	Yes, plant-specific	The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, will be used to manage the loss of material due to pitting and crevice corrosion in stainless steel piping, piping components, piping elements, and tank internal surfaces exposed to a wetted gas environment. See Subsection 3.2.2.2.3.6. The One-Time Inspection program, B.2.1.18, will be used to manage the loss of material due to pitting and crevice corrosion in stainless steel piping, piping components, piping elements, pump casings, and tank internal surfaces exposed to a wetted gas environment. See Subsection 3.2.2.2.3.6.

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
3.2.1-9	Steel, stainless steel, and copper alloy heat exchanger tubes exposed to lubricating oil	Reduction of heat transfer due to fouling	Lubricating Oil Analysis and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801 with exceptions. The One-Time Inspection program, B.2.1.18, will be used to verify the effectiveness of the Lubricating Oil Analysis program, B.2.1.23, to manage the reduction of heat transfer due to fouling in copper alloy heat exchanger tubes exposed to lubricating oil. Exceptions apply to the NUREG-1801 recommendations for One-Time Inspection and Lubricating Oil Analysis program implementation. See Subsection 3.2.2.2.4.1.
3.2.1-10	Stainless steel heat exchanger tubes exposed to treated water	Reduction of heat transfer due to fouling	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Not Applicable. See Subsection 3.2.2.2.4.2.
3.2.1-11	BWR Only				
3.2.1-12	Stainless steel high-pressure safety injection (charging) pump miniflow orifice exposed to treated borated water	Loss of material due to erosion	A plant-specific aging management program is to be evaluated for erosion of the orifice due to extended use of the centrifugal HPSI pump for normal charging.	Yes, plant-specific	The Water Chemistry program, B.2.1.2, will be used to manage the loss of material due to erosion in the stainless steel high-pressure injection pump recirculation flow orifices in a treated water environment. See Subsection 3.2.2.2.6.

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	BWR Only				
3.2.1-14	BWR Only				
3.2.1-15	Steel containment isolation piping, piping components, and piping elements internal surfaces exposed to treated water	Loss of material due to general, pitting, and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801 with exceptions. The One-Time Inspection program, B.2.1.18, will be used to verify the effectiveness of the Water Chemistry program, B.2.1.2, to manage the loss of material due to general, pitting, and crevice corrosion in steel piping, piping components, piping elements, heat exchanger components, and tanks exposed to treated water. Exceptions apply to the NUREG-1801 recommendations for One-Time Inspection program implementation. See Subsection 3.2.2.2.8.2.
3.2.1-16	Steel piping, piping components, and piping elements exposed to lubricating oil	Loss of material due to general, pitting, and crevice corrosion	Lubricating Oil Analysis and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Not Applicable. 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
3.2.1-17	Steel (with or without coating or wrapping) piping, piping components, and piping elements buried in soil	Loss of material due to general, pitting, crevice, and microbiologically-influenced 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	Not Applicable. See Subsection 3.2.2.2.9.
3.2.1-18	BWR Only				
3.2.1-19	BWR Only				
3.2.1-20	BWR Only				
3.2.1-21	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. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.
3.2.1-22	Steel closure bolting exposed to air with steam or water leakage	Loss of material due to general corrosion	Bolting Integrity	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.
3.2.1-23	Steel bolting and closure bolting exposed to air –	Loss of material due to general, pitting,	Bolting Integrity	No	Consistent with NUREG-1801 with exceptions. The Bolting Integrity program, B.2.1.7, will be

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
	outdoor (external), or air – indoor uncontrolled (external)	and crevice corrosion			used to manage the loss of material due to general, pitting, and crevice corrosion in steel bolting exposed to outdoor air, indoor air, or air with borated water leakage in the Containment Isolation System, Core Flooding System, Decay Heat Removal System, Makeup and Purification System (High Pressure Injection), Reactor Building Spray System, Reactor Building Sump and Drain System, Reactor Coolant System, and Reactor Vessel. The External Surfaces Monitoring program, B.2.1.21, has been substituted and will be used to manage the loss of material due to general, pitting, and crevice corrosion in steel piping, piping components, and piping elements, tanks, and other components exposed to outdoor air, indoor air, or air with borated water leakage in the Containment Isolation System, Core Flooding System, Decay Heat Removal System, Makeup and Purification System (High Pressure Injection), Reactor Building Spray System, Reactor Building Sump and Drain System, Reactor Coolant System, Reactor Vessel, and Steam Generator. The Reactor Head Closure Studs program, B.2.1.3, has been substituted and will be used to manage loss of material due to general, pitting, and crevice corrosion in high strength low alloy steel bolting exposed to air with borated water leakage in the Reactor Vessel. The ASME Section XI, Subsection IWE program, B.2.1.24, has been substituted and will be used to manage loss of material due to general,

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
					pitting, and crevice corrosion in steel bolting exposed to indoor air or air with borated water leakage in the Reactor Building. Exceptions apply to the NUREG-1801 recommendations for External Surfaces Monitoring, Reactor Head Closure Studs, and ASME Section XI, Subsection IWE program implementation.
3.2.1-24	Steel closure bolting exposed to air – indoor uncontrolled (external)	Loss of preload due to thermal effects, gasket creep, and self-loosening	Bolting Integrity	No	Consistent with NUREG-1801. The Bolting Integrity program, B.2.1.7, will be used to manage the loss of preload due to thermal effects, gasket creep, and self-loosening in steel bolting exposed to indoor air or air with borated water leakage in the Containment Isolation System, Core Flooding System, Decay Heat Removal System, Makeup and Purification System (High Pressure Injection), Reactor Building Spray System, and Reactor Building Sump and Drain System. The 10 CFR Part 50, Appendix J program, B.2.1.27, has been substituted and will be used to manage loss of preload due to thermal effects, gasket creep, and self-loosening in steel bolting exposed to indoor air or air with borated water leakage in the Reactor Building.
3.2.1-25	Stainless steel piping, piping components, and piping elements exposed to closed cycle cooling water >60°C (>140°F)	Cracking due to stress corrosion cracking	Closed-Cycle Cooling Water System	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.

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
3.2.1-26	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	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.
3.2.1-27	Steel heat exchanger components exposed to closed cycle cooling water	Loss of material due to general, pitting, crevice, and galvanic corrosion	Closed-Cycle Cooling Water System	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.
3.2.1-28	Stainless steel piping, piping components, piping elements, and heat exchanger components exposed to closed-cycle cooling water	Loss of material due to pitting and crevice corrosion	Closed-Cycle Cooling Water System	No	Consistent with NUREG-1801 with exceptions. The Closed-Cycle Cooling Water System, B.2.1.10, will be used to manage the loss of material due to pitting and crevice corrosion in stainless steel heat exchanger components exposed to closed-cycle cooling water in the Closed Cycle Cooling Water System. Exceptions apply to the NUREG-1801 recommendations for Closed-Cycle Cooling Water System program implementation.
3.2.1-29	Copper alloy piping, piping components, piping elements, and heat exchanger components exposed to closed cycle cooling water	Loss of material due to pitting, crevice, and galvanic corrosion	Closed-Cycle Cooling Water System	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.

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
3.2.1-30	Stainless steel and copper alloy heat exchanger tubes exposed to closed cycle cooling water	Reduction of heat transfer due to fouling	Closed-Cycle Cooling Water System	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.
3.2.1-31	External surfaces of steel components including ducting, piping, ducting closure bolting, and containment isolation piping external surfaces exposed to air - indoor uncontrolled (external); condensation (external) and air - outdoor (external)	Loss of material due to general corrosion	External Surfaces Monitoring	No	Consistent with NUREG-1801 with exceptions. The External Surfaces Monitoring program, B.2.1.21, will be used to manage the loss of material due to general corrosion on the external surfaces of steel containment isolation piping and components exposed to indoor air in the Containment Isolation System. Exceptions apply to the NUREG-1801 recommendations for External Surfaces Monitoring program implementation.
3.2.1-32	Steel piping and ducting components and internal surfaces exposed to air – indoor uncontrolled (Internal)	Loss of material due to general corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	No	Consistent with NUREG-1801 with exceptions. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, will be used to manage the loss of material due to general corrosion on the internal surfaces of steel tanks exposed to an indoor air environment in the Main Generator and Auxiliary Systems. Exceptions apply to the NUREG-1801 recommendations for Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program implementation.

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
3.2.1-33	Steel encapsulation components exposed to air-indoor uncontrolled (internal)	Loss of material due to general, pitting, and crevice corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.
3.2.1-34	Steel piping, piping components, and piping elements exposed to condensation (internal)	Loss of material due to general, pitting, and crevice corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	No	Consistent with NUREG-1801 with exceptions. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, will be used to manage the loss of material due to general, pitting, and crevice corrosion on steel piping, piping components, and piping elements exposed to a wetted gas environment in the Containment Isolation System, Reactor Building Spray System, and Reactor Building Sump and Drain System. Exceptions apply to the NUREG-1801 recommendations for Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program implementation.

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	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	Open-Cycle Cooling Water System	No	Consistent with NUREG-1801 with exceptions. The Open-Cycle Cooling Water System program, B.2.1.9, will be used to manage the loss of material due to general, pitting, crevice, and microbiologically-influenced corrosion, and fouling in steel piping, piping components, piping elements, and heat exchanger components exposed to raw water in the Circulating Water System. Exceptions apply to the NUREG-1801 recommendations for Open-Cycle Cooling Water System program implementation.
3.2.1-36	Steel heat exchanger components exposed to raw water	Loss of material due to general, pitting, crevice, galvanic, and microbiologically-influenced corrosion, and fouling	Open-Cycle Cooling Water System	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.
3.2.1-37	Stainless steel 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. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.
3.2.1-38	Stainless steel containment isolation piping and components internal surfaces exposed to raw water	Loss of material due to pitting, crevice, and microbiologically-influenced corrosion, and fouling	Open-Cycle Cooling Water System	No	Consistent with NUREG-1801 with exceptions. The Open-Cycle Cooling Water System, B.2.1.9, will be used to manage loss of material due to pitting, crevice, and microbiologically-influenced corrosion, and fouling in stainless steel piping and components internal surfaces exposed to raw water in the Circulating Water System.

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
					The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, has been substituted and will be used to manage the loss of material due to pitting, crevice, and microbiologically-influenced corrosion, and fouling in stainless steel piping and components, heat exchanger components, and tanks internal surfaces exposed to raw water in the Miscellaneous Floor and Equipment Drains System, Radwaste System, Reactor Building Sump and Drain System, and Water Treatment and Distribution System. The External Surfaces Monitoring program, B.2.1.21, has been substituted and will be used to manage the loss of material due to pitting, crevice, and microbiologically-influenced corrosion, and fouling in stainless steel piping and components external surfaces exposed to raw water in the Miscellaneous Floor and Equipment Drains System, and Reactor Building Sump and Drain System. Exceptions apply to the NUREG-1801 recommendations for Open-Cycle Cooling Water System, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components, and External Surfaces Monitoring program implementation.
3.2.1-39	Stainless steel heat exchanger components 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. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.

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
3.2.1-40	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. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.
3.2.1-41	Copper alloy >15% Zn piping, piping components, piping elements, and heat exchanger components exposed to 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.2.1.19, will be used to manage the loss of material due to selective leaching in copper alloy >15% Zn heat exchanger components exposed to closed cycle cooling water in the Closed Cycle Cooling Water System and Open Cycle Cooling Water System.
3.2.1-42	Gray cast iron piping, piping components, piping elements exposed to closed-cycle cooling water	Loss of material due to selective leaching	Selective Leaching of Materials	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.
3.2.1-43	Gray cast iron piping, piping components, and piping elements exposed to soil	Loss of material due to selective leaching	Selective Leaching of Materials	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.
3.2.1-44	Gray cast iron motor cooler exposed to treated water	Loss of material due to selective leaching	Selective Leaching of Materials	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.

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
3.2.1-45	Aluminum, copper alloy >15% Zn, and steel external surfaces, bolting, and piping, piping components, and piping elements exposed to air with borated water leakage	Loss of material due to Boric acid corrosion	Boric Acid Corrosion	No	Consistent with NUREG-1801. The Boric Acid Corrosion program, B.2.1.4, will be used to manage the loss of material due to boric acid corrosion for copper alloy >15% Zn, and steel external surfaces, bolting, and piping, piping components, piping elements, and tanks exposed to air with borated water leakage in the Containment Isolation System, Core Flooding System, Decay Heat Removal System, Makeup and Purification System (High Pressure Injection), Reactor Building, Reactor Building Spray System, Reactor Building Sump and Drain System, Reactor Coolant System, and Reactor Vessel.
3.2.1-46	Steel encapsulation components exposed to air with borated water leakage (internal)	Loss of material due to general, pitting, crevice and boric acid corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	No	Consistent with NUREG-1801 with exceptions. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, will be used to manage the loss of material due to general, pitting, and crevice corrosion in steel encapsulation components exposed to air with borated water leakage in the Reactor Building Spray system. Exceptions apply to the NUREG-1801 recommendations for Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program implementation.

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
3.2.1-47	Cast austenitic stainless steel piping, piping components, and piping elements exposed to treated borated water >250°C (>482°F)	Loss of fracture toughness due to thermal aging embrittlement	Thermal Aging Embrittlement of CASS	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.
3.2.1-48	Stainless steel or stainless-steel-clad steel piping, piping components, piping elements, and tanks (including safety injection tanks/accumulators) exposed to treated borated water >60°C (>140°F)	Cracking due to stress corrosion cracking	Water Chemistry	No	Consistent with NUREG-1801. The Water Chemistry program, B.2.1.2, will be used to manage the effects of cracking due to stress corrosion cracking in stainless steel piping, piping components, and piping elements exposed to treated borated water >60°C (>140°F) in the Decay Heat Removal System, Makeup and Purification System (High Pressure Injection), and Reactor Vessel.

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
3.2.1-49	Stainless steel piping, piping components, piping elements, and tanks exposed to treated borated water	Loss of material due to pitting and crevice corrosion	Water Chemistry	No	Consistent with NUREG-1801 with exceptions. The Water Chemistry program, B.2.1.2, will be used to manage loss of material due to pitting and crevice corrosion in stainless steel piping, piping components, piping elements, and tanks exposed to treated borated water in the Core Flooding System, Decay Heat Removal System, Fuel Handling and Fuel Storage System, Makeup and Purification System (High Pressure Injection), Reactor Building Spray System, and Reactor Building Sump and Drain System. The One-Time Inspection (B.2.1.18) program is used to augment the Water Chemistry program for managing loss of material due to pitting and crevice corrosion in stainless steel piping, piping components, and piping elements exposed to treated borated water for the Reactor Building Sump and Drain System. Exceptions apply to the NUREG-1801 recommendations for One-Time Inspection program implementation.
3.2.1-50	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.

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
3.2.1-51	Galvanized steel ducting exposed to air – indoor controlled (external)	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.
3.2.1-52	Glass piping elements exposed to air – indoor uncontrolled (external), lubricating oil, raw water, treated water, or treated borated water	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.
3.2.1-53	Stainless 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.
3.2.1-54	Steel piping, piping components, and piping elements exposed to air – indoor controlled (external)	None	None	NA - No AEM or AMP	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Engineered Safety Features.
3.2.1-55	Steel and stainless steel piping, piping components, and piping elements in concrete	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
3.2.1-56	Steel, stainless steel, and copper alloy piping, piping components, and piping elements exposed to gas	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.
3.2.1-57	Stainless steel and copper alloy <15% Zn piping, piping components, and piping elements exposed to air with borated water leakage	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.

Table 3.2.2-1
Core Flooding System
Summary of Aging Management Evaluation

Table 3.2.2-1 Core Flooding System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-2	3.2.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	V.E-4	3.2.1-23	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	V.E-5	3.2.1-24	A
Class 1 piping, fittings and branch connections < NPS 4"	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Class 1 piping, fittings and branch connections < NPS 4"	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking, Thermal and Mechanical Loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-1	3.1.1-70	E, 3
Class 1 piping, fittings and branch connections < NPS 4"	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking, Thermal and Mechanical Loading	Water Chemistry (B.2.1.2)	IV.C2-1	3.1.1-70	E, 3
Class 1 piping, fittings and branch connections < NPS 4"	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A

Table 3.2.2-1 Core Flooding System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking, Thermal and Mechanical Loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-1	3.1.1-70	E, 3
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking, Thermal and Mechanical Loading	Water Chemistry (B.2.1.2)	IV.C2-1	3.1.1-70	E, 3
Class 1 piping, fittings and branch connections < NPS 4"	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Flow Element	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Flow Element	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-2	3.1.1-68	B
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-2	3.1.1-68	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Piping and fittings	Pressure Boundary	Nickel Alloy	Air with Borated Water Leakage (External)	None	None			G, 5

Table 3.2.2-1 Core Flooding 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	Nickel Alloy	Treated Water (Internal)	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-13	3.1.1-31	B, 4
Piping and fittings	Pressure Boundary	Nickel Alloy	Treated Water (Internal)	Cracking/Stress Corrosion Cracking	Nickel Alloy Aging Management Program (B.2.2.1)	IV.C2-13	3.1.1-31	A, 4
Piping and fittings	Pressure Boundary	Nickel Alloy	Treated Water (Internal)	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-13	3.1.1-31	A, 4
Piping and fittings	Pressure Boundary	Nickel Alloy	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	IV.C2-15	3.1.1-83	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D1-29	3.2.1-8	E,1
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-1	3.1.1-70	E, 3
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-1	3.1.1-70	E, 3
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cumulative Fatigue Damage/Fatigue	TLAA	V.D1-27	3.2.1-1	A
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Tanks (Core Flooding Tanks)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.D1-1	3.2.1-45	A
Tanks (Core Flooding Tanks)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 2
Tanks (Core Flooding Tanks)	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D1-29	3.2.1-8	E, 1
Valve Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A

Table 3.2.2-1 Core Flooding 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	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D1-29	3.2.1-8	E,1
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-5	3.1.1-68	B
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-5	3.1.1-68	A
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	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 stainless steel in an air/gas - wetted (internal) environment include loss of material due to pitting and crevice corrosion. These aging effects are managed by the One Time Inspection Program.
2. The aging effects of carbon steel in an air with borated water leakage (external) environment include loss of material due to general, pitting and crevice corrosion. These aging effects are managed by the External Surfaces Monitoring Program.
3. NUREG-1801 program XI.M35, "One-Time Inspection of ASME Code Class 1 Small-Bore Piping" does not apply due to previous operating experience with cracking due to thermal and mechanical loading of small-bore piping at TMI-1. The inspection of Code Class 1 small-bore piping for cracking due to stress corrosion cracking and thermal and mechanical loading is performed periodically under the XI.M1, "ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD" aging management program. In accordance with NUREG-1801, the XI.M2 Water Chemistry program also applies.
4. The aging effects of nickel alloy in a treated water (internal) environment > 500F include cracking due to /stress corrosion cracking.

5. Nickel alloy in an air with borated water leakage environment has no aging effects.

Table 3.2.2-2
Decay Heat Removal System
Summary of Aging Management Evaluation

Table 3.2.2-2 Decay Heat Removal System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	V.E-1	3.2.1-23	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Outdoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)			G, 1
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-2	3.2.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	V.E-4	3.2.1-23	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	V.E-5	3.2.1-24	A
Cyclone Separator	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Cyclone Separator	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	V.D1-31	3.2.1-48	A
Cyclone Separator	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Flame Arrestor	Fire Barrier	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Flame Arrestor	Fire Barrier	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Lubricating Oil Analysis (B.2.1.23)	V.D1-24	3.2.1-6	B, 4
Flame Arrestor	Fire Barrier	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D1-24	3.2.1-6	B, 4

Table 3.2.2-2 Decay Heat Removal System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heater (BWST - electrical)	Pressure Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B4-7	3.5.1-50	E, 2
Heater (BWST - electrical)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Piping and fittings	Direct Flow	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.D1-1	3.2.1-45	A
Piping and fittings	Direct Flow	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 5
Piping and fittings	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.D1-1	3.2.1-45	A
Piping and fittings	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 5
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.C-6	3.2.1-15	B
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.C-6	3.2.1-15	A
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Air with Borated Water Leakage (External)	None	None	V.F-5	3.2.1-57	A
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.A-5	3.4.1-15	B
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.A-5	3.4.1-15	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B4-7	3.5.1-50	E, 2
Piping and fittings	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A

Table 3.2.2-2 Decay Heat Removal 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	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.C1-14	3.3.1-33	B
Piping and fittings	Leakage Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.C1-14	3.3.1-33	B
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	V.D1-31	3.2.1-48	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cumulative Fatigue Damage/Fatigue	TLAA	V.D1-27	3.2.1-1	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Piping and fittings	Pressure Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.D1-1	3.2.1-45	A
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 5
Piping and fittings	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.C-6	3.2.1-15	B
Piping and fittings	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.C-6	3.2.1-15	A
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.A6-11	3.5.1-47	E, 3
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air with Borated Water Leakage (External)	None	None	V.F-5	3.2.1-57	A

Table 3.2.2-2 Decay Heat Removal 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 with less than 15% Zinc	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.A-5	3.4.1-15	B
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.A-5	3.4.1-15	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B4-7	3.5.1-50	E, 2
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Piping and fittings	Pressure Boundary	Stainless Steel	Concrete (Embedded)	None	None	V.F-14	3.2.1-55	A
Piping and fittings	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.C1-14	3.3.1-33	B
Piping and fittings	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.C1-14	3.3.1-33	B
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-2	3.1.1-68	B
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-2	3.1.1-68	A
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	V.D1-31	3.2.1-48	A
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking, Thermal and Mechanical Loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-1	3.1.1-70	E, 6
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking, Thermal and Mechanical Loading	Water Chemistry (B.2.1.2)	IV.C2-1	3.1.1-70	E, 6

Table 3.2.2-2 Decay Heat Removal 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) > 140 F	Cumulative Fatigue Damage/Fatigue	TLAA	V.D1-27	3.2.1-1	A
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Pump Casing (Decay Heat Removal Pumps)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Pump Casing (Decay Heat Removal Pumps)	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	V.D1-31	3.2.1-48	A
Pump Casing (Decay Heat Removal Pumps)	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	V.D1-31	3.2.1-48	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Restricting Orifices	Throttle	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Restricting Orifices	Throttle	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	V.D1-31	3.2.1-48	A
Restricting Orifices	Throttle	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Strainer Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Strainer Body	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	V.D1-31	3.2.1-48	A
Strainer Body	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Tanks (BWST)	Pressure Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B4-7	3.5.1-50	E, 2

Table 3.2.2-2 Decay Heat Removal 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 (BWST)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Tanks (Lube Oil External Reservoirs)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Tanks (Lube Oil External Reservoirs)	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.C1-14	3.3.1-33	B
Tanks (Lube Oil External Reservoirs)	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.C1-14	3.3.1-33	B
Tanks (Lube Oil Open Overflow)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Tanks (Lube Oil Open Overflow)	Leakage Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.C1-14	3.3.1-33	B
Tanks (Lube Oil Open Overflow)	Leakage Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.C1-14	3.3.1-33	B
Thermowell	Pressure Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B4-7	3.5.1-50	E, 2
Thermowell	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Thermowell	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	V.D1-31	3.2.1-48	A
Thermowell	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Valve Body	Leakage Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B4-7	3.5.1-50	E, 2
Valve Body	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A

Table 3.2.2-2 Decay Heat Removal 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 (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	V.D1-31	3.2.1-48	A
Valve Body	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Valve Body	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Valve Body	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Treated Water (Internal) > 482 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	V.D1-31	3.2.1-48	A
Valve Body	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Treated Water (Internal) > 482 F	Loss of Fracture Toughness/Thermal Aging Embrittlement	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-6	3.1.1-55	B
Valve Body	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Treated Water (Internal) > 482 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Valve Body	Pressure Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B4-7	3.5.1-50	E, 2
Valve Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-5	3.1.1-68	B
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-5	3.1.1-68	A
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	V.D1-31	3.2.1-48	A
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	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 for this component is Air - outdoor. The Aging Effect/Mechanism and program for the Air - indoor uncontrolled environment are used.
2. Stainless steel piping and components, tanks, or valves are substituted for the supports component type, and the External Surfaces Monitoring program is used in lieu of the Structures Monitoring program.
3. The Piping and Fittings component type is substituted for Metal Components, and the External Surfaces Monitoring program is used for this component.
4. Lubricating oil vapor is the wetted gas environment for this stainless steel component. The applicable aging effect and mechanisms for lubricating oil in stainless steel are appropriate for this component in this environment.
5. The aging effects for carbon steel in an air with borated water leakage environment include loss of material due to general, pitting, and crevice corrosion. These aging effects/mechanisms are managed by the External Surfaces Monitoring program.
6. NUREG-1801 program XI.M35, One-Time Inspection of ASME Code Class 1 Small-Bore Piping does not apply due to previous operating

experience with cracking due to thermal and mechanical loading of small-bore piping at TMI-1. The inspection of Code Class 1 small-bore piping for cracking due to stress corrosion cracking and thermal and mechanical loading is performed periodically under the XI.M1, ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD aging management program. In accordance with NUREG-1801, the XI.M2 Water Chemistry program also applies.

Table 3.2.2-3
Makeup and Purification System (High Pressure Injection)
Summary of Aging Management Evaluation

Table 3.2.2-3 Makeup and Purification System (High Pressure Injection)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-2	3.2.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	V.E-4	3.2.1-23	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	V.E-5	3.2.1-24	A
Bolting	Mechanical Closure	Stainless Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	IV.C2-8	3.1.1-52	A
Bolting	Mechanical Closure	Stainless Steel Bolting	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	C
Cyclone Separator	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Cyclone Separator	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Electric Heaters (Boric Acid Mix Tank Heater)	Pressure Boundary	Aluminum Alloy	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.E1-10	3.3.1-88	A, 2
Electric Heaters (Boric Acid Mix Tank Heater)	Pressure Boundary	Aluminum Alloy	Air with Borated Water Leakage (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)			H, 3
Electric Heaters (Boric Acid Mix Tank Heater)	Pressure Boundary	Aluminum Alloy	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D2-19	3.2.1-5	B

Table 3.2.2-3 Makeup and Purification System (High Pressure Injection) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Electric Heaters (Boric Acid Mix Tank Heater)	Pressure Boundary	Aluminum Alloy	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D2-19	3.2.1-5	A
Filter Housing (Letdown Filter, Letdown Pre-Filter, Seal Injection Filter)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Filter Housing (Letdown Filter, Letdown Pre-Filter, Seal Injection Filter)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Filter Housing (Seal Return Filter)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Filter Housing (Seal Return Filter)	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	V.D1-31	3.2.1-48	A
Filter Housing (Seal Return Filter)	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Filter Housing (Suction Lube Oil Filter)	Pressure Boundary	Ductile Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.D1-1	3.2.1-45	A
Filter Housing (Suction Lube Oil Filter)	Pressure Boundary	Ductile Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 7
Filter Housing (Suction Lube Oil Filter)	Pressure Boundary	Ductile Cast Iron	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D

Table 3.2.2-3 Makeup and Purification System (High Pressure Injection) (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 (Suction Lube Oil Filter)	Pressure Boundary	Ductile Cast Iron	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Flow Device	Leakage Boundary	Glass	Air with Borated Water Leakage (External)	None	None			G, 1
Flow Device	Leakage Boundary	Glass	Treated Water (Internal)	None	None	V.F-9	3.2.1-52	A
Flow Device	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Flow Device	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Flow Device	Pressure Boundary	Glass	Air with Borated Water Leakage (External)	None	None			G, 1
Flow Device	Pressure Boundary	Glass	Lubricating Oil (Internal)	None	None	V.F-7	3.2.1-52	A
Flow Device	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Flow Device	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.C1-14	3.3.1-33	B
Flow Device	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.C1-14	3.3.1-33	B
Flow Element	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Flow Element	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Erosion	Water Chemistry (B.2.1.2)	V.D1-14	3.2.1-12	E, 11
Flow Element	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Piping and fittings	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.D1-1	3.2.1-45	A

Table 3.2.2-3 Makeup and Purification System (High Pressure Injection) (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 Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 7
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.C-6	3.2.1-15	B
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.C-6	3.2.1-15	A
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Air with Borated Water Leakage (External)	None	None	V.F-5	3.2.1-57	A
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.A-5	3.4.1-15	B
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.A-5	3.4.1-15	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	V.D1-31	3.2.1-48	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cumulative Fatigue Damage/Fatigue	TLAA	V.D1-27	3.2.1-1	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.D1-1	3.2.1-45	A
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 7

Table 3.2.2-3 Makeup and Purification System (High Pressure Injection) (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 Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Piping and fittings	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Piping and fittings	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.C-6	3.2.1-15	B
Piping and fittings	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.C-6	3.2.1-15	A
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air with Borated Water Leakage (External)	None	None	V.F-5	3.2.1-57	A
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Lubricating Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)			H, 9
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Lubricating Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)			H, 9
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Lubricating Oil (Internal)	Loss of Material/Pitting and Crevice Corrosion	Lubricating Oil Analysis (B.2.1.23)	V.D1-18	3.2.1-6	B
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Lubricating Oil (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D1-18	3.2.1-6	B
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.A-5	3.4.1-15	B

Table 3.2.2-3 Makeup and Purification System (High Pressure Injection) (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 with less than 15% Zinc	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.A-5	3.4.1-15	A
Piping and fittings	Pressure Boundary	PVC	Air with Borated Water Leakage (External)	None	None			F, 8
Piping and fittings	Pressure Boundary	PVC	Lubricating Oil (Internal)	None	None			F, 8
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Piping and fittings	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.C1-14	3.3.1-33	B
Piping and fittings	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.C1-14	3.3.1-33	B
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-2	3.1.1-68	B
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-2	3.1.1-68	A
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	V.D1-31	3.2.1-48	A
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking, Thermal and Mechanical Loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-1	3.1.1-70	E, 10
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking, Thermal and Mechanical Loading	Water Chemistry (B.2.1.2)	IV.C2-1	3.1.1-70	E, 10

Table 3.2.2-3 Makeup and Purification System (High Pressure Injection) (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) > 140 F	Cumulative Fatigue Damage/Fatigue	TLAA	V.D1-27	3.2.1-1	A
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Pump Casing (Aux. Gear Oil Pumps; Shaft Dr Gear Oil Pumps)	Pressure Boundary	Ductile Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.D1-1	3.2.1-45	A
Pump Casing (Aux. Gear Oil Pumps; Shaft Dr Gear Oil Pumps)	Pressure Boundary	Ductile Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 7
Pump Casing (Aux. Gear Oil Pumps; Shaft Dr Gear Oil Pumps)	Pressure Boundary	Ductile Cast Iron	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Pump Casing (Aux. Gear Oil Pumps; Shaft Dr Gear Oil Pumps)	Pressure Boundary	Ductile Cast Iron	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Pump Casing (Aux. L.O. Pumps; Main L.O. Pumps)	Pressure Boundary	Ductile Cast Iron	Lubricating Oil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Pump Casing (Aux. L.O. Pumps; Main L.O. Pumps)	Pressure Boundary	Ductile Cast Iron	Lubricating Oil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D

Table 3.2.2-3 Makeup and Purification System (High Pressure Injection) (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 (Aux. L.O. Pumps; Main L.O. Pumps)	Pressure Boundary	Ductile Cast Iron	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Pump Casing (Aux. L.O. Pumps; Main L.O. Pumps)	Pressure Boundary	Ductile Cast Iron	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Pump Casing (Boric Acid Injection Pumps)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Pump Casing (Boric Acid Injection Pumps)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Pump Casing (Lithium Hydroxide Tank Pump; Drum Chem. Add. Pump; Caustic Mix Tank Pump; Precoat Filter Holding Pumps; 4% Boric Acid Tank Pump; Zinc Injection Pump)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A

Table 3.2.2-3 Makeup and Purification System (High Pressure Injection) (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 (Lithium Hydroxide Tank Pump; Drum Chem. Add. Pump; Caustic Mix Tank Pump; Precoat Filter Holding Pumps; 4% Boric Acid Tank Pump; Zinc Injection Pump)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Pump Casing (Makeup Pump Gear Unit Casing)	Pressure Boundary	Ductile Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.D1-1	3.2.1-45	A
Pump Casing (Makeup Pump Gear Unit Casing)	Pressure Boundary	Ductile Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 7
Pump Casing (Makeup Pump Gear Unit Casing)	Pressure Boundary	Ductile Cast Iron	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Pump Casing (Makeup Pump Gear Unit Casing)	Pressure Boundary	Ductile Cast Iron	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Pump Casing (Makeup Pumps)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Pump Casing (Makeup Pumps)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	V.D1-31	3.2.1-48	A

Table 3.2.2-3 Makeup and Purification System (High Pressure Injection) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Restricting Orifices	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Sight Glasses	Leakage Boundary	Glass	Air with Borated Water Leakage (External)	None	None			G, 1
Sight Glasses	Leakage Boundary	Glass	Lubricating Oil (Internal)	None	None	V.F-7	3.2.1-52	A
Sight Glasses	Leakage Boundary	Glass	Treated Water (Internal)	None	None	V.F-9	3.2.1-52	A
Sight Glasses	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Sight Glasses	Leakage Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.C1-14	3.3.1-33	B
Sight Glasses	Leakage Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.C1-14	3.3.1-33	B
Sight Glasses	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Tanks (Boric Acid Mix Tank)	Pressure Boundary	Aluminum Alloy	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.E1-10	3.3.1-88	A, 2
Tanks (Boric Acid Mix Tank)	Pressure Boundary	Aluminum Alloy	Air with Borated Water Leakage (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)			H, 4
Tanks (Boric Acid Mix Tank)	Pressure Boundary	Aluminum Alloy	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D2-19	3.2.1-5	B
Tanks (Boric Acid Mix Tank)	Pressure Boundary	Aluminum Alloy	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D2-19	3.2.1-5	A

Table 3.2.2-3 Makeup and Purification System (High Pressure Injection) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tanks (Caustic Mix Tank, Lithium Hydroxide Mix Tank, Filter Precoat Tank, 4% Boric Acid Tank, Zinc Injection Tank)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	C
Tanks (Caustic Mix Tank, Lithium Hydroxide Mix Tank, Filter Precoat Tank, 4% Boric Acid Tank, Zinc Injection Tank)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A, 5
Tanks (Demineralizers)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	C
Tanks (Demineralizers)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Tanks (Makeup Tank)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	C
Tanks (Makeup Tank)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Tanks (Pump & Motor Lube Oil Reservoir)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.D1-1	3.2.1-45	A
Tanks (Pump & Motor Lube Oil Reservoir)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 7

Table 3.2.2-3 Makeup and Purification System (High Pressure Injection) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tanks (Pump & Motor Lube Oil Reservoir)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Tanks (Pump & Motor Lube Oil Reservoir)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Tanks (Resin Slurry Mix Tank)	Leakage Boundary	Carbon Steel with phenoline lining	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.D1-1	3.2.1-45	A
Tanks (Resin Slurry Mix Tank)	Leakage Boundary	Carbon Steel with phenoline lining	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 7
Tanks (Resin Slurry Mix Tank)	Leakage Boundary	Carbon Steel with phenoline lining	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-41	3.4.1-6	B, 6
Tanks (Resin Slurry Mix Tank)	Leakage Boundary	Carbon Steel with phenoline lining	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.G-41	3.4.1-6	A, 6
Thermowell	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Thermowell	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.C1-14	3.3.1-33	B
Thermowell	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.C1-14	3.3.1-33	B
Thermowell	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Valve Body	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A

Table 3.2.2-3 Makeup and Purification System (High Pressure Injection) (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 (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-11	3.2.1-45	A
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Lubricating Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)			H, 9
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Lubricating Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)			H, 9
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Lubricating Oil (Internal)	Loss of Material/Pitting and Crevice Corrosion	Lubricating Oil Analysis (B.2.1.23)	V.D1-18	3.2.1-6	B
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Lubricating Oil (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D1-18	3.2.1-6	B
Valve Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Valve Body	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.C1-14	3.3.1-33	B
Valve Body	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.C1-14	3.3.1-33	B
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)	IV.C2-5	3.1.1-68	B
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	IV.C2-5	3.1.1-68	A

Table 3.2.2-3 Makeup and Purification System (High Pressure Injection) (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) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	V.D1-31	3.2.1-48	A
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	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. Component contains glass material in air with borated water leakage environment. NUREG-1801 (V.F-6) lists glass with air (uncontrolled) environment as having no aging effect/mechanism and no AMP required. NUREG-1801 (V.F-9) lists glass in treated borated water environment as having no aging effect/mechanism and no AMP required.
2. Aluminum alloy in Boric Acid Mix Tank (ASTM B209, 5052) and in its electric heater flange (ASTM B247, 6061) does not contain zinc >12% or magnesium >6%, therefore SCC is not an applicable aging mechanism.
3. Component is an aluminum flange subject to air with borated water leakage environment. An applicable aging effect and mechanism for this material and environment is loss of material due to pitting and crevice corrosion. NUREG-1801 line item for aluminum with condensation environment (e.g., VII.F2-12) lists this aging effect and mechanism. NUREG-1801 specifies a plant-specific program for this combination. External Surfaces Monitoring is used.
4. Component is an aluminum tank subject to air with borated water leakage environment. An applicable aging effect and mechanism for this material and environment is loss of material due to pitting and crevice corrosion. NUREG-1801 line item for aluminum with condensation

environment (e.g., VII.F2-12) lists this aging effect and mechanism. NUREG-1801 specifies a plant-specific program for this combination. External Surfaces Monitoring is used.

5. The stainless steel Caustic Mix Tank and Lithium Hydroxide Mix Tank are assumed not to be subject to caustic corrosion as normal operating temperature of each tank is less than 200 deg. F. Similarly, these tanks are assumed not to be subject to caustic SCC as normal operating temperature of each tank is less than 212 deg. F.

6. The phenoline lining of this tank is not credited with preventing aging effects of carbon steel in treated water.

7. The aging effects of carbon steel or ductile cast iron in an air with borated water leakage environment include loss of material due to general, pitting, and crevice corrosion. These aging effects/mechanisms are managed by the External Surfaces Monitoring program.

8. Aging effects/mechanisms for PVC (polymer) in air with borated water leakage or lubricating oil environments are "none". No NUREG-1801 listing exists for PVC piping.

9. The aging effects/mechanisms of copper alloy in a lubricating oil environment include loss of material due to microbiologically influenced corrosion. This aging effect/mechanism is managed by the Lubricating Oil Analysis and One-Time Inspection Programs.

10. NUREG-1801 program XI.M35, "One-Time inspection of ASME Code Class 1 Small-Bore Piping" does not apply due to previous operating experience with cracking due to thermal and mechanical loading of small-bore piping at TMI-1. The inspection of Code Class 1 small-bore piping for cracking due to stress corrosion cracking and thermal and mechanical loading is performed periodically under the XI.M1, "ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD" aging management program. In accordance with NUREG-1801, the XI.M2 Water Chemistry program also applies.

11. NUREG-1801 specifies a plant-specific program for this component, material, environment, and aging effect/mechanism combination. The Water Chemistry program is used to manage loss of material due to erosion.

Table 3.2.2-4
Primary Containment Heating and Ventilation System
Summary of Aging Management Evaluation

Table 3.2.2-4 Primary Containment 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
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.F3-4	3.3.1-55	B
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Damper Housing	Pressure Boundary	Galvanized Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Damper Housing	Pressure Boundary	Galvanized Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1

Table 3.2.2-4 Primary Containment 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
Damper Housing	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F3-3	3.3.1-72	B
Ducting and Components	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Ducting and Components	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Ducting and Components	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F3-3	3.3.1-72	B
Ducting and Components	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	C
Ducting and Components	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F3-3	3.3.1-72	B
Expansion Joints	Pressure Boundary	Asbestos	Air - Indoor (External)	Loss of Material/Cracking	External Surfaces Monitoring (B.2.1.21)			F, 2
Expansion Joints	Pressure Boundary	Asbestos	Air/Gas - Wetted (Internal)	Loss of Material/Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			F, 3
Expansion Joints	Pressure Boundary	Neoprene	Air - Indoor (External)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F3-7	3.3.1-11	E, 9

Table 3.2.2-4 Primary Containment 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
Expansion Joints	Pressure Boundary	Neoprene	Air/Gas - Wetted (Internal)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F3-7	3.3.1-11	E, 9
Expansion Joints	Pressure Boundary	Rubber	Air - Indoor (External)	N/A	N/A			4
Expansion Joints	Pressure Boundary	Rubber	Raw Water (Internal)	N/A	N/A			4
Fan Housing	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.F3-2	3.3.1-56	B
Fan Housing	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F3-3	3.3.1-72	B
Filter Housing	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.F3-2	3.3.1-56	B
Filter Housing	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	C
Filter Housing	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Filter Housing	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F3-3	3.3.1-72	B
Filter Housing	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Filter Housing	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F3-1	3.3.1-27	E, 5
Flow Element	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.2.2-4 Primary Containment 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
Flow Element	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Heat exchanger components (RB Recirc Units)	Heat Transfer	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	Reduction of Heat Transfer/Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G, 6
Heat exchanger components (RB Recirc Units)	Heat Transfer	Copper Alloy with less than 15% Zinc	Raw Water (Internal)	Reduction of Heat Transfer/Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-6	3.3.1-83	B
Heat exchanger components (RB Recirc Units)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Heat exchanger components (RB Recirc Units)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Heat exchanger components (RB Recirc Units)	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F3-3	3.3.1-72	B
Heat exchanger components (RB Recirc Units)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	C
Heat exchanger components (RB Recirc Units)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-3	3.3.1-82	I, 7
Heat exchanger components (RB Recirc Units)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-4	3.3.1-84	A

Table 3.2.2-4 Primary Containment 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
Heat exchanger components (RB Recirc Units)	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	C
Heat exchanger components (RB Recirc Units)	Pressure Boundary	Copper Alloy with less than 15% Zinc	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-3	3.3.1-82	I, 7
Heat exchanger components (Reactor Compartment Coolers)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Heat exchanger components (Reactor Compartment Coolers)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Heat exchanger components (Reactor Compartment Coolers)	Structural Support	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F3-3	3.3.1-72	B
Piping and fittings	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Piping and fittings	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Piping and fittings	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A

Table 3.2.2-4 Primary Containment 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
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Piping and fittings	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Piping and fittings	Pressure Boundary	Carbon Steel (Concrete coated)	Soil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VII.C1-18	3.3.1-19	B
Piping and fittings	Pressure Boundary	Carbon Steel (Concrete lined)	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, Fouling, and Lining/Coating Degradation	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Piping and fittings	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F3-1	3.3.1-27	E, 5
Pump Casing (Emergency Cooling Pumps)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.2.2-4 Primary Containment 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
Pump Casing (Emergency Cooling Pumps)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Pump Casing (Emergency Cooling Pumps)	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Emergency Cooling Pumps)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Pump Casing (Emergency Cooling Pumps)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Thermowell	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Thermowell	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F3-1	3.3.1-27	E, 5
Valve Body	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Valve Body	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.2.2-4 Primary Containment 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
Valve Body	Pressure Boundary	Gray Cast Iron	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F3-3	3.3.1-72	B
Valve Body	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Valve Body	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Valve Body	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Valve Body	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)			H, 8

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 carbon steel in an air with borated water leakage environment include loss of material due to general, pitting, and crevice corrosion. These aging effects/mechanisms are managed by the External Surfaces Monitoring Program.
2. The aging effects of asbestos in an air - indoor environment include loss of material. This aging effect/mechanism is managed by the External Surfaces Monitoring Program.
3. The aging effects of asbestos in an air/gas wetted environment include loss of material. This aging effects/mechanism is managed by the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program.
4. Expansion joints are replaced every 12 years per the Preventative Maintenance Program. As such, they are short-lived components.
5. NUREG-1801 specifies a plant-specific program. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program is used to manage the aging effect(s) applicable to this component type, material, and environment combination.
6. The aging effects of copper alloy in an air environment include reduction of heat transfer due to fouling. This aging effects/mechanism is managed by the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program.

7. The aging mechanism of galvanic corrosion does not apply since the material is not in contact with material higher in galvanic series.
8. The aging effects of stainless steel in a raw water environment include loss of material due to pitting, crevice, and microbiologically influenced corrosion and fouling. These aging effects/mechanisms are managed by the Open-Cycle Cooling Water System Program.
9. NUREG-1801 specifies a plant-specific program. The Internal Surfaces in Miscellaneous Piping and Ducting Components program is used to manage the aging effect(s) applicable to this component type, material, and environment combination. Inspections of the expansion joints require physical manipulation; therefore, internal and external inspections, which include physical manipulation of elastomers, will be performed at the same time under the Internal Surfaces in Miscellaneous Piping and Ducting Components program.

Table 3.2.2-5
Reactor Building Spray System
Summary of Aging Management Evaluation

Table 3.2.2-5 Reactor Building Spray System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	V.E-1	3.2.1-23	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Outdoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)			H,1
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-2	3.2.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	V.E-4	3.2.1-23	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	V.E-5	3.2.1-24	A
Bolting	Mechanical Closure	Stainless Steel Bolting	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	III.B2-7	3.5.1-50	E,2
Bolting	Mechanical Closure	Stainless Steel Bolting	Air - Outdoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)			H,1
Bolting	Mechanical Closure	Stainless Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	IV.C2-8	3.1.1-52	A
Bolting	Mechanical Closure	Stainless Steel Bolting	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Cyclone Separator	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A

Table 3.2.2-5 Reactor Building 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 (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.A-27	3.2.1-49	A
Flow Element	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Flow Element	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.A-27	3.2.1-49	A
Flow Element	Throttle	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Flow Element	Throttle	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.A-27	3.2.1-49	A
Piping and fittings	Direct Flow	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.A-4	3.2.1-45	A
Piping and fittings	Direct Flow	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.A-3	3.2.1-46	B
Piping and fittings	Direct Flow	Carbon Steel	Concrete (Embedded)	None	None	V.F-17	3.2.1-55	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B2-7	3.5.1-50	E,4
Piping and fittings	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Cumulative Fatigue Damage/Fatigue	TLAA	V.D1-27	3.2.1-1	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.A-27	3.2.1-49	A
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-9	3.2.1-45	A
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E,5

Table 3.2.2-5 Reactor Building 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 Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.D2-17	3.2.1-34	B
Piping and fittings	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Cumulative Fatigue Damage/Fatigue	TLAA	V.D2-32	3.2.1-1	A
Piping and fittings	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.C-6	3.2.1-15	B
Piping and fittings	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.C-6	3.2.1-15	A
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.A6-11	3.5.1-47	E,7
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air with Borated Water Leakage (External)	None	None	V.F-5	3.2.1-57	A
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-9	3.3.1-28	E,6
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.F-15	3.4.1-15	B
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.F-15	3.4.1-15	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B2-7	3.5.1-50	E,4
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A

Table 3.2.2-5 Reactor Building 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	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D2-35	3.2.1-8	E,8
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cumulative Fatigue Damage/Fatigue	TLAA	V.D1-27	3.2.1-1	A
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.A-27	3.2.1-49	A
Pump Casing	Pressure Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B2-7	3.5.1-50	E,4
Pump Casing	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Pump Casing	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A
Spray Nozzles	Spray	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Spray Nozzles	Spray	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D2-35	3.2.1-8	E,8
Tanks (Sodium Hydroxide)	Leakage Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Aboveground Steel Tanks (B.2.1.15)	VIII.E-39	3.4.1-20	B
Tanks (Sodium Hydroxide)	Leakage Boundary	Carbon Steel	Air - Outdoor (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VIII.B1-6	3.4.1-30	B
Tanks (Sodium Hydroxide)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.E-40	3.4.1-6	B
Tanks (Sodium Hydroxide)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.E-40	3.4.1-6	A
Tanks (Sodium Thiosulfate)	Leakage Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	Aboveground Steel Tanks (B.2.1.15)	III.B2-7	3.5.1-50	E, 11

Table 3.2.2-5 Reactor Building 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
Tanks (Sodium Thiosulfate)	Leakage Boundary	Stainless Steel	Air - Outdoor (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	III.B2-7	3.5.1-50	E, 12
Tanks (Sodium Thiosulfate)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.E-40	3.4.1-6	B
Tanks (Sodium Thiosulfate)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.E-40	3.4.1-6	B
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-11	3.2.1-45	A
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.F1-16	3.3.1-25	E,10
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-9	3.3.1-28	E,9
Valve Body	Pressure Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B2-7	3.5.1-50	E,4
Valve Body	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D2-35	3.2.1-8	E,8
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.A-27	3.2.1-49	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 bolting in an air-outdoor environment include loss of preload/thermal effects, gasket creep, and self loosening. These aging effects/mechanisms are managed by the Bolting Integrity Program.
2. The aging effects of stainless steel bolting in an air-outdoor environment include loss of material due to pitting and crevice corrosion. These aging effects/mechanisms are managed by the Bolting Integrity Program.
3. The aging effects of copper alloy with 15% Zinc or more in an air/gas - wetted environment include loss of material due to selective leaching. These aging effects/mechanisms are managed by the Selective Leaching Program.
4. The aging effects of stainless steel in an air-outdoor environment include loss of material due to pitting and crevice corrosion. These aging effects/mechanisms are managed by the External Surfaces Monitoring Program.
5. The aging effects of carbon steel in an air with borated water leakage (external) environment include loss of material due to general, pitting and crevice corrosion. These aging effects are managed by the External Surfaces Monitoring Program.
6. NUREG-1801 specifies a plant-specific program. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program is

used to manage the aging effect(s) applicable to this component type, material, and environment combination.
7. The aging effects of copper alloy in an air-outdoor environment include loss of material due to pitting and crevice corrosion. These aging effects/mechanisms are managed by the External Surfaces Monitoring Program.
8. NUREG-1801 specifies a plant-specific program. The One Time Inspection Program is used to manage the aging effect(s) applicable to this component type, material, and environment combination.
9. NUREG-1801 specifies a plant-specific program. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program is used to manage the aging effect(s) applicable to this component type, material, and environment combination.
10. NUREG-1801 specifies a plant-specific program. The External Surfaces Monitoring Program is used to manage the aging effect(s) applicable to this component type, material, and environment combination.
11. The aging effects of stainless steel in an air-outdoor (external) environment include loss of material due to pitting and crevice corrosion. These aging effects/mechanisms are managed by the Aboveground Steel Tanks Program.
12. The aging effects of stainless steel in an air-outdoor environment include loss of material due to pitting and crevice corrosion. These aging effects/mechanisms are managed by the internal inspection of this component by the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Component Program.

Table 3.2.2-6
Reactor Building Sump and Drain System
Summary of Aging Management Evaluation

Table 3.2.2-6 Reactor Building Sump and Drain System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-2	3.2.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	V.E-4	3.2.1-23	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	V.E-5	3.2.1-24	A
Bolting	Mechanical Closure	Stainless Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	IV.C2-8	3.1.1-52	A
Bolting	Mechanical Closure	Stainless Steel Bolting	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Bolting	Mechanical Closure	Stainless Steel Bolting	Raw Water (External)	Loss of Material/Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)			G
Bolting	Mechanical Closure	Stainless Steel Bolting	Raw Water (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)			G
Piping and fittings	Direct Flow	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-9	3.2.1-45	A
Piping and fittings	Direct Flow	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Piping and fittings	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-9	3.2.1-45	A
Piping and fittings	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1

Table 3.2.2-6 Reactor Building Sump and 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 Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.D2-17	3.2.1-34	B
Piping and fittings	Leakage Boundary	Carbon Steel	Concrete (Embedded)	None	None	V.F-17	3.2.1-55	A
Piping and fittings	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VIII.G-36	3.4.1-8	E, 2
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.C-6	3.2.1-15	B
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.C-6	3.2.1-15	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.D1-29	3.2.1-8	E, 2
Piping and fittings	Leakage Boundary	Stainless Steel	Concrete (Embedded)	None	None	V.F-14	3.2.1-55	A
Piping and fittings	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 3
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D1-30	3.2.1-49	E, 4
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A, 4

Table 3.2.2-6 Reactor Building Sump and 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	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-9	3.2.1-45	A
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Piping and fittings	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.D2-17	3.2.1-34	B
Piping and fittings	Pressure Boundary	Carbon Steel	Concrete (Embedded)	None	None	V.F-17	3.2.1-55	A
Piping and fittings	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VIII.G-36	3.4.1-8	E, 2
Piping and fittings	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.C-6	3.2.1-15	B
Piping and fittings	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.C-6	3.2.1-15	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Piping and fittings	Pressure Boundary	Stainless Steel	Concrete (Embedded)	None	None	V.F-14	3.2.1-55	A
Piping and fittings	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 3
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D1-30	3.2.1-49	E, 4
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A, 4

Table 3.2.2-6 Reactor Building Sump and 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	Structural Support	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Strainer Body	Structural Support	Stainless Steel	Raw Water (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	External Surfaces Monitoring (B.2.1.21)	V.C-3	3.2.1-38	E, 5
Strainer Element	Filter	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A, 6
Tanks (Rx Bldg Sump)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Tanks (Rx Bldg Sump)	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.D1-29	3.2.1-8	E, 2
Tanks (Rx Bldg Sump)	Pressure Boundary	Stainless Steel	Concrete (Embedded)	None	None	V.F-14	3.2.1-55	A, 7
Tanks (Rx Bldg Sump)	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 3
Valve Body	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Valve Body	Leakage Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.D1-29	3.2.1-8	E, 2
Valve Body	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 3

Table 3.2.2-6 Reactor Building Sump and 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	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D1-30	3.2.1-49	E, 4
Valve Body	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	A, 4
Valve Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Valve Body	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.D1-29	3.2.1-8	E, 2
Valve Body	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 3
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D1-30	3.2.1-49	E, 4
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.D1-30	3.2.1-49	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. The aging effects of carbon steel in an air with borated water leakage environment include loss of material due to general, pitting, and crevice corrosion. These aging effects/mechanisms are managed by the External Surfaces Monitoring program.
2. NUREG-1801 specifies a plant-specific program. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is used to manage the aging effect(s) applicable to this component type, material, and environment combination.
3. The Reactor Building Sump and Drain System provides for drainage of various liquid wastes, therefore raw water was chosen as the internal environment for a portion of the piping and components, and the sump. This raw water environment is not covered by a chemistry based aging management program. The aging effects of stainless steel in this raw water environment include loss of material due to pitting, crevice, microbiologically influenced corrosion, and fouling. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program will be used to manage the aging effects for these components in this raw water environment.
4. Portions of the Reactor Building Sump and Drain System provide for drainage or reactor grade borated treated water. Based on plant operating experience, aging effects are expected to progress very slowly in this environment, but the local environment may be more adverse than generally

expected. The One-Time Inspection program will augment the Water Chemistry program by verifying the absence of aging effects.
5. The Reactor Building Sump and Drain System provides for drainage of various liquid wastes, therefore raw water was chosen as the internal environment for the sump, in which the strainer assembly is located. This raw water environment is not covered by a chemistry based aging management program. The strainer body assembly is partially submerged during normal plant operations. The External Surfaces Monitoring program will be used to manage the aging effects for the portion of the exterior of this component in this raw water environment.
6. The normal environment for the stainless steel strainer elements is air with borated water leakage. They are not submerged during normal plant operation activities. They would only be submerged during a loss of coolant accident when the decay heat pumps are operating in recirculation mode.
7. Concrete environment for the Reactor Building Sump stainless steel liner includes wet concrete. Source of moisture is likely from previous leakage of treated water from plant equipment inside the containment. Chemical tests of samples from beneath the sump liner indicate the water is not aggressive (pH approximately 11.5) and therefore will not result in an aging effect.

3.3 AGING MANAGEMENT OF AUXILIARY 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.

- Auxiliary and Fuel Handling Building Ventilation Systems (2.3.3.1)
- Auxiliary Steam System (2.3.3.2)
- Circulating Water System (2.3.3.3)
- Closed Cycle Cooling Water System (2.3.3.4)
- Containment Isolation System (2.3.3.5)
- Control Building Ventilation System (2.3.3.6)
- Cranes and Hoists (2.3.3.7)
- Diesel Generator Building Ventilation System (2.3.3.8)
- Emergency Diesel Generators and Auxiliary Systems (2.3.3.9)
- Fire Protection System (2.3.3.10)
- Fuel Handling and Fuel Storage System (2.3.3.11)
- Fuel Oil System (2.3.3.12)
- Hydrogen Monitoring (2.3.3.13)
- Instrument and Control Air System (2.3.3.14)
- Intake Screen and Pump House Ventilation System (2.3.3.15)
- Intermediate Building Ventilation System (2.3.3.16)
- Liquid and Gas Sampling System (2.3.3.17)
- Miscellaneous Floor and Equipment Drains System (2.3.3.18)
- Open Cycle Cooling Water System (2.3.3.19)
- Radiation Monitoring System (2.3.3.20)
- Radwaste System (2.3.3.21)
- Service Building Chilled Water System (2.3.3.22)
- Spent Fuel Cooling System (2.3.3.23)
- Station Blackout and UPS Diesel Generator Systems (2.3.3.24)
- Water Treatment & Distribution System (2.3.3.25)

3.3.2 RESULTS

The following tables summarize the results of the aging management review for Auxiliary Systems.

Table 3.3.2-1 Summary of Aging Management Evaluation – Auxiliary and Fuel Handling Building Ventilation Systems

Table 3.3.2-2 Summary of Aging Management Evaluation – Auxiliary Steam System

Table 3.3.2-3 Summary of Aging Management Evaluation – Circulating Water System

Table 3.3.2-22 Summary of Aging Management Evaluation – Service Building Chilled Water System

Table 3.3.2-23 Summary of Aging Management Evaluation – Spent Fuel Cooling System

Table 3.3.2-24 Summary of Aging Management Evaluation – Station Blackout and UPS Diesel Generator Systems

Table 3.3.2-25 Summary of Aging Management Evaluation – Water Treatment & Distribution System

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

3.3.2.1.1 Auxiliary and Fuel Handling Building Ventilation Systems

Materials

The materials of construction for the Auxiliary and Fuel Handling Building Ventilation Systems components are:

- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Galvanized Steel
- Neoprene
- Stainless Steel

Environments

The Auxiliary and Fuel Handling Building Ventilation Systems components are exposed to the following environments:

- Air - Indoor
- Air - Outdoor
- Air with Borated Water Leakage
- Air/Gas - Wetted

Aging Effects Requiring Management

The following aging effects associated with the Auxiliary and Fuel Handling Building Ventilation Systems components require management:

- Hardening and Loss of Strength/Elastomer Degradation
- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting and Crevice Corrosion
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

The following aging management programs manage the aging effects for the Auxiliary and Fuel Handling Building Ventilation Systems components:

- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- External Surfaces Monitoring (B.2.1.21)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)

Table 3.3.2-1, Summary of Aging Management Evaluation – Auxiliary and Fuel Handling Building Ventilation Systems summarizes the results of the aging management review for the Auxiliary and Fuel Handling Building Ventilation Systems.

3.3.2.1.2 Auxiliary Steam System

Materials

The materials of construction for the Auxiliary Steam System components are:

- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Copper Alloy with 15% Zinc or More
- Copper Alloy with less than 15% Zinc
- Glass
- Gray Cast Iron
- Rubber
- Stainless Steel

Environments

The Auxiliary Steam System components are exposed to the following environments:

- Air - Indoor
- Air with Borated Water Leakage
- Air/Gas - Wetted
- Fuel Oil
- Treated Water
- Treated Water > 140 F

Aging Effects Requiring Management

The following aging effects associated with the Auxiliary Steam System components require management:

- Cracking/Stress Corrosion Cracking
- Cumulative Fatigue Damage/Fatigue
- Hardening and Loss of Strength/Elastomer Degradation
- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling
- Loss of Material/Selective Leaching
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening
- Wall Thinning/Flow Accelerated Corrosion

Aging Management Programs

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

- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- External Surfaces Monitoring (B.2.1.21)
- Flow-Accelerated Corrosion (B.2.1.6)
- Fuel Oil Chemistry (B.2.1.16)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)
- One-Time Inspection (B.2.1.18)
- Selective Leaching of Materials (B.2.1.19)
- TLAA
- Water Chemistry (B.2.1.2)

Table 3.3.2-2, Summary of Aging Management Evaluation – Auxiliary Steam System summarizes the results of the aging management review for the Auxiliary Steam System.

3.3.2.1.3 Circulating Water System

Materials

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

- Carbon and Low Alloy Steel Bolting

- Carbon Steel
- Concrete
- Copper Alloy with 15% Zinc or More
- Copper Alloy with less than 15% Zinc
- Gray Cast Iron
- Stainless Steel

Environments

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

- Air - Indoor
- Lubricating Oil
- Raw Water
- Soil
- Treated Water

Aging Effects Requiring Management

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

- Cracking and Expansion/Reaction with aggregates
- Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)/Corrosion of embedded steel
- Cracks and Distortion/Increased stress levels from settlement
- Increase in Porosity and Permeability, Cracking, Loss of Material (Spalling, Scaling)/ Aggressive chemical attack
- Increase in Porosity and Permeability, Loss of Strength/ Leaching of calcium hydroxide
- Loss of Material/General, Pitting, Crevice, Galvanic, and Microbiologically Influenced Corrosion, and Fouling
- Loss of Material/Selective Leaching
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening
- Reduction of Heat Transfer/Fouling

Aging Management Programs

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

- Bolting Integrity (B.2.1.7)

- Buried Piping and Tanks Inspection (B.2.1.20)
- External Surfaces Monitoring (B.2.1.21)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)
- Lubricating Oil Analysis (B.2.1.23)
- One-Time Inspection (B.2.1.18)
- Open-Cycle Cooling Water System (B.2.1.9)
- Selective Leaching of Materials (B.2.1.19)

Table 3.3.2-3, Summary of Aging Management Evaluation – Circulating Water System summarizes the results of the aging management review for the Circulating Water System.

3.3.2.1.4 Closed Cycle Cooling Water System

Materials

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

- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Copper Alloy with 15% Zinc or More
- Gray Cast Iron
- Stainless Steel

Environments

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

- Air - Indoor
- Air with Borated Water Leakage
- Closed Cycle Cooling Water
- Closed Cycle Cooling Water > 140 F
- Lubricating Oil
- Raw Water
- Treated Water > 140 F
- Treated Water

Aging Effects Requiring Management

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

- Cracking/Stress Corrosion Cracking
- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting, Crevice, Galvanic, and Microbiologically Influenced Corrosion, and Fouling
- Loss of Material/Selective Leaching
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening
- Reduction of Heat Transfer/Fouling

Aging Management Programs

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

- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- Closed-Cycle Cooling Water System (B.2.1.10)
- External Surfaces Monitoring (B.2.1.21)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)
- Lubricating Oil Analysis (B.2.1.23)
- One-Time Inspection (B.2.1.18)
- Selective Leaching of Materials (B.2.1.19)
- Water Chemistry (B.2.1.2)

Table 3.3.2-4, Summary of Aging Management Evaluation – Closed Cycle Cooling Water System summarizes the results of the aging management review for the Closed Cycle Cooling Water System.

3.3.2.1.5 Containment Isolation System

Materials

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

- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Copper Alloy with 15% Zinc or More
- Copper Alloy with less than 15% Zinc

- Galvanized Steel
- Stainless Steel

Environments

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

- Air - Indoor
- Air with Borated Water Leakage
- Air/Gas - Dry
- Air/Gas - Wetted

Aging Effects Requiring Management

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

- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting and Crevice Corrosion
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

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

- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- External Surfaces Monitoring (B.2.1.21)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)
- One-Time Inspection (B.2.1.18)

Table 3.3.2-5, Summary of Aging Management Evaluation – Containment Isolation System summarizes the results of the aging management review for the Containment Isolation System.

3.3.2.1.6 <u>Control Building Ventilation System</u>

Materials

The materials of construction for the Control Building Ventilation System components are:

- Carbon and Low Alloy Steel Bolting
- Carbon Steel

- Copper Alloy with 15% Zinc or More
- Copper Alloy with less than 15% Zinc
- Galvanized Steel
- Glass
- Gray Cast Iron
- Neoprene
- Stainless Steel

Environments

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

- Air – Indoor
- Air/Gas - Dry
- Air/Gas - Wetted
- Closed Cycle Cooling Water

Aging Effects Requiring Management

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

- Hardening and Loss of Strength/Elastomer Degradation
- Loss of Material/General, Pitting and Crevice Corrosion
- Loss of Material/Selective Leaching
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening
- Reduction of Heat Transfer/Fouling

Aging Management Programs

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

- Bolting Integrity (B.2.1.7)
- Closed-Cycle Cooling Water System (B.2.1.10)
- Compressed Air Monitoring (B.2.1.12)
- External Surfaces Monitoring (B.2.1.21)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)
- Selective Leaching of Materials (B.2.1.19)

Table 3.3.2-6, Summary of Aging Management Evaluation – Control Building Ventilation System summarizes the results of the aging management review for the Control Building Ventilation System.

3.3.2.1.7 Cranes and Hoists

Materials

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

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

Environments

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

- Air – Indoor
- Air – Outdoor
- Air with Borated Water Leakage
- Lubricating Oil

Aging Effects Requiring Management

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

- Cumulative Fatigue Damage/Fatigue
- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion
- Loss of Material/Wear
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

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

- Boric Acid Corrosion (B.2.1.4)
- Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)
- TLAA

Table 3.3.2-7, Summary of Aging Management Evaluation – Cranes and Hoists summarizes the results of the aging management review for Cranes and Hoists.

3.3.2.1.8 Diesel Generator Building Ventilation System

Materials

The materials of construction for the Diesel Generator Building Ventilation System components are:

- Carbon and Low Alloy Steel Bolting
- Galvanized Steel
- Neoprene

Environments

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

- Air - Indoor
- Air/Gas - Wetted

Aging Effects Requiring Management

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

- Hardening and Loss of Strength/Elastomer Degradation
- Loss of Material/General, Pitting and Crevice Corrosion

Aging Management Programs

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

- External Surfaces Monitoring (B.2.1.21)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)

Table 3.3.2-8, Summary of Aging Management Evaluation – Diesel Generator Building Ventilation System summarizes the results of the aging management review for the Diesel Generator Building Ventilation System.

3.3.2.1.9 Emergency Diesel Generators and Auxiliary Systems

Materials

The materials of construction for the Emergency Diesel Generators and Auxiliary Systems components are:

- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Copper Alloy with 15% Zinc or More
- Copper Alloy with less than 15% Zinc
- Glass
- Gray Cast Iron
- Rubber
- Stainless Steel

Environments

The Emergency Diesel Generators and Auxiliary Systems components are exposed to the following environments:

- Air - Indoor
- Air - Outdoor
- Air/Gas - Wetted
- Closed Cycle Cooling Water
- Closed Cycle Cooling Water > 140 F
- Concrete (Embedded)
- Diesel Exhaust
- Fuel Oil
- Lubricating Oil
- Soil

Aging Effects Requiring Management

The following aging effects associated with the Emergency Diesel Generators and Auxiliary Systems components require management:

- Cracking/Stress Corrosion Cracking
- Hardening and Loss of Strength/Elastomer Degradation
- Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling
- Loss of Material/Selective Leaching

- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening
- Reduction of Heat Transfer/Fouling

Aging Management Programs

The following aging management programs manage the aging effects for the Emergency Diesel Generators and Auxiliary Systems components:

- Bolting Integrity (B.2.1.7)
- Buried Piping and Tanks Inspection (B.2.1.20)
- Closed-Cycle Cooling Water System (B.2.1.10)
- External Surfaces Monitoring (B.2.1.21)
- Fuel Oil Chemistry (B.2.1.16)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)
- Lubricating Oil Analysis (B.2.1.23)
- One-Time Inspection (B.2.1.18)
- Selective Leaching of Materials (B.2.1.19)

Table 3.3.2-9, Summary of Aging Management Evaluation – Emergency Diesel Generators and Auxiliary Systems summarizes the results of the aging management review for the Emergency Diesel Generators and Auxiliary Systems.

3.3.2.1.10 Fire Protection System

Materials

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

- Aluminum Alloy
- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Concrete
- Copper Alloy with 15% Zinc or More
- Copper Alloy with less than 15% Zinc
- Ductile Cast Iron
- Elastomer
- Glass
- Gray Cast Iron
- Grout

- Gypsum Board
- Mecatiss
- Polymer
- Stainless Steel
- Stainless Steel Bolting
- Thermo-lag

Environments

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

- Air - Indoor
- Air - Outdoor
- Air with Borated Water Leakage
- Air/Gas - Dry
- Air/Gas – Wetted
- Closed Cycle Cooling Water
- Lubricating Oil
- Raw Water
- Soil

Aging Effects Requiring Management

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

- Change in Material Properties/Various Degradation Mechanisms
- Concrete Cracking and Spalling/Freeze-Thaw, Aggressive Chemical Attack, and Reaction with Aggregates
- Cracking/Various Degradation Mechanisms
- Hardening and Loss of Strength/Elastomer Degradation
- Loss of Material/Boric Acid Corrosion
- Loss of Material/Corrosion of Embedded Steel
- Loss of Material/General, Pitting, Crevice, Galvanic, and Microbiologically Influenced Corrosion, and Fouling
- Loss of Material/Other
- Loss of Material/Selective leaching
- Loss of Material/Wear
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

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

- Aboveground Steel Tanks (B.2.1.15)
- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- Buried Piping and Tanks Inspection (B.2.1.20)
- Closed-Cycle Cooling Water System (B.2.1.10)
- External Surfaces Monitoring (B.2.1.21)
- Fire Protection (B.2.1.13)
- Fire Water System (B.2.1.14)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)
- Selective Leaching of Materials (B.2.1.19)
- Structures Monitoring Program (B.2.1.28)

Table 3.3.2-10, Summary of Aging Management Evaluation – Fire Protection System summarizes the results of the aging management review for the Fire Protection System.

3.3.2.1.11 Fuel Handling and Fuel Storage System

Materials

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

- Aluminum Alloy
- Boral
- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Stainless Steel
- Stainless Steel Bolting
- Tygon

Environments

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

- Air with Borated Water Leakage
- Treated Water

Aging Effects Requiring Management

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

- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting and Crevice Corrosion
- Loss of Material/Wear
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

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

- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)
- Water Chemistry (B.2.1.2)

Table 3.3.2-11, Summary of Aging Management Evaluation – Fuel Handling and Fuel Storage System summarizes the results of the aging management review for the Fuel Handling and Fuel Storage System.

3.3.2.1.12 Fuel Oil System

Materials

The materials of construction for the Fuel Oil System components are:

- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Copper Alloy with 15% Zinc or More
- Copper Alloy with less than 15% Zinc

Environments

The Fuel Oil System components are exposed to the following environments:

- Air - Indoor
- Air - Outdoor
- Fuel Oil

Aging Effects Requiring Management

The following aging effects associated with the Fuel Oil System components require management:

- Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

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

- Bolting Integrity (B.2.1.7)
- External Surfaces Monitoring (B.2.1.21)
- Fuel Oil Chemistry (B.2.1.16)
- One-Time Inspection (B.2.1.18)

Table 3.3.2-12 Summary of Aging Management Evaluation – Fuel Oil System summarizes the results of the aging management review for the Fuel Oil System.

3.3.2.1.13 Hydrogen Monitoring

Materials

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

- Carbon and Low Alloy Steel Bolting
- Stainless Steel

Environments

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

- Air - Indoor
- Air with Borated Water Leakage
- Air/Gas - Wetted

Aging Effects Requiring Management

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

- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting and Crevice Corrosion

- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

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

- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)

Table 3.3.2-13, Summary of Aging Management Evaluation – Hydrogen Monitoring summarizes the results of the aging management review for the Hydrogen Monitoring system.

3.3.2.1.14 Instrument and Control Air System

Materials

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

- Aluminum
- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Copper Alloy with 15% Zinc or More
- Copper Alloy with less than 15% Zinc
- Elastomer
- Stainless Steel
- Stainless Steel Bolting

Environments

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

- Air - Indoor
- Air with Borated Water Leakage
- Air/Gas – Dry
- Air/Gas – Wetted
- Closed Cycle Cooling Water
- Soil

Aging Effects Requiring Management

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

- Hardening and Loss of Strength/Elastomer Degradation
- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting, Crevice, Galvanic, and Microbiologically Influenced Corrosion
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening
- Reduction of Heat Transfer/Fouling

Aging Management Programs

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

- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- Buried Piping and Tanks Inspection (B.2.1.20)
- Closed-Cycle Cooling Water System (B.2.1.10)
- Compressed Air Monitoring (B.2.1.12)
- External Surfaces Monitoring (B.2.1.21)

Table 3.3.2-14, Summary of Aging Management Evaluation – Instrument and Control Air System summarizes the results of the aging management review for the Instrument and Control Air System.

3.3.2.1.15 Intake Screen and Pump House Ventilation System

Materials

The materials of construction for the Intake Screen and Pump House Ventilation System components are:

- Carbon and Low Alloy Steel Bolting
- Galvanized Steel
- Neoprene

Environments

The Intake Screen and Pump House Ventilation System components are exposed to the following environments:

- Air - Indoor
- Air/Gas - Wetted

Aging Effects Requiring Management

The following aging effects associated with the Intake Screen and Pump House Ventilation System components require management:

- Hardening and Loss of Strength/Elastomer Degradation
- Loss of Material/General, Pitting and Crevice Corrosion

Aging Management Programs

The following aging management programs manage the aging effects for the Intake Screen and Pump House Ventilation System components:

- External Surfaces Monitoring (B.2.1.21)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)

Table 3.3.2-15, Summary of Aging Management Evaluation – Intake Screen and Pump House Ventilation System summarizes the results of the aging management review for the Intake Screen and Pump House Ventilation System.

3.3.2.1.16 Intermediate Building Ventilation System

Materials

The materials of construction for the Intermediate Building Ventilation System components are:

- Carbon and Low Alloy Steel Bolting
- Galvanized Steel
- Neoprene

Environments

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

- Air - Indoor
- Air/Gas - Wetted

Aging Effects Requiring Management

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

- Hardening and Loss of Strength/Elastomer Degradation
- Loss of Material/General, Pitting and Crevice Corrosion

Aging Management Programs

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

- External Surfaces Monitoring (B.2.1.21)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)

Table 3.3.2-16, Summary of Aging Management Evaluation – Intermediate Building Ventilation System summarizes the results of the aging management review for the Intermediate Building Ventilation System.

3.3.2.1.17 Liquid and Gas Sampling System

Materials

The materials of construction for the Liquid and Gas Sampling System components are:

- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Copper Alloy with 15% Zinc or More
- Copper Alloy with less than 15% Zinc
- Low Alloy Steel
- Stainless Steel

Environments

The Liquid and Gas Sampling System components are exposed to the following environments:

- Air - Indoor
- Air with Borated Water Leakage
- Treated Water
- Treated Water > 140

Aging Effects Requiring Management

The following aging effects associated with the Liquid and Gas Sampling System components require management:

- Cracking/Stress Corrosion Cracking
- Cumulative Fatigue Damage/Fatigue
- Loss of Material/Boric Acid Corrosion

- Loss of Material/General, Pitting and Crevice Corrosion
- Loss of Material/Selective Leaching
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

The following aging management programs manage the aging effects for the Liquid and Gas Sampling System components:

- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- External Surfaces Monitoring (B.2.1.21)
- One-Time Inspection (B.2.1.18)
- Selective Leaching of Materials (B.2.1.19)
- TLAA
- Water Chemistry (B.2.1.2)

Table 3.3.2-17, Summary of Aging Management Evaluation – Liquid and Gas Sampling System summarizes the results of the aging management review for the Liquid and Gas Sampling System.

3.3.2.1.18 Miscellaneous Floor and Equipment Drains System

Materials

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

- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Copper Alloy with less than 15% Zinc
- Gray Cast Iron
- Stainless Steel
- Various Organic Polymers

Environments

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

- Air - Indoor
- Air - Outdoor
- Air with Borated Water Leakage
- Air/Gas - Wetted
- Concrete
- Raw Water

- Soil
- Treated Water

Aging Effects Requiring Management

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

- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling
- Loss of Material/Selective Leaching
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

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

- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- Buried Piping and Tanks Inspection (B.2.1.20)
- External Surfaces Monitoring (B.2.1.21)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)
- One-Time Inspection (B.2.1.18)
- Selective Leaching of Materials (B.2.1.19)
- Water Chemistry (B.2.1.2)

Table 3.3.2-18, Summary of Aging Management Evaluation – Miscellaneous Floor and Equipment Drains System summarizes the results of the aging management review for the Miscellaneous Floor and Equipment Drains System.

3.3.2.1.19 <u>Open Cycle Cooling Water System</u>

Materials

The materials of construction for the Open Cycle Cooling Water System components are:

- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Copper Alloy with 15% Zinc or More
- Copper Alloy with less than 15% Zinc
- Gray Cast Iron
- Stainless Steel

Environments

The Open Cycle Cooling Water System components are exposed to the following environments:

- Air - Indoor
- Air - Outdoor
- Closed Cycle Cooling Water
- Raw Water
- Soil

Aging Effects Requiring Management

The following aging effects associated with the Open Cycle Cooling Water System components require management:

- Loss of Material/General, Pitting, Crevice, Galvanic and Microbiologically Influenced Corrosion, Fouling, and Lining/Coating Degradation
- Loss of Material/Selective Leaching
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening
- Reduction of Heat Transfer/Fouling

Aging Management Programs

The following aging management programs manage the aging effects for the Open Cycle Cooling Water System components:

- Bolting Integrity (B.2.1.7)
- Buried Piping and Tanks Inspection (B.2.1.20)
- Closed-Cycle Cooling Water System (B.2.1.10)
- External Surfaces Monitoring (B.2.1.21)
- Open-Cycle Cooling Water System (B.2.1.9)
- Selective Leaching of Materials (B.2.1.19)

Table 3.3.2-19, Summary of Aging Management Evaluation – Open Cycle Cooling Water System summarizes the results of the aging management review for the Open Cycle Cooling Water System.

3.3.2.1.20 Radiation Monitoring System

Materials

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

- Carbon and Low Alloy Steel Bolting

- Stainless Steel

Environments

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

- Air - Indoor
- Air with Borated Water Leakage
- Air/Gas - Wetted

Aging Effects Requiring Management

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

- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting and Crevice Corrosion
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

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

- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- One-Time Inspection (B.2.1.18)

Table 3.3.2-20, Summary of Aging Management Evaluation – Radiation Monitoring System summarizes the results of the aging management review for the Radiation Monitoring System.

3.3.2.1.21 Radwaste System

Materials

The materials of construction for the Radwaste System components are:

- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Copper Alloy with 15% Zinc or More
- Copper Alloy with less than 15% Zinc
- Glass
- Nickel Alloy
- Stainless Steel

- Stainless Steel Bolting
- Titanium Alloy

Environments

The Radwaste System components are exposed to the following environments:

- Air - Indoor
- Air with Borated Water Leakage
- Air/Gas - Wetted
- Lubricating Oil
- Raw Water
- Raw Water > 140 F
- Treated Water
- Treated Water > 140 F

Aging Effects Requiring Management

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

- Cracking/Stress Corrosion Cracking
- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

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

- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- External Surfaces Monitoring (B.2.1.21)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)
- One-Time Inspection (B.2.1.18)
- Water Chemistry (B.2.1.2)

Table 3.3.2-21, Summary of Aging Management Evaluation – Radwaste System summarizes the results of the aging management review for the Radwaste System.

3.3.2.1.22 Service Building Chilled Water System

Materials

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

- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Copper Alloy with 15% Zinc or More
- Gray Cast Iron
- Rubber
- Stainless Steel

Environments

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

- Air - Indoor
- Closed Cycle Cooling Water

Aging Effects Requiring Management

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

- Loss of Material/General, Pitting and Crevice Corrosion
- Loss of Material/Selective leaching
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

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

- Bolting Integrity (B.2.1.7)
- Closed-Cycle Cooling Water System (B.2.1.10)
- External Surfaces Monitoring (B.2.1.21)
- Selective Leaching of Materials (B.2.1.19)

Table 3.3.2-22, Summary of Aging Management Evaluation – Service Building Chilled Water System summarizes the results of the aging management review for the Service Building Chilled Water System.

3.3.2.1.23 Spent Fuel Cooling System

Materials

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

- Carbon and Low Alloy Steel Bolting
- Stainless Steel

Environments

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

- Air with Borated Water Leakage
- Treated Water

Aging Effects Requiring Management

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

- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting and Crevice Corrosion
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

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

- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- Water Chemistry (B.2.1.2)

Table 3.3.2-23, Summary of Aging Management Evaluation – Spent Fuel Cooling System summarizes the results of the aging management review for the Spent Fuel Cooling System.

3.3.2.1.24 Station Blackout and UPS Diesel Generator Systems

Materials

The materials of construction for the Station Blackout and UPS Diesel Generator Systems components are:

- Carbon and Low Alloy Steel Bolting
- Carbon Steel

- Copper Alloy with less than 15% Zinc
- Ductile Cast Iron
- Rubber
- Stainless Steel

Environments

The Station Blackout and UPS Diesel Generator Systems components are exposed to the following environments:

- Air - Indoor
- Air - Outdoor
- Air/Gas - Dry
- Air/Gas - Wetted
- Closed Cycle Cooling Water
- Diesel Exhaust
- Fuel Oil
- Lubricating Oil
- Raw Water
- Soil

Aging Effects Requiring Management

The following aging effects associated with the Station Blackout and UPS Diesel Generator Systems components require management:

- Cracking/Stress Corrosion Cracking
- Hardening and Loss of Strength/Elastomer Degradation
- Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening
- Reduction of Heat Transfer/Fouling

Aging Management Programs

The following aging management programs manage the aging effects for the Station Blackout and UPS Diesel Generator Systems components:

- Bolting Integrity (B.2.1.7)
- Buried Piping and Tanks Inspection (B.2.1.20)
- Closed-Cycle Cooling Water System (B.2.1.10)
- External Surfaces Monitoring (B.2.1.21)

- Fuel Oil Chemistry (B.2.1.16)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)
- Lubricating Oil Analysis (B.2.1.23)
- One-Time Inspection (B.2.1.18)
- Open-Cycle Cooling Water System (B.2.1.9)

Table 3.3.2-24, Summary of Aging Management Evaluation – Station Blackout and UPS Diesel Generator Systems summarizes the results of the aging management review for the Station Blackout and UPS Diesel Generator Systems.

3.3.2.1.25 Water Treatment & Distribution System

Materials

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

- Carbon and Low Alloy Steel Bolting
- Carbon Steel
- Copper Alloy with 15% Zinc or More
- Copper Alloy with less than 15% Zinc
- Ductile Cast Iron
- Gray Cast Iron
- PVC
- Stainless Steel

Environments

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

- Air - Indoor
- Air - Outdoor
- Air with Borated Water Leakage
- Raw Water
- Raw Water > 140 F
- Treated Water
- Treated Water > 140 F

Aging Effects Requiring Management

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

- Cracking/Stress Corrosion Cracking
- Loss of Material/Boric Acid Corrosion
- Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling
- Loss of Material/Selective Leaching
- Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening

Aging Management Programs

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

- Bolting Integrity (B.2.1.7)
- Boric Acid Corrosion (B.2.1.4)
- External Surfaces Monitoring (B.2.1.21)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)
- One-Time Inspection (B.2.1.18)
- Selective Leaching of Materials (B.2.1.19)
- Water Chemistry (B.2.1.2)

Table 3.3.2-25, 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 for Which Further Evaluation is Recommended by the GALL Report

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

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 Auxiliary Steam System, Condensate System, Extraction Steam System, Feedwater System, Liquid and Gas Sampling System, Main Steam System, and Steam Turbine and Auxiliary System is discussed in Section 4.3. The evaluation of crane load cycles as a TLAA for Cranes and Hoists is discussed in Section 4.6.

3.3.2.2.2 Reduction of Heat Transfer due to Fouling

Reduction of heat transfer due to fouling could occur for stainless steel heat exchanger tubes exposed to treated water. The existing program relies on control of water chemistry to manage reduction of heat transfer due to fouling. However, control of water chemistry may have been inadequate. Therefore, the GALL Report recommends that the effectiveness of the water chemistry control program should be verified to ensure that reduction of heat transfer due to fouling is not occurring. A one-time inspection is an acceptable method to ensure that reduction of heat transfer is not occurring and that the component's intended function will be maintained during the period of extended operation.

TMI-1 will implement a One-Time Inspection program, B.2.1.18, to verify the effectiveness of the Water Chemistry program, B.2.1.2, to manage the reduction of heat transfer due to fouling in stainless steel heat exchanger components exposed to treated water in the Closed Cycle Cooling Water System. The Water Chemistry and One-Time Inspection programs are described in Appendix B.

3.3.2.2.3 Cracking due to Stress Corrosion Cracking (SCC)

1. Item 3.3.1-4 is applicable to BWRs only. This item is not used by TMI-1.

2. *Cracking due to SCC could occur in stainless steel and stainless clad steel heat exchanger components exposed to treated water greater than 60°C (>140°F). The GALL Report recommends further evaluation of a plant-specific aging management program to ensure that these aging effects are adequately managed. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1 of this SRP-LR.)*

   Item Number 3.3.1-5 is not applicable to TMI-1. This component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.

3. *Cracking due to SCC could occur in stainless steel diesel engine exhaust piping, piping components, and piping elements exposed to diesel exhaust. The GALL Report recommends further evaluation of a plant-specific aging management program to ensure that these aging effects are adequately managed. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1 of this SRP-LR.)*

   TMI-1 will implement an Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, to manage cracking due to stress corrosion cracking of the stainless steel diesel engine exhaust piping, piping components, and piping elements exposed to diesel exhaust in the Emergency Diesel Generators and Auxiliary Systems and Station Blackout and UPS Diesel Generator Systems. These internal inspections are performed during the periodic system and component surveillances or during the performance of maintenance activities when the surfaces are made accessible for visual inspection. The program includes visual inspections to assure that existing environmental conditions are not causing material degradation that could result in a loss of component intended functions. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is described in Appendix B.

3.3.2.2.4 Cracking due to Stress Corrosion Cracking and Cyclic Loading

1. *Cracking due to SCC and cyclic loading could occur in stainless steel PWR non-regenerative heat exchanger components exposed to treated borated water greater than 60°C (>140°F) in the chemical and volume control system. The existing aging management program on monitoring and control of primary water chemistry in PWRs to manage the aging effects of cracking due to SCC. However, control of water chemistry does not preclude cracking due to SCC and cyclic loading. Therefore, the effectiveness of the water chemistry control program should be verified to ensure that cracking is not occurring. The GALL Report recommends that a plant-specific aging management program be evaluated to verify the absence of cracking due to SCC and cyclic loading to ensure that these aging effects are managed adequately. An acceptable verification program is to include temperature and radioactivity monitoring of the shell side water, and eddy current testing of tubes.*

   Item Number 3.3.1-7 is not applicable to TMI-1. This component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.

2. *Cracking due to SCC and cyclic loading could occur in stainless steel PWR regenerative heat exchanger components exposed to treated borated water greater than 60°C (>140°F). The existing aging management program relies on monitoring and control of primary water chemistry in PWRs to manage the aging effects of cracking due to SCC. However, control of water chemistry does not preclude cracking due to SCC and cyclic loading. Therefore, the effectiveness of the water chemistry control program should be verified to ensure that cracking is not occurring. The GALL Report recommends that a plant-specific aging management program be evaluated to verify the absence of cracking due to SCC and cyclic loading to ensure that these aging effects are managed adequately. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1 of this SRP-LR.)*

   Item Number 3.3.1-8 is not applicable to TMI-1. This component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.

3. *Cracking due to SCC and cyclic loading could occur for the stainless steel pump casing for the PWR high-pressure pumps in the chemical and volume control system. The existing aging management program relies on monitoring and control of primary water chemistry in PWRs to manage the aging effects of cracking due to SCC. However, control of water chemistry does not preclude cracking due to SCC and cyclic loading. Therefore, the effectiveness of the water chemistry control program*

should be verified to ensure that cracking is not occurring. The GALL Report recommends that a plant-specific aging management program be evaluated to verify the absence of cracking due to SCC and cyclic loading to ensure that these aging effects are managed adequately. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1 of this SRP-LR.)

Item Number 3.3.1-9 is not applicable to TMI-1. This component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.

4. Item Number 3.3.1-10 is not applicable to TMI-1. This component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.

3.3.2.2.5 <u>Hardening and Loss of Strength due to Elastomer Degradation</u>

1. *Hardening and loss of strength due to elastomer degradation could occur in elastomer seals and components of heating and ventilation systems exposed to air – indoor uncontrolled (internal/external). The GALL Report recommends further evaluation of a plant-specific aging management program to ensure that these aging effects are adequately managed. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1 of this SRP-LR.)*

   TMI-1 will implement a External Surfaces Monitoring program, B.2.1.21, to manage hardening and loss of strength due to elastomer degradation of elastomer hoses exposed to indoor air, air with borated water leakage, and dry air in the Auxiliary Steam System, Emergency Diesel Generators and Auxiliary Systems, Instrument and Control Air System, Reactor Coolant System, and Station Blackout and UPS Diesel Generator Systems. The External Surfaces Monitoring program consists of system inspections and walkdowns. This program includes periodic visual inspections of elastomer hoses within the scope of license renewal and subject to AMR in order to manage aging effects. The program manages aging effects through visual inspection of elastomer surfaces for evidence of elastomer degradation. The External Surfaces Monitoring program is described in Appendix B.

   TMI-1 will implement a Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, to manage hardening and loss of strength due to elastomer degradation of elastomer expansion joints exposed to indoor air and wetted air in the Auxiliary and Fuel Handling Building Ventilation Systems, Control Building Ventilation System, Diesel Generator Building Ventilation System, Intake Screen and Pump House Ventilation System, Intermediate Building Ventilation System, and Primary Containment Heating and Ventilation System. These internal inspections are performed during the periodic system and component surveillances or during the performance of maintenance activities when the surfaces are made accessible for visual inspection. The program includes visual inspections to assure that existing environmental conditions are not causing material degradation that could result in a loss of component intended functions. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components 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) exposed to treated water or to treated borated water. The GALL Report recommends that a plant-specific aging management program be evaluated to determine and assesses the qualified life of the linings in the environment to ensure that these aging effects are adequately managed. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1 of this SRP-LR.)*

   TMI-1 will implement a Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, to manage hardening and loss of strength due to elastomer degradation of elastomer hoses exposed to treated water in the Auxiliary Steam System. These internal inspections are performed during the periodic system and component surveillances or during the performance of maintenance activities when the surfaces are made accessible for visual inspection. The program includes visual inspections to assure that existing environmental conditions are not causing material degradation that could result in a loss of component intended functions. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is described in Appendix B.

3.3.2.2.6 Reduction of Neutron-Absorbing Capacity and Loss of Material due to General Corrosion

Reduction of neutron-absorbing capacity and loss of material due to general corrosion could occur in the neutron-absorbing sheets of BWR and PWR spent fuel storage racks exposed to treated water or to treated borated water. The GALL Report recommends further evaluation of a plant-specific aging management program to ensure that these aging effects are adequately managed. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1 of this SRP-LR).

TMI-1 will implement a Water Chemistry program, B.2.1.2, to manage loss of material due to general corrosion of the boral, boron steel spent fuel storage racks neutron-absorbing sheets exposed to treated water in the Fuel Handling and Fuel Storage System. The Water Chemistry program consists of measures that are used to manage aging of piping, piping components, piping elements and heat exchangers and mitigate damage caused by corrosion and stress corrosion cracking (SCC). The water chemistry program relies on monitoring and control of reactor water chemistry based on industry guidelines for primary water and secondary water chemistry such as EPRI TR-105714, Rev. 3 and TR-102134, Rev. 3 or later revisions. The Water Chemistry program is described in Appendix B.

Reduction of neutron-absorbing capacity of the boral, boron steel spent fuel storage racks neutron-absorbing sheets exposed to treated water is insignificant and requires no aging management. The potential for aging effects due to sustained irradiation of Boral was previously evaluated by the staff (BNL-NUREG-25582, dated January 1979; NUREG-1787, VC Summer SER, paragraph 3.5.2.4.2, page 3-406) and determined to be insignificant. Plant operating experience with Boral coupons inspected in 1995, 1997, 1999, and 2001 is consistent with the staff's conclusion and an aging management program is not required.

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

1. *Loss of material due to general, pitting, and crevice corrosion could occur in steel piping, piping components, and piping elements, including the tubing, valves, and tanks in the reactor coolant pump oil collection system, exposed to lubricating oil (as part of the fire protection system). The existing aging management program relies on the periodic sampling and analysis of lubricating oil to maintain contaminants within acceptable limits, thereby preserving an environment that is not conducive to corrosion. However, control of lube oil contaminants may not always have been adequate to preclude corrosion. Therefore, the effectiveness of lubricating oil control 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 lubricating oil 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.*

   In addition, corrosion may occur at locations in the reactor coolant pump oil collection tank 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 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.

   Item Number 3.3.1-14, 3.3.1-15, and 3.3.1-16 are not applicable to TMI-1. The component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.

2. Item 3.3.1-17 is applicable to BWRs only. This item is not used by TMI-1.

3. *Loss of material due to general (steel only) pitting and crevice corrosion could occur for steel and stainless steel diesel exhaust piping, piping components, and piping elements exposed to diesel exhaust. The GALL Report recommends further evaluation of a plant-specific aging management program to ensure that these aging effects are adequately*

managed. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1 of this SRP-LR.)

TMI-1 will implement a Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, to manage loss of material due to general, pitting, and crevice corrosion of the stainless steel and steel diesel engine exhaust piping, piping components, and piping elements exposed to diesel exhaust in the Emergency Diesel Generators and Auxiliary Systems and Station Blackout and UPS Diesel Generator Systems. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program consists of inspections of the internal surfaces of steel and stainless steel components that are not covered by other aging management programs. These internal inspections are performed during the periodic system and component surveillances or during the performance of maintenance activities when the surfaces are made accessible for visual inspection. The program includes visual inspections to assure that existing environmental conditions are not causing material degradation that could result in a loss of component intended functions. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is described in Appendix B.

3.3.2.2.8 Loss of Material due to General, Pitting, Crevice, and Microbiologically-Influenced Corrosion (MIC)

Loss of material due to general, pitting, crevice corrosion, and microbiologically-influenced corrosion (MIC) could occur for steel (with or without coating or wrapping) 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 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.

TMI-1 will implement a Buried Piping and Tanks Inspection program, B.2.1.20, to manage the loss of material due to general, pitting, crevice, and microbiologically influenced corrosion of the steel (with or without coating or wrapping) piping, piping components, piping elements, and structural members exposed to soil in the Circulating Water System, Emergency Diesel Generators and Auxiliaries System, Fire Protection System, Instrument and Control Air System, Open Cycle Cooling Water System, Primary Containment Heating and Ventilation System, Station Blackout and UPS Diesel Generator Systems, and Dike/Flood Control System. The Buried Piping and Tanks Inspection program is described in Appendix B.

3.3.2.2.9 Loss of Material due to General, Pitting, Crevice, Microbiologically-Influenced Corrosion and Fouling

1. *Loss of material due to general, pitting, crevice, MIC, and fouling could occur for 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 to manage loss of material due to corrosion or fouling. Corrosion or fouling may occur at locations where contaminants accumulate. The effectiveness of the fuel oil chemistry control 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, crevice, MIC, and fouling to verify the effectiveness of the fuel oil chemistry 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.*

   TMI-1 will implement a One-Time Inspection program, B.2.1.18, to verify the effectiveness of the Fuel Oil Chemistry program, B.2.1.16, to manage the loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, and fouling of the steel piping, piping components, piping elements, and tanks exposed to fuel oil in the Auxiliary Steam System, Emergency Diesel Generators and Auxiliary Systems, Fuel Oil System, and Station Blackout and UPS Diesel Systems. The Fuel Oil Chemistry and One-Time Inspection programs are described in Appendix B.

   TMI-1 will implement a Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, to manage the loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, and fouling of the steel piping, piping components, piping elements, and tanks exposed to fuel oil in the Emergency Diesel Generators and Auxiliary Systems and Station Blackout and UPS Diesel Systems. These internal inspections are performed during the periodic system and component surveillances or during the performance of maintenance activities when the surfaces are made accessible for visual inspection. The program includes visual inspections to assure that existing environmental conditions are not causing material degradation that could result in a loss of component intended functions. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is described in Appendix B.

2. *Loss of material due to general, pitting, crevice, MIC, and fouling could occur for steel heat exchanger components exposed to lubricating oil. The existing aging management program relies on the periodic sampling and analysis of lubricating oil to maintain contaminants within acceptable limits, thereby preserving an environment that is not conducive to corrosion. However, control of lube oil contaminants may not always have been adequate to preclude corrosion. Therefore, the effectiveness of lubricating oil control 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 lube oil 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.

TMI-1 will implement a One-Time Inspection program, B.2.1.18, to verify the effectiveness of the Lubricating Oil Analysis program, B.2.1.23, to manage loss of material due to general, pitting, crevice, and microbiologically influenced corrosion of steel piping, piping components, and piping elements exposed to lubricating oil in the Reactor Coolant System. Fouling is not predicted for this component, material and environment combination. The Lubricating Oil Analysis and One-Time Inspection programs are described in Appendix B.

3.3.2.2.10 Loss of Material due to Pitting and Crevice Corrosion

1. *Loss of material due to pitting and crevice corrosion could occur in BWR and PWR steel piping with elastomer lining or stainless steel cladding that are exposed to treated water and treated borated water if the cladding or lining is degraded. The existing aging management program relies on monitoring and control of reactor water chemistry to manage the aging effects of loss of material from pitting and 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.*

   Item Number 3.3.1-22 is not applicable to TMI-1. The component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.

2. *Loss of material due to pitting and crevice corrosion could occur for stainless steel and aluminum piping, piping components, piping elements, and for stainless steel and steel with stainless steel cladding heat exchanger components exposed to treated water. The existing aging management program relies on monitoring and control of reactor water chemistry to manage the aging effects of loss of material from pitting and 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.

TMI-1 will implement a One-Time Inspection program, B.2.1.18, to verify the effectiveness of the Water Chemistry program, B.2.1.2, to manage the loss of material due to pitting and crevice corrosion of the stainless steel and steel with stainless steel cladding heat exchanger components, tanks, penetration bellows, support members, fuel transfer canal liner, and, aluminum support members exposed to treated water in the Closed Cycle Cooling Water System, Components Supports Commodities Group, Fuel Handling Building, Miscellaneous Floor and Equipment Drains System, and Reactor Building. The Water Chemistry and One-Time Inspection programs are described in Appendix B.

3. *Loss of material due to pitting and crevice corrosion could occur for copper alloy HVAC piping, piping components, and piping elements exposed to condensation (external). The GALL Report recommends further evaluation of a plant-specific aging management program to ensure that these aging effects are adequately managed. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1 of this SRP-LR.)*

   TMI-1 will implement an Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, to manage loss of material due to pitting and crevice corrosion of the copper alloy heat exchanger components exposed to wetted air in the Control Building Ventilation System. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program consists of inspections of the copper alloy heat exchanger coils exposed to air that are not covered by other aging management programs. These inspections are performed during the periodic system and component surveillances or during the performance of maintenance activities when the surfaces are made accessible for visual inspection. The program includes visual inspections to assure that existing environmental conditions are not causing material degradation that could result in a loss of component intended functions. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is described in Appendix B.

   TMI-1 will implement a External Surfaces Monitoring program, B.2.1.21, to manage loss of material due to pitting and crevice corrosion of the copper alloy piping, piping components, and piping elements exposed to outdoor air and air with borated water leakage in the Fuel Oil System and Reactor Building Spray System. The External Surfaces Monitoring program consists of system inspections and walkdowns. This program includes periodic visual inspections of components within the scope of license renewal and subject to AMR in order to manage aging effects. The program manages aging effects through visual inspection of external surfaces for evidence of aging effects. The External Surfaces Monitoring program is described in Appendix B.

4. *Loss of material due to pitting and crevice corrosion could occur for copper alloy piping, piping components, and piping elements exposed to lubricating oil. The existing aging management program relies on the periodic sampling and analysis of lubricating oil to maintain contaminants within acceptable limits, thereby preserving an environment that is not conducive to corrosion. However, control of lube oil contaminants may not always have been adequate to preclude corrosion. Therefore, the effectiveness of lubricating oil control 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 lubricating oil 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.*

   TMI-1 will implement a One-Time Inspection program, B.2.1.18, to verify the effectiveness of the Lubricating Oil Analysis program, B.2.1.23, to manage the loss of material due to pitting and crevice corrosion of the copper alloy heat exchanger components exposed to lubricating oil in the Closed Cycle Cooling Water System. The Lubricating Oil Analysis and One-Time Inspection programs are described in Appendix B.

   TMI-1 will implement an Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, to manage the loss of material due to pitting and crevice corrosion of the copper alloy piping, piping components, and piping elements exposed to waste lubricating oil in the Radwaste System. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program consists of inspections of the copper alloy piping, piping components, and piping elements exposed to lubricating oil that are not covered by other aging management programs. These inspections are performed during the periodic system and component surveillances or during the performance of maintenance activities when the surfaces are made accessible for visual inspection. The program includes visual inspections to assure that existing environmental conditions are not causing material degradation that could result in a loss of component intended functions. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is described in Appendix B.

5. *Loss of material due to pitting and crevice corrosion could occur for HVAC aluminum piping, piping components, and piping elements and stainless steel ducting and components exposed to condensation. The GALL Report recommends further evaluation of a plant-specific aging management program to ensure that these aging effects are adequately managed. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1 of this SRP-LR.)*

   TMI-1 will implement a Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, to manage loss of material due to pitting and crevice corrosion of the stainless steel piping, piping components, piping elements, and tanks exposed to wetted air in the Auxiliary and Fuel Handling Building Ventilation System, Extraction Steam System, Main Steam System, Primary Containment Heating and Ventilation System, and Steam Turbine and Auxiliary Systems. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program consists of inspections of the internal surfaces of stainless steel components that are not covered by other aging management programs. These internal inspections are performed during the periodic system and component surveillances or during the performance of maintenance activities when the surfaces are made accessible for visual inspection. The program includes visual inspections to assure that existing environmental conditions are not causing material degradation that could result in a loss of component intended functions. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is described in Appendix B.

6. *Loss of material due to pitting and crevice corrosion could occur for copper alloy fire protection system piping, piping components, and piping elements exposed to internal condensation. The GALL Report recommends further evaluation of a plant-specific aging management program to ensure that these aging effects are adequately managed. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1 of this SRP-LR.)*

   TMI-1 will implement a Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, to manage loss of material due to pitting and crevice corrosion of the copper alloy piping, piping components, and piping elements exposed to wetted air in the Emergency Diesel Generators and Auxiliary System, Radwaste System, and Reactor Building Spray System. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program consists of inspections of the internal surfaces of copper alloy components that are not covered by other aging management programs. These internal inspections are performed during the periodic system and component surveillances or during the performance of maintenance activities when the surfaces are made accessible for visual inspection. The program includes visual inspections to assure that existing environmental conditions are not causing material degradation that could result in a loss of component intended functions. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is described in Appendix B.

   TMI-1 will implement a Compressed Air Monitoring program, B.2.1.12, to manage loss of material due to pitting and crevice corrosion of the copper alloy piping, piping components, piping elements, and heat exchanger components exposed to wetted air in the Control Building Ventilation System and Instrument and Control Air System. The Compressed Air Monitoring program consists of inspections of the internal surfaces of copper alloy components. The program includes inspections to assure that existing environmental conditions are not causing material degradation that could result in a loss of component intended functions. The Compressed Air Monitoring program is described in Appendix B.

TMI-1 will implement a One-Time Inspection program, B.2.1.18, to manage loss of material due to pitting and crevice corrosion of the copper alloy piping, piping components, and piping elements exposed to wetted air in the Containment Isolation System. The One-Time Inspection program consists of inspections of the internal surfaces of copper alloy components that are not covered by other aging management programs. Pitting and crevice corrosion is not expected for this material and environment combination because contaminant concentration is not expected. This internal inspection is performed to verify the absence of these aging effects on copper alloy exposed to a wetted air environment. The One-Time Inspection program is described in Appendix B.

The Fire Protection program, B.2.1.13, will be used to manage loss of material due to pitting and crevice corrosion of the copper alloy spray nozzles exposed to wetted air in the Fire Protection System. The Fire Protection program includes monitoring, testing, and inspection activities including low-pressure carbon dioxide fire suppression system flow testing to verify flow from each nozzle. Any adverse conditions such as broken or missing parts, loose fasteners, excessive dirt or debris, or other degrading condition are required to be reported for corrective action evaluation. The Fire Protection program is described in Appendix B.

The Fire Water System program, B.2.1.14, will be used to manage loss of material due to pitting and crevice corrosion of the copper alloy sprinkler heads exposed to wetted air in the Fire Protection System. The Fire Water System program manages the aging effects of fire water system sprinkler heads through system monitoring, periodic tests and inspection activities. The Fire Water System program is described in Appendix B.

7. *Loss of material due to pitting and crevice corrosion could occur for stainless steel piping, piping components, and piping elements exposed to soil. The GALL Report recommends further evaluation of a plant-specific aging management program to ensure that these aging effects are adequately managed. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1 of this SRP-LR.)*

   TMI-1 will implement a Buried Piping and Tanks Inspection program, B.2.1.20, to manage loss of material due to pitting and crevice corrosion of the stainless steel piping, piping components, and piping elements exposed to soil in the Fire Protection System. The Buried Piping and Tanks Inspection program consists of preventive measures to mitigate corrosion and periodic inspection to manage the effects of corrosion on the pressure-retaining capacity of buried stainless steel piping, piping components, and piping elements. The Buried Piping and Tanks Inspection program is described in Appendix B.

8. *Loss of material due to pitting and crevice corrosion could occur for stainless steel piping, piping components, and piping elements of the BWR Standby Liquid Control System that are exposed to sodium pentaborate solution. The existing aging management program relies on monitoring and control of water chemistry to manage the aging effects of*

loss of material due to pitting and crevice corrosion. However, high concentrations of impurities at crevices and locations of stagnant flow conditions could cause loss of material due to pitting and crevice corrosion. Therefore, the GALL Report recommends that the effectiveness of the water chemistry control program should be verified to ensure this aging is not occurring. A one-time inspection of select components at susceptible locations is an acceptable method to ensure that loss of material due to pitting and crevice corrosion is not occurring and that the component's intended function will be maintained during the period of extended operation.

Item Number 3.3.1-30 is applicable to BWRs only. This item is not used by TMI-1.

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

Item Number 3.3.1-31 is applicable to BWRs only. This item is not used by TMI-1.

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

1. *Loss of material due to pitting, crevice, and MIC could occur in stainless steel, aluminum, and copper alloy piping, piping components, and piping elements exposed to fuel oil. The existing aging management program relies on the fuel oil chemistry program for monitoring and control of fuel oil contamination to manage loss of material due to corrosion. However, corrosion may occur at locations where contaminants accumulate and the effectiveness of fuel oil chemistry control 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 fuel oil chemistry control 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.*

   TMI-1 will implement a One-Time Inspection program, B.2.1.18, to verify the effectiveness of the Fuel Oil Chemistry program, B.2.1.16, to manage the loss of material due to pitting, crevice, and microbiologically influenced corrosion of the stainless steel and copper alloy with greater than 15 percent zinc piping, piping components, and piping elements exposed to fuel oil in the Auxiliary Steam System, Emergency Diesel Generators and Auxiliary Systems, and Fuel Oil System. The Fuel Oil Chemistry program consists of surveillance and maintenance procedures to mitigate corrosion and measures to verify the effectiveness of an aging management program (AMP) and confirm the insignificance of an aging effect. Fuel oil quality is maintained by monitoring and controlling fuel oil contamination in accordance with the plant's technical specifications and the guidelines of the American Society for Testing Materials (ASTM) Standards D 1796, D 2276, D 2709, D6217, and D 4057. Exposure to fuel oil contaminants, such as water and microbiological organisms, is minimized by periodic draining or cleaning of tanks and by verifying the quality of new oil before its introduction into the storage tanks. The Fuel Oil Chemistry and One-Time Inspection programs are described in Appendix B.

TMI-1 will implement the Fuel Oil Chemistry program, B.2.1.16, and One-Time Inspection program, B.2.1.18, to manage the loss of material due to microbiologically influenced corrosion of the copper alloy with less than 15 percent zinc piping, piping components, and piping elements exposed to fuel oil in the Auxiliary Steam System, Emergency Diesel Generators and Auxiliary Systems, Fuel Oil System, and Station Blackout and UPS Diesels and Auxiliary Systems. The loss of material due to pitting and crevice corrosion in copper alloy with less than 15 percent zinc exposed to fuel oil is not predicted. The Fuel Oil Chemistry program consists of surveillance and maintenance procedures to mitigate corrosion and measures to verify the effectiveness of an aging management program (AMP) and confirm the insignificance of an aging effect. Fuel oil quality is maintained by monitoring and controlling fuel oil contamination in accordance with the plant's technical specifications and the guidelines of the American Society for Testing Materials (ASTM) Standards D 1796, D 2276, D 2709, D6217, and D 4057. Exposure to fuel oil contaminants, such as water and microbiological organisms, is minimized by periodic draining or cleaning of tanks and by verifying the quality of new oil before its introduction into the storage tanks. The Fuel Oil Chemistry and One-Time Inspection programs are described in Appendix B.

2. *Loss of material due to pitting, crevice, and MIC could occur in stainless steel piping, piping components, and piping elements exposed to lubricating oil. The existing program relies on the periodic sampling and analysis of lubricating oil to maintain contaminants within acceptable limits, thereby preserving an environment that is not conducive to corrosion. However, control of lube oil contaminants may not always have been adequate to preclude corrosion. Therefore, the effectiveness of lubricating oil control 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 lubricating oil 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.*

   TMI-1 will implement a One-Time Inspection program, B.2.1.18, to verify the effectiveness of the Lubricating Oil Analysis program, B.2.1.23, to manage the loss of material due to pitting, crevice, and microbiologically influenced corrosion of the stainless steel piping, piping components, piping elements, heat exchanger components, and tanks exposed to lubricating oil in the Decay Heat Removal System, Emergency Diesel Generators and Auxiliaries System, Makeup and Purification System, Reactor Coolant System, and Station Blackout and UPS Diesel Generator System. The Lubricating Oil Analysis and One-Time Inspection programs are described in Appendix B.

TMI-1 will implement an Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, to manage loss of material due to pitting, crevice, and microbiologically influenced corrosion of the stainless steel piping, piping components, piping elements, and tanks exposed to waste lubricating oil in the Fire Protection System. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program consists of inspections of components exposed to lubricating oil that are not covered by other aging management programs. These inspections are performed during the periodic system and component surveillances or during the performance of maintenance activities when the surfaces are made accessible for visual inspection. The program includes visual inspections to assure that existing environmental conditions are not causing material degradation that could result in a loss of component intended functions. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is described in Appendix B.

TMI-1 will implement an External Surfaces Monitoring program, B.2.1.21, to manage loss of material due to pitting, crevice, and microbiologically influenced corrosion of the stainless steel drip pans exposed to waste lubricating oil in the Fire Protection System. The External Surfaces Monitoring program consists of system inspections and walkdowns. This program includes periodic visual inspections of components within the scope of license renewal and subject to AMR in order to manage aging effects. The program manages aging effects through visual inspection of external surfaces for evidence of aging effects. The External Surfaces Monitoring program is described in Appendix B.

3.3.2.2.13 Loss of Material due to Wear

Loss of material due to wear could occur in the elastomer seals and components exposed to air indoor uncontrolled (internal or external). The GALL Report recommends further evaluation to ensure that these aging effects are adequately managed. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1 of this SRP-LR.)

Item Number 3.3.1-34 is not applicable to TMI-1. The component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.

3.3.2.2.14 Loss of Material due to Cladding Breach

Loss of material due to cladding breach could occur for PWR steel charging pump casings with stainless steel cladding exposed to treated borated water. The GALL Report references NRC Information Notice 94-63, Boric Acid Corrosion of Charging Pump Casings Caused by Cladding Cracks, and recommends further evaluation of a plant-specific aging management program to ensure that the aging effect is adequately managed. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1 of this SRP-LR).

Item Number 3.3.1-35 is not applicable to TMI-1. The component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.

3.3.2.2.15 Quality Assurance for Aging Management of Nonsafety-Related Components

QA provisions applicable to License Renewal are discussed in Section B.1.3.

3.3.2.3 Time-Limited Aging Analysis

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

- Section 4.3, Metal Fatigue of Piping and Components
- Section 4.6, Crane Load Cycle Limits

3.3.3 CONCLUSION

The Auxiliary Systems piping, piping components, piping elements, heat exchangers, and tanks 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	Steel and stainless steel piping, piping components, piping elements, and heat exchanger components exposed to air – indoor uncontrolled, treated borated water or treated water	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.

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
3.3.1-3	Stainless steel heat exchanger tubes exposed to treated water	Reduction of heat transfer due to fouling	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801 with exceptions. The One-Time Inspection program, B.2.1.18, will be used to verify the effectiveness of the Water Chemistry program, B.2.1.2, to manage reduction of heat transfer due to fouling of stainless steel heat exchanger components exposed to treated water. Exceptions apply to the NUREG-1801 recommendations for One-Time Inspection program implementation. See subsection 3.3.2.2.2.
3.3.1-4	BWR Only				
3.3.1-5	Stainless steel and stainless clad steel heat exchanger components exposed to treated water >60°C (>140°F)	Cracking due to stress corrosion cracking	A plant specific aging management program is to be evaluated.	Yes, plant specific	Not Applicable. 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
3.3.1-6	Stainless steel diesel engine exhaust piping, piping components, and piping elements exposed to diesel exhaust	Cracking due to stress corrosion cracking	A plant specific aging management program is to be evaluated.	Yes, plant specific	The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, will be used to manage cracking due to stress corrosion cracking of the stainless steel diesel engine exhaust piping, piping components, and piping elements exposed to diesel exhaust. See subsection 3.3.2.2.3.3.
3.3.1-7	Stainless steel non-regenerative heat exchanger components exposed to treated borated water >60°C (>140°F)	Cracking due to stress corrosion cracking and cyclic loading	Water Chemistry and a plant-specific verification program. An acceptable verification program is to include temperature and radioactivity monitoring of the shell side water, and eddy current testing of tubes.	Yes, plant specific	Not Applicable. See subsection 3.3.2.2.4.1.

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
3.3.1-8	Stainless steel regenerative heat exchanger components exposed to treated borated water >60°C (>140°F)	Cracking due to stress corrosion cracking and cyclic loading	Water Chemistry and a plant-specific verification program. The AMP is to be augmented by verifying the absence of cracking due to stress corrosion cracking and cyclic loading. A plant specific aging management program is to be evaluated.	Yes, plant specific	Not Applicable. See subsection 3.3.2.2.4.2.
3.3.1-9	Stainless steel high-pressure pump casing in PWR chemical and volume control system	Cracking due to stress corrosion cracking and cyclic loading	Water Chemistry and a plant-specific verification program. The AMP is to be augmented by verifying the absence of cracking due to stress corrosion cracking and cyclic loading. A plant specific aging management program is to be evaluated.	Yes, plant specific	Not Applicable. See subsection 3.3.2.2.4.3.

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
3.3.1-10	High-strength steel closure bolting exposed to air with steam or water leakage.	Cracking due to stress corrosion cracking, cyclic loading	Bolting Integrity The AMP is to be augmented by appropriate inspection to detect cracking if the bolts are not otherwise replaced during maintenance.	Yes, if the bolts are not replaced during maintenance	Not Applicable. See subsection 3.3.2.2.4.4.
3.3.1-11	Elastomer seals and components exposed to air – indoor uncontrolled (internal/external)	Hardening and loss of strength due to elastomer degradation	A plant specific aging management program is to be evaluated.	Yes, plant specific	The External Surfaces Monitoring program, B.2.1.21, and Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, will be used to manage hardening and loss of strength due to elastomer degradation of the elastomer components exposed to indoor air, wetted air, dry air, and air with borated water leakage. See subsection 3.3.2.2.5.1.
3.3.1-12	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 is to be evaluated.	Yes, plant specific	The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, will be used to manage hardening and loss of strength due to elastomer degradation of elastomer hoses exposed to treated water. See subsection 3.3.2.2.5.2.

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
3.3.1-13	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	A plant specific aging management program is to be evaluated.	Yes, plant specific	The Water Chemistry program, B.2.1.2, will be used to manage loss of material due to general corrosion of the boral, boron steel spent fuel storage racks neutron-absorbing sheets exposed to treated water. Reduction of neutron-absorbing capacity of the boral, boron steel spent fuel storage racks neutron-absorbing sheets exposed to treated water is insignificant and requires no aging management. See subsection 3.3.2.2.6.
3.3.1-14	Steel piping, piping component, and piping elements exposed to lubricating oil	Loss of material due to general, pitting, and crevice corrosion	Lubricating Oil Analysis and One-Time Inspection	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 reactor coolant pump oil collection system piping, tubing, and valve bodies exposed to lubricating oil	Loss of material due to general, pitting, and crevice corrosion	Lubricating Oil Analysis and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Not Applicable. See subsection 3.3.2.2.7.1.
3.3.1-16	Steel reactor coolant pump oil collection system tank exposed to lubricating oil	Loss of material due to general, pitting, and crevice corrosion	Lubricating Oil Analysis and One-Time Inspection to evaluate the thickness of the lower portion of the tank	Yes, detection of aging effects is to be evaluated	Not Applicable. See subsection 3.3.2.2.7.1.
3.3.1-17	BWR Only				
3.3.1-18	Stainless steel and steel diesel engine exhaust piping, piping components, and piping elements exposed to diesel exhaust	Loss of material/ general (steel only), pitting and crevice corrosion	A plant specific aging management program is to be evaluated.	Yes, plant specific	The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, will be used to manage loss of material due to general, pitting, and crevice corrosion of stainless steel and steel diesel engine exhaust piping, piping components, and piping elements exposed to diesel exhaust. 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
3.3.1-19	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	No Yes, detection of aging effects and operating experience are to be further evaluated	Consistent with NUREG-1801 with exceptions. The Buried Piping and Tanks Inspection program, B.2.1.20, will be used to manage loss of material due to general, pitting, crevice, and microbiologically influenced corrosion of the steel (with or without coating or wrapping) piping, piping components, piping elements, and structural members exposed to soil. Exceptions apply to the NUREG-1801 recommendations for Buried Piping and Tanks Inspection program implementation. See subsection 3.3.2.2.8.

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 and One-Time Inspection	Yes, detection of aging effects is to be evaluated)	Consistent with NUREG-1801 with exceptions. The One-Time Inspection program, B.2.1.18, will be used to verify the effectiveness of the Fuel Oil Chemistry program, B.2.1.16, to manage loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, and fouling of the steel piping, piping components, piping elements, and tanks exposed to fuel oil. Exceptions apply to the NUREG-1801 recommendations for Fuel Oil Chemistry and One-Time Inspection program implementation. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, has been substituted and will be used to manage loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, and fouling of the steel piping, piping components, piping elements, and tanks exposed to fuel oil. See subsection 3.3.2.2.9.1.

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
3.3.1-21	Steel heat exchanger components exposed to lubricating oil	Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, and fouling	Lubricating Oil Analysis and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Not consistent with NUREG-1801. The One-Time Inspection program (B.2.1.18) will be used to verify the effectiveness of the Lubricating Oil Analysis program (B.2.1.23) to manage loss of material due to general, pitting, crevice, and microbiologically influenced corrosion of the steel piping, piping components, and piping elements exposed to lubricating oil. Fouling is not predicted for this component, material and environment combination. See subsection 3.3.2.2.9.2.
3.3.1-22	Steel with elastomer lining or stainless steel cladding piping, piping components, and piping elements exposed to treated water and treated borated water	Loss of material due to pitting and crevice corrosion (only for steel after lining/cladding degradation)	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Not Applicable. See subsection 3.3.2.2.10.1.

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
3.3.1-23	Stainless steel and steel with stainless steel cladding heat exchanger components exposed to treated water	Loss of material due to pitting and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801 with exceptions. The One-Time Inspection program, B.2.1.18, will be used to verify the effectiveness of the Water Chemistry program, B.2.1.2, to manage loss of material due to pitting and crevice corrosion of the stainless steel and steel with stainless steel cladding heat exchanger components exposed to treated water. Exceptions apply to the NUREG-1801 recommendations for One-Time Inspection program implementation. See subsection 3.3.2.2.10.2.
3.3.1-24	Stainless steel and aluminum piping, piping components, and piping elements exposed to treated water	Loss of material due to pitting and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801 with exceptions. The One-Time Inspection program, B.2.1.18, will be used to verify the effectiveness of the Water Chemistry program, B.2.1.2, to manage loss of material due to pitting and crevice corrosion of the stainless steel tanks, penetration bellows, support members, fuel transfer canal liner, and, aluminum support members exposed to treated water. Exceptions apply to the NUREG-1801 recommendations for One-Time Inspection program implementation. See subsection 3.3.2.2.10.2.

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
3.3.1-25	Copper alloy HVAC piping, piping components, piping elements exposed to condensation (external)	Loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	Yes, plant specific	The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, and External Surfaces Monitoring program, B.2.1.21, will be used to manage loss of material due to pitting and crevice corrosion of the copper alloy HVAC piping, piping components, piping elements, and heat exchanger components exposed to wetted air, outdoor air, and air with borated water leakage. See subsection 3.3.2.2.10.3

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
3.3.1-26	Copper alloy piping, piping components, and piping elements exposed to lubricating oil	Loss of material due to pitting and crevice corrosion	Lubricating Oil Analysis and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801 with exceptions. The One-Time Inspection program, B.2.1.18, will be used to verify the effectiveness of the Lubricating Oil Analysis program, B.2.1.23, to manage loss of material due to pitting and crevice corrosion of the copper alloy heat exchanger components exposed to lubricating oil. Exceptions apply to the NUREG-1801 recommendations for Lubricating Oil Analysis and One-Time Inspection program implementation. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, has been substituted and will be used to manage loss of material due to pitting and crevice corrosion of the copper alloy piping, piping components, and piping elements exposed to lubricating oil. See subsection 3.3.2.2.10.4.
3.3.1-27	Stainless steel HVAC ducting and aluminum HVAC piping, piping components and piping elements exposed to condensation	Loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	Yes, plant specific	The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, will be used to manage loss of material due to pitting and crevice corrosion of the stainless steel piping, piping components, piping elements, and tanks exposed to wetted air. See subsection 3.3.2.2.10.5.

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
3.3.1-28	Copper alloy fire protection piping, piping components, and piping elements exposed to condensation (internal)	Loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	Yes, plant specific	The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, will be used to manage loss of material due to pitting and crevice corrosion of the copper alloy piping, piping components, and piping elements exposed to wetted air. The Compressed Air Monitoring program, B.2.1.12, will be used to manage loss of material due to pitting and crevice corrosion of the copper alloy piping, piping components, piping elements, and heat exchanger components exposed to wetted air. The One-Time Inspection program, B.2.1.18, will be used to manage loss of material due to pitting and crevice corrosion of the copper alloy piping, piping components, and piping elements exposed to wetted air. The Fire Protection program, B.2.1.13, will be used to manage loss of material due to pitting and crevice corrosion of the copper alloy spray nozzles exposed to wetted air. The Fire Water System program, B.2.1.14, will be used to manage loss of material due to pitting and crevice corrosion of the copper alloy sprinkler heads exposed to wetted air. See subsection 3.3.2.2.10.6.

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
3.3.1-29	Stainless steel piping, piping components, and piping elements exposed to soil	Loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	Yes, plant specific	The Buried Piping and Tanks Inspection program, B.2.1.20, will be used to manage loss of material due to pitting and crevice corrosion of the stainless steel piping, piping components, and piping elements exposed to soil. See subsection 3.3.2.2.10.7.
3.3.1-30	BWR Only				
3.3.1-31	BWR 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
3.3.1-32	Stainless steel, aluminum and copper alloy piping, piping components, and piping elements exposed to fuel oil	Loss of material due to pitting, crevice, and microbiologically influenced corrosion	Fuel Oil Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Not consistent with NUREG-1801. The One-Time Inspection program, B.2.1.18, will be used to verify the effectiveness of the Fuel Oil Chemistry program, B.2.1.16, to manage loss of material due to pitting, crevice, and microbiologically influenced corrosion of the stainless steel and copper alloy with greater than 15 percent zinc piping, piping components, and piping elements exposed to fuel oil. The One-Time Inspection program, B.2.1.18, will be used to verify the effectiveness of the Fuel Oil Chemistry program, B.2.1.16, to manage loss of material due to microbiologically influenced corrosion of the copper alloy with less than 15 percent zinc piping, piping components, and piping elements exposed to fuel oil. The loss of material due to pitting and crevice corrosion is not predicted for this component, material, and environment combination. 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
3.3.1-33	Stainless steel piping, piping components, and piping elements exposed to lubricating oil	Loss of material due to pitting, crevice, and microbiologically influenced corrosion	Lubricating Oil Analysis and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801 with exceptions. The One-Time Inspection program, B.2.1.18, will be used to verify the effectiveness of the Lubricating Oil Analysis program, B.2.1.23, to manage loss of material due to pitting, crevice, and microbiologically influenced corrosion of the stainless steel piping, piping components, piping elements, heat exchanger components, and tanks exposed to lubricating oil. Exceptions apply to the NUREG-1801 recommendations for Lubricating Oil Analysis and One-Time Inspection program implementation. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, has been substituted and will be used to manage loss of material due to pitting, crevice, and microbiologically influenced corrosion of the stainless steel piping, piping components, piping elements, and tanks exposed to lubricating oil. The External Surfaces Monitoring program, B.2.1.21, has been substituted and will be used to manage loss of material due to pitting, crevice, and microbiologically influenced corrosion of the stainless steel drip pans exposed to lubricating oil. See subsection 3.3.2.2.12.2.

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
3.3.1-34	Elastomer seals and components exposed to air – indoor uncontrolled (internal or external)	Loss of material due to Wear	A plant specific aging management program is to be evaluated.	Yes, plant specific	Not Applicable. See subsection 3.3.2.2.13.
3.3.1-35	Steel with stainless steel cladding pump casing exposed to treated borated water	Loss of material due to cladding breach	A plant-specific aging management program is to be evaluated. Reference NRC Information Notice 94-63, “Boric Acid Corrosion of Charging Pump Casings Caused by Cladding Cracks."	Yes, verify plant-specific program addresses cladding breach	Not Applicable. See subsection 3.3.2.2.14.
3.3.1-36	BWR Only				
3.3.1-37	BWR Only				
3.3.1-38	BWR Only				
3.3.1-39	BWR 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
3.3.1-40	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 Steel Tanks program, B.2.1.15, will be used to manage loss of material due to general, pitting, and crevice corrosion of the steel tanks exposed to outdoor air in the Fire Protection System. Exceptions apply to the NUREG-1801 recommendations for Aboveground Steel Tanks program implementation.
3.3.1-41	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. This component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.
3.3.1-42	Steel closure bolting exposed to air with steam or water leakage	Loss of material due to general corrosion	Bolting Integrity	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.
3.3.1-43	Steel bolting and closure	Loss of material due	Bolting Integrity	No	Consistent with NUREG-1801 with exceptions.

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
	bolting exposed to air – indoor uncontrolled (external) or air – outdoor (external)	to general, pitting, and crevice corrosion			The Bolting Integrity program, B.2.1.7, will be used to manage loss of material due to general, pitting, and crevice corrosion of the steel bolting and closure bolting, piping, piping components, piping elements, heat exchanger components, and tanks exposed to indoor or outdoor air for Auxiliary and Fuel Handling Building Ventilation Systems, Auxiliary Steam System, Circulating Water System, Closed Cycle Cooling Water System, Control Building Ventilation System, Cranes and Hoists, Diesel Generator Building Ventilation System, Emergency Diesel Generators and Auxiliary Systems, Fire Protection System, Fuel Handling and Fuel Storage System, Fuel Oil System, Hydrogen Monitoring, Instrument and Control Air System, Intake Screen and Pump House Ventilation System, Intermediate Building Ventilation System, Liquid and Gas Sampling System, Miscellaneous Floor and Equipment Drain System, Open Cycle Cooling Water System, Primary Containment Heating and Ventilation System, Radiation Monitoring System, Radwaste System, Service Building Chilled Water System, Spent Fuel Cooling System, Station Blackout and UPS Diesel Generator Systems, Steam Generator, and Water Treatment & Distribution System. The External Surfaces Monitoring program, B.2.1.25, has been substituted and will be used to manage loss of material due to general, pitting, and crevice corrosion of carbon steel external surfaces and ducting closure bolting exposed to outdoor air for the Auxiliary and Fuel

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
					Handling Building Ventilation Systems. The External Surfaces Monitoring program will be used to manage loss of material due to general, pitting, and crevice corrosion of carbon steel external surfaces exposed to air with borated water leakage for the Auxiliary and Fuel Handling Building Ventilation Systems, Auxiliary Steam System, Closed Cycle Cooling Water System, Instrument and Control Air System, Miscellaneous Floor and Equipment Drain System, Primary Containment Heating and Ventilation System, and Radwaste System. The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems program, B.2.1.11, has been substituted and will be used to manage loss of material due to general, pitting, and crevice corrosion of carbon steel external surfaces exposed to air with borated water leakage for Cranes and Hoists, and Fuel Handling and Fuel Storage System. Exceptions apply to the NUREG-1801 recommendations for External Surfaces Monitoring 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
3.3.1-44	Steel compressed air system closure bolting exposed to condensation	Loss of material due to general, pitting, and crevice corrosion	Bolting Integrity	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.
3.3.1-45	Steel closure bolting exposed to air – indoor uncontrolled (external)	Loss of preload due to thermal effects, gasket creep, and self-loosening	Bolting Integrity	No	Consistent with NUREG-1801. The Bolting Integrity program, B.2.1.7, will be used to manage loss of preload due to thermal effects, gasket creep, and self-loosening of the steel closure bolting exposed to indoor air or air with borated water leakage for Auxiliary and Fuel Handling Building Ventilation Systems, Auxiliary Steam System, Circulating Water System, Closed Cycle Cooling Water System, Control Building Ventilation System, Diesel Generator Building Ventilation System, Emergency Diesel Generators and Auxiliary Systems, Fire Protection System, Fuel Handling and Fuel Storage System, Fuel Oil System, Hydrogen Monitoring, Instrument and Control Air System, Intake Screen and Pump House Ventilation System, Intermediate Building Ventilation System, Liquid and Gas Sampling System, Miscellaneous Floor and Equipment Drains System, Open Cycle Cooling Water System, Primary Containment Heating and Ventilation System, Radiation Monitoring System, Radwaste System, Service Building Chilled Water 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
					Spent Fuel Cooling System, Station Blackout and UPS Diesel Generator Systems, and Water Treatment & Distribution System. The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems program, B.2.1.11, has been substituted and will be used to manage loss of preload due to thermal effects, gasket creep, and self-loosening of carbon steel bolting exposed to indoor and air with borated water leakage for the Cranes and Hoists system. The Structures Monitoring Program, B.2.1.28, has been substituted and will be used to manage the loss of preload due to self-loosening of the steel and galvanized steel structural bolting exposed to indoor air, outdoor air, and air with borated water leakage for Structural Commodities.
3.3.1-46	Stainless steel and stainless clad steel piping, piping components, piping elements, and heat exchanger components exposed to closed cycle cooling water >60°C (>140°F)	Cracking due to stress corrosion cracking	Closed-Cycle Cooling Water System	No	Consistent with NUREG-1801 with exceptions. The Closed-Cycle Cooling Water System program, B.2.1.10, will be used to manage cracking due to stress corrosion cracking of the stainless steel and stainless clad steel piping, piping components, piping elements, and heat exchanger components exposed to closed cycle cooling water >140°F for Closed Cycle Cooling Water System and Emergency Diesel Generators and Auxiliary Systems. 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
3.3.1-47	Steel piping, piping components, piping elements, tanks, and heat exchanger components exposed to closed cycle cooling water	Loss of material due to general, pitting, and crevice corrosion	Closed-Cycle Cooling Water System	No	Consistent with NUREG-1801 with exceptions. The Closed-Cycle Cooling Water System program, B.2.1.10, will be used to manage loss of material due to general, pitting, and crevice corrosion of the steel piping, piping components, piping elements, tanks, and heat exchanger components exposed to closed cycle cooling water for Closed Cycle Cooling Water System, Control Building Ventilation System, Emergency Diesel Generators and Auxiliary Systems, Fire Protection System, Open Cycle Cooling Water System, Service Building Chilled Water System, and Station Blackout and UPS Diesel Generator Systems. Exceptions apply to the NUREG-1801 recommendations for Closed-Cycle Cooling Water System program implementation.
3.3.1-48	Steel piping, piping components, piping elements, tanks, and heat exchanger components exposed to closed cycle cooling water	Loss of material due to general, pitting, crevice, and galvanic corrosion	Closed-Cycle Cooling Water System	No	Not consistent with NUREG-1801. The Closed-Cycle Cooling Water System program, B.2.1.10, will be used to manage loss of material due to general, pitting, and crevice corrosion of the steel heat exchanger components exposed to closed cycle cooling water for Emergency Diesel Generators and Auxiliary Systems and Service Building Chilled Water System. Galvanic corrosion is not predicted for this material and environment combination.

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
3.3.1-49	Stainless steel; steel with stainless steel cladding heat exchanger components exposed to closed cycle cooling water	Loss of material due to microbiologically influenced corrosion	Closed-Cycle Cooling Water System	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.
3.3.1-50	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	Consistent with NUREG-1801 with exceptions. The Closed-Cycle Cooling Water System program, B.2.1.10, will be used to manage loss of material due to pitting and crevice corrosion of the stainless steel piping, piping components, piping elements, and heat exchanger components exposed to closed cycle cooling water for Closed Cycle Cooling Water System, Control Building Ventilation System, Emergency Diesel Generators and Auxiliary Systems, Fire Protection System, and Service Building Chilled 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
3.3.1-51	Copper alloy piping, piping components, piping elements, and heat exchanger components exposed to closed cycle cooling water	Loss of material due to pitting, crevice, and galvanic corrosion	Closed-Cycle Cooling Water System	No	Not consistent with NUREG-1801. The Closed-Cycle Cooling Water System program, B.2.1.10, will be used to manage loss of material due to pitting, crevice, and galvanic corrosion of the copper alloy piping, piping components, piping elements, and heat exchanger components exposed to closed cycle cooling water for Closed Cycle Cooling Water System, Fire Protection System, Instrument and Control Air System, and Open Cycle Cooling Water System. The Closed-Cycle Cooling Water System program, B.2.1.10, will be used to manage loss of material due to pitting and crevice corrosion of the copper alloy piping, piping components, piping elements, and heat exchanger components exposed to closed cycle cooling water for Closed Cycle Cooling Water System, Control Building Ventilation System, Emergency Diesel Generators and Auxiliary Systems, Service Building Chilled Water System, and Station Blackout and UPS Diesel Generator Systems. Galvanic corrosion is not predicted for this material and environment combination.

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
3.3.1-52	Steel, stainless steel, and copper alloy 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 System program, B.2.1.10, will be used to manage reduction of heat transfer due to fouling of the steel, stainless steel, and copper alloy heat exchanger tubes exposed to closed cycle cooling water for Closed Cycle Cooling Water System, Control Building Ventilation System, Emergency Diesel Generators and Auxiliary Systems, Instrument and Control Air System, Open Cycle Cooling Water System, and Station Blackout and UPS Diesel Generator Systems. Exceptions apply to the NUREG-1801 recommendations for Closed-Cycle Cooling Water System program implementation.
3.3.1-53	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. This component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.
3.3.1-54	Stainless steel compressed air system piping, piping components, and piping elements exposed to	Loss of material due to pitting and crevice corrosion	Compressed Air Monitoring	No	Consistent with NUREG-1801 with exceptions. The Compressed Air Monitoring program, B.2.1.12, will be used to manage loss of material due to pitting and crevice corrosion of the stainless steel piping, piping components, piping elements, and tanks exposed to wetted air for

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
	internal condensation				the Instrument and Control Air System. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.26 has been substituted and will be used to manage loss of material due to pitting and crevice corrosion of the stainless steel piping, piping components, piping elements, and tanks exposed to wetted air for the Condensers & Air Removal System, Emergency Diesel Generators and Auxiliary Systems, Fire Protection System, and Radwaste System. The Fire Protection program, B.2.1.13 has been substituted and will be used to manage loss of material due to pitting and crevice corrosion of the stainless steel spray nozzles exposed to wetted air for the Fire Protection system. The Fire Water System program, B.2.1.14 has been substituted and will be used to manage loss of material due to pitting and crevice corrosion of the stainless steel sprinkler heads exposed to wetted air for the Fire Protection system. Exceptions apply to the NUREG-1801 recommendations for Compressed Air Monitoring program, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, and 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
3.3.1-55	Steel ducting closure bolting exposed to air – indoor uncontrolled (external)	Loss of material due to general corrosion	External Surfaces Monitoring	No	Consistent with NUREG-1801 with exceptions. The External Surfaces Monitoring program, B.2.1.21, will be used to manage loss of material due to general corrosion of steel ducting closure bolting exposed to indoor air for the Control Building Ventilation System, Diesel Generator Building Ventilation System, Intake Screen and Pump House Ventilation System, Intermediate Building Ventilation System, and Primary Containment Heating and Ventilation System. Exceptions apply to the NUREG-1801 recommendations for External Surfaces Monitoring program implementation.
3.3.1-56	Steel HVAC ducting and components external surfaces exposed to air – indoor uncontrolled (external)	Loss of material due to general corrosion	External Surfaces Monitoring	No	Consistent with NUREG-1801 with exceptions. The External Surfaces Monitoring program, B.2.1.21, will be used to manage loss of material due to general corrosion of the steel HVAC ducting and components external surfaces exposed to indoor air for the Primary Containment Heating and Ventilation System. Exceptions apply to the NUREG-1801 recommendations for External Surfaces Monitoring 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	Steel piping and components external surfaces exposed to air – indoor uncontrolled (External)	Loss of material due to general corrosion	External Surfaces Monitoring	No	Consistent with NUREG-1801 with exceptions. The External Surfaces Monitoring program, B.2.1.21, will be used to manage loss of material due to general corrosion of the steel piping and components, and tanks external surfaces exposed to indoor air for the Auxiliary Steam System, Circulating Water System, Fire Protection System, Liquid and Gas Sampling System, and Water Treatment & Distribution System. Exceptions apply to the NUREG-1801 recommendations for External Surfaces Monitoring 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
3.3.1-58	Steel external surfaces exposed to air – indoor uncontrolled (external), air - outdoor (external), and condensation (external)	Loss of material due to general corrosion	External Surfaces Monitoring	No	Consistent with NUREG-1801 with exceptions. The External Surfaces Monitoring program, B.2.1.21, will be used to manage loss of material due to general corrosion of the steel external surfaces exposed to indoor air for the Circulating Water System, Closed Cycle Cooling Water System, Control Building Ventilation System, Emergency Diesel Generators and Auxiliary Systems, Fire Protection System, Fuel Oil System, Instrument and Control Air System, Miscellaneous Floor and Equipment Drains System, Open Cycle Cooling Water System, Primary Containment Heating and Ventilation System, Radwaste System, Service Building Chilled Water System, and Station Blackout and UPS Diesel Generator Systems. The Fire Protection program, B.2.1.13, has been substituted and will be used to manage loss of material due to general corrosion of the steel fire barriers exposed to indoor air for the Fire Protection System. Exceptions apply to the NUREG-1801 recommendations for External Surfaces Monitoring program and 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
3.3.1-59	Steel heat exchanger components exposed to air – indoor uncontrolled (external) or air -outdoor (external)	Loss of material due to general, pitting, and crevice corrosion	External Surfaces Monitoring	No	Consistent with NUREG-1801 with exceptions. The External Surfaces Monitoring program, B.2.1.21, will be used to manage loss of material due to general, pitting, and crevice corrosion of the steel heat exchanger components, piping, piping components, piping elements, and tanks exposed to indoor, outdoor air, or air with borated water leakage for the Auxiliary and Fuel Handling Building Ventilation Systems, Auxiliary Steam System, Condensers & Air Removal System, Fire Protection System, and Water Treatment and Distribution System. Exceptions apply to the NUREG-1801 recommendations for External Surfaces Monitoring program implementation.
3.3.1-60	Steel piping, piping components, and piping elements exposed to air - outdoor (external)	Loss of material due to general, pitting, and crevice corrosion	External Surfaces Monitoring	No	Consistent with NUREG-1801 with exceptions. The External Surfaces Monitoring program, B.2.1.21, will be used to manage loss of material due to general, pitting, and crevice corrosion of the steel piping, piping components, piping elements, and tanks exposed to outdoor air for the Auxiliary and Fuel Handling Building Ventilation Systems, Decay Heat Removal System, Emergency Diesel Generators and Auxiliary Systems, Emergency Feedwater System, Fire Protection System, Fuel Oil System, Miscellaneous Floor and Equipment Drains System, Open Cycle Cooling Water System, Station Blackout and UPS Diesel Generator Systems, and Water Treatment & Distribution 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 Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems program, B.2.1.11, has been substituted and will be used manage loss of material due to general, pitting, and crevice corrosion of the steel crane and hoist components exposed to outdoor air for Cranes and Hoists. The Fire Protection program, B.2.1.13, has been substituted and will be used to manage loss of material due to general, pitting, and crevice corrosion of the steel fire barriers exposed to outdoor air for the Fire Protection System. Exceptions apply to the NUREG-1801 recommendations for External Surfaces Monitoring program and Fire Protection program implementation.
3.3.1-61	Elastomer fire barrier penetration seals exposed to air – outdoor or air - indoor uncontrolled	Increased hardness, shrinkage and loss of strength due to weathering	Fire Protection	No	Consistent with NUREG-1801 with exceptions. The Fire Protection program, B.2.1.13, will be used to manage hardening and loss of strength due to elastomer degradation of the elastomer fire barrier penetration seals exposed to indoor air or air with borated water leakage for the Fire Protection System. 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
3.3.1-62	Aluminum piping, piping components, and piping elements exposed to raw water	Loss of material due to pitting and crevice corrosion	Fire Protection	No	Consistent with NUREG-1801. The Fire Water System program, B.2.1.14, has been substituted and will be used to manage loss of material due to pitting and crevice corrosion of the aluminum piping components, and piping elements exposed to raw water for the Fire Protection System. The Structures Monitoring Program, B.2.1.28, has been substituted and will be used to manage loss of material due to pitting and crevice corrosion of the aluminum support members; welds; bolted connections; support anchorage to building structure exposed to raw water for the Circulating Water Pump House and Component Supports Commodity Group.

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
3.3.1-63	Steel fire rated doors exposed to air – outdoor or air - indoor uncontrolled	Loss of material due to Wear	Fire Protection	No	Consistent with NUREG-1801 with exceptions. The Fire Protection program, B.2.1.13, will be used to manage loss of material due to wear of the steel fire barriers exposed to indoor, outdoor air, or air with borated water leakage for the Fire Protection System. The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems program, B.2.1.11, has been substituted and will be used to manage loss of material due to wear of the crane and hoist components exposed to outdoor air for Cranes and Hoists. Exceptions apply to the NUREG-1801 recommendations for Fire Protection program implementation.
3.3.1-64	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	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.

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	Reinforced concrete structural fire barriers – walls, ceilings and floors exposed to air – indoor uncontrolled	Concrete cracking and spalling due to 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.2.1.13, and Structures Monitoring program, B.2.1.28, will be used to manage concrete cracking and spalling due to aggressive chemical attack, and reaction with aggregates of the reinforced concrete structural fire barriers walls, ceilings and floors exposed to indoor air for the Fire Protection System. Exceptions apply to the NUREG-1801 recommendations for Fire Protection program implementation.
3.3.1-66	Reinforced concrete structural fire barriers – walls, ceilings and floors exposed to air – outdoor	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.2.1.13, and Structures Monitoring program, B.2.1.28, will be used to manage concrete cracking and spalling due to freeze thaw, aggressive chemical attack, and reaction with aggregates of the reinforced concrete structural fire barriers walls, ceilings, floors, and curbs exposed to outdoor air for the Fire Protection System. 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
3.3.1-67	Reinforced concrete structural fire barriers – walls, ceilings and floors exposed to air – outdoor or air - 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 (B.2.1.13) and Structures Monitoring (B.2.1.28) programs will be used to manage loss of material due to corrosion of embedded steel of the reinforced concrete structural fire barriers walls, ceilings, floors, and curbs exposed to indoor or outdoor air for Fire Protection System. Exceptions apply to the NUREG-1801 recommendations for Fire Protection program implementation.
3.3.1-68	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 with exceptions. The Fire Water System program, B.2.1.14, will be used to manage loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, and fouling of the steel piping, piping components, piping elements, and tanks exposed to raw water for the Fire Protection System. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, has been substituted and will be used to manage loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, and fouling of the steel piping, piping components, piping elements, and tanks exposed to raw water for the Closed Cycle Cooling Water System and Miscellaneous Floor and Equipment Drains System. The External Surfaces Monitoring program, B.2.1.21, has been substituted and will be 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
					to manage loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, and fouling of the steel piping, piping components, piping elements, and tanks exposed to raw water for the Miscellaneous Floor and Equipment Drains System. Exceptions apply to the NUREG-1801 recommendations for Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program and External Surfaces Monitoring program implementation.
3.3.1-69	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.2.1.14, will be used to manage loss of material due to pitting and crevice corrosion, and fouling of the stainless steel piping, piping components, and piping elements exposed to raw water for Fire Protection System.
3.3.1-70	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.2.1.14, will be used to manage loss of material due to pitting, crevice, and microbiologically influenced corrosion, and fouling of the copper alloy piping, piping components, and piping elements exposed to raw water for 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
3.3.1-71	Steel piping, piping components, and piping elements exposed to moist air or condensation (Internal)	Loss of material due to general, pitting, and crevice corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	No	Consistent with NUREG-1801 with exceptions. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, will be used to manage loss of material due to general, pitting, and crevice corrosion of the steel piping, piping components, piping elements, and tanks exposed to wetted air for the Auxiliary and Fuel Handling Building Ventilation Systems, Auxiliary Steam System, Condensers & Air Removal System, Emergency Diesel Generators and Auxiliary Systems, Miscellaneous Floor and Equipment Drains System, and Radwaste System. The Fire Protection program, B.2.1.13, has been substituted and will be used to manage loss of material due to general, pitting, and crevice corrosion of the steel spray nozzles exposed to wetted air for the Fire Protection System. The Compressed Air Monitoring program, B.2.1.12, has been substituted and will be used to manage loss of material due to general, pitting, and crevice corrosion of the steel piping and piping components, heat exchanger components, and tanks exposed to wetted air for the Instrument and Control Air System. Exceptions apply to the NUREG-1801 recommendations for Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program and 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
3.3.1-72	Steel HVAC ducting and components internal surfaces exposed to condensation (Internal)	Loss of material due to general, pitting, crevice, and (for drip pans and drain lines) microbiologically influenced corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	No	Consistent with NUREG-1801 with exceptions. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, will be used to manage loss of material due to general, pitting, and crevice corrosion of the steel HVAC ducting and components internal surfaces exposed to wetted air for the Auxiliary and Fuel Handling Building Ventilation Systems, Containment Isolation System, Control Building Ventilation System, Diesel Generator Building Ventilation System, Intake Screen and Pump House Ventilation System, Intermediate Building Ventilation System, and Primary Containment Heating and Ventilation System. The Compressed Air Monitoring program, B.2.1.12, has been substituted and will manage loss of material due to general, pitting, and crevice corrosion of the steel HVAC ducting and components internal surfaces exposed to wetted air for the Control Building Ventilation System. Exceptions apply to the NUREG-1801 recommendations for Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components 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
3.3.1-73	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. The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems program, B.2.1.11, will be used to manage loss of material due to general corrosion of the steel crane structural girders in load handling system exposed to indoor air for Cranes and Hoists.
3.3.1-74	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. The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems program, B.2.1.11, will be used to manage loss of material due to wear of the steel crane rails exposed to indoor air or air with borated water leakage for Cranes and Hoists, and the Fuel Handling and Fuel Storage System.
3.3.1-75	Elastomer seals and components exposed to raw water	Hardening and loss of strength due to elastomer degradation; loss of material due to erosion	Open-Cycle Cooling Water System	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.

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
3.3.1-76	Steel piping, piping components, and piping elements (without lining/coating or with degraded lining/coating) exposed to raw water	Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, fouling, and lining/coating degradation	Open-Cycle Cooling Water System	No	Consistent with NUREG-1801 with exceptions. The Open-Cycle Cooling Water System program, B.2.1.9, program will be used to manage loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, and fouling of the steel piping, piping components, piping elements, and heat exchanger components exposed to raw water for the Open Cycle Cooling Water System, Primary Containment Heating and Ventilation System, and Station Blackout and UPS Diesel Generator Systems. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, has been substituted and will manage loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, and fouling of the steel piping, piping components, piping elements, and tanks exposed to raw water for the Water Treatment and Distribution System. Exceptions involve differences from NUREG-1801 recommendations for Open-Cycle Cooling Water System program and Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program application.

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
3.3.1-77	Steel heat exchanger components exposed to raw water	Loss of material due to general, pitting, crevice, galvanic, and microbiologically influenced corrosion, and fouling	Open-Cycle Cooling Water System	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.
3.3.1-78	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	Consistent with NUREG-1801 with exceptions. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, has been substituted and will be used to manage loss of material due to pitting and crevice corrosion of the nickel alloy piping, piping components, and piping elements exposed to raw water for the Radwaste System. The Structures Monitoring Program, B.2.1.28, has been substituted and will be used to manage loss of material due to pitting and crevice corrosion of the stainless steel support members; welds; bolted connections; support anchorage to building structure, and, metal components exposed to raw water for the Component Supports Commodity Group and Intake Screen and Pump House. Exceptions involve differences from NUREG-1801 recommendations for Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program application.

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
3.3.1-79	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	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.
3.3.1-80	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	Consistent with NUREG-1801 with exceptions. The Open-Cycle Cooling Water System program, B.2.1.9, will be used to manage loss of material due to pitting, crevice, and microbiologically influenced corrosion of the stainless steel piping, piping components, and piping elements exposed to raw water for the Open Cycle Cooling Water System and Station Blackout and UPS Diesel Generator Systems. The Fire Water System program, B.2.1.14, has been substituted and will manage loss of material due to pitting, crevice, and microbiologically influenced corrosion of the stainless steel piping, piping components, and piping elements exposed to raw water for the Fire Protection System. Exceptions involve differences from NUREG-1801 recommendations for Open-Cycle Cooling Water System program application.

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
3.3.1-81	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	Open-Cycle Cooling Water System	No	Consistent with NUREG-1801 with exceptions. The Open-Cycle Cooling Water System program, B.2.1.9, will be used to manage loss of material due to pitting, crevice, and microbiologically influenced corrosion, and fouling of the copper alloy piping, piping components, and piping elements, exposed to raw water for the Circulating Water System and Open Cycle Cooling Water System. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program, B.2.1.22, has been substituted and will manage loss of material due to pitting, crevice, and microbiologically influenced corrosion, and fouling of the copper alloy piping, piping components, piping elements, and tanks exposed to raw water for the Miscellaneous Floor and Equipment Drains System and Water Treatment and Distribution System. Exceptions involve differences from NUREG-1801 recommendations for Open-Cycle Cooling Water System program and Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program application.

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
3.3.1-82	Copper alloy heat exchanger components exposed to raw water	Loss of material due to pitting, crevice, galvanic, and microbiologically influenced corrosion, and fouling	Open-Cycle Cooling Water System	No	Not consistent with NUREG-1801. The Open-Cycle Cooling Water System program, B.2.1.9, will be used to manage loss of material due to pitting, crevice, galvanic, and microbiologically influenced corrosion, and fouling of the copper alloy heat exchanger components exposed to raw water for Circulating Water System and Open Cycle Cooling Water System. The Open-Cycle Cooling Water System program, B.2.1.9, will be used to manage loss of material due to pitting, crevice, and microbiologically influenced corrosion, and fouling of the copper alloy heat exchanger components exposed to raw water for the Primary Containment Heating and Ventilation System. Galvanic corrosion is not predicted for this component, material, and environment combination for the Primary Containment Heating and Ventilation System.
3.3.1-83	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	Consistent with NUREG-1801 with exceptions. The Open-Cycle Cooling Water System program, B.2.1.9, will be used to manage reduction of heat transfer due to fouling of the stainless steel and copper alloy heat exchanger tubes exposed to raw water for the Circulating Water System, Open Cycle Cooling Water System, and Primary Containment Heating and Ventilation System. Exceptions involve differences from NUREG-1801 recommendations for Open-Cycle Cooling Water System program application.

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
3.3.1-84	Copper alloy >15% Zn piping, piping components, piping elements, and heat exchanger components 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.2.1.19, will be used to manage loss of material due to selective leaching of the copper alloy with greater than 15% zinc piping, piping components, piping elements, heat exchanger components, and tanks exposed to raw water or closed cycle cooling water in the Circulating Water System, Closed Cycle Cooling Water System, Emergency Diesel Generators and Auxiliary Systems, Fire Protection System, Open Cycle Cooling Water System, Primary Containment Heating and Ventilation System, Service Building Chilled Water System, and Water Treatment & Distribution 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
3.3.1-85	Gray cast iron piping, piping components, and piping elements exposed to soil, raw water, treated water, or closed-cycle cooling water	Loss of material due to selective leaching	Selective Leaching of Materials	No	Consistent with NUREG-1801. The Selective Leaching of Materials program, B.2.1.19, will be used to manage loss of material due to selective leaching of the gray cast iron piping, piping components, piping elements, tanks, hatches/plugs, metal components, and heat exchanger components exposed to soil, raw water, treated water, or closed-cycle cooling water in the Circulating Water Pump House, Circulating Water System, Closed Cycle Cooling Water System, Control Building Ventilation System, Emergency Diesel Generators and Auxiliary Systems, Fire Protection System, Miscellaneous Floor and Equipment Drains System, Miscellaneous Yard Structures, Open Cycle Cooling Water System, Primary Containment Heating and Ventilation System, Service Building Chilled Water System, and Water Treatment & Distribution System.
3.3.1-86	Structural steel (new fuel storage rack assembly) exposed to air – indoor uncontrolled (external)	Loss of material due to general, pitting, and crevice corrosion	Structures Monitoring Program	No	Consistent with NUREG-1801 with exceptions. The Fire Protection program, B.2.1.13, has been substituted and will be used to manage loss of material due to general, pitting, and crevice corrosion of the fire barriers exposed to air with borated water leakage for the Fire Protection System. Exceptions involve differences from NUREG-1801 recommendations for Fire Protection program application.

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
3.3.1-87	Boraflex spent fuel storage racks neutron-absorbing sheets exposed to treated borated water	Reduction of neutron-absorbing capacity due to boraflex degradation	Boraflex Monitoring	No	Not Applicable. This component, material, environment, and aging effect/mechanism does not apply to Auxiliary Systems.
3.3.1-88	Aluminum and copper alloy >15% Zn piping, piping components, and piping elements exposed to air with borated water leakage	Loss of material due to Boric acid corrosion	Boric Acid Corrosion	No	Consistent with NUREG-1801. The Boric Acid Corrosion program, B.2.1.4, will be used to manage loss of material due to boric acid corrosion of the aluminum and copper alloy >15% Zn piping, piping components, piping elements, heat exchanger components, and tanks exposed to air with borated water leakage in the Closed Cycle Cooling Water System, Fire Protection System, Fuel Handling and Fuel Storage System, Instrument and Control Air System, Main Steam System, Makeup and Purification System (High Pressure Injection), and Radwaste 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
3.3.1-89	Steel bolting and external surfaces exposed to air with borated water leakage	Loss of material due to Boric acid corrosion	Boric Acid Corrosion	No	Consistent with NUREG-1801. The Boric Acid Corrosion program, B.2.1.4, will be used to manage Loss of material due to Boric acid corrosion of steel bolting and external surfaces exposed to air with borated water leakage in the Auxiliary and Fuel Handling Building Ventilation Systems, Auxiliary Steam System, Closed Cycle Cooling Water System, Cranes and Hoists, Fire Protection System, Fuel Handling and Fuel Storage System, Hydrogen Monitoring, Instrument and Control Air System, Liquid and Gas Sampling System, Miscellaneous Floor and Equipment Drains System, Primary Containment Heating and Ventilation System, Radiation Monitoring System, Radwaste System, Spent Fuel Cooling System, Steam Generator, and Water Treatment and Distribution 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
3.3.1-90	Stainless steel and steel with stainless steel cladding piping, piping components, piping elements, tanks, and fuel storage racks exposed to treated borated water >60°C (>140°F)	Cracking due to stress corrosion cracking	Water Chemistry	No	Consistent with NUREG-1801 with exceptions. The Water Chemistry program, B.2.1.2, will be used to manage cracking due to stress corrosion cracking of the stainless steel piping, piping components, piping elements, tanks, and heat exchanger components exposed to treated water >140°F for the Radwaste System and Water Treatment and Distribution System. The One-Time Inspection program, B.2.1.18, will be used to verify the effectiveness of the Water Chemistry program to manage cracking due to stress corrosion cracking of the stainless steel piping, piping components, piping elements, tanks, and heat exchanger components exposed to treated water >140°F for the Radwaste System. Exceptions involve differences from NUREG-1801 recommendations for One-Time Inspection program application.

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
3.3.1-91	Stainless steel and steel with stainless steel cladding piping, piping components, and piping elements exposed to treated borated water	Loss of material due to pitting and crevice corrosion	Water Chemistry	No	Consistent with NUREG-1801 with exceptions. The Water Chemistry program, B.2.1.2, will be used to manage loss of material due to pitting and crevice corrosion of the stainless steel piping, piping components, piping elements, fuel storage racks, crane and hoist components, and heat exchanger components exposed to treated water for the Fuel Handling and Fuel Storage System, Liquid and Gas Sampling System, Radwaste System, and Spent Fuel Cooling System. The One-Time Inspection program, B.2.1.18, will also be used to verify the effectiveness of the Water Chemistry program to manage loss of material due to pitting and crevice corrosion of the stainless steel piping, piping components, piping elements, tanks, and heat exchanger components exposed to treated water for the Radwaste System. Exceptions involve differences from NUREG-1801 recommendations for One-Time Inspection program application.

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
3.3.1-92	Galvanized steel piping, piping components, and piping elements exposed to air – indoor uncontrolled	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.
3.3.1-93	Glass piping elements exposed to air, air – indoor uncontrolled (external), fuel oil, lubricating oil, raw water, treated water, and treated borated water	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.
3.3.1-94	Stainless steel and nickel alloy piping, piping components, and piping elements exposed to air – indoor uncontrolled (external)	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.

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
3.3.1-95	Steel and aluminum piping, piping components, and piping elements exposed to air – indoor controlled (external)	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.
3.3.1-96	Steel and stainless steel piping, piping components, and piping elements in concrete	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.
3.3.1-97	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.

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
3.3.1-98	Steel, stainless steel, and copper alloy piping, piping components, and piping elements exposed to dried air	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.
3.3.1-99	Stainless steel and copper alloy <15% Zn piping, piping components, and piping elements exposed to air with borated water leakage	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.

Table 3.3.2-1
Auxiliary and Fuel Handling Building Ventilation Systems
Summary of Aging Management Evaluation

Table 3.3.2-1 Auxiliary and Fuel Handling Building Ventilation Systems

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-1	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-1	3.3.1-43	E, 8
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Outdoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)			H, 1
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 2
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Damper Housing	Pressure Boundary	Galvanized Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-6	3.3.1-59	D
Damper Housing	Pressure Boundary	Galvanized Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Damper Housing	Pressure Boundary	Galvanized Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 2

Table 3.3.2-1 Auxiliary and Fuel Handling Building Ventilation Systems (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	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-3	3.3.1-72	B
Ducting and Components	Pressure Boundary	Galvanized Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-6	3.3.1-59	D
Ducting and Components	Pressure Boundary	Galvanized Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Ducting and Components	Pressure Boundary	Galvanized Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 2
Ducting and Components	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-3	3.3.1-72	B
Expansion Joints	Pressure Boundary	Neoprene	Air - Indoor (External)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-7	3.3.1-11	E, 4
Expansion Joints	Pressure Boundary	Neoprene	Air - Outdoor (External)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VI.A-12	3.6.1-10	E, 3
Expansion Joints	Pressure Boundary	Neoprene	Air/Gas - Wetted (Internal)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-7	3.3.1-11	E, 4
Fan Housing	Pressure Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	D

Table 3.3.2-1 Auxiliary and Fuel Handling Building Ventilation Systems (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 Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-3	3.3.1-72	B
Filter Housing	Pressure Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	D
Filter Housing	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-3	3.3.1-72	B
Filter Housing	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	C
Filter Housing	Pressure Boundary	Galvanized Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	D
Filter Housing	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-3	3.3.1-72	B
Piping and fittings	Pressure Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-1	3.3.1-43	E, 7
Piping and fittings	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.H2-21	3.3.1-71	B
Piping and fittings	Pressure Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B2-7	3.5.1-50	E, 5

Table 3.3.2-1 Auxiliary and Fuel Handling Building Ventilation Systems (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	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-1	3.3.1-27	E, 6
Thermowell	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-1	3.3.1-27	E, 6
Valve Body	Pressure Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-1	3.3.1-43	E, 7
Valve Body	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.H2-21	3.3.1-71	B
Valve Body	Pressure Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B2-7	3.5.1-50	E, 5
Valve Body	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.A-26	3.2.1-8	E, 6

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 carbon and low alloy steel bolting in an outdoor air environment include loss of preload due to thermal effects, gasket creep, and self-loosening. These aging effects/mechanisms are managed by the Bolting Integrity Program.
2. The aging effects of galvanized steel in an air with borated water leakage environment include loss of material due to general, pitting, and crevice corrosion. These aging effects/mechanisms are managed by the External Surfaces Monitoring program.
3. The aging effects of neoprene in an outdoor air environment are hardening and loss of strength due to elastomer degradation. These aging effects/mechanisms are managed by the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program.
4. NUREG-1801 specifies a plant-specific program. The Internal Surfaces in Miscellaneous Piping and Ducting Components program is used to manage the aging effect(s) applicable to this component type, material, and environment combination. Inspections of the expansion joints require physical manipulation; therefore, internal and external inspections, which include physical manipulation of elastomers, will be performed at the same time under the Internal Surfaces in Miscellaneous Piping and Ducting Components program.
5. The aging effects of stainless steel in an outdoor air environment include loss of material due to pitting and crevice corrosion. These aging

effects/mechanisms are managed by the External Surfaces Monitoring program.

6. The aging effects of stainless steel in a wetted air environment include loss of material due to pitting and crevice corrosion. These aging effects/mechanisms are managed by the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program.

7. The aging effects of carbon steel in an outdoor air environment include loss of material due to general, pitting, and crevice corrosion. These aging effects/mechanisms are managed by the External Surfaces Monitoring program.

8. The aging effects of carbon and low alloy steel ducting closure bolting in an outdoor air environment include loss of material due to general, pitting, and crevice corrosion. These aging effects/mechanisms are managed by the External Surfaces Monitoring program.

Table 3.3.2-2
Auxiliary Steam System
Summary of Aging Management Evaluation

Table 3.3.2-2 Auxiliary Steam System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Boiler Casing (Auxiliary Boiler outer casing)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.F1-10	3.3.1-59	B
Boiler Casing (Auxiliary Boiler outer casing)	Leakage Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-23	3.3.1-71	D
Boiler Casing (Auxiliary Boiler outer casing)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-11	3.4.1-4	D
Boiler Casing (Auxiliary Boiler outer casing)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-11	3.4.1-4	C
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A

Table 3.3.2-2 Auxiliary 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 exchanger components (WDL Tank Heaters)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Heat exchanger components (WDL Tank Heaters)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 4
Heat exchanger components (WDL Tank Heaters)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.E-37	3.4.1-3	B
Heat exchanger components (WDL Tank Heaters)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.E-37	3.4.1-3	A
Hoses	Leakage Boundary	Rubber	Air - Indoor (External)	Hardening and Loss of Strength/Elastomer Degradation	External Surfaces Monitoring (B.2.1.21)	VII.F1-7	3.3.1-11	E, 1
Hoses	Leakage Boundary	Rubber	Treated Water (Internal)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.A4-1	3.3.1-12	E, 2
Hoses	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Hoses	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-4	3.4.1-16	B
Hoses	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-4	3.4.1-16	A
Piping and fittings	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Piping and fittings	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A

Table 3.3.2-2 Auxiliary 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	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Piping and fittings	Leakage Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Piping and fittings	Leakage Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Cumulative Fatigue Damage/Fatigue	TLAA	VIII.B1-10	3.4.1-1	A
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-11	3.4.1-4	B
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-11	3.4.1-4	A
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Wall Thinning/Flow Accelerated Corrosion	Flow-Accelerated Corrosion (B.2.1.6)	VIII.A-17	3.4.1-29	B
Piping and fittings	Leakage Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Piping and fittings	Leakage Boundary	Copper Alloy with 15% Zinc or More	Treated Water (Internal)	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)			H, 5
Piping and fittings	Leakage Boundary	Copper Alloy with 15% Zinc or More	Treated Water (Internal)	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)			H, 5

Table 3.3.2-2 Auxiliary 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	Copper Alloy with 15% Zinc or More	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.A-5	3.4.1-15	B
Piping and fittings	Leakage Boundary	Copper Alloy with 15% Zinc or More	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.A-5	3.4.1-15	A
Piping and fittings	Leakage Boundary	Copper Alloy with 15% Zinc or More	Treated Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VIII.E-21	3.4.1-35	A
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Fuel Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	Fuel Oil Chemistry (B.2.1.16)	VII.H1-3	3.3.1-32	I, 3
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Fuel Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.H1-3	3.3.1-32	I, 3
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.A-5	3.4.1-15	B
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.A-5	3.4.1-15	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Leakage Boundary	Stainless Steel	Fuel Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Fuel Oil Chemistry (B.2.1.16)	VII.H1-6	3.3.1-32	B
Piping and fittings	Leakage Boundary	Stainless Steel	Fuel Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.H1-6	3.3.1-32	B
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VIII.B1-5	3.4.1-14	B

Table 3.3.2-2 Auxiliary 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	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VIII.B1-5	3.4.1-14	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cumulative Fatigue Damage/Fatigue	TLAA	VII.E3-14	3.3.1-2	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-4	3.4.1-16	B
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-4	3.4.1-16	A
Piping and fittings	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Piping and fittings	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Cumulative Fatigue Damage/Fatigue	TLAA	VIII.B1-10	3.4.1-1	A
Piping and fittings	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-11	3.4.1-4	B
Piping and fittings	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-11	3.4.1-4	A
Piping and fittings	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Wall Thinning/Flow Accelerated Corrosion	Flow-Accelerated Corrosion (B.2.1.6)	VIII.A-17	3.4.1-29	B
Pump Casing (Aux Boiler Chem Injection)	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Pump Casing (Aux Boiler Chem Injection)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VIII.B1-5	3.4.1-14	B
Pump Casing (Aux Boiler Chem Injection)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VIII.B1-5	3.4.1-14	A
Pump Casing (Aux Boiler Chem Injection)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-4	3.4.1-16	B
Pump Casing (Aux Boiler Chem Injection)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-4	3.4.1-16	A

Table 3.3.2-2 Auxiliary 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 (Aux Boiler Feed Pump)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Pump Casing (Aux Boiler Feed Pump)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-11	3.4.1-4	B
Pump Casing (Aux Boiler Feed Pump)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-11	3.4.1-4	A
Pump Casing (Condensate Return Unit Pumps)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Pump Casing (Condensate Return Unit Pumps)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 4
Pump Casing (Condensate Return Unit Pumps)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-11	3.4.1-4	B
Pump Casing (Condensate Return Unit Pumps)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-11	3.4.1-4	A
Restricting Orifices	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Restricting Orifices	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VIII.B1-5	3.4.1-14	B
Restricting Orifices	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VIII.B1-5	3.4.1-14	A
Restricting Orifices	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-4	3.4.1-16	B
Restricting Orifices	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-4	3.4.1-16	A

Table 3.3.2-2 Auxiliary 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	Glass	Air - Indoor (External)	None	None	VII.J-8	3.3.1-93	A
Sight Glasses	Leakage Boundary	Glass	Fuel Oil (Internal)	None	None	VII.J-9	3.3.1-93	A
Sight Glasses	Leakage Boundary	Glass	Treated Water (Internal)	None	None	VII.J-13	3.3.1-93	A
Steam Traps	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Steam Traps	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Steam Traps	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 4
Steam Traps	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-11	3.4.1-4	B
Steam Traps	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-11	3.4.1-4	A
Steam Traps	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Steam Traps	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-11	3.4.1-4	B
Steam Traps	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-11	3.4.1-4	A
Strainer Body	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Strainer Body	Leakage Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B

Table 3.3.2-2 Auxiliary 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	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Strainer Body	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-11	3.4.1-4	B
Strainer Body	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-11	3.4.1-4	A
Tanks (Ammonia Injection)	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Tanks (Ammonia Injection)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.E-40	3.4.1-6	B
Tanks (Ammonia Injection)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.E-40	3.4.1-6	A
Tanks (Aux Boiler Blowdown)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	D
Tanks (Aux Boiler Blowdown)	Leakage Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VIII.B1-7	3.4.1-30	D
Tanks (Aux Boiler Blowdown)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.E-40	3.4.1-6	B
Tanks (Aux Boiler Blowdown)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.E-40	3.4.1-6	A
Tanks (Condensate Return Unit)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A

Table 3.3.2-2 Auxiliary 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 (Condensate Return Unit)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 4
Tanks (Condensate Return Unit)	Leakage Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VIII.B1-7	3.4.1-30	D
Tanks (Condensate Return Unit)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.E-40	3.4.1-6	B
Tanks (Condensate Return Unit)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.E-40	3.4.1-6	A
Tanks (Hydrazine Injection)	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Tanks (Hydrazine Injection)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.E-40	3.4.1-6	B
Tanks (Hydrazine Injection)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.E-40	3.4.1-6	A
Valve Body	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Valve Body	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Valve Body	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 4

Table 3.3.2-2 Auxiliary 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 Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Valve Body	Leakage Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Valve Body	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-11	3.4.1-4	B
Valve Body	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-11	3.4.1-4	A
Valve Body	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Wall Thinning/Flow Accelerated Corrosion	Flow-Accelerated Corrosion (B.2.1.6)	VIII.A-17	3.4.1-29	B
Valve Body	Leakage Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Valve Body	Leakage Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Valve Body	Leakage Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 4
Valve Body	Leakage Boundary	Gray Cast Iron	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Valve Body	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Valve Body	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VIII.B1-5	3.4.1-14	B

Table 3.3.2-2 Auxiliary 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	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VIII.B1-5	3.4.1-14	A
Valve Body	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-4	3.4.1-16	B
Valve Body	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-4	3.4.1-16	A
Valve Body	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Valve Body	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-11	3.4.1-4	B
Valve Body	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-11	3.4.1-4	A
Valve Body	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Wall Thinning/Flow Accelerated Corrosion	Flow-Accelerated Corrosion (B.2.1.6)	VIII.A-17	3.4.1-29	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. NUREG-1801 specifies a plant-specific program. The External Surfaces Monitoring program is used to manage the aging effect(s) applicable to this component type, material, and environment combination.
2. NUREG-1801 specifies a plant-specific program. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is used to manage the aging effect(s) applicable to this component type, material, and environment combination.
3. Pitting and crevice corrosion are not predicted for this combination because zinc content is less than 15 percent. Only microbiologically influenced corrosion is predicted for this combination. The Fuel Oil Chemistry and One-Time Inspection Programs are used to manage the aging effect.
4. General, pitting, and crevice corrosion are predicted for carbon steel in air with borated water leakage. The External Surfaces Monitoring program is substituted to manage the aging effects.
5. The aging effects/mechanisms of copper alloy with greater than 15% zinc in a treated water environment include cracking due to stress corrosion. This additional aging effect is managed by the Water Chemistry and One-Time Inspection Programs.

Table 3.3.2-3
Circulating Water System
Summary of Aging Management Evaluation

Table 3.3.2-3 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
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Expansion Joints	None - Short Lived	Not applicable	Not applicable	None	None			1
Heat exchanger components (Lube Oil Heat Exchangers for Main Vacuum Pumps)	Heat Transfer	Copper Alloy with 15% Zinc or More	Lubricating Oil (Internal)	Reduction of Heat Transfer/Fouling	Lubricating Oil Analysis (B.2.1.23)	V.A-12	3.2.1-9	B
Heat exchanger components (Lube Oil Heat Exchangers for Main Vacuum Pumps)	Heat Transfer	Copper Alloy with 15% Zinc or More	Lubricating Oil (Internal)	Reduction of Heat Transfer/Fouling	One-Time Inspection (B.2.1.18)	V.A-12	3.2.1-9	B
Heat exchanger components (Lube Oil Heat Exchangers for Main Vacuum Pumps)	Heat Transfer	Copper Alloy with 15% Zinc or More	Raw Water (External)	Reduction of Heat Transfer/Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-6	3.3.1-83	B

Table 3.3.2-3 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
Heat exchanger components (Lube Oil Heat Exchangers for Main Vacuum Pumps)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	D
Heat exchanger components (Lube Oil Heat Exchangers for Main Vacuum Pumps)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	V.C-5	3.2.1-35	D
Heat exchanger components (Lube Oil Heat Exchangers for Main Vacuum Pumps)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)			H, 2
Heat exchanger components (Lube Oil Heat Exchangers for Main Vacuum Pumps)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)			H, 2
Heat exchanger components (Lube Oil Heat Exchangers for Main Vacuum Pumps)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Raw Water (External)	Loss of Material/Pitting, Crevice, Galvanic, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-3	3.3.1-82	B
Heat exchanger components (Lube Oil Heat Exchangers for Main Vacuum Pumps)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Raw Water (External)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-4	3.3.1-84	A

Table 3.3.2-3 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
Heat exchanger components (Lube Oil Heat Exchangers for Main Vacuum Pumps)	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (Lube Oil Heat Exchangers for Main Vacuum Pumps)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)			F
Heat exchanger components (Lube Oil Heat Exchangers for Main Vacuum Pumps)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	C
Heat exchanger components (Seal Water Coolers for Aux Vacuum Pumps)	Heat Transfer	Stainless Steel	Raw Water (External)	Reduction of Heat Transfer/Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-7	3.3.1-83	B
Heat exchanger components (Seal Water Coolers for Aux Vacuum Pumps)	Heat Transfer	Stainless Steel	Raw Water (Internal)	Reduction of Heat Transfer/Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-7	3.3.1-83	B
Heat exchanger components (Seal Water Coolers for Aux Vacuum Pumps)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	D

Table 3.3.2-3 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
Heat exchanger components (Seal Water Coolers for Aux Vacuum Pumps)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	V.C-5	3.2.1-35	D
Heat exchanger components (Seal Water Coolers for Aux Vacuum Pumps)	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (Seal Water Coolers for Aux Vacuum Pumps)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)			F
Heat exchanger components (Seal Water Coolers for Aux Vacuum Pumps)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	C
Heat exchanger components (Seal Water Coolers for Aux Vacuum Pumps)	Pressure Boundary	Stainless Steel	Raw Water (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VIII.E-3	3.4.1-33	B
Heat exchanger components (Seal Water Coolers for Aux Vacuum Pumps)	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VIII.E-3	3.4.1-33	B

Table 3.3.2-3 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
Heat exchanger components (Seal Water Coolers for Main Vacuum Pumps)	Heat Transfer	Stainless Steel	Raw Water (External)	Reduction of Heat Transfer/Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-7	3.3.1-83	B
Heat exchanger components (Seal Water Coolers for Main Vacuum Pumps)	Heat Transfer	Stainless Steel	Raw Water (Internal)	Reduction of Heat Transfer/Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-7	3.3.1-83	B
Heat exchanger components (Seal Water Coolers for Main Vacuum Pumps)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	D
Heat exchanger components (Seal Water Coolers for Main Vacuum Pumps)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	V.C-5	3.2.1-35	D
Heat exchanger components (Seal Water Coolers for Main Vacuum Pumps)	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (Seal Water Coolers for Main Vacuum Pumps)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)			F

Table 3.3.2-3 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
Heat exchanger components (Seal Water Coolers for Main Vacuum Pumps)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	C
Heat exchanger components (Seal Water Coolers for Main Vacuum Pumps)	Pressure Boundary	Stainless Steel	Raw Water (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VIII.E-3	3.4.1-33	B
Heat exchanger components (Seal Water Coolers for Main Vacuum Pumps)	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VIII.E-3	3.4.1-33	B
Piping and fittings	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Piping and fittings	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	V.C-5	3.2.1-35	D
Piping and fittings	Pressure Boundary	Carbon Steel	Soil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VII.C1-18	3.3.1-19	B
Piping and fittings	Pressure Boundary	Concrete	Raw Water (Internal)	Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)/Corrosion of embedded steel	Open-Cycle Cooling Water System (B.2.1.9)	III.A3-4	3.5.1-31	E, 3
Piping and fittings	Pressure Boundary	Concrete	Raw Water (Internal)	Cracking/Expansion and Reaction with Aggregates	Open-Cycle Cooling Water System (B.2.1.9)	III.A3-2	3.5.1-27	E, 3

Table 3.3.2-3 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	Pressure Boundary	Concrete	Raw Water (Internal)	Increase in Porosity and Permeability, Cracking, Loss of Material (Spalling, Scaling)/ Aggressive chemical attack	Open-Cycle Cooling Water System (B.2.1.9)	III.A3-5	3.5.1-31	E, 3
Piping and fittings	Pressure Boundary	Concrete	Raw Water (Internal)	Increase in Porosity and Permeability, Loss of Strength/ Leaching of calcium hydroxide	Open-Cycle Cooling Water System (B.2.1.9)	III.A6-6	3.5.1-37	E, 3
Piping and fittings	Pressure Boundary	Concrete	Soil (External)	Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)/Corrosion of embedded steel	None	III.A3-4	3.5.1-31	I, 5
Piping and fittings	Pressure Boundary	Concrete	Soil (External)	Cracking/Expansion and Reaction with Aggregates	None	III.A3-2	3.5.1-27	I, 4
Piping and fittings	Pressure Boundary	Concrete	Soil (External)	Cracks and Distortion/Increased stress levels from settlement	None	III.A3-3	3.5.1-28	I, 6
Piping and fittings	Pressure Boundary	Concrete	Soil (External)	Increase in Porosity and Permeability, Cracking, Loss of Material (Spalling, Scaling)/ Aggressive chemical attack	None	III.A3-5	3.5.1-31	I, 7
Piping and fittings	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	V.C-3	3.2.1-38	D
Pump Casing (Circulating Water Pumps)	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-3 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
Pump Casing (Circulating Water Pumps)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	V.C-5	3.2.1-35	D
Pump Casing (Circulating Water Pumps)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Strainer Body	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Strainer Body	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	V.C-5	3.2.1-35	D
Strainer Body	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Strainer Body	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	V.C-5	3.2.1-35	D
Thermowell	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Thermowell	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	V.C-3	3.2.1-38	D
Valve Body	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-3 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	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	V.C-5	3.2.1-35	D
Valve Body	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Valve Body	Pressure Boundary	Copper Alloy with less than 15% Zinc	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-9	3.3.1-81	B
Valve Body	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	V.C-5	3.2.1-35	D
Valve Body	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Valve Body	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VIII.B1-4	3.4.1-16	E, 8

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. Rubber expansion joints are short-lived components and replaced every six refueling cycles (12 years) per recurring work tasks PM207986 and PM208145.
2. Lubricating Oil and One Time Inspection are used to manage pitting and crevice corrosion for copper alloy in lubricating oil. Microbiologic Influenced Corrosion is also predicted and managed with the same programs.
3. The Open Cycle Cooling Water System Program is used for inspection of buried concrete piping internal surfaces.
4. For concrete in a soil environment, cracking and expansion due to reaction with aggregates is not applicable.
5. For concrete in a soil environment, cracking, loss of bond, and loss of material (spalling, scaling) due to corrosion of embedded steel is not applicable.
6. For concrete in a soil environment, cracks and distortion due to increased stress levels from settlement is not applicable.
7. For concrete in a soil environment, increase in porosity and permeability, cracking, loss of material (spalling, scaling) due to aggressive chemical attack is not applicable.

8. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is substituted for this component, material, and environment combination.

Table 3.3.2-4
Closed Cycle Cooling Water System
Summary of Aging Management Evaluation

Table 3.3.2-4 Closed Cycle 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
Annubar	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Annubar	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-10	3.3.1-50	B
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Filter Housing	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Filter Housing	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Filter Housing	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	B

Table 3.3.2-4 Closed Cycle 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
Flow Element	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Flow Element	Leakage Boundary	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-10	3.3.1-50	B
Flow Element	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Flow Element	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-10	3.3.1-50	B
Heat exchanger components (Auxiliary Boiler Sample Rack Coolers)	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	C
Heat exchanger components (Auxiliary Boiler Sample Rack Coolers)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.A4-2	3.3.1-23	B
Heat exchanger components (Auxiliary Boiler Sample Rack Coolers)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A4-2	3.3.1-23	A
Heat exchanger components (Condensate Booster Pump Oil Cooler)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (Condensate Booster Pump Oil Cooler)	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D

Table 3.3.2-4 Closed Cycle 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 exchanger components (Condensate Pump Motor Oil Cooler)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (Condensate Pump Motor Oil Cooler)	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (Control Building Air Conditioning)	Leakage Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	V.F-3	3.2.1-53	C
Heat exchanger components (Control Building Air Conditioning)	Leakage Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting, Crevice, and Galvanic Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E1-2	3.3.1-51	B
Heat exchanger components (Control Building Air Conditioning)	Leakage Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	V.A-6	3.2.1-41	A
Heat exchanger components (Control Rod Drive Cooling Coils)	Heat Transfer	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-2	3.3.1-52	B
Heat exchanger components (Control Rod Drive Cooling Coils)	Heat Transfer	Stainless Steel	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-3	3.3.1-52	B

Table 3.3.2-4 Closed Cycle 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 exchanger components (Control Rod Drive Cooling Coils)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting, Crevice, and Galvanic Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E1-2	3.3.1-51	B
Heat exchanger components (Control Rod Drive Cooling Coils)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	V.A-6	3.2.1-41	A
Heat exchanger components (Control Rod Drive Cooling Coils)	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	V.D1-4	3.2.1-28	B
Heat exchanger components (Decay Heat Removal Coolers)	Heat Transfer	Stainless Steel	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-3	3.3.1-52	B
Heat exchanger components (Decay Heat Removal Coolers)	Heat Transfer	Stainless Steel	Treated Water (External) > 140 F	Reduction of Heat Transfer/Fouling	One-Time Inspection (B.2.1.18)	VII.A4-4	3.3.1-3	B
Heat exchanger components (Decay Heat Removal Coolers)	Heat Transfer	Stainless Steel	Treated Water (External) > 140 F	Reduction of Heat Transfer/Fouling	Water Chemistry (B.2.1.2)	VII.A4-4	3.3.1-3	A
Heat exchanger components (Decay Heat Removal Coolers)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Heat exchanger components (Decay Heat Removal Coolers)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1

Table 3.3.2-4 Closed Cycle 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 exchanger components (Decay Heat Removal Coolers)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (Decay Heat Removal Coolers)	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.E-37	3.4.1-3	B
Heat exchanger components (Decay Heat Removal Coolers)	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.E-37	3.4.1-3	A
Heat exchanger components (Decay Heat Removal Coolers)	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	V.D1-4	3.2.1-28	B
Heat exchanger components (Decay Heat Removal Coolers)	Pressure Boundary	Stainless Steel	Treated Water (External) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VIII.F-3	3.4.1-14	B
Heat exchanger components (Decay Heat Removal Coolers)	Pressure Boundary	Stainless Steel	Treated Water (External) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VIII.F-3	3.4.1-14	A
Heat exchanger components (Decay Heat Removal Coolers)	Pressure Boundary	Stainless Steel	Treated Water (External) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.A4-2	3.3.1-23	B
Heat exchanger components (Decay Heat Removal Coolers)	Pressure Boundary	Stainless Steel	Treated Water (External) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A4-2	3.3.1-23	A

Table 3.3.2-4 Closed Cycle 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 exchanger components (EFW Pump Rooms and Instr Air Comp Room Coolers)	Heat Transfer	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	Reduction of Heat Transfer/Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Heat exchanger components (EFW Pump Rooms and Instr Air Comp Room Coolers)	Heat Transfer	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-2	3.3.1-52	B
Heat exchanger components (EFW Pump Rooms and Instr Air Comp Room Coolers)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	V.F-3	3.2.1-53	C
Heat exchanger components (EFW Pump Rooms and Instr Air Comp Room Coolers)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting, Crevice, and Galvanic Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E1-2	3.3.1-51	B
Heat exchanger components (EFW Pump Rooms and Instr Air Comp Room Coolers)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	V.A-6	3.2.1-41	A
Heat exchanger components (EHC Cooler)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (EHC Cooler)	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D

Table 3.3.2-4 Closed Cycle 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 exchanger components (Evaporator Condensers)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	C
Heat exchanger components (Evaporator Condensers)	Leakage Boundary	Stainless Steel	Closed Cycle Cooling Water > 140 F	Cracking/Stress Corrosion Cracking	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E3-2	3.3.1-46	B
Heat exchanger components (Evaporator Condensers)	Leakage Boundary	Stainless Steel	Closed Cycle Cooling Water > 140 F	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	V.D1-4	3.2.1-28	B
Heat exchanger components (Evaporator Distillate Coolers)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	C
Heat exchanger components (Evaporator Distillate Coolers)	Leakage Boundary	Stainless Steel	Closed Cycle Cooling Water > 140 F	Cracking/Stress Corrosion Cracking	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E3-2	3.3.1-46	B
Heat exchanger components (Evaporator Distillate Coolers)	Leakage Boundary	Stainless Steel	Closed Cycle Cooling Water > 140 F	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	V.D1-4	3.2.1-28	B
Heat exchanger components (Evaporator Vacuum Pump Seal Water Coolers)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Heat exchanger components (Evaporator Vacuum Pump Seal Water Coolers)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1

Table 3.3.2-4 Closed Cycle 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 exchanger components (Evaporator Vacuum Pump Seal Water Coolers)	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	B
Heat exchanger components (Evaporator Vacuum Pump Seal Water Coolers)	Leakage Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Heat exchanger components (Evaporator Vacuum Pump Seal Water Coolers)	Leakage Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Heat exchanger components (Evaporator Vacuum Pump Seal Water Coolers)	Leakage Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (Evaporator Vacuum Pump Seal Water Coolers)	Leakage Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C2-8	3.3.1-85	C
Heat exchanger components (Exciter Air Cooler)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-4 Closed Cycle 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 exchanger components (Exciter Air Cooler)	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (Feedpump Turbine Lube Oil Cooler)	Leakage Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (Feedpump Turbine Lube Oil Cooler)	Leakage Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (Feedpump Turbine Lube Oil Cooler)	Leakage Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C2-8	3.3.1-85	A
Heat exchanger components (Hydrogen Coolers)	Leakage Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (Hydrogen Coolers)	Leakage Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (Hydrogen Coolers)	Leakage Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C2-8	3.3.1-85	A
Heat exchanger components (Instrument Air Aftercooler)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-4 Closed Cycle 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 exchanger components (Instrument Air Aftercooler)	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (Leak Rate Test Aftercooler)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Heat exchanger components (Leak Rate Test Aftercooler)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Heat exchanger components (Leak Rate Test Aftercooler)	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (Letdown Coolers)	Heat Transfer	Stainless Steel	Closed Cycle Cooling Water > 140 F	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-3	3.3.1-52	B
Heat exchanger components (Letdown Coolers)	Heat Transfer	Stainless Steel	Treated Water (Internal)	Reduction of Heat Transfer/Fouling	One-Time Inspection (B.2.1.18)	VII.A4-4	3.3.1-3	B
Heat exchanger components (Letdown Coolers)	Heat Transfer	Stainless Steel	Treated Water (Internal)	Reduction of Heat Transfer/Fouling	Water Chemistry (B.2.1.2)	VII.A4-4	3.3.1-3	A
Heat exchanger components (Letdown Coolers)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Heat exchanger components (Letdown Coolers)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1

Table 3.3.2-4 Closed Cycle 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 exchanger components (Letdown Coolers)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (Letdown Coolers)	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water > 140 F	Cracking/Stress Corrosion Cracking	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E3-2	3.3.1-46	B
Heat exchanger components (Letdown Coolers)	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water > 140 F	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	V.D1-4	3.2.1-28	B
Heat exchanger components (Letdown Coolers)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.A4-2	3.3.1-23	B
Heat exchanger components (Letdown Coolers)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A4-2	3.3.1-23	A
Heat exchanger components (Main Turbine Oil Cooler)	Leakage Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (Main Turbine Oil Cooler)	Leakage Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (Main Turbine Oil Cooler)	Leakage Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C2-8	3.3.1-85	C

Table 3.3.2-4 Closed Cycle 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 exchanger components (Makeup, Decay Heat Removal, RB Spray Pump & Motor Lube Oil Cooler)	Heat Transfer	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-2	3.3.1-52	B
Heat exchanger components (Makeup, Decay Heat Removal, RB Spray Pump & Motor Lube Oil Cooler)	Heat Transfer	Copper Alloy with 15% Zinc or More	Lubricating Oil (External)	Reduction of Heat Transfer/Fouling	Lubricating Oil Analysis (B.2.1.23)	VIII.G-8	3.4.1-10	B
Heat exchanger components (Makeup, Decay Heat Removal, RB Spray Pump & Motor Lube Oil Cooler)	Heat Transfer	Copper Alloy with 15% Zinc or More	Lubricating Oil (External)	Reduction of Heat Transfer/Fouling	One-Time Inspection (B.2.1.18)	VIII.G-8	3.4.1-10	B
Heat exchanger components (Makeup, Decay Heat Removal, RB Spray Pump & Motor Lube Oil Cooler)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Heat exchanger components (Makeup, Decay Heat Removal, RB Spray Pump & Motor Lube Oil Cooler)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1

Table 3.3.2-4 Closed Cycle 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 exchanger components (Makeup, Decay Heat Removal, RB Spray Pump & Motor Lube Oil Cooler)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	B
Heat exchanger components (Makeup, Decay Heat Removal, RB Spray Pump & Motor Lube Oil Cooler)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	B
Heat exchanger components (Makeup, Decay Heat Removal, RB Spray Pump & Motor Lube Oil Cooler)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting, Crevice, and Galvanic Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E1-2	3.3.1-51	B
Heat exchanger components (Makeup, Decay Heat Removal, RB Spray Pump & Motor Lube Oil Cooler)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	V.A-6	3.2.1-41	A
Heat exchanger components (Makeup, Decay Heat Removal, RB Spray Pump & Motor Lube Oil Cooler)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Lubricating Oil (External)	Loss of Material/Pitting and Crevice Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.C1-8	3.3.1-26	D

Table 3.3.2-4 Closed Cycle 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 exchanger components (Makeup, Decay Heat Removal, RB Spray Pump & Motor Lube Oil Cooler)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Lubricating Oil (External)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.C1-8	3.3.1-26	D
Heat exchanger components (Nuclear Service and Decay Heat Cooling Pump Area Air Coolers)	Heat Transfer	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Reduction of Heat Transfer/Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Heat exchanger components (Nuclear Service and Decay Heat Cooling Pump Area Air Coolers)	Heat Transfer	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-2	3.3.1-52	B
Heat exchanger components (Nuclear Service and Decay Heat Cooling Pump Area Air Coolers)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-12	3.3.1-88	C
Heat exchanger components (Nuclear Service and Decay Heat Cooling Pump Area Air Coolers)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting, Crevice, and Galvanic Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E1-2	3.3.1-51	B

Table 3.3.2-4 Closed Cycle 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 exchanger components (Nuclear Service and Decay Heat Cooling Pump Area Air Coolers)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	V.A-6	3.2.1-41	A
Heat exchanger components (Pressurizer Sample and OTSG Sample Coolers)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Heat exchanger components (Pressurizer Sample and OTSG Sample Coolers)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Heat exchanger components (Pressurizer Sample and OTSG Sample Coolers)	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (Primary and Secondary Cooling Coils)	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	C
Heat exchanger components (Primary and Secondary Cooling Coils)	Leakage Boundary	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	V.D1-4	3.2.1-28	B

Table 3.3.2-4 Closed Cycle 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 exchanger components (Primary Sample Coolers)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Heat exchanger components (Primary Sample Coolers)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Heat exchanger components (Primary Sample Coolers)	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (Primary Sample Coolers)	Leakage Boundary	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-12	3.3.1-88	C
Heat exchanger components (Primary Sample Coolers)	Leakage Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting, Crevice, and Galvanic Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E1-2	3.3.1-51	B
Heat exchanger components (Primary Sample Coolers)	Leakage Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	V.A-6	3.2.1-41	A
Heat exchanger components (RC Pump Seal Return Coolers)	Heat Transfer	Stainless Steel	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-3	3.3.1-52	B
Heat exchanger components (RC Pump Seal Return Coolers)	Heat Transfer	Stainless Steel	Treated Water (Internal)	Reduction of Heat Transfer/Fouling	One-Time Inspection (B.2.1.18)	VII.A4-4	3.3.1-3	B
Heat exchanger components (RC Pump Seal Return Coolers)	Heat Transfer	Stainless Steel	Treated Water (Internal)	Reduction of Heat Transfer/Fouling	Water Chemistry (B.2.1.2)	VII.A4-4	3.3.1-3	A

Table 3.3.2-4 Closed Cycle 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 exchanger components (RC Pump Seal Return Coolers)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Heat exchanger components (RC Pump Seal Return Coolers)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Heat exchanger components (RC Pump Seal Return Coolers)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (RC Pump Seal Return Coolers)	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water > 140 F	Cracking/Stress Corrosion Cracking	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E3-2	3.3.1-46	B
Heat exchanger components (RC Pump Seal Return Coolers)	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water > 140 F	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	V.D1-4	3.2.1-28	B
Heat exchanger components (RC Pump Seal Return Coolers)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.A4-2	3.3.1-23	B
Heat exchanger components (RC Pump Seal Return Coolers)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A4-2	3.3.1-23	A
Heat exchanger components (Reactor Building Fan Motor Coolers)	Heat Transfer	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Reduction of Heat Transfer/Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G

Table 3.3.2-4 Closed Cycle 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 exchanger components (Reactor Building Fan Motor Coolers)	Heat Transfer	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-2	3.3.1-52	B
Heat exchanger components (Reactor Building Fan Motor Coolers)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-12	3.3.1-88	C
Heat exchanger components (Reactor Building Fan Motor Coolers)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting, Crevice, and Galvanic Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E1-2	3.3.1-51	B
Heat exchanger components (Reactor Building Fan Motor Coolers)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	V.A-6	3.2.1-41	A
Heat exchanger components (Reactor Coolant Drain Tank Heat Exchanger)	Heat Transfer	Stainless Steel	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-3	3.3.1-52	B
Heat exchanger components (Reactor Coolant Drain Tank Heat Exchanger)	Heat Transfer	Stainless Steel	Treated Water (Internal) > 140 F	Reduction of Heat Transfer/Fouling	One-Time Inspection (B.2.1.18)	VII.A4-4	3.3.1-3	B
Heat exchanger components (Reactor Coolant Drain Tank Heat Exchanger)	Heat Transfer	Stainless Steel	Treated Water (Internal) > 140 F	Reduction of Heat Transfer/Fouling	Water Chemistry (B.2.1.2)	VII.A4-4	3.3.1-3	A

Table 3.3.2-4 Closed Cycle 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 exchanger components (Reactor Coolant Drain Tank Heat Exchanger)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	C
Heat exchanger components (Reactor Coolant Drain Tank Heat Exchanger)	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	V.D1-4	3.2.1-28	B
Heat exchanger components (Reactor Coolant Drain Tank Heat Exchanger)	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VIII.F-3	3.4.1-14	B
Heat exchanger components (Reactor Coolant Drain Tank Heat Exchanger)	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VIII.F-3	3.4.1-14	A
Heat exchanger components (Reactor Coolant Drain Tank Heat Exchanger)	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.A4-2	3.3.1-23	B
Heat exchanger components (Reactor Coolant Drain Tank Heat Exchanger)	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A4-2	3.3.1-23	A
Heat exchanger components (Service Air Aftercooler)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-4 Closed Cycle 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 exchanger components (Service Air Aftercooler)	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (Spent Fuel Coolers)	Heat Transfer	Stainless Steel	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-3	3.3.1-52	B
Heat exchanger components (Spent Fuel Coolers)	Heat Transfer	Stainless Steel	Treated Water (Internal)	Reduction of Heat Transfer/Fouling	One-Time Inspection (B.2.1.18)	VII.A4-4	3.3.1-3	B
Heat exchanger components (Spent Fuel Coolers)	Heat Transfer	Stainless Steel	Treated Water (Internal)	Reduction of Heat Transfer/Fouling	Water Chemistry (B.2.1.2)	VII.A4-4	3.3.1-3	A
Heat exchanger components (Spent Fuel Coolers)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Heat exchanger components (Spent Fuel Coolers)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Heat exchanger components (Spent Fuel Coolers)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (Spent Fuel Coolers)	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	V.D1-4	3.2.1-28	B
Heat exchanger components (Spent Fuel Coolers)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.A4-2	3.3.1-23	B

Table 3.3.2-4 Closed Cycle 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 exchanger components (Spent Fuel Coolers)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A4-2	3.3.1-23	A
Heat exchanger components (Spent Fuel Pump Room Cooling Coils)	Heat Transfer	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Reduction of Heat Transfer/Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Heat exchanger components (Spent Fuel Pump Room Cooling Coils)	Heat Transfer	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-2	3.3.1-52	B
Heat exchanger components (Spent Fuel Pump Room Cooling Coils)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-12	3.3.1-88	C
Heat exchanger components (Spent Fuel Pump Room Cooling Coils)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting, Crevice, and Galvanic Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E1-2	3.3.1-51	B
Heat exchanger components (Spent Fuel Pump Room Cooling Coils)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	V.A-6	3.2.1-41	A
Heat exchanger components (Stator Water Cooling)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-4 Closed Cycle 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 exchanger components (Stator Water Cooling)	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (Steam Generator Hot Drain Coolers)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Heat exchanger components (Steam Generator Hot Drain Coolers)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Heat exchanger components (Steam Generator Hot Drain Coolers)	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Piping and fittings	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Piping and fittings	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Piping and fittings	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	B
Piping and fittings	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 4
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VIII.B1-11	3.4.1-4	E, 2

Table 3.3.2-4 Closed Cycle 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	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Leakage Boundary	Stainless Steel	Closed Cycle Cooling Water > 140 F	Cracking/Stress Corrosion Cracking	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-11	3.3.1-46	B
Piping and fittings	Leakage Boundary	Stainless Steel	Closed Cycle Cooling Water > 140 F	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-10	3.3.1-50	B
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Piping and fittings	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	B
Pump Casing (Decay Heat Closed Cooling)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Decay Heat Closed Cooling)	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-10	3.3.1-50	B
Pump Casing (Industrial Cooler Water)	Leakage Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Industrial Cooler Water)	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 4
Pump Casing (Industrial Cooler Water)	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C2-8	3.3.1-85	A

Table 3.3.2-4 Closed Cycle 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 (Intermediate Cooling)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Pump Casing (Intermediate Cooling)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Pump Casing (Intermediate Cooling)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	B
Pump Casing (Nuclear Services Closed Cooling)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Pump Casing (Nuclear Services Closed Cooling)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Pump Casing (Nuclear Services Closed Cooling)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	B
Tanks (Chemical Mix - Nuclear Service, Intermediate Cooling, Decay Closed, Industrial Cooler)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Tanks (Chemical Mix - Nuclear Service, Intermediate Cooling, Decay Closed, Industrial Cooler)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1

Table 3.3.2-4 Closed Cycle 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
Tanks (Chemical Mix - Nuclear Service, Intermediate Cooling, Decay Closed, Industrial Cooler)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VIII.E-40	3.4.1-6	E, 2
Tanks (Industrial Cooler Expansion Tank)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Tanks (Industrial Cooler Expansion Tank)	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 4
Tanks (Surge - Nuclear Service, Intermediate Cooling, Decay Closed, Secondary Closed)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Tanks (Surge - Nuclear Service, Intermediate Cooling, Decay Closed, Secondary Closed)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A

Table 3.3.2-4 Closed Cycle 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
Tanks (Surge - Nuclear Service, Intermediate Cooling, Decay Closed, Secondary Closed)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Tanks (Surge - Nuclear Service, Intermediate Cooling, Decay Closed, Secondary Closed)	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	B
Tanks (Surge - Nuclear Service, Intermediate Cooling, Decay Closed, Secondary Closed)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Tanks (Surge - Nuclear Service, Intermediate Cooling, Decay Closed, Secondary Closed)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Tanks (Surge - Nuclear Service, Intermediate Cooling, Decay Closed, Secondary Closed)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	B

Table 3.3.2-4 Closed Cycle 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	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Thermowell	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water > 140 F	Cracking/Stress Corrosion Cracking	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-11	3.3.1-46	B
Thermowell	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water > 140 F	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-10	3.3.1-50	B
Valve Body	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Valve Body	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Valve Body	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	B
Valve Body	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 4
Valve Body	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VIII.B1-11	3.4.1-4	E, 2
Valve Body	Leakage Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Valve Body	Leakage Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-4	3.3.1-51	I, 3
Valve Body	Leakage Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C2-6	3.3.1-84	A
Valve Body	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Valve Body	Leakage Boundary	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-10	3.3.1-50	B

Table 3.3.2-4 Closed Cycle 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	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Valve Body	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 1
Valve Body	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	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. Carbon steel in air with borated water leakage predicts general, pitting, and crevice corrosion. External Surfaces Monitoring is used to manage the aging effects.
2. The Closed-cycle Cooling Water System program is substituted to manage these aging effects.
3. Galvanic corrosion is not predicted for this material and environment combination.
4. The Inspection of Internal Surfaces of Miscellaneous Piping and Ducting program is substituted to manage these aging effects.

Table 3.3.2-5
Containment Isolation System
Summary of Aging Management Evaluation

Table 3.3.2-5 Containment Isolation System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	V.E-4	3.2.1-23	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	V.E-5	3.2.1-24	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-2	3.2.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	V.E-4	3.2.1-23	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	V.E-5	3.2.1-24	A
Ducting and Components	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	V.F-1	3.2.1-51	A
Ducting and Components	Pressure Boundary	Galvanized Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-9	3.2.1-45	A
Ducting and Components	Pressure Boundary	Galvanized Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Ducting and Components	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F3-3	3.3.1-72	B
Piping and fittings	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-7	3.2.1-31	B

Table 3.3.2-5 Containment Isolation 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 Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-9	3.2.1-45	A
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Piping and fittings	Pressure Boundary	Carbon Steel	Air/Gas - Dry (Internal)	None	None	V.F-18	3.2.1-56	A
Piping and fittings	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F3-3	3.3.1-72	B
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air with Borated Water Leakage (External)	None	None	V.F-5	3.2.1-57	A
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air/Gas - Dry (Internal)	None	None	V.F-4	3.2.1-56	A
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.G-9	3.3.1-28	E, 2
Piping and fittings	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	V.F-12	3.2.1-53	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D1-29	3.2.1-8	E, 3
Piping and fittings	Structural Support	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-7	3.2.1-31	B
Piping and fittings	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-9	3.2.1-45	A
Piping and fittings	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Piping and fittings	Structural Support	Carbon Steel	Air/Gas - Dry (Internal)	None	None	V.F-18	3.2.1-56	A

Table 3.3.2-5 Containment Isolation 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	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F3-3	3.3.1-72	B
Piping and fittings	Structural Support	Copper Alloy with less than 15% Zinc	Air with Borated Water Leakage (External)	None	None	V.F-5	3.2.1-57	A
Piping and fittings	Structural Support	Copper Alloy with less than 15% Zinc	Air/Gas - Dry (Internal)	None	None	V.F-4	3.2.1-56	A
Piping and fittings	Structural Support	Copper Alloy with less than 15% Zinc	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.G-9	3.3.1-28	E, 2
Piping and fittings	Structural Support	Stainless Steel	Air - Indoor (External)	None	None	V.F-12	3.2.1-53	A
Piping and fittings	Structural Support	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Piping and fittings	Structural Support	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D1-29	3.2.1-8	E, 3
Valve Body	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-7	3.2.1-31	B
Valve Body	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	V.E-9	3.2.1-45	A
Valve Body	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	V.E-4	3.2.1-23	E, 1
Valve Body	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.D2-17	3.2.1-34	B
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	V.F-3	3.2.1-53	A

Table 3.3.2-5 Containment Isolation 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 with 15% Zinc or More	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.G-9	3.3.1-28	E, 2
Valve Body	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	V.F-12	3.2.1-53	A
Valve Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	V.F-13	3.2.1-57	A
Valve Body	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.D1-29	3.2.1-8	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. The aging effects of carbon steel and galvanized steel in air with borated water leakage environment include loss of material due to general, pitting, and crevice corrosion. These aging effects/mechanisms are managed by the External Surfaces Monitoring Program.
2. Pitting and crevice corrosion is not expected for this material and environment combination because contaminant concentration is not expected. The One-Time Inspection program will be used to verify the absence of these aging effects/mechanisms on copper alloy exposed to an air/gas (wetted) internal environment.
3. Pitting and crevice corrosion is not expected for this material and environment combination because contaminant concentration is not expected. The One-Time Inspection program will be used to verify the absence of these aging effects/mechanisms on stainless steel exposed to an air/gas (wetted) internal environment.

Table 3.3.2-6
Control Building Ventilation System
Summary of Aging Management Evaluation

Table 3.3.2-6 **Control 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
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.F1-4	3.3.1-55	B
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Damper Housing	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	A
Damper Housing	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F1-3	3.3.1-72	B
Ducting and Components	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	A
Ducting and Components	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F1-3	3.3.1-72	B
Expansion Joints	Pressure Boundary	Neoprene	Air - Indoor (External)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F1-7	3.3.1-11	E, 7

Table 3.3.2-6 Control 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
Expansion Joints	Pressure Boundary	Neoprene	Air/Gas - Wetted (Internal)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F1-7	3.3.1-11	E, 7
Fan Housing	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	A
Fan Housing	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F1-3	3.3.1-72	B
Fan Housing	Structural Support	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	A
Fan Housing	Structural Support	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F1-3	3.3.1-72	B
Filter Housing	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Filter Housing	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air/Gas - Dry (Internal)	None	None	VII.J-4	3.3.1-97	A
Filter Housing	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	A
Filter Housing	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F1-3	3.3.1-72	B
Filter Housing	Pressure Boundary	Glass	Air - Indoor (External)	None	None	VII.J-8	3.3.1-93	A
Filter Housing	Pressure Boundary	Glass	Air/Gas - Dry (Internal)	None	None	VII.J-7	3.3.1-93	A
Heat exchanger components (Air Dryer)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-6 Control 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
Heat exchanger components (Air Dryer)	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.F1-3	3.3.1-72	E, 1
Heat exchanger components (Air Dryer)	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Heat exchanger components (Air Dryer)	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.G-9	3.3.1-28	E, 2
Heat exchanger components (Cooling Coils)	Heat Transfer	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	Reduction of Heat Transfer/Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			H, 3
Heat exchanger components (Cooling Coils)	Heat Transfer	Copper Alloy with less than 15% Zinc	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.F1-12	3.3.1-52	B
Heat exchanger components (Cooling Coils)	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F1-16	3.3.1-25	E, 4
Heat exchanger components (Cooling Coils)	Pressure Boundary	Copper Alloy with less than 15% Zinc	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.F1-15	3.3.1-51	I, 5
Piping and fittings	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Piping and fittings	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.F1-20	3.3.1-47	B
Piping and fittings	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Piping and fittings	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.F1-20	3.3.1-47	B

Table 3.3.2-6 Control 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	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air/Gas - Dry (Internal)	None	None	VII.J-3	3.3.1-98	A
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.G-9	3.3.1-28	E, 2
Piping and fittings	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-10	3.3.1-50	B
Pump Casing	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing	Pressure Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.F1-20	3.3.1-47	B
Pump Casing	Pressure Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C2-8	3.3.1-85	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-10	3.3.1-50	B
Restricting Orifices	Throttle	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-10	3.3.1-50	B
Sight Glasses	Pressure Boundary	Glass	Air - Indoor (External)	None	None	VII.J-8	3.3.1-93	A
Sight Glasses	Pressure Boundary	Glass	Closed Cycle Cooling Water	None	None			G, 6
Strainer Body	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Strainer Body	Pressure Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.F1-20	3.3.1-47	B

Table 3.3.2-6 Control 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
Strainer Body	Pressure Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C2-8	3.3.1-85	A
Strainer Element	Filter	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-10	3.3.1-50	B
Tanks	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Tanks	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.F1-20	3.3.1-47	B
Valve Body	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.F1-20	3.3.1-47	B
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air/Gas - Dry (Internal)	None	None	VII.J-3	3.3.1-98	A
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.G-9	3.3.1-28	E, 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. The aging effects of carbon steel in an air/gas wetted environment include loss of material due to general, pitting, and crevice corrosion. These aging effects/mechanisms are managed by the Compressed Air Monitoring Program.
2. NUREG-1801 specifies a plant specific program for managing this aging effect. The Compressed Air Monitoring Program will be used.
3. The aging effects of copper alloy in an air - indoor environment include reduction of heat transfer due to fouling. This aging effect/mechanism is managed by the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program.
4. The aging effects of copper alloy in an air - indoor environment include loss material due to pitting and crevice corrosion. These aging effects/mechanisms are managed by the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program.
5. The aging mechanism of galvanic corrosion does not apply since the material is not in contact with material higher in galvanic series.
6. There are no aging effects for glass in a closed cycle cooling water environment.
7. NUREG-1801 specifies a plant-specific program. The Internal Surfaces in Miscellaneous Piping and Ducting Components program is used to manage the aging effect(s) applicable to this component type, material, and environment combination. Inspections of the expansion joints require

physical manipulation; therefore, internal and external inspections, which include physical manipulation of elastomers, will be performed at the same time under the Internal Surfaces in Miscellaneous Piping and Ducting Components program..

Table 3.3.2-7
Cranes and Hoists
Summary of Aging Management Evaluation

Table 3.3.2-7 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
Bolting	Structural Support	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.I-4	3.3.1-43	E, 1
Bolting	Structural Support	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Self-Loosening	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.I-5	3.3.1-45	I, 4
Bolting	Structural Support	Carbon and Low Alloy Steel Bolting	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.I-1	3.3.1-43	E, 1
Bolting	Structural Support	Carbon and Low Alloy Steel Bolting	Air - Outdoor (External)	Loss of Preload/Self-Loosening	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)			H
Bolting	Structural Support	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Structural Support	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.I-4	3.3.1-43	E, 1

Table 3.3.2-7 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
Bolting	Structural Support	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Self-Loosening	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.I-5	3.3.1-45	I, 4
Bolting	Structural Support	Stainless Steel Bolting	Lubricating Oil (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)			G
Bolting	Structural Support	Stainless Steel Bolting	Lubricating Oil (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)			G
Crane/Hoist (Bridge/Trolley/Girders)	Structural Support	Carbon Steel	Air - Indoor (External)	Cumulative Fatigue Damage/Fatigue	TLAA	VII.B-2	3.3.1-1	E, 2
Crane/Hoist (Bridge/Trolley/Girders)	Structural Support	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.B-3	3.3.1-73	C
Crane/Hoist (Bridge/Trolley/Girders)	Structural Support	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.H1-8	3.3.1-60	E, 1
Crane/Hoist (Bridge/Trolley/Girders)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Crane/Hoist (Bridge/Trolley/Girders)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.I-4	3.3.1-43	E, 3

Table 3.3.2-7 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
Crane/Hoist (Jib Crane Columns/Beams/ Plates/Anchorage)	Structural Support	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.B-3	3.3.1-73	A
Crane/Hoist (Jib Crane Columns/Beams/ Plates/Anchorage)	Structural Support	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.H1-8	3.3.1-60	E, 1
Crane/Hoist (Jib Crane Columns/Beams/ Plates/Anchorage)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Crane/Hoist (Jib Crane Columns/Beams/ Plates/Anchorage)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.I-4	3.3.1-43	E, 3
Crane/Hoist (Monorail Beams/Lifting Devices/Plates)	Structural Support	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.B-3	3.3.1-73	A
Crane/Hoist (Monorail Beams/Lifting Devices/Plates)	Structural Support	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.H1-8	3.3.1-60	E, 1
Crane/Hoist (Monorail Beams/Lifting Devices/Plates)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A

Table 3.3.2-7 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
Crane/Hoist (Monorail Beams/Lifting Devices/Plates)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.I-4	3.3.1-43	E, 3
Crane/Hoist (Rail System)	Structural Support	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.B-3	3.3.1-73	C
Crane/Hoist (Rail System)	Structural Support	Carbon Steel	Air - Indoor (External)	Loss of Material/Wear	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.B-1	3.3.1-74	A
Crane/Hoist (Rail System)	Structural Support	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.H1-8	3.3.1-60	E, 1
Crane/Hoist (Rail System)	Structural Support	Carbon Steel	Air - Outdoor (External)	Loss of Material/Wear	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.G-4	3.3.1-63	E, 1
Crane/Hoist (Rail System)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Crane/Hoist (Rail System)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.I-4	3.3.1-43	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. The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems program will be used for managing this aging effect and mechanism.
2. Cumulative fatigue damage is predicted for crane girders. A TLAA is evaluated for the period of extended operation.
3. General, pitting, and crevice corrosion are predicted for carbon steel in air with borated water leakage. The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems program is used to manage the aging effects.
4. The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems program will be used for managing this aging effect and mechanism. Loss of preload due to thermal effects and gasket creep is not applicable to bolting in this environment.

Table 3.3.2-8
Diesel Generator Building Ventilation System
Summary of Aging Management Evaluation

Table 3.3.2-8 Diesel Generator 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
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.F4-3	3.3.1-55	B
Damper Housing	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	C
Damper Housing	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F4-2	3.3.1-72	B
Ducting and Components	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	C
Ducting and Components	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F4-2	3.3.1-72	B
Expansion Joints	Pressure Boundary	Neoprene	Air - Indoor (External)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F4-6	3.3.1-11	E, 1
Expansion Joints	Pressure Boundary	Neoprene	Air/Gas - Wetted (Internal)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F4-6	3.3.1-11	E, 1
Fan Housing	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	C

Table 3.3.2-8 Diesel Generator 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
Fan Housing	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F4-2	3.3.1-72	B
Filter Housing	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	C
Filter Housing	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F4-2	3.3.1-72	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. NUREG-1801 specifies a plant-specific program. The Internal Surfaces in Miscellaneous Piping and Ducting Components program is used to manage the aging effect(s) applicable to this component type, material, and environment combination. Inspections of the expansion joints require physical manipulation; therefore, internal and external inspections, which include physical manipulation of elastomers, will be performed at the same time under the Internal Surfaces in Miscellaneous Piping and Ducting Components program.

Table 3.3.2-9
Emergency Diesel Generators and Auxiliary Systems
Summary of Aging Management Evaluation

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-1	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Outdoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)			H, 1
Electric Heaters (Housing)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Electric Heaters (Housing)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Electric Heaters (Housing)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Expansion Joints	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Expansion Joints	Pressure Boundary	Carbon Steel	Diesel Exhaust (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.H2-2	3.3.1-18	E, 2
Expansion Joints	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Expansion Joints	Pressure Boundary	Stainless Steel	Diesel Exhaust (Internal)	Cracking/Stress Corrosion Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.H2-1	3.3.1-6	E, 2
Expansion Joints	Pressure Boundary	Stainless Steel	Diesel Exhaust (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.H2-2	3.3.1-18	E, 2
Filter Housing	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Filter Housing	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Filter Housing	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Filter Housing	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (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	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Flow Device	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Flow Device	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Flow Device	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Heat exchanger components (Air Cooler Coolant Radiator)	Heat Transfer	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	Reduction of Heat Transfer/Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			H, 3
Heat exchanger components (Air Cooler Coolant Radiator)	Heat Transfer	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-2	3.3.1-52	B
Heat exchanger components (Air Cooler Coolant Radiator)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (Air Cooler Coolant Radiator)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-1	3.3.1-48	I, 4

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (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 components (Air Cooler Coolant Radiator)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Heat exchanger components (Air Cooler Coolant Radiator)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E1-2	3.3.1-51	I, 4
Heat exchanger components (Air Cooler Coolant Radiator)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.H2-12	3.3.1-84	A
Heat exchanger components (Gear Box Lube Oil Cooler)	Heat Transfer	Copper Alloy with less than 15% Zinc	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-2	3.3.1-52	B
Heat exchanger components (Gear Box Lube Oil Cooler)	Heat Transfer	Copper Alloy with less than 15% Zinc	Lubricating Oil (External)	Reduction of Heat Transfer/Fouling	Lubricating Oil Analysis (B.2.1.23)	VIII.G-8	3.4.1-10	B
Heat exchanger components (Gear Box Lube Oil Cooler)	Heat Transfer	Copper Alloy with less than 15% Zinc	Lubricating Oil (External)	Reduction of Heat Transfer/Fouling	One-Time Inspection (B.2.1.18)	VIII.G-8	3.4.1-10	B
Heat exchanger components (Gear Box Lube Oil Cooler)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (Gear Box Lube Oil Cooler)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	B

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (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 components (Gear Box Lube Oil Cooler)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	B
Heat exchanger components (Gear Box Lube Oil Cooler)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E1-2	3.3.1-51	I, 4
Heat exchanger components (Gear Box Lube Oil Cooler)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Lubricating Oil (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)			H, 8
Heat exchanger components (Gear Box Lube Oil Cooler)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Lubricating Oil (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)			H, 8
Heat exchanger components (Jacket Coolant Radiator)	Heat Transfer	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	Reduction of Heat Transfer/Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			H, 3
Heat exchanger components (Jacket Coolant Radiator)	Heat Transfer	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-2	3.3.1-52	B
Heat exchanger components (Jacket Coolant Radiator)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (Jacket Coolant Radiator)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-1	3.3.1-48	I, 4

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (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 components (Jacket Coolant Radiator)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Heat exchanger components (Jacket Coolant Radiator)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E1-2	3.3.1-51	I, 4
Heat exchanger components (Jacket Coolant Radiator)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.H2-12	3.3.1-84	A
Heat exchanger components (Lube Oil Cooler)	Heat Transfer	Stainless Steel	Closed Cycle Cooling Water > 140 F	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-3	3.3.1-52	B
Heat exchanger components (Lube Oil Cooler)	Heat Transfer	Stainless Steel	Lubricating Oil (External)	Reduction of Heat Transfer/Fouling	Lubricating Oil Analysis (B.2.1.23)	VIII.G-12	3.4.1-10	B
Heat exchanger components (Lube Oil Cooler)	Heat Transfer	Stainless Steel	Lubricating Oil (External)	Reduction of Heat Transfer/Fouling	One-Time Inspection (B.2.1.18)	VIII.G-12	3.4.1-10	B
Heat exchanger components (Lube Oil Cooler)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (Lube Oil Cooler)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-1	3.3.1-48	I, 4
Heat exchanger components (Lube Oil Cooler)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	B

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (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 components (Lube Oil Cooler)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	B
Heat exchanger components (Lube Oil Cooler)	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water > 140 F	Cracking/Stress Corrosion Cracking	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E3-2	3.3.1-46	B
Heat exchanger components (Lube Oil Cooler)	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water > 140 F	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-10	3.3.1-50	B
Heat exchanger components (Lube Oil Cooler)	Pressure Boundary	Stainless Steel	Lubricating Oil (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.H2-17	3.3.1-33	B
Heat exchanger components (Lube Oil Cooler)	Pressure Boundary	Stainless Steel	Lubricating Oil (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.H2-17	3.3.1-33	B
Heat exchanger components (Standby Heat Exchanger/Lube Oil Heater)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (Standby Heat Exchanger/Lube Oil Heater)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-1	3.3.1-48	I, 4
Heat exchanger components (Standby Heat Exchanger/Lube Oil Heater)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	B

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (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 components (Standby Heat Exchanger/Lube Oil Heater)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	B
Hoses	Pressure Boundary	Rubber	Air - Indoor (External)	Hardening and Loss of Strength/Elastomer Degradation	External Surfaces Monitoring (B.2.1.21)	VII.F1-7	3.3.1-11	E, 5
Hoses	Pressure Boundary	Rubber	Air/Gas - Wetted (Internal)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Hoses	Pressure Boundary	Rubber	Closed Cycle Cooling Water	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Hoses	Pressure Boundary	Rubber	Fuel Oil (Internal)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Hoses	Pressure Boundary	Rubber	Lubricating Oil (Internal)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Piping and fittings	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Piping and fittings	Pressure Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (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 Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.H2-21	3.3.1-71	B
Piping and fittings	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-23	3.3.1-47	B
Piping and fittings	Pressure Boundary	Carbon Steel	Concrete (Embedded)	None	None	VII.J-21	3.3.1-96	A
Piping and fittings	Pressure Boundary	Carbon Steel	Diesel Exhaust (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.H2-2	3.3.1-18	E, 2
Piping and fittings	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Piping and fittings	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.H1-10	3.3.1-20	E, 6
Piping and fittings	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (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 Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Piping and fittings	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Piping and fittings	Pressure Boundary	Carbon Steel	Soil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VII.H1-9	3.3.1-19	B
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Fuel Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	Fuel Oil Chemistry (B.2.1.16)	VII.H1-3	3.3.1-32	I, 9
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Fuel Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.H1-3	3.3.1-32	I, 9
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)			H, 8
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)			H, 8
Piping and fittings	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (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	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.D-4	3.3.1-54	E, 6
Pump Casing (Diesel Fuel Transfer)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Diesel Fuel Transfer)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Pump Casing (Diesel Fuel Transfer)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Pump Casing (Air Cooler Coolant Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Air Cooler Coolant Pump)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-23	3.3.1-47	B
Pump Casing (DC Motor-driven Fuel Oil Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (DC Motor-driven Fuel Oil Pump)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (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 (DC Motor-driven Fuel Oil Pump)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Pump Casing (Engine-driven Fuel Oil Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Engine-driven Fuel Oil Pump)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Pump Casing (Engine-driven Fuel Oil Pump)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Pump Casing (Hand Priming Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Hand Priming Pump)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Pump Casing (Hand Priming Pump)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (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 (Jacket Coolant Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Jacket Coolant Pump)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-23	3.3.1-47	B
Pump Casing (Main Lube Oil Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Main Lube Oil Pump)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Pump Casing (Main Lube Oil Pump)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Pump Casing (Pre-lube Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Pre-lube Pump)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Pump Casing (Pre-lube Pump)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Pump Casing (Standby Circulating Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (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 (Standby Circulating Pump)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Pump Casing (Standby Circulating Pump)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Pump Casing (Standby Coolant Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Standby Coolant Pump)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-23	3.3.1-47	B
Sight Glasses	Pressure Boundary	Glass	Air - Indoor (External)	None	None	VII.J-8	3.3.1-93	A
Sight Glasses	Pressure Boundary	Glass	Closed Cycle Cooling Water	None	None			G, 7
Sight Glasses	Pressure Boundary	Glass	Fuel Oil (Internal)	None	None	VII.J-9	3.3.1-93	A
Strainer Body	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Strainer Body	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Strainer Body	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (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 Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Strainer Body	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Strainer Element	Filter	Stainless Steel	Fuel Oil (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Fuel Oil Chemistry (B.2.1.16)	VII.H1-6	3.3.1-32	B
Strainer Element	Filter	Stainless Steel	Fuel Oil (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.H1-6	3.3.1-32	B
Strainer Element	Filter	Stainless Steel	Lubricating Oil (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.H2-17	3.3.1-33	B
Strainer Element	Filter	Stainless Steel	Lubricating Oil (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.H2-17	3.3.1-33	B
Tanks (Air Receiver)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Tanks (Air Receiver)	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VIII.B1-7	3.4.1-30	B
Tanks (Coolant Drain Tank)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tanks (Coolant Drain Tank)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-23	3.3.1-47	B
Tanks (Day Tank 550 Gal)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Tanks (Day Tank 550 Gal)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Tanks (Day Tank 550 Gal)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Tanks (Diesel Generator Fuel Storage 30,000 Gal)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Tanks (Diesel Generator Fuel Storage 30,000 Gal)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Tanks (Diesel Generator Fuel Storage 30,000 Gal)	Pressure Boundary	Carbon Steel	Soil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VIII.E-1	3.4.1-11	B
Tanks (Dirty Fuel Drain Tank)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tanks (Dirty Fuel Drain Tank)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.H1-10	3.3.1-20	E, 6
Tanks (Expansion Tank)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Tanks (Expansion Tank)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-23	3.3.1-47	B
Thermowell	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Thermowell	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Thermowell	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Valve Body	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.H2-21	3.3.1-71	B
Valve Body	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (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 Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Valve Body	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Valve Body	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-9	3.3.1-28	E, 2
Valve Body	Pressure Boundary	Copper Alloy with less than 15% Zinc	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H1-2	3.3.1-51	I, 4
Valve Body	Pressure Boundary	Copper Alloy with less than 15% Zinc	Fuel Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	Fuel Oil Chemistry (B.2.1.16)	VII.H1-3	3.3.1-32	I, 9
Valve Body	Pressure Boundary	Copper Alloy with less than 15% Zinc	Fuel Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.H1-3	3.3.1-32	I, 9
Valve Body	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Pressure Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-23	3.3.1-47	B
Valve Body	Pressure Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C2-8	3.3.1-85	A
Valve Body	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A

Table 3.3.2-9 Emergency Diesel Generators and Auxiliary Systems (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	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.D-4	3.3.1-54	E, 6

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. Loss of Preload due to Thermal Effects, Gasket Creep, and Self-Loosening is predicted for bolting in outdoor air. Bolting Integrity is selected to manage this aging effect.
2. NUREG-1801 specifies a plant-specific program. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program is used to manage the aging effect(s) applicable to this component type, material, and environment combination.
3. Reduction of heat transfer due to fouling is predicted. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program is used to manage the aging effect(s) applicable to this component type, material, and environment combination.
4. Loss of material due to galvanic corrosion is not predicted because materials that cause galvanic corrosion are not in contact for this component.
5. NUREG-1801 specifies a plant-specific program. The External Surfaces Monitoring Program is used to manage the aging effect(s) applicable to this component type, material, and environment combination.
6. Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program is substituted to manage the aging effect(s) applicable to this component type, material, and environment combination.

7. No aging effects are predicted for glass in a closed cycle cooling water environment.
8. Pitting, crevice, and microbiologically influenced corrosion are predicted for this combination. The Lubricating Oil Analysis and One-Time Inspection programs are used to manage the aging effects.
9. Pitting and crevice corrosion are not predicted for this combination, and microbiologically influenced corrosion is predicted for this combination. The Fuel Oil Chemistry and One-Time Inspection programs are used to manage the aging effects.

Table 3.3.2-10
Fire Protection System
Summary of Aging Management Evaluation

Table 3.3.2-10 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
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-1	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Outdoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)			H, 1
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Soil (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)			G, 2
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Soil (External)	Loss of Material/Microbiologically Influenced Corrosion	Bolting Integrity (B.2.1.7)			G, 2

Table 3.3.2-10 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
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Soil (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)			G, 2
Bolting	Mechanical Closure	Ductile Cast Iron	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Ductile Cast Iron	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Mechanical Closure	Ductile Cast Iron	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-1	3.3.1-43	A
Bolting	Mechanical Closure	Ductile Cast Iron	Air - Outdoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)			H, 1
Bolting	Mechanical Closure	Ductile Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Mechanical Closure	Ductile Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Ductile Cast Iron	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Mechanical Closure	Ductile Cast Iron	Soil (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)			G, 2, 3
Bolting	Mechanical Closure	Ductile Cast Iron	Soil (External)	Loss of Material/Microbiologically Influenced Corrosion	Bolting Integrity (B.2.1.7)			G, 2
Bolting	Mechanical Closure	Ductile Cast Iron	Soil (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)			G, 2
Bolting	Mechanical Closure	Stainless Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	IV.C2-8	3.1.1-52	A

Table 3.3.2-10 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
Bolting	Mechanical Closure	Stainless Steel Bolting	Air - Indoor (External)	None	None	III.B1.2-7	3.5.1-59	A
Bolting	Mechanical Closure	Stainless Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	IV.C2-8	3.1.1-52	A
Bolting	Mechanical Closure	Stainless Steel Bolting	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	C
Concrete Curbs	Fire Barrier (Contain oil spills)	Concrete	Air - Outdoor (External)	Concrete cracking and spalling/freeze-thaw, aggressive chemical attack, and reaction with aggregates	Fire Protection (B.2.1.13)	VII.G-30	3.3.1-66	B
Concrete Curbs	Fire Barrier (Contain oil spills)	Concrete	Air - Outdoor (External)	Concrete cracking and spalling/freeze-thaw, aggressive chemical attack, and reaction with aggregates	Structures Monitoring Program (B.2.1.28)	VII.G-30	3.3.1-66	A
Concrete Curbs	Fire Barrier (Contain oil spills)	Concrete	Air - Outdoor (External)	Loss of Material/Corrosion of Embedded Steel	Fire Protection (B.2.1.13)	VII.G-31	3.3.1-67	B
Concrete Curbs	Fire Barrier (Contain oil spills)	Concrete	Air - Outdoor (External)	Loss of Material/Corrosion of Embedded Steel	Structures Monitoring Program (B.2.1.28)	VII.G-31	3.3.1-67	A
Drip Pan	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Drip Pan	Leakage Boundary	Stainless Steel	Lubricating Oil (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-18	3.3.1-33	E, 23
Electric Heaters	Pressure Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B

Table 3.3.2-10 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
Electric Heaters	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A
Expansion Joints	None - Short Lived	N/A	N/A	None	None			13
Fire Barriers (Doors)	Fire Barrier	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	Fire Protection (B.2.1.13)	VII.I-8	3.3.1-58	E, 11
Fire Barriers (Doors)	Fire Barrier	Carbon Steel	Air - Indoor (External)	Loss of Material/Wear	Fire Protection (B.2.1.13)	VII.G-3	3.3.1-63	B
Fire Barriers (Doors)	Fire Barrier	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Fire Protection (B.2.1.13)	VII.H1-8	3.3.1-60	E, 11
Fire Barriers (Doors)	Fire Barrier	Carbon Steel	Air - Outdoor (External)	Loss of Material/Wear	Fire Protection (B.2.1.13)	VII.G-4	3.3.1-63	B
Fire Barriers (Doors)	Fire Barrier	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Fire Barriers (Doors)	Fire Barrier	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Fire Protection (B.2.1.13)	VII.A1-1	3.3.1-86	E, 11
Fire Barriers (Doors)	Fire Barrier	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Wear	Fire Protection (B.2.1.13)	VII.G-3	3.3.1-63	B
Fire Barriers (Fire Rated Enclosures)	Fire Barrier	Mecatiss	Air - Indoor (External)	Change in Material Properties/Various Degradation Mechanisms	Fire Protection (B.2.1.13)			F
Fire Barriers (Fire Rated Enclosures)	Fire Barrier	Mecatiss	Air with Borated Water Leakage (External)	Change in Material Properties/Various Degradation Mechanisms	Fire Protection (B.2.1.13)			F
Fire Barriers (Fire Rated Enclosures)	Fire Barrier	Thermo-lag	Air - Indoor (External)	Cracking/Various Degradation Mechanisms	Fire Protection (B.2.1.13)			F
Fire Barriers (Fire Rated Enclosures)	Fire Barrier	Thermo-lag	Air - Indoor (External)	Loss of Material/Other	Fire Protection (B.2.1.13)			F

Table 3.3.2-10 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 Barriers (Fire Rated Enclosures)	Fire Barrier	Thermo-lag	Air with Borated Water Leakage (External)	Cracking/Various Degradation Mechanisms	Fire Protection (B.2.1.13)			F
Fire Barriers (Fire Rated Enclosures)	Fire Barrier	Thermo-lag	Air with Borated Water Leakage (External)	Loss of Material/Other	Fire Protection (B.2.1.13)			F
Fire Barriers (Penetration Seals)	Fire Barrier	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	Fire Protection (B.2.1.13)	VII.I-8	3.3.1-58	E, 11
Fire Barriers (Penetration Seals)	Fire Barrier	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Fire Barriers (Penetration Seals)	Fire Barrier	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Fire Protection (B.2.1.13)	VII.A1-1	3.3.1-86	E, 11
Fire Barriers (Penetration Seals)	Fire Barrier	Elastomer	Air - Indoor (External)	Hardening and Loss of Strength/Elastomer Degradation	Fire Protection (B.2.1.13)	VII.G-1	3.3.1-61	B
Fire Barriers (Penetration Seals)	Fire Barrier	Elastomer	Air with Borated Water Leakage (External)	Hardening and Loss of Strength/Elastomer Degradation	Fire Protection (B.2.1.13)	VII.G-1	3.3.1-61	B
Fire Barriers (Penetration Seals)	Fire Barrier	Grout	Air - Indoor (External)	Cracking/Various Degradation Mechanisms	Fire Protection (B.2.1.13)			F, 10
Fire Barriers (Penetration Seals)	Fire Barrier	Grout	Air with Borated Water Leakage (External)	Cracking/Various Degradation Mechanisms	Fire Protection (B.2.1.13)			F, 10
Fire Barriers (Walls and Slabs)	Fire Barrier	Concrete	Air - Indoor (External)	Concrete Cracking and Spalling/Aggressive Chemical Attack, and Reaction with Aggregates	Fire Protection (B.2.1.13)	VII.G-28	3.3.1-65	B
Fire Barriers (Walls and Slabs)	Fire Barrier	Concrete	Air - Indoor (External)	Concrete Cracking and Spalling/Aggressive Chemical Attack, and Reaction with Aggregates	Structures Monitoring Program (B.2.1.28)	VII.G-28	3.3.1-65	A

Table 3.3.2-10 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 Barriers (Walls and Slabs)	Fire Barrier	Concrete	Air - Indoor (External)	Loss of Material/Corrosion of Embedded Steel	Fire Protection (B.2.1.13)	VII.G-29	3.3.1-67	B
Fire Barriers (Walls and Slabs)	Fire Barrier	Concrete	Air - Indoor (External)	Loss of Material/Corrosion of Embedded Steel	Structures Monitoring Program (B.2.1.28)	VII.G-29	3.3.1-67	A
Fire Barriers (Walls and Slabs)	Fire Barrier	Concrete	Air - Outdoor (External)	Concrete Cracking and Spalling/Aggressive Chemical Attack, and Reaction with Aggregates	Fire Protection (B.2.1.13)	VII.G-30	3.3.1-66	B
Fire Barriers (Walls and Slabs)	Fire Barrier	Concrete	Air - Outdoor (External)	Concrete Cracking and Spalling/Aggressive Chemical Attack, and Reaction with Aggregates	Structures Monitoring Program (B.2.1.28)	VII.G-30	3.3.1-66	A
Fire Barriers (Walls and Slabs)	Fire Barrier	Concrete	Air - Outdoor (External)	Loss of Material/Corrosion of Embedded Steel	Fire Protection (B.2.1.13)	VII.G-31	3.3.1-67	B
Fire Barriers (Walls and Slabs)	Fire Barrier	Concrete	Air - Outdoor (External)	Loss of Material/Corrosion of Embedded Steel	Structures Monitoring Program (B.2.1.28)	VII.G-31	3.3.1-67	A
Fire Barriers (Walls and Slabs)	Fire Barrier	Concrete	Air with Borated Water Leakage (External)	Concrete Cracking and Spalling/Aggressive Chemical Attack, and Reaction with Aggregates	Fire Protection (B.2.1.13)			G, 18
Fire Barriers (Walls and Slabs)	Fire Barrier	Concrete	Air with Borated Water Leakage (External)	Concrete Cracking and Spalling/Aggressive Chemical Attack, and Reaction with Aggregates	Structures Monitoring Program (B.2.1.28)			G, 18
Fire Barriers (Walls and Slabs)	Fire Barrier	Concrete	Air with Borated Water Leakage (External)	Loss of Material/Corrosion of Embedded Steel	Fire Protection (B.2.1.13)			G, 18
Fire Barriers (Walls and Slabs)	Fire Barrier	Concrete	Air with Borated Water Leakage (External)	Loss of Material/Corrosion of Embedded Steel	Structures Monitoring Program (B.2.1.28)			G, 18

Table 3.3.2-10 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 Barriers (Walls and Slabs)	Fire Barrier	Gypsum Board	Air - Indoor (External)	None	None			F
Fire Hydrant	Pressure Boundary	Gray Cast Iron	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Fire Hydrant	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A
Fire Hydrant	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-14	3.3.1-85	A
Fire Hydrant	Pressure Boundary	Gray Cast Iron	Soil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VII.G-25	3.3.1-19	B
Fire Hydrant	Pressure Boundary	Gray Cast Iron	Soil (External)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-15	3.3.1-85	A
Flow Element	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Flow Element	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Flow Element	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-19	3.3.1-69	A
Flow Element	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Fire Water System (B.2.1.14)	VII.H2-18	3.3.1-80	E, 7
Flow Element	Throttle	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Flow Element	Throttle	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A

Table 3.3.2-10 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
Flow Element	Throttle	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-19	3.3.1-69	A
Flow Element	Throttle	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Fire Water System (B.2.1.14)	VII.H2-18	3.3.1-80	E, 7
Gas Bottles	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Gas Bottles	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Gas Bottles	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-5	3.3.1-59	D
Gas Bottles	Pressure Boundary	Carbon Steel	Air/Gas - Dry (Internal)	None	None	VII.J-23	3.3.1-97	A
Piping and fittings	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Piping and fittings	Leakage Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Piping and fittings	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Piping and fittings	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-5	3.3.1-59	D
Piping and fittings	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A

Table 3.3.2-10 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	Leakage Boundary	Carbon Steel	Soil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VII.G-25	3.3.1-19	B
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Air with Borated Water Leakage (External)	None	None	VII.J-5	3.3.1-99	A
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-12	3.3.1-70	A
Piping and fittings	Leakage Boundary	Polymer	Air - Indoor (External)	None	None			F, 5
Piping and fittings	Leakage Boundary	Polymer	Air/Gas - Wetted (Internal)	None	None			F, 5
Piping and fittings	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B4-7	3.5.1-50	E, 6
Piping and fittings	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-19	3.3.1-69	A
Piping and fittings	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Fire Water System (B.2.1.14)	VII.H2-18	3.3.1-80	E, 7
Piping and fittings	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B

Table 3.3.2-10 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 Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-5	3.3.1-59	D
Piping and fittings	Pressure Boundary	Carbon Steel	Air/Gas - Dry (Internal)	None	None	VII.J-23	3.3.1-97	A
Piping and fittings	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-23	3.3.1-47	B, 8
Piping and fittings	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A, 14
Piping and fittings	Pressure Boundary	Carbon Steel	Soil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VII.G-25	3.3.1-19	B
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air with Borated Water Leakage (External)	None	None	VII.J-5	3.3.1-99	A
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air/Gas - Dry (Internal)	None	None	VII.J-4	3.3.1-97	A
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Closed Cycle Cooling Water	Loss of Material/Pitting, Crevice, and Galvanic Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-8	3.3.1-51	B, 8

Table 3.3.2-10 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	Copper Alloy with less than 15% Zinc	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-12	3.3.1-70	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B4-7	3.5.1-50	E, 6
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air/Gas - Dry (Internal)	None	None	VII.J-19	3.3.1-97	A
Piping and fittings	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-10	3.3.1-50	B, 8
Piping and fittings	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-18	3.3.1-33	E, 23
Piping and fittings	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-19	3.3.1-69	A, 14
Piping and fittings	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Fire Water System (B.2.1.14)	VII.H2-18	3.3.1-80	E, 7, 14
Piping and fittings	Pressure Boundary	Stainless Steel	Soil (External)	Loss of Material/Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)			H, 4
Piping and fittings	Pressure Boundary	Stainless Steel	Soil (External)	Loss of Material/Pitting and Crevice Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VII.G-20	3.3.1-29	E, 9
Pump Casing (Altitude tank recirculation pump)	Pressure Boundary	Gray Cast Iron	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B

Table 3.3.2-10 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 (Altitude tank recirculation pump)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A
Pump Casing (Altitude tank recirculation pump)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-14	3.3.1-85	A
Pump Casing (Diesel Horizontal Fire Pump - circ water flume)	Pressure Boundary	Gray Cast Iron	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Pump Casing (Diesel Horizontal Fire Pump - circ water flume)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A
Pump Casing (Diesel Horizontal Fire Pump - circ water flume)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-14	3.3.1-85	A
Pump Casing (Jockey pump)	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Jockey pump)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A

Table 3.3.2-10 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 (Jockey pump)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-14	3.3.1-85	A
Pump Casing (Kidney filter spray pumps)	Pressure Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Pump Casing (Kidney filter spray pumps)	Pressure Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-5	3.3.1-59	D
Pump Casing (Kidney filter spray pumps)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A
Pump Casing (Kidney filter spray pumps)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-14	3.3.1-85	A
Pump Casing (River Fire Pumps)	Pressure Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Pump Casing (River Fire Pumps)	Pressure Boundary	Carbon Steel	Raw Water (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A
Pump Casing (River Fire Pumps)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A

Table 3.3.2-10 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 (River Fire Pumps)	Pressure Boundary	Copper Alloy with less than 15% Zinc	Raw Water (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-12	3.3.1-70	A
Pump Casing (River Fire Pumps)	Pressure Boundary	Copper Alloy with less than 15% Zinc	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-12	3.3.1-70	A
Pump Casing (River Fire Pumps)	Pressure Boundary	Gray Cast Iron	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Pump Casing (River Fire Pumps)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A
Pump Casing (River Fire Pumps)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-14	3.3.1-85	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-19	3.3.1-69	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Fire Water System (B.2.1.14)	VII.H2-18	3.3.1-80	E, 7
Restricting Orifices	Throttle	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A

Table 3.3.2-10 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
Restricting Orifices	Throttle	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Restricting Orifices	Throttle	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-19	3.3.1-69	A
Restricting Orifices	Throttle	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Fire Water System (B.2.1.14)	VII.H2-18	3.3.1-80	E, 7
Sight Glasses	Leakage Boundary	Glass	Air - Indoor (External)	None	None	VII.J-8	3.3.1-93	A
Sight Glasses	Leakage Boundary	Glass	Air - Outdoor (External)	None	None	VII.J-7	3.3.1-93	A
Sight Glasses	Leakage Boundary	Glass	Raw Water (Internal)	None	None	VII.J-11	3.3.1-93	A
Sight Glasses	Leakage Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Sight Glasses	Leakage Boundary	Gray Cast Iron	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Sight Glasses	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A
Sight Glasses	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-14	3.3.1-85	A
Spray Nozzles (CO2, Halon)	Spray	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Spray Nozzles (CO2, Halon)	Spray	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Fire Protection (B.2.1.13)	VII.G-23	3.3.1-71	E, 12
Spray Nozzles (CO2, Halon)	Spray	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A

Table 3.3.2-10 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 Nozzles (CO2, Halon)	Spray	Copper Alloy with 15% Zinc or More	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Fire Protection (B.2.1.13)	VII.G-9	3.3.1-28	E, 19
Spray Nozzles (CO2, Halon)	Spray	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Spray Nozzles (CO2, Halon)	Spray	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B4-7	3.5.1-50	E, 6
Spray Nozzles (CO2, Halon)	Spray	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Fire Protection (B.2.1.13)	VII.D-4	3.3.1-54	E, 15
Sprinklers Heads	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Sprinklers Heads	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.A6-11	3.5.1-47	E, 21
Sprinklers Heads	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-12	3.3.1-88	A
Sprinklers Heads	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Fire Water System (B.2.1.14)	VII.G-9	3.3.1-28	E, 19
Sprinklers Heads	Pressure Boundary	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-12	3.3.1-70	A
Sprinklers Heads	Pressure Boundary	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-13	3.3.1-84	A
Sprinklers Heads	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Sprinklers Heads	Pressure Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B4-7	3.5.1-50	E, 6
Sprinklers Heads	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A

Table 3.3.2-10 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
Sprinklers Heads	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Fire Water System (B.2.1.14)	VII.D-4	3.3.1-54	E, 15
Sprinklers Heads	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-19	3.3.1-69	A
Sprinklers Heads	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Fire Water System (B.2.1.14)	VII.H2-18	3.3.1-80	E, 7
Sprinklers Heads	Spray	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Sprinklers Heads	Spray	Copper Alloy with 15% Zinc or More	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.A6-11	3.5.1-47	E, 21
Sprinklers Heads	Spray	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-12	3.3.1-88	A
Sprinklers Heads	Spray	Copper Alloy with 15% Zinc or More	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Fire Water System (B.2.1.14)	VII.G-9	3.3.1-28	E, 19
Sprinklers Heads	Spray	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-12	3.3.1-70	A
Sprinklers Heads	Spray	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-13	3.3.1-84	A
Sprinklers Heads	Spray	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Sprinklers Heads	Spray	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B4-7	3.5.1-50	E, 6
Sprinklers Heads	Spray	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A

Table 3.3.2-10 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
Sprinklers Heads	Spray	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Fire Water System (B.2.1.14)	VII.D-4	3.3.1-54	E, 15
Sprinklers Heads	Spray	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-19	3.3.1-69	A
Sprinklers Heads	Spray	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Fire Water System (B.2.1.14)	VII.H2-18	3.3.1-80	E, 7
Strainer Body	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Strainer Body	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air with Borated Water Leakage (External)	None	None	VII.J-5	3.3.1-99	A
Strainer Body	Pressure Boundary	Copper Alloy with less than 15% Zinc	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-12	3.3.1-70	A
Strainer Body	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Strainer Body	Pressure Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Strainer Body	Pressure Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-5	3.3.1-59	D
Strainer Body	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A

Table 3.3.2-10 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	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-14	3.3.1-85	A
Strainer Element	Filter	Stainless Steel	Raw Water (External)	Loss of Material/Pitting, Crevice Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-19	3.3.1-69	A
Strainer Element	Filter	Stainless Steel	Raw Water (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Fire Water System (B.2.1.14)	VII.H2-18	3.3.1-80	E, 7
Tanks (Altitude Tank)	Pressure Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Aboveground Steel Tanks (B.2.1.15)	VII.H1-11	3.3.1-40	B
Tanks (Altitude Tank)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A
Tanks (Chemical Mix Tank)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Tanks (Chemical Mix Tank)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-5	3.3.1-59	D
Tanks (Chemical Mix Tank)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A, 22
Tanks (CO2)	Pressure Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Tanks (CO2)	Pressure Boundary	Carbon Steel	Air/Gas - Dry (Internal)	None	None	VII.J-23	3.3.1-97	A

Table 3.3.2-10 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 (Coolant expansion)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Tanks (Coolant expansion)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-23	3.3.1-47	B, 8
Tanks (Halon Spheres)	Pressure Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Tanks (Halon Spheres)	Pressure Boundary	Carbon Steel	Air/Gas - Dry (Internal)	None	None	VII.J-23	3.3.1-97	A
Tanks (RC Pump lube oil drain tanks)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Tanks (RC Pump lube oil drain tanks)	Leakage Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-18	3.3.1-33	E, 23
Tanks (Retard Chamber)	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Tanks (Retard Chamber)	Pressure Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Tanks (Retard Chamber)	Pressure Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-5	3.3.1-59	D
Tanks (Retard Chamber)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A
Tanks (Retard Chamber)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-14	3.3.1-85	A

Table 3.3.2-10 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 Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Tanks (Water storage)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-5	3.3.1-59	D
Tanks (Water storage)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A
Thermowell	Pressure Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Thermowell	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A
Valve Body	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Valve Body	Leakage Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Valve Body	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Valve Body	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-5	3.3.1-59	D
Valve Body	Leakage Boundary	Carbon Steel	Air/Gas - Dry (Internal)	None	None	VII.J-23	3.3.1-97	A

Table 3.3.2-10 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	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A
Valve Body	Leakage Boundary	Carbon Steel	Soil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VII.G-25	3.3.1-19	B
Valve Body	Leakage Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Valve Body	Leakage Boundary	Copper Alloy with 15% Zinc or More	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.A6-11	3.5.1-47	E, 21
Valve Body	Leakage Boundary	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-12	3.3.1-88	A
Valve Body	Leakage Boundary	Copper Alloy with 15% Zinc or More	Air/Gas - Dry (Internal)	None	None	VII.J-4	3.3.1-97	A
Valve Body	Leakage Boundary	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-12	3.3.1-70	A
Valve Body	Leakage Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Valve Body	Leakage Boundary	Copper Alloy with less than 15% Zinc	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.A6-11	3.5.1-47	E, 21

Table 3.3.2-10 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	Leakage Boundary	Copper Alloy with less than 15% Zinc	Air with Borated Water Leakage (External)	None	None	VII.J-5	3.3.1-99	A
Valve Body	Leakage Boundary	Copper Alloy with less than 15% Zinc	Air/Gas - Dry (Internal)	None	None	VII.J-4	3.3.1-97	A
Valve Body	Leakage Boundary	Copper Alloy with less than 15% Zinc	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-12	3.3.1-70	A
Valve Body	Leakage Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Leakage Boundary	Gray Cast Iron	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Valve Body	Leakage Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Valve Body	Leakage Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-5	3.3.1-59	D
Valve Body	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A
Valve Body	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-14	3.3.1-85	A
Valve Body	Leakage Boundary	Gray Cast Iron	Soil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VII.G-25	3.3.1-19	B

Table 3.3.2-10 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	Leakage Boundary	Gray Cast Iron	Soil (External)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-15	3.3.1-85	A
Valve Body	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Valve Body	Leakage Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B4-7	3.5.1-50	E, 6
Valve Body	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Valve Body	Leakage Boundary	Stainless Steel	Air/Gas - Dry (Internal)	None	None	VII.J-19	3.3.1-97	A
Valve Body	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-19	3.3.1-69	A
Valve Body	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Fire Water System (B.2.1.14)	VII.H2-18	3.3.1-80	E, 7
Valve Body	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Valve Body	Pressure Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Valve Body	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Valve Body	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-5	3.3.1-59	D
Valve Body	Pressure Boundary	Carbon Steel	Air/Gas - Dry (Internal)	None	None	VII.J-23	3.3.1-97	A
Valve Body	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-23	3.3.1-47	B, 8

Table 3.3.2-10 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 Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A
Valve Body	Pressure Boundary	Carbon Steel	Soil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VII.G-25	3.3.1-19	B
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.A6-11	3.5.1-47	E, 21
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-12	3.3.1-88	A
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air/Gas - Dry (Internal)	None	None	VII.J-4	3.3.1-97	A
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting, Crevice, and Galvanic Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-8	3.3.1-51	B, 8
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.H2-12	3.3.1-84	A, 8
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-12	3.3.1-70	A, 14

Table 3.3.2-10 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	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-13	3.3.1-84	A, 14
Valve Body	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Valve Body	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.A6-11	3.5.1-47	E, 21
Valve Body	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air with Borated Water Leakage (External)	None	None	VII.J-5	3.3.1-99	A
Valve Body	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air/Gas - Dry (Internal)	None	None	VII.J-4	3.3.1-97	A
Valve Body	Pressure Boundary	Copper Alloy with less than 15% Zinc	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-12	3.3.1-70	A
Valve Body	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Pressure Boundary	Gray Cast Iron	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Valve Body	Pressure Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Valve Body	Pressure Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-5	3.3.1-59	D
Valve Body	Pressure Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-23	3.3.1-47	B, 8

Table 3.3.2-10 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	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C2-8	3.3.1-85	A, 8
Valve Body	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A
Valve Body	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-14	3.3.1-85	A
Valve Body	Pressure Boundary	Gray Cast Iron	Soil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VII.G-25	3.3.1-19	B
Valve Body	Pressure Boundary	Gray Cast Iron	Soil (External)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-15	3.3.1-85	A
Valve Body	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Valve Body	Pressure Boundary	Stainless Steel	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	III.B4-7	3.5.1-50	E, 6
Valve Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Valve Body	Pressure Boundary	Stainless Steel	Air/Gas - Dry (Internal)	None	None	VII.J-19	3.3.1-97	A
Valve Body	Pressure Boundary	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-10	3.3.1-50	B, 8
Valve Body	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-18	3.3.1-33	E, 23

Table 3.3.2-10 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	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-19	3.3.1-69	A, 14
Valve Body	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Fire Water System (B.2.1.14)	VII.H2-18	3.3.1-80	E, 7, 14
Water Motor Alarm	Pressure Boundary	Aluminum Alloy	Air - Indoor (External)	None	None	VII.J-1	3.3.1-95	A
Water Motor Alarm	Pressure Boundary	Aluminum Alloy	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.A3-4	3.3.1-88	A
Water Motor Alarm	Pressure Boundary	Aluminum Alloy	Air with Borated Water Leakage (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)			H, 17
Water Motor Alarm	Pressure Boundary	Aluminum Alloy	Raw Water (Internal)	Loss of Material/Microbiologically Influenced Corrosion and Fouling	Fire Water System (B.2.1.14)			H, 20
Water Motor Alarm	Pressure Boundary	Aluminum Alloy	Raw Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Fire Water System (B.2.1.14)	VII.G-8	3.3.1-62	E, 16
Water Motor Alarm	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Water Motor Alarm	Pressure Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Water Motor Alarm	Pressure Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-5	3.3.1-59	D
Water Motor Alarm	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fire Water System (B.2.1.14)	VII.G-24	3.3.1-68	A
Water Motor Alarm	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.G-14	3.3.1-85	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 for this component is Air - outdoor. The Aging effect/mechanism and program for Air - indoor uncontrolled is used.
2. Carbon steel and ductile cast iron bolting materials in a soil (external) environment have aging effects/mechanisms of loss of material due to general, pitting and crevice corrosion, microbiologically induced corrosion (MIC), and loss of preload due to thermal effects, gasket creep, and self-loosening. External inspections of buried bolting will occur in accordance with the frequency outlined in the Buried Piping and Tanks Inspection program.
3. Ductile cast iron material is not susceptible to selective leaching.
4. The Buried Piping and Tanks Inspection program will be used to manage loss of material due to MIC in this item.
5. NUREG-1801 has no listing for polymer piping. There are no aging effects/mechanisms for polymer materials in an air/gas environment.
6. Stainless steel piping and components, tanks, or valves are substituted for the supports component type, and External Surfaces Monitoring is used in lieu of Structures Monitoring program.
7. The Fire Water System program is substituted for the Open-Cycle Cooling Water program for managing the effects of MIC in these fire protection

components. Pitting and crevice corrosion are managed by the Fire Water System in accordance with NUREG-1801 item VII.G-19.
8. These piping and component items are associated with the cooling system for the fire pump diesels and have a closed cycle cooling water environment.
9. NUREG-1801 specifies a plant specific program for managing this aging effect. The Buried Piping and Tanks Inspection program will be used.
10. NUREG-1801 does not contain grout fire barriers, however cracking and spalling due to freeze-thaw, aggressive chemical attack, and reaction with aggregates are applicable aging effects and mechanisms for grout and concrete materials, and are managed for grout fire barriers by the Fire Protection program.
11. Loss of material of steel components of fire barrier doors and fire barrier penetrations is managed by the Fire Protection program.
12. The Fire Protection program is used to manage the aging effects of an air/gas wetted environment applied to the internal surfaces of carbon steel halon and CO2 spray nozzles.
13. The expansion joint is replaced every 12 years per the Preventative Maintenance Program. As such, it is a short lived component and is not subject to aging management.
14. The piping and component items and valve bodies associated with the antifreeze piping loop are subject to a raw water environment with antifreeze chemicals added as necessary. This remains a raw water environment.
15. The Fire Water System program is used to manage the aging effects of an air/gas wetted environment applied to the internal surfaces of stainless steel sprinkler heads, and the Fire Protection program is used to manage the aging effects of an air/gas wetted environment applied to the internal surfaces of stainless steel halon and CO2 spray nozzles.
16. Fire Water System program is used in lieu of Fire Protection program for these components in a raw water environment. In addition, additional aging mechanisms of MIC and fouling are included as applicable.
17. Pitting and crevice corrosion are applicable aging mechanisms for aluminum material piping and components in an air with borated water leakage environment. NUREG-1801 does not list these aging mechanisms for this combination. External Surfaces Monitoring program will be used to manage the aging effect from these mechanisms.
18. Concrete fire barriers (walls and slabs) with environment of air with borated water leakage have the same aging effects and mechanisms, and are managed with the same programs as air - indoor. The air with borated water leakage environment is not listed in NUREG-1801 for this component and material.
19. NUREG-1801 specifies a plant-specific program. The Fire Water System program is used to manage the aging effects of an air/gas wetted environment applied to the internal surfaces of copper alloy sprinkler heads, and the Fire Protection program is used to manage the aging effects of an air/gas wetted environment applied to the internal surfaces of copper alloy halon and CO2 spray nozzles.
20. Loss of material due to MIC and fouling are applicable aging effects/mechanisms for aluminum components in a raw water environment. These aging mechanisms are not addressed in NUREG-1801 for this material and environment. These aging mechanisms are addressed by the Fire Water System program.
21. Copper piping components are substituted for Metal Components, and the External Surfaces Monitoring program is used for this line item.
22. The applicable environment for the charcoal filter fire suppression subsystem is raw water. The Chemical Mix Tank is not routinely used to provide chemically treated water for this subsystem.
23. This component, material, and environment combination is associated with waste oil collection equipment. As such, the Lubricating Oil Analysis and One-Time Inspection programs do not apply. The aging effects/mechanisms will be managed by the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program or the External Surfaces Monitoring program, as appropriate.

Table 3.3.2-11
Fuel Handling and Fuel Storage System
Summary of Aging Management Evaluation

Table 3.3.2-11 Fuel Handling and Fuel Storage System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Structural Support	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Structural Support	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Structural Support	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Structural Support	Stainless Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)			G
Bolting	Structural Support	Stainless Steel Bolting	Treated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.A-27	3.2.1-49	C
Bolting	Structural Support	Stainless Steel Bolting	Treated Water (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)			G
Crane/Hoist (Auxiliary Fuel Handling Bridge)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A

Table 3.3.2-11 Fuel Handling and Fuel Storage System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Crane/Hoist (Auxiliary Fuel Handling Bridge)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.I-4	3.3.1-43	E, 1
Crane/Hoist (Auxiliary Fuel Handling Bridge)	Structural Support	Stainless Steel	Air with Borated Water Leakage (External)	None	None	III.B1.1-10	3.5.1-59	A
Crane/Hoist (Grapple/Mast for All Bridges)	Structural Support	Stainless Steel	Air with Borated Water Leakage (External)	None	None	III.B1.1-10	3.5.1-59	A
Crane/Hoist (Grapple/Mast for All Bridges)	Structural Support	Stainless Steel	Treated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A2-1	3.3.1-91	C
Crane/Hoist (Main Fuel Handling Bridge)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Crane/Hoist (Main Fuel Handling Bridge)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.I-4	3.3.1-43	E, 1
Crane/Hoist (Main Fuel Handling Bridge)	Structural Support	Stainless Steel	Air with Borated Water Leakage (External)	None	None	III.B1.1-10	3.5.1-59	A
Crane/Hoist (Rails)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Crane/Hoist (Rails)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.I-4	3.3.1-43	E, 1

Table 3.3.2-11 Fuel Handling and Fuel Storage System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Crane/Hoist (Rails)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Wear	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.B-1	3.3.1-74	A
Crane/Hoist (Rails)	Structural Support	Stainless Steel	Air with Borated Water Leakage (External)	Loss of Material/Wear	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)			G
Crane/Hoist (Rails)	Structural Support	Stainless Steel	Treated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A2-1	3.3.1-91	C
Crane/Hoist (Spent Fuel Handling Bridge)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Crane/Hoist (Spent Fuel Handling Bridge)	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.11)	VII.I-4	3.3.1-43	E, 1
Crane/Hoist (Spent Fuel Handling Bridge)	Structural Support	Stainless Steel	Air with Borated Water Leakage (External)	None	None	III.B1.1-10	3.5.1-59	A
Fuel Storage Racks (New Fuel)	Structural Support	Aluminum Alloy	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.E1-10	3.3.1-88	C
Fuel Storage Racks (New Fuel)	Structural Support	Aluminum Alloy	Air with Borated Water Leakage (External)	None	None	III.B1.1-6	3.5.1-58	A
Fuel Storage Racks (Spent Fuel)	Absorb Neutrons	Boral	Treated Water (External)	Reduction of Neutron-Absorbing Capacity and Loss of Material/General Corrosion	Water Chemistry (B.2.1.2)	VII.A2-5	3.3.1-13	I, 2
Fuel Storage Racks (Spent Fuel)	Structural Support	Stainless Steel	Treated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A2-1	3.3.1-91	C

Table 3.3.2-11 Fuel Handling and Fuel Storage System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Hoses	Leakage Boundary	Tygon	Air with Borated Water Leakage (External)	None	None			F
Hoses	Leakage Boundary	Tygon	Treated Water (Internal)	None	None			F
Piping and fittings	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A2-1	3.3.1-91	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A2-1	3.3.1-91	A
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A2-1	3.3.1-91	A
Valve Body	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Valve Body	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A2-1	3.3.1-91	A
Valve Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A2-1	3.3.1-91	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. General, pitting, and crevice corrosion is predicted for carbon steel in air with borated water leakage. The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems program is used to manage the aging effects.
2. NUREG-1801 specifies a plant-specific program. The Water Chemistry Program is used to manage the loss of material due to general corrosion. Reduction of neutron-absorbing capacity of the boral spent fuel storage racks neutron-absorbing sheets exposed to treated water is insignificant and requires no aging management. The potential for aging effects due to sustained irradiation of Boral was previously evaluated by the staff (BNL-NUREG-25582, dated January 1979; NUREG-1787, VC Summer SER, paragraph 3.5.2.4.2, page 3-406) and determined to be insignificant. Plant operating experience with Boral coupons inspected in 1995, 1997, 1999, and 2001 is consistent with the staff's conclusion and an aging management program is not required.

Table 3.3.2-12
Fuel Oil System
Summary of Aging Management Evaluation

Table 3.3.2-12 Fuel Oil System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-1	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Outdoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)			H, 3
Flow Device	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Flow Device	Leakage Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Piping and fittings	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Piping and fittings	Leakage Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B

Table 3.3.2-12 Fuel Oil 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 Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Piping and fittings	Pressure Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Piping and fittings	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Piping and fittings	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.F1-16	3.3.1-25	E, 2
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Fuel Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	Fuel Oil Chemistry (B.2.1.16)	VII.H1-3	3.3.1-32	I, 1
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Fuel Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.H1-3	3.3.1-32	I, 1
Pump Casing (Auxiliary Boiler Fuel Oil Transfer Pumps)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-12 Fuel Oil 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 (Auxiliary Boiler Fuel Oil Transfer Pumps)	Leakage Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Pump Casing (Auxiliary Boiler Fuel Oil Transfer Pumps)	Leakage Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Strainer Body	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Strainer Body	Leakage Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Strainer Body	Leakage Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Tanks (All Diesel Fire Pump Fuel Oil Tanks)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Tanks (All Diesel Fire Pump Fuel Oil Tanks)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B

Table 3.3.2-12 Fuel Oil 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 (All Diesel Fire Pump Fuel Oil Tanks)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Valve Body	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Leakage Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Valve Body	Leakage Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Valve Body	Leakage Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Valve Body	Leakage Boundary	Copper Alloy with less than 15% Zinc	Fuel Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	Fuel Oil Chemistry (B.2.1.16)	VII.H1-3	3.3.1-32	I, 1
Valve Body	Leakage Boundary	Copper Alloy with less than 15% Zinc	Fuel Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.H1-3	3.3.1-32	I, 1
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air - Outdoor (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.F1-16	3.3.1-25	E, 2
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Fuel Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Fuel Oil Chemistry (B.2.1.16)	VII.H1-3	3.3.1-32	B

Table 3.3.2-12 Fuel Oil 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 with 15% Zinc or More	Fuel Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.H1-3	3.3.1-32	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. Pitting and crevice corrosion are not predicted for this combination, and microbiologically influenced corrosion is predicted for this combination. The Fuel Oil Chemistry and One-Time Inspection Programs are used to manage the aging effects.
2. External Surfaces Monitoring is adequate for managing this material/environment/aging effect combination.
3. Environment for this component is Air - outdoor. Aging effect/mechanism and program for Air - indoor uncontrolled is used.

Table 3.3.2-13
Hydrogen Monitoring
Summary of Aging Management Evaluation

Table 3.3.2-13 Hydrogen Monitoring

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	None	None			G, 1
Valve Body	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Valve Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Valve Body	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	None	None			G, 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 internal environment for this component is air/gas (wetted), however pooling of condensation would not be present because the lines are sloped to prevent pooling per Drawing LR-302-674. Stainless steel in an air/gas internal environment without the potential for pooling condensation is equivalent to stainless steel in an air - indoor uncontrolled environment, and no aging effects are predicted for this combination per NUREG-1801, Item VII.J-15.

Table 3.3.2-14
Instrument and Control Air System
Summary of Aging Management Evaluation

Table 3.3.2-14 Instrument and 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
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Mechanical Closure	Stainless Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)			H,1
Bolting	Mechanical Closure	Stainless Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)			H,1
Filter Housing	Pressure Boundary	Aluminum	Air - Indoor (External)	None	None	VII.J-1	3.3.1-95	A
Filter Housing	Pressure Boundary	Aluminum	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.A3-4	3.3.1-88	A
Filter Housing	Pressure Boundary	Aluminum	Air with Borated Water Leakage (External)	Loss of Material/Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)			H,2
Filter Housing	Pressure Boundary	Aluminum	Air/Gas - Dry (Internal)	None	None	VII.J-2	3.3.1-97	A

Table 3.3.2-14 Instrument and 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	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Filter Housing	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Filter Housing	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E,3
Filter Housing	Pressure Boundary	Carbon Steel	Air/Gas - Dry (Internal)	None	None	VII.J-22	3.3.1-98	A
Filter Housing	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.G-23	3.3.1-71	E,5
Filter Housing	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	V.F-3	3.2.1-53	A
Filter Housing	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air/Gas - Dry (Internal)	None	None	VII.J-3	3.3.1-98	A
Filter Housing	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Filter Housing	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Filter Housing	Pressure Boundary	Stainless Steel	Air/Gas - Dry (Internal)	None	None	VII.J-18	3.3.1-98	A
Filter Housing	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.D-4	3.3.1-54	B
Flow Device	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Flow Device	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Flow Device	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E,3
Flow Device	Pressure Boundary	Carbon Steel	Air/Gas - Dry (Internal)	None	None	VII.J-22	3.3.1-98	A
Flow Device	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	V.F-3	3.2.1-53	A

Table 3.3.2-14 Instrument and 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
Flow Device	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-12	3.3.1-88	A
Flow Device	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air/Gas - Dry (Internal)	None	None	VII.J-3	3.3.1-98	A
Gas Bottles	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Gas Bottles	Pressure Boundary	Carbon Steel	Air/Gas - Dry (Internal)	None	None	VII.J-22	3.3.1-98	A
Heat exchanger components	Heat Transfer	Copper Alloy with less than 15% Zinc	Air/Gas - Wetted (Internal)	Reduction of Heat Transfer/Fouling	Compressed Air Monitoring (B.2.1.12)			G,4
Heat exchanger components	Heat Transfer	Copper Alloy with less than 15% Zinc	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-2	3.3.1-52	B
Heat exchanger components	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.G-23	3.3.1-71	E,5
Heat exchanger components	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.G-9	3.3.1-28	E,7
Heat exchanger components	Pressure Boundary	Copper Alloy with less than 15% Zinc	Closed Cycle Cooling Water	Loss of Material/Pitting, Crevice, and Galvanic Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-4	3.3.1-51	B
Hoses	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	V.F-3	3.2.1-53	A
Hoses	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air with Borated Water Leakage (External)	None	None	VII.J-5	3.3.1-99	A
Hoses	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air/Gas - Dry (Internal)	None	None	VII.J-3	3.3.1-98	A

Table 3.3.2-14 Instrument and 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
Hoses	Pressure Boundary	Elastomer	Air - Indoor (External)	Hardening and Loss of Strength/Elastomer Degradation	External Surfaces Monitoring (B.2.1.21)	VII.F1-7	3.3.1-11	E,6
Hoses	Pressure Boundary	Elastomer	Air with Borated Water Leakage (External)	Hardening and Loss of Strength/Elastomer Degradation	External Surfaces Monitoring (B.2.1.21)	VII.F1-7	3.3.1-11	E,6
Hoses	Pressure Boundary	Elastomer	Air/Gas - Dry (Internal)	Hardening and Loss of Strength/Elastomer Degradation	External Surfaces Monitoring (B.2.1.21)	VII.F1-7	3.3.1-11	G
Hoses	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Hoses	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Hoses	Pressure Boundary	Stainless Steel	Air/Gas - Dry (Internal)	None	None	VII.J-18	3.3.1-98	A
Piping and fittings	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E,3
Piping and fittings	Pressure Boundary	Carbon Steel	Air/Gas - Dry (Internal)	None	None	VII.J-22	3.3.1-98	A
Piping and fittings	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.G-23	3.3.1-71	E,5
Piping and fittings	Pressure Boundary	Carbon Steel	Soil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VII.C1-18	3.3.1-19	B
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	V.F-3	3.2.1-53	A

Table 3.3.2-14 Instrument and 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	Copper Alloy with less than 15% Zinc	Air/Gas - Dry (Internal)	None	None	VII.J-3	3.3.1-98	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air/Gas - Dry (Internal)	None	None	VII.J-18	3.3.1-98	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.D-4	3.3.1-54	B
Piping and fittings	Structural Support	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Piping and fittings	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Piping and fittings	Structural Support	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E,3
Piping and fittings	Structural Support	Carbon Steel	Air/Gas - Dry (Internal)	None	None	VII.J-22	3.3.1-98	A
Piping and fittings	Structural Support	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.G-23	3.3.1-71	E,5
Piping and fittings	Structural Support	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	V.F-3	3.2.1-53	A
Piping and fittings	Structural Support	Copper Alloy with less than 15% Zinc	Air/Gas - Dry (Internal)	None	None	VII.J-3	3.3.1-98	A
Piping and fittings	Structural Support	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Structural Support	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Structural Support	Stainless Steel	Air/Gas - Dry (Internal)	None	None	VII.J-18	3.3.1-98	A
Piping and fittings	Structural Support	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.D-4	3.3.1-54	B
Pump Casing [Compressor]	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-14 Instrument and 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
Pump Casing [Compressor]	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.G-23	3.3.1-71	E,5
Regulator	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Regulator	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Regulator	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E,3
Regulator	Pressure Boundary	Carbon Steel	Air/Gas - Dry (Internal)	None	None	VII.J-22	3.3.1-98	A
Regulator	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	V.F-3	3.2.1-53	A
Regulator	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air/Gas - Dry (Internal)	None	None	VII.J-3	3.3.1-98	A
Regulator	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Regulator	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Regulator	Pressure Boundary	Stainless Steel	Air/Gas - Dry (Internal)	None	None	VII.J-18	3.3.1-98	A
Strainer Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	V.F-3	3.2.1-53	A
Strainer Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air/Gas - Dry (Internal)	None	None	VII.J-3	3.3.1-98	A
Strainer Body	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Strainer Body	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.D-4	3.3.1-54	B
Tanks	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Tanks	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A

Table 3.3.2-14 Instrument and 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
Tanks	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E,3
Tanks	Pressure Boundary	Carbon Steel	Air/Gas - Dry (Internal)	None	None	VII.J-22	3.3.1-98	A
Tanks	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.G-23	3.3.1-71	E,5
Tanks	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	VII.I-2	3.4.1-41	A
Tanks	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air/Gas - Dry (Internal)	None	None	VII.J-3	3.3.1-98	C
Tanks	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	C
Tanks	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	C
Tanks	Pressure Boundary	Stainless Steel	Air/Gas - Dry (Internal)	None	None	VII.J-18	3.3.1-98	C
Tanks	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.D-4	3.3.1-54	D
Tanks (Instrument Air Dryers)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Tanks (Instrument Air Dryers)	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.G-23	3.3.1-71	E,5
Valve Body	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Valve Body	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E,3
Valve Body	Pressure Boundary	Carbon Steel	Air/Gas - Dry (Internal)	None	None	VII.J-22	3.3.1-98	A

Table 3.3.2-14 Instrument and 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	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.G-23	3.3.1-71	E,5
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	V.F-3	3.2.1-53	A
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-12	3.3.1-88	A
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or More	Air/Gas - Dry (Internal)	None	None	VII.J-3	3.3.1-98	A
Valve Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Valve Body	Pressure Boundary	Stainless Steel	Air/Gas - Dry (Internal)	None	None	VII.J-18	3.3.1-98	A
Valve Body	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.D-4	3.3.1-54	B
Water Trap	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Water Trap	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Compressed Air Monitoring (B.2.1.12)	VII.G-23	3.3.1-71	E,5

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 stainless steel bolting in this environment include loss of preload due to thermal effects, gasket creep and self-loosening. These aging effects/mechanisms are managed by the Bolting Integrity Program.
2. The aging effects of aluminum in an air with borated water leakage environment include loss of material due to pitting, and crevice corrosion. These aging effects/mechanisms are managed by the External Surfaces Monitoring program.
3. The aging effects of carbon steel in an air with borated water leakage environment include loss of material due to general, pitting, and crevice corrosion. These aging effects/mechanisms are managed by the External Surfaces Monitoring program.
4. The aging effects of copper alloy in an air/gas - wetted (internal) environment include reduction of heat transfer due to fouling. These aging effects/mechanisms are managed by the Compressed Air Monitoring program.
5. The aging effects of carbon steel in an air/gas - wetted (internal) environment include loss of material due to general, pitting, and crevice corrosion. These aging effects/mechanisms are managed by the Compressed Air Monitoring program.
6. NUREG-1801 specifies a plant-specific program. The External Surfaces Monitoring Program is used to manage the aging effect(s) applicable to

this component type, material, and environment combination.
7. NUREG-1801 specifies a plant-specific program. The Compressed Air Monitoring Program is used to manage the aging effect(s) applicable to this component type, material, and environment combination.

Table 3.3.2-15
Intake Screen and Pump House Ventilation System
Summary of Aging Management Evaluation

Table 3.3.2-15 Intake Screen and Pump House Ventilation System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.F2-4	3.3.1-55	B
Damper Housing	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	C
Damper Housing	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-3	3.3.1-72	B
Ducting and Components	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	C
Ducting and Components	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-3	3.3.1-72	B
Expansion Joints	Pressure Boundary	Neoprene	Air - Indoor (External)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-7	3.3.1-11	E, 1
Expansion Joints	Pressure Boundary	Neoprene	Air/Gas - Wetted (Internal)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-7	3.3.1-11	E, 1
Fan Housing	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	C

Table 3.3.2-15 Intake Screen and Pump House 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
Fan Housing	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-3	3.3.1-72	B
Filter Housing	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	C
Filter Housing	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-3	3.3.1-72	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. NUREG-1801 specifies a plant-specific program. The Internal Surfaces in Miscellaneous Piping and Ducting Components program is used to manage the aging effect(s) applicable to this component type, material, and environment combination. Inspections of the expansion joints require physical manipulation; therefore, internal and external inspections, which include physical manipulation of elastomers, will be performed at the same time under the Internal Surfaces in Miscellaneous Piping and Ducting Components program.

Table 3.3.2-16
Intermediate Building Ventilation System
Summary of Aging Management Evaluation

Table 3.3.2-16 Intermediate 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
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.F2-4	3.3.1-55	B
Damper Housing	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	C
Damper Housing	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-3	3.3.1-72	B
Ducting and Components	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	C
Ducting and Components	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-3	3.3.1-72	B
Expansion Joints	Pressure Boundary	Neoprene	Air - Indoor (External)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-7	3.3.1-11	E, 1
Expansion Joints	Pressure Boundary	Neoprene	Air/Gas - Wetted (Internal)	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-7	3.3.1-11	E, 1
Fan Housing	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	C

Table 3.3.2-16 Intermediate 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
Fan Housing	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-3	3.3.1-72	B
Filter Housing	Pressure Boundary	Galvanized Steel	Air - Indoor (External)	None	None	VII.J-6	3.3.1-92	C
Filter Housing	Pressure Boundary	Galvanized Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.F2-3	3.3.1-72	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. NUREG-1801 specifies a plant-specific program. The Internal Surfaces in Miscellaneous Piping and Ducting Components program is used to manage the aging effect(s) applicable to this component type, material, and environment combination. Inspections of the expansion joints require physical manipulation; therefore, internal and external inspections, which include physical manipulation of elastomers, will be performed at the same time under the Internal Surfaces in Miscellaneous Piping and Ducting Components program.

Table 3.3.2-17
Liquid and Gas Sampling System
Summary of Aging Management Evaluation

Table 3.3.2-17 Liquid and Gas Sampling System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Heat exchanger components (Auxiliary Boiler Sample Rack Coolers)	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Heat exchanger components (Auxiliary Boiler Sample Rack Coolers)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VIII.F-3	3.4.1-14	B

Table 3.3.2-17 Liquid and Gas 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
Heat exchanger components (Auxiliary Boiler Sample Rack Coolers)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VIII.F-3	3.4.1-14	A
Heat exchanger components (Auxiliary Boiler Sample Rack Coolers)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.E-40	3.4.1-6	D
Heat exchanger components (Auxiliary Boiler Sample Rack Coolers)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.E-40	3.4.1-6	C
Piping and fittings	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-11	3.4.1-4	B
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-11	3.4.1-4	A
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	V.F-3	3.2.1-53	A
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.A-5	3.4.1-15	B
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.A-5	3.4.1-15	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A

Table 3.3.2-17 Liquid and Gas 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 (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VIII.B1-5	3.4.1-14	B
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VIII.B1-5	3.4.1-14	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A2-1	3.3.1-91	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VIII.B1-5	3.4.1-14	B
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VIII.B1-5	3.4.1-14	A
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cumulative Fatigue Damage/Fatigue	TLAA	VII.E1-16	3.3.1-2	A
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A2-1	3.3.1-91	A
Pump Casing (All Condenser Sample Pumps)	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Pump Casing (All Condenser Sample Pumps)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A2-1	3.3.1-91	A
Valve Body	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Valve Body	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-11	3.4.1-4	B
Valve Body	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-11	3.4.1-4	A
Valve Body	Leakage Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	V.F-3	3.2.1-53	A

Table 3.3.2-17 Liquid and Gas 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	Copper Alloy with 15% Zinc or More	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.A-5	3.4.1-15	B
Valve Body	Leakage Boundary	Copper Alloy with 15% Zinc or More	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.A-5	3.4.1-15	A
Valve Body	Leakage Boundary	Copper Alloy with 15% Zinc or More	Treated Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VIII.A-6	3.4.1-35	A
Valve Body	Leakage Boundary	Low Alloy Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Valve Body	Leakage Boundary	Low Alloy Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-11	3.4.1-4	B
Valve Body	Leakage Boundary	Low Alloy Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-11	3.4.1-4	A
Valve Body	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Valve Body	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Valve Body	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A2-1	3.3.1-91	A
Valve Body	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VIII.B1-5	3.4.1-14	B
Valve Body	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VIII.B1-5	3.4.1-14	A
Valve Body	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A2-1	3.3.1-91	A
Valve Body	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Valve Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VIII.B1-5	3.4.1-14	B

Table 3.3.2-17 Liquid and Gas 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) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VIII.B1-5	3.4.1-14	A
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A2-1	3.3.1-91	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:

None

Table 3.3.2-18
Miscellaneous Floor and Equipment Drains System
Summary of Aging Management Evaluation

Table 3.3.2-18 Miscellaneous Floor and Equipment Drains System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Filter Housing	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Filter Housing	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 1
Flow Device	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Flow Device	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 3

Table 3.3.2-18 Miscellaneous Floor and Equipment Drains 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 Device	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 1
Flow Device	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Flow Device	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 1
Flow Element	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Flow Element	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 1
Flow Element	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Flow Element	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 1
Heat exchanger components (OSTG Drn Cooler)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Heat exchanger components (OSTG Drn Cooler)	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 3

Table 3.3.2-18 Miscellaneous Floor and Equipment Drains 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 components (OSTG Drn Cooler)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 1
Piping and fittings	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Piping and fittings	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Piping and fittings	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 3
Piping and fittings	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 1
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-11	3.4.1-4	B
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-11	3.4.1-4	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 1
Piping and fittings	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-18 Miscellaneous Floor and Equipment Drains 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 Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Piping and fittings	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 3
Piping and fittings	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 1
Piping and fittings	Pressure Boundary	Carbon Steel	Soil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VII.G-25	3.3.1-19	B
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 1
Pump Casing (Air Tunnel Sump)	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Air Tunnel Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	External Surfaces Monitoring (B.2.1.21)	VII.G-24	3.3.1-68	E, 2

Table 3.3.2-18 Miscellaneous Floor and Equipment Drains 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 (Air Tunnel Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (External)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Pump Casing (Air Tunnel Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 1
Pump Casing (Air Tunnel Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Pump Casing (Aux Building Sump)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Aux Building Sump)	Pressure Boundary	Stainless Steel	Raw Water (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	External Surfaces Monitoring (B.2.1.21)	V.C-3	3.2.1-38	E, 2
Pump Casing (Aux Building Sump)	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 1
Pump Casing (Borated Water Tank Tunnel Sump)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Borated Water Tank Tunnel Sump)	Leakage Boundary	Stainless Steel	Raw Water (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	External Surfaces Monitoring (B.2.1.21)	V.C-3	3.2.1-38	E, 2

Table 3.3.2-18 Miscellaneous Floor and Equipment Drains 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 (Borated Water Tank Tunnel Sump)	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 1
Pump Casing (Heat Exchanger Vault Sump)	Leakage Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Pump Casing (Heat Exchanger Vault Sump)	Leakage Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 3
Pump Casing (Heat Exchanger Vault Sump)	Leakage Boundary	Gray Cast Iron	Raw Water (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	External Surfaces Monitoring (B.2.1.21)	VII.G-24	3.3.1-68	E, 2
Pump Casing (Heat Exchanger Vault Sump)	Leakage Boundary	Gray Cast Iron	Raw Water (External)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Pump Casing (Heat Exchanger Vault Sump)	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 1
Pump Casing (Heat Exchanger Vault Sump)	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Pump Casing (Industrial Cooler Continuous Blowdown)	Leakage Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-18 Miscellaneous Floor and Equipment Drains 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 (Industrial Cooler Continuous Blowdown)	Leakage Boundary	Gray Cast Iron	Raw Water (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	External Surfaces Monitoring (B.2.1.21)	VII.G-24	3.3.1-68	E, 2
Pump Casing (Industrial Cooler Continuous Blowdown)	Leakage Boundary	Gray Cast Iron	Raw Water (External)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Pump Casing (Industrial Cooler Continuous Blowdown)	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 1
Pump Casing (Industrial Cooler Continuous Blowdown)	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Pump Casing (Intermediate Building Sump)	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Intermediate Building Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	External Surfaces Monitoring (B.2.1.21)	VII.G-24	3.3.1-68	E, 2
Pump Casing (Intermediate Building Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (External)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A

Table 3.3.2-18 Miscellaneous Floor and Equipment Drains 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 (Intermediate Building Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 1
Pump Casing (Intermediate Building Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Pump Casing (Spent Fuel Pit Room Sump)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Spent Fuel Pit Room Sump)	Pressure Boundary	Stainless Steel	Raw Water (External)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	External Surfaces Monitoring (B.2.1.21)	V.C-3	3.2.1-38	E, 2
Pump Casing (Spent Fuel Pit Room Sump)	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 1
Pump Casing (Steam Generator Drain)	Leakage Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Pump Casing (Steam Generator Drain)	Leakage Boundary	Gray Cast Iron	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 3
Pump Casing (Steam Generator Drain)	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 1

Table 3.3.2-18 Miscellaneous Floor and Equipment Drains 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 (Steam Generator Drain)	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Pump Casing (Tendon Access Gallery Sump)	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Tendon Access Gallery Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	External Surfaces Monitoring (B.2.1.21)	VII.G-24	3.3.1-68	E, 2
Pump Casing (Tendon Access Gallery Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (External)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Pump Casing (Tendon Access Gallery Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 1
Pump Casing (Tendon Access Gallery Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Pump Casing (Turbine Condenser Sump)	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Turbine Condenser Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	External Surfaces Monitoring (B.2.1.21)	VII.G-24	3.3.1-68	E, 2

Table 3.3.2-18 Miscellaneous Floor and Equipment Drains 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 (Turbine Condenser Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (External)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Pump Casing (Turbine Condenser Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 1
Pump Casing (Turbine Condenser Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Pump Casing (Turbine Deluge Sump)	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Turbine Deluge Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	External Surfaces Monitoring (B.2.1.21)	VII.G-24	3.3.1-68	E, 2
Pump Casing (Turbine Deluge Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (External)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Pump Casing (Turbine Deluge Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 1
Pump Casing (Turbine Deluge Sump)	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A

Table 3.3.2-18 Miscellaneous Floor and Equipment Drains System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Spectacle Blinds	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Spectacle Blinds	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 3
Spectacle Blinds	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 1
Strainer Body	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Strainer Body	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 3
Strainer Body	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 1
Tanks (Industrial Cooler Continuous Blowdown Collection)	Leakage Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Tanks (Industrial Cooler Continuous Blowdown Collection)	Leakage Boundary	Gray Cast Iron	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-23	3.3.1-71	D

Table 3.3.2-18 Miscellaneous Floor and Equipment Drains 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 (Industrial Cooler Continuous Blowdown Collection)	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 1
Tanks (Industrial Cooler Continuous Blowdown Collection)	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Tanks (OTSG Wet Layup Chem Addition)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Tanks (OTSG Wet Layup Chem Addition)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E3-15	3.3.1-24	B
Tanks (OTSG Wet Layup Chem Addition)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E3-15	3.3.1-24	A
Tanks (Various Floor Sumps)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage	None	None	VII.J-16	3.3.1-99	A
Tanks (Various Floor Sumps)	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.D-4	3.3.1-54	E, 1
Tanks (Various Floor Sumps)	Pressure Boundary	Stainless Steel	Concrete (Embedded)	None	None	VII.J-17	3.3.1-96	A
Tanks (Various Floor Sumps)	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C3-7	3.3.1-78	E, 1
Tanks (Various Floor Sumps)	Pressure Boundary	Various Organic Polymers	Air with Borated Water Leakage	None	None			F

Table 3.3.2-18 Miscellaneous Floor and Equipment Drains 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 (Various Floor Sumps)	Pressure Boundary	Various Organic Polymers	Air/Gas - Wetted (Internal)	None	None			F
Tanks (Various Floor Sumps)	Pressure Boundary	Various Organic Polymers	Concrete (Embedded)	None	None			F
Tanks (Various Floor Sumps)	Pressure Boundary	Various Organic Polymers	Raw Water (Internal)	None	None			F
Valve Body	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Valve Body	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 3
Valve Body	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 1
Valve Body	Leakage Boundary	Copper Alloy with less than 15% Zinc	Air with Borated Water Leakage (External)	None	None	VII.J-5	3.3.1-99	A
Valve Body	Leakage Boundary	Copper Alloy with less than 15% Zinc	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-9	3.3.1-81	E, 1
Valve Body	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Valve Body	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 1

Table 3.3.2-18 Miscellaneous Floor and Equipment Drains 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 Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Valve Body	Pressure Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 3
Valve Body	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	E, 1
Valve Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Valve Body	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 1
Valve Discharge Target	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Discharge Target	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-24	3.3.1-68	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. This combination is for sump drainage piping, which is not part of an Open Cycle Cooling system. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is substituted to manage these aging effects and mechanisms.
2. This combination is for sump drainage piping, which is not part of an Open Cycle Cooling system. The External Surfaces Monitoring program is substituted to manage these aging effects and mechanisms.
3. General, pitting, and crevice corrosion are predicted for carbon steel in air with borated water leakage. The External Surfaces Monitoring program is substituted to manage the aging effects.
4. Selective leaching is predicted for gray cast iron tank in a condensation environment. The Selective Leaching program is used to manage this aging effect.

Table 3.3.2-19
Open Cycle Cooling Water System
Summary of Aging Management Evaluation

Table 3.3.2-19 Open Cycle 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
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Expansion Joints	None - Short Lived	Not applicable	Not applicable	None	None			1
Heat exchanger components (Decay Heat Service Closed Cooling)	Heat Transfer	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-2	3.3.1-52	B
Heat exchanger components (Decay Heat Service Closed Cooling)	Heat Transfer	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Reduction of Heat Transfer/Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-6	3.3.1-83	B
Heat exchanger components (Decay Heat Service Closed Cooling)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (Decay Heat Service Closed Cooling)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D

Table 3.3.2-19 Open Cycle 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 exchanger components (Decay Heat Service Closed Cooling)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	D
Heat exchanger components (Decay Heat Service Closed Cooling)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting, Crevice, and Galvanic Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E1-2	3.3.1-51	B
Heat exchanger components (Decay Heat Service Closed Cooling)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	V.A-6	3.2.1-41	A
Heat exchanger components (Decay Heat Service Closed Cooling)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Pitting, Crevice, Galvanic, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-3	3.3.1-82	B
Heat exchanger components (Decay Heat Service Closed Cooling)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-4	3.3.1-84	A
Heat exchanger components (Intermediate Closed Cooling)	Heat Transfer	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-2	3.3.1-52	B
Heat exchanger components (Intermediate Closed Cooling)	Heat Transfer	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Reduction of Heat Transfer/Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-6	3.3.1-83	B

Table 3.3.2-19 Open Cycle 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 exchanger components (Intermediate Closed Cooling)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (Intermediate Closed Cooling)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (Intermediate Closed Cooling)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	D
Heat exchanger components (Intermediate Closed Cooling)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting, Crevice, and Galvanic Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E1-2	3.3.1-51	B
Heat exchanger components (Intermediate Closed Cooling)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	V.A-6	3.2.1-41	A
Heat exchanger components (Intermediate Closed Cooling)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Pitting, Crevice, Galvanic, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-3	3.3.1-82	B
Heat exchanger components (Intermediate Closed Cooling)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-4	3.3.1-84	A
Heat exchanger components (ISPH Ventilation Cooling Coils)	Leakage Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	C

Table 3.3.2-19 Open Cycle 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 exchanger components (ISPH Ventilation Cooling Coils)	Leakage Boundary	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Pitting, Crevice, Galvanic, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-3	3.3.1-82	B
Heat exchanger components (ISPH Ventilation Cooling Coils)	Leakage Boundary	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-4	3.3.1-84	A
Heat exchanger components (Nuclear Service Closed Cooling Water)	Heat Transfer	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-2	3.3.1-52	B
Heat exchanger components (Nuclear Service Closed Cooling Water)	Heat Transfer	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Reduction of Heat Transfer/Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-6	3.3.1-83	B
Heat exchanger components (Nuclear Service Closed Cooling Water)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (Nuclear Service Closed Cooling Water)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (Nuclear Service Closed Cooling Water)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	D

Table 3.3.2-19 Open Cycle 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 exchanger components (Nuclear Service Closed Cooling Water)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting, Crevice, and Galvanic Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.E1-2	3.3.1-51	B
Heat exchanger components (Nuclear Service Closed Cooling Water)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	V.A-6	3.2.1-41	A
Heat exchanger components (Nuclear Service Closed Cooling Water)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Pitting, Crevice, Galvanic, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-3	3.3.1-82	B
Heat exchanger components (Nuclear Service Closed Cooling Water)	Pressure Boundary	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-4	3.3.1-84	A
Piping and fittings	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Piping and fittings	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Piping and fittings	Leakage Boundary	Carbon Steel (Concrete coated)	Soil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VII.C1-18	3.3.1-19	B

Table 3.3.2-19 Open Cycle 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 Steel (Concrete lined)	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, Fouling, and Lining/Coating Degradation	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Piping and fittings	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Open-Cycle Cooling Water System (B.2.1.9)	VII.H2-18	3.3.1-80	B
Piping and fittings	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Piping and fittings	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Piping and fittings	Pressure Boundary	Carbon Steel (Concrete coated)	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Piping and fittings	Pressure Boundary	Carbon Steel (Concrete coated)	Soil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VII.C1-18	3.3.1-19	B

Table 3.3.2-19 Open Cycle 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	Carbon Steel (Concrete lined)	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, Fouling, and Lining/Coating Degradation	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Pump Casing (Decay Heat River Water)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Decay Heat River Water)	Pressure Boundary	Carbon Steel	Raw Water (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Pump Casing (Decay Heat River Water)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Pump Casing (Nuclear Service)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Nuclear Service)	Pressure Boundary	Carbon Steel	Raw Water (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B

Table 3.3.2-19 Open Cycle 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 (Nuclear Service)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Pump Casing (Screen Wash)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Screen Wash)	Leakage Boundary	Carbon Steel	Raw Water (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Pump Casing (Screen Wash)	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Pump Casing (Screen Wash)	Leakage Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Screen Wash)	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Pump Casing (Screen Wash)	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Pump Casing (Secondary Service)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-19 Open Cycle 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 (Secondary Service)	Leakage Boundary	Carbon Steel	Raw Water (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Pump Casing (Secondary Service)	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Pump Casing (Service Water Vent Equipment)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Service Water Vent Equipment)	Leakage Boundary	Carbon Steel	Raw Water (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Pump Casing (Service Water Vent Equipment)	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Pump Casing (Service Water Vent Equipment)	Leakage Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (Service Water Vent Equipment)	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B

Table 3.3.2-19 Open Cycle 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 (Service Water Vent Equipment)	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Open-Cycle Cooling Water System (B.2.1.9)	VII.H2-18	3.3.1-80	B
Strainer Body	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Strainer Body	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Strainer Body	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Strainer Body	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Valve Body	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B

Table 3.3.2-19 Open Cycle 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	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Valve Body	Leakage Boundary	Copper Alloy with less than 15% Zinc	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-9	3.3.1-81	B
Valve Body	Leakage Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Valve Body	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	A
Valve Body	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Valve Body	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Open-Cycle Cooling Water System (B.2.1.9)	VII.H2-18	3.3.1-80	B
Valve Body	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Valve Body	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A

Table 3.3.2-19 Open Cycle 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	Copper Alloy with less than 15% Zinc	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-9	3.3.1-81	B
Valve Body	Pressure Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	B
Valve Body	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C1-11	3.3.1-85	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. Expansion joints are short-lived components and are replaced on a 12-year frequency per the Preventive Maintenance program.

Table 3.3.2-20
Radiation Monitoring System
Summary of Aging Management Evaluation

Table 3.3.2-20 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
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Filter Housing	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Filter Housing	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.A-26	3.2.1-8	E, 1
Piping and fittings	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.A-26	3.2.1-8	E, 1
Piping and fittings	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.A-26	3.2.1-8	E, 1

Table 3.3.2-20 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
Pump Casing (All Sample Pumps)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (All Sample Pumps)	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.A-26	3.2.1-8	E, 1
Valve Body	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Valve Body	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.A-26	3.2.1-8	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. NUREG-1801 specifies a plant-specific program. The One-Time Inspection Program is used to verify aging effects are not occurring for this component type, material, and environment combination.

Table 3.3.2-21
Radwaste System
Summary of Aging Management Evaluation

Table 3.3.2-21 Radwaste System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Mechanical Closure	Stainless Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	IV.C2-8	3.1.1-52	A
Bolting	Mechanical Closure	Stainless Steel Bolting	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	C
Eductor (Waste Concentrators)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Eductor (Waste Concentrators)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Eductor (Waste Concentrators)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Eductor (Waste Concentrators)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VII.E1-20	3.3.1-90	E, 9

Table 3.3.2-21 Radwaste System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Eductor (Waste Concentrators)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Eductor (Waste Concentrators)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Eductor (Waste Concentrators)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Filter Housing (Precoat Filters)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Filter Housing (Precoat Filters)	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Filter Housing (Precoat Filters)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Filter Housing (Precoat Filters)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Filter Housing (Resin Traps/Filters)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Filter Housing (Resin Traps/Filters)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Filter Housing (Resin Traps/Filters)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Flow Device	Leakage Boundary	Glass	Air with Borated Water Leakage (External)	None	None			G, 12
Flow Device	Leakage Boundary	Glass	Treated Water (Internal)	None	None	VII.J-12	3.3.1-93	A
Flow Device	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Flow Device	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9

Table 3.3.2-21 Radwaste 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 Device	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Flow Element	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Flow Element	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Flow Element	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Flow Element	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Flow Element	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VII.E1-20	3.3.1-90	E, 9
Flow Element	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Flow Element	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Flow Element	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Flow Element	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Flow Element	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Flow Element	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Flow Venturi	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Flow Venturi	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10

Table 3.3.2-21 Radwaste 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 Venturi	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Flow Venturi	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Heat exchanger components (Distillate Cooler shell side components)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Heat exchanger components (Distillate Cooler shell side components)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Heat exchanger components (Distillate Cooler shell side components)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Heat exchanger components (Distillate Cooler shell side components)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VII.E1-20	3.3.1-90	E, 9
Heat exchanger components (Distillate Cooler shell side components)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Heat exchanger components (Distillate Cooler shell side components)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9

Table 3.3.2-21 Radwaste 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 components (Distillate Cooler shell side components)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Heat exchanger components (Evaporator Seal Water Coolers shell side components)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Heat exchanger components (Evaporator Seal Water Coolers shell side components)	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Heat exchanger components (Evaporator Seal Water Coolers shell side components)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Heat exchanger components (Evaporator Seal Water Coolers shell side components)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Heat exchanger components (Reactor Coolant Drain Tank Heat Exchanger tube side components)	Evaluated with the Closed Cycle Cooling Water System							1

Table 3.3.2-21 Radwaste 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 components (Seal Water Heat Exchanger tube side components)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Heat exchanger components (Seal Water Heat Exchanger tube side components)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 6
Heat exchanger components (Seal Water Heat Exchanger tube side components)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.C-6	3.2.1-15	D
Heat exchanger components (Seal Water Heat Exchanger tube side components)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.C-6	3.2.1-15	C
Piping and fittings	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Piping and fittings	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 6
Piping and fittings	Leakage Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VIII.G-6	3.4.1-12	E, 3
Piping and fittings	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VIII.G-36	3.4.1-8	E, 10

Table 3.3.2-21 Radwaste 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 Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.C-6	3.2.1-15	D
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.C-6	3.2.1-15	C
Piping and fittings	Leakage Boundary	Nickel Alloy	Air with Borated Water Leakage (External)	None	None			G, 7
Piping and fittings	Leakage Boundary	Nickel Alloy	Raw Water (Internal)	Loss of Material/Microbiologically Influenced Corrosion and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			H, 5
Piping and fittings	Leakage Boundary	Nickel Alloy	Raw Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-13	3.3.1-78	E, 4
Piping and fittings	Leakage Boundary	Nickel Alloy	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Piping and fittings	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.D-4	3.3.1-54	E, 8

Table 3.3.2-21 Radwaste 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	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Piping and fittings	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Piping and fittings	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VII.E1-20	3.3.1-90	E, 9
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A

Table 3.3.2-21 Radwaste 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 (Boric Acid Recycle Pumps)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Boric Acid Recycle Pumps)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VII.E1-20	3.3.1-90	E, 9
Pump Casing (Boric Acid Recycle Pumps)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Pump Casing (Boric Acid Recycle Pumps)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Pump Casing (Boric Acid Recycle Pumps)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Pump Casing (Concentrate Radwaste Pumps)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Concentrate Radwaste Pumps)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Pump Casing (Concentrate Radwaste Pumps)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Pump Casing (Decant Pump)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Decant Pump)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Pump Casing (Decant Pump)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A

Table 3.3.2-21 Radwaste 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 (Evaporator Condensate Pumps)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Evaporator Condensate Pumps)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Pump Casing (Evaporator Condensate Pumps)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Pump Casing (Evaporator Distillate Pumps)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Evaporator Distillate Pumps)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Pump Casing (Evaporator Distillate Pumps)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Pump Casing (Evaporator Distillate Pumps)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VII.E1-20	3.3.1-90	E, 9
Pump Casing (Evaporator Distillate Pumps)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Pump Casing (Evaporator Distillate Pumps)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9

Table 3.3.2-21 Radwaste 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 (Evaporator Distillate Pumps)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Pump Casing (Evaporator Vacuum Pumps)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Pump Casing (Evaporator Vacuum Pumps)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 6
Pump Casing (Evaporator Vacuum Pumps)	Leakage Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-23	3.3.1-71	B
Pump Casing (Evaporator Vacuum Pumps)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Evaporator Vacuum Pumps)	Leakage Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.D-4	3.3.1-54	E, 8
Pump Casing (Laundry Waste Pump)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Laundry Waste Pump)	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Pump Casing (Miscellaneous Waste Transfer Pumps)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A

Table 3.3.2-21 Radwaste 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 (Miscellaneous Waste Transfer Pumps)	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Pump Casing (Neutralizer Pumps)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Neutralizer Pumps)	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Pump Casing (Reactor Coolant Drain Tank Pump)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Reactor Coolant Drain Tank Pump)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Pump Casing (Reactor Coolant Drain Tank Pump)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Pump Casing (Reactor Drain Pump)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Reactor Drain Pump)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Pump Casing (Reactor Drain Pump)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A

Table 3.3.2-21 Radwaste 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 (Slurry Pump)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Slurry Pump)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Pump Casing (Slurry Pump)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Pump Casing (Waste Feed Pumps)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Waste Feed Pumps)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Pump Casing (Waste Feed Pumps)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Pump Casing (Waste Feed Pumps)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VII.E1-20	3.3.1-90	E, 9
Pump Casing (Waste Feed Pumps)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Pump Casing (Waste Feed Pumps)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Pump Casing (Waste Feed Pumps)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Pump Casing (Waste Gas Compressors)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A

Table 3.3.2-21 Radwaste 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 (Waste Gas Compressors)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 6
Pump Casing (Waste Gas Compressors)	Leakage Boundary	Copper Alloy with less than 15% Zinc	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-9	3.3.1-28	E, 11
Pump Casing (Waste Gas Compressors)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Waste Gas Compressors)	Leakage Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.D-4	3.3.1-54	E, 8
Pump Casing (Waste Oil Transfer Pump)	Leakage Boundary	Copper Alloy with less than 15% Zinc	Air with Borated Water Leakage (External)	None	None	VII.J-5	3.3.1-99	A
Pump Casing (Waste Oil Transfer Pump)	Leakage Boundary	Copper Alloy with less than 15% Zinc	Lubricating Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			H, 2
Pump Casing (Waste Oil Transfer Pump)	Leakage Boundary	Copper Alloy with less than 15% Zinc	Lubricating Oil (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.E1-12	3.3.1-26	E, 3
Pump Casing (Waste Transfer Pumps)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Waste Transfer Pumps)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9

Table 3.3.2-21 Radwaste 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 (Waste Transfer Pumps)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Rupture Disks	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Rupture Disks	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Rupture Disks	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Rupture Disks	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Rupture Disks	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Rupture Disks	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VII.E1-20	3.3.1-90	E, 9
Rupture Disks	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Rupture Disks	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Rupture Disks	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Sight Glasses	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Sight Glasses	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 6
Sight Glasses	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.C-6	3.2.1-15	D

Table 3.3.2-21 Radwaste 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 Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.C-6	3.2.1-15	C
Sight Glasses	Leakage Boundary	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-12	3.3.1-88	A
Sight Glasses	Leakage Boundary	Copper Alloy with 15% Zinc or More	Lubricating Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			H, 2
Sight Glasses	Leakage Boundary	Copper Alloy with 15% Zinc or More	Lubricating Oil (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.E1-12	3.3.1-26	E, 3
Sight Glasses	Leakage Boundary	Glass	Air with Borated Water Leakage (External)	None	None			G, 12
Sight Glasses	Leakage Boundary	Glass	Lubricating Oil (Internal)	None	None	VII.J-10	3.3.1-93	A
Sight Glasses	Leakage Boundary	Glass	Treated Water (Internal)	None	None	VII.J-12	3.3.1-93	A
Sight Glasses	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Sight Glasses	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Sight Glasses	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Sight Glasses	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VII.E1-20	3.3.1-90	E, 9
Sight Glasses	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Sight Glasses	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9

Table 3.3.2-21 Radwaste 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	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Sight Glasses	Pressure Boundary	Glass	Air with Borated Water Leakage (External)	None	None			G, 12
Sight Glasses	Pressure Boundary	Glass	Treated Water (Internal)	None	None	VII.J-12	3.3.1-93	A
Sight Glasses	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Sight Glasses	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Sight Glasses	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Sparger	Spray	Stainless Steel	Treated Water (External)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Sparger	Spray	Stainless Steel	Treated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Sparger	Spray	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Sparger	Spray	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Strainer Body	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Strainer Body	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Strainer Body	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G

Table 3.3.2-21 Radwaste 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 (Internal) > 140 F	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Strainer Body	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Strainer Body	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Strainer Body	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VII.E1-20	3.3.1-90	E, 9
Strainer Body	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Strainer Body	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Strainer Body	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Tanks (Cation Demineralizers)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Tanks (Cation Demineralizers)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Tanks (Cation Demineralizers)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Tanks (Chemical Mix Tank)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Tanks (Chemical Mix Tank)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Tanks (Chemical Mix Tank)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Tanks (Concentrate Waste Storage Tanks)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A

Table 3.3.2-21 Radwaste 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 (Concentrate Waste Storage Tanks)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Tanks (Concentrate Waste Storage Tanks)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Tanks (Deborating Demineralizers)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Tanks (Deborating Demineralizers)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Tanks (Deborating Demineralizers)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Tanks (Distillate Reservoirs)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Tanks (Distillate Reservoirs)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Tanks (Distillate Reservoirs)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Tanks (Distillate Reservoirs)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VII.E1-20	3.3.1-90	E, 9
Tanks (Distillate Reservoirs)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A

Table 3.3.2-21 Radwaste 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 (Distillate Reservoirs)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Tanks (Distillate Reservoirs)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Tanks (Evaporator Air/Water Separators)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Tanks (Evaporator Air/Water Separators)	Leakage Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.D-4	3.3.1-54	E, 8
Tanks (Evaporator Air/Water Separators)	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Tanks (Evaporator Air/Water Separators)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Tanks (Evaporator Air/Water Separators)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Tanks (Evaporator Condensate Demineralizers)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Tanks (Evaporator Condensate Demineralizers)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9

Table 3.3.2-21 Radwaste 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 (Evaporator Condensate Demineralizers)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Tanks (Gas Sample Air/Water Separators)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Tanks (Gas Sample Air/Water Separators)	Leakage Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.D-4	3.3.1-54	E, 8
Tanks (Gas Sample Air/Water Separators)	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Tanks (Gas Sample Air/Water Separators)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Tanks (Gas Sample Air/Water Separators)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Tanks (Laundry Waste Storage Tank)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Tanks (Laundry Waste Storage Tank)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 6

Table 3.3.2-21 Radwaste 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 (Laundry Waste Storage Tank)	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VIII.G-36	3.4.1-8	E, 10
Tanks (Miscellaneous Radioactive Waste Storage Tank)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Tanks (Miscellaneous Radioactive Waste Storage Tank)	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Tanks (Neutralized Waste Storage Tank)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Tanks (Neutralized Waste Storage Tank)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 6
Tanks (Neutralized Waste Storage Tank)	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VIII.G-36	3.4.1-8	E, 10
Tanks (Neutralizer Feed Tank)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Tanks (Neutralizer Feed Tank)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 6

Table 3.3.2-21 Radwaste 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 (Neutralizer Feed Tank)	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VIII.G-36	3.4.1-8	E, 10
Tanks (Neutralizer Mixing Tank)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Tanks (Neutralizer Mixing Tank)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 6
Tanks (Neutralizer Mixing Tank)	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VIII.G-36	3.4.1-8	E, 10
Tanks (Reactor Coolant Bleed Tanks)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Tanks (Reactor Coolant Bleed Tanks)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Tanks (Reactor Coolant Bleed Tanks)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Tanks (Reactor Coolant Drain Tank)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Tanks (Reactor Coolant Drain Tank)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9

Table 3.3.2-21 Radwaste 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 (Reactor Coolant Drain Tank)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Tanks (Reclaimed Boric Acid Tanks)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Tanks (Reclaimed Boric Acid Tanks)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VII.E1-20	3.3.1-90	E, 9
Tanks (Reclaimed Boric Acid Tanks)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Tanks (Reclaimed Boric Acid Tanks)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Tanks (Reclaimed Boric Acid Tanks)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Tanks (Spent Resin Storage Tank)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Tanks (Spent Resin Storage Tank)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Tanks (Spent Resin Storage Tank)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Tanks (Used Precoat Tank)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Tanks (Used Precoat Tank)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Tanks (Used Precoat Tank)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Tanks (Waste Concentrators)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A

Table 3.3.2-21 Radwaste 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 (Waste Concentrators)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 6
Tanks (Waste Concentrators)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.C-6	3.2.1-15	D
Tanks (Waste Concentrators)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.C-6	3.2.1-15	C
Tanks (Waste Concentrators)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Tanks (Waste Concentrators)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Tanks (Waste Concentrators)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Tanks (Waste Concentrators)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VII.E1-20	3.3.1-90	E, 9
Tanks (Waste Concentrators)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Tanks (Waste Concentrators)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Tanks (Waste Concentrators)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Tanks (Waste Concentrators)	Leakage Boundary	Titanium Alloy	Air with Borated Water Leakage (External)	None	None			F

Table 3.3.2-21 Radwaste 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 (Waste Concentrators)	Leakage Boundary	Titanium Alloy	Raw Water (Internal) > 140 F	Loss of Material/Crevice Corrosion and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			F
Tanks (Waste Concentrators)	Leakage Boundary	Titanium Alloy	Treated Water (Internal) > 140 F	Loss of Material/Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			F
Tanks (Waste Evaporator Condensate Storage Tanks)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Tanks (Waste Evaporator Condensate Storage Tanks)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 6
Tanks (Waste Evaporator Condensate Storage Tanks)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.C-6	3.2.1-15	D
Tanks (Waste Evaporator Condensate Storage Tanks)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.C-6	3.2.1-15	C
Tanks (Waste Feed Tanks)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Tanks (Waste Feed Tanks)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G

Table 3.3.2-21 Radwaste 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 (Waste Feed Tanks)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Tanks (Waste Feed Tanks)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VII.E1-20	3.3.1-90	E, 9
Tanks (Waste Feed Tanks)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Tanks (Waste Feed Tanks)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Tanks (Waste Feed Tanks)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Tanks (Waste Gas Separator Tank)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Tanks (Waste Gas Separator Tank)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 6
Tanks (Waste Gas Separator Tank)	Leakage Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.G-23	3.3.1-71	B
Tanks (Waste Gas Separator Tank)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.C-6	3.2.1-15	D
Tanks (Waste Gas Separator Tank)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.C-6	3.2.1-15	C
Tanks (Waste Oil Storage Tanks)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Tanks (Waste Oil Storage Tanks)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 6

Table 3.3.2-21 Radwaste 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 (Waste Oil Storage Tanks)	Leakage Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VIII.G-6	3.4.1-12	E, 3
Thermowell	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Thermowell	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Thermowell	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Thermowell	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Thermowell	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Thermowell	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VII.E1-20	3.3.1-90	E, 9
Thermowell	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Thermowell	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Thermowell	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Thermowell	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A

Table 3.3.2-21 Radwaste 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 (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Thermowell	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Thermowell	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Valve Body	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Valve Body	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-4	3.3.1-43	E, 6
Valve Body	Leakage Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VIII.G-6	3.4.1-12	E, 3
Valve Body	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	V.C-6	3.2.1-15	D
Valve Body	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	V.C-6	3.2.1-15	C
Valve Body	Leakage Boundary	Copper Alloy with 15% Zinc or More	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-12	3.3.1-88	A
Valve Body	Leakage Boundary	Copper Alloy with 15% Zinc or More	Lubricating Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			H, 2

Table 3.3.2-21 Radwaste 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 with 15% Zinc or More	Lubricating Oil (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.E1-12	3.3.1-26	E, 3
Valve Body	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Valve Body	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Valve Body	Leakage Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.D-4	3.3.1-54	E, 8
Valve Body	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Valve Body	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Valve Body	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 10
Valve Body	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Valve Body	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Valve Body	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	One-Time Inspection (B.2.1.18)	VII.E1-20	3.3.1-90	E, 9

Table 3.3.2-21 Radwaste 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 (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Valve Body	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Valve Body	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	A
Valve Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VII.E1-17	3.3.1-91	E, 9
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.E1-17	3.3.1-91	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 Reactor Coolant Drain Tank Heat Exchanger is evaluated with the Closed Cycle Cooling Water System.
2. The aging effects/mechanisms of copper alloy in a lubricating oil environment include loss of material due to microbiologically influenced corrosion. This aging effect/mechanism is managed by the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program.
3. This component, material, and environment combination is associated with waste oil collection and processing equipment. As such, the Lubricating Oil Analysis and One-Time Inspection programs do not apply. The aging effects/mechanisms will be managed by the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program.
4. The aging effects/mechanisms of nickel alloy in a raw water environment include the loss of material due to pitting and crevice corrosion. These aging effects/mechanisms are managed by the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting program.
5. The aging effects/mechanisms of nickel alloy in a raw water environment include the loss of material due to microbiologically influenced corrosion and fouling. These aging effects/mechanisms are managed by the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting program.

6. The aging effects/mechanisms of carbon and low alloy steel in an air with borated water leakage environment include loss of material due to general, pitting, and crevice corrosion. These aging effects/mechanisms are managed by the External Surfaces Monitoring program.
7. Nickel Alloy has no aging effects in an air with borated water leakage environment.
8. The aging effects/mechanisms of stainless steel in an air/gas-wetted environment include the loss of material due to pitting and crevice corrosion. These aging effects/mechanisms are managed by the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting program.
9. Portions of the Radwaste System provide for drainage of reactor and spent fuel pool grade borated treated water. Based on plant operating experience, aging effects are expected to progress very slowly in this environment, but the local environment may be more adverse than generally expected. The One-Time Inspection program will augment the Water Chemistry program by verifying the absence of aging effects.
10. Portions of the Radwaste System provide for drainage of miscellaneous liquid wastes; therefore, raw water was chosen as the internal environment. This raw water environment is not covered by a chemistry based aging management program. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting program is used to manage the aging effects for this raw water environment.
11. NUREG-1801 specifies a plant-specific program. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting program is used to manage the aging effect(s) applicable to this component type, material, and environment combination.
12. Glass has no aging effects in an air with borated water leakage environment.

Table 3.3.2-22
Service Building Chilled Water System
Summary of Aging Management Evaluation

Table 3.3.2-22 Service Building Chilled Water System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Expansion Joints	Leakage Boundary	Rubber	Air - Indoor (External)	N/A	N/A			1
Expansion Joints	Leakage Boundary	Rubber	Closed Cycle Cooling Water	N/A	N/A			1
Heat exchanger components (SB Chiller - shell)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (SB Chiller - shell)	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-1	3.3.1-48	I, 2
Piping and fittings	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Piping and fittings	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	B
Piping and fittings	Leakage Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Piping and fittings	Leakage Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-4	3.3.1-51	I, 2

Table 3.3.2-22 Service Building Chilled 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 Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C2-6	3.3.1-84	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Leakage Boundary	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-10	3.3.1-50	B
Pump Casing (SB Chilled Water Pump)	Leakage Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (SB Chilled Water Pump)	Leakage Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	B
Pump Casing (SB Chilled Water Pump)	Leakage Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C2-8	3.3.1-85	A
Restricting Orifices	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Restricting Orifices	Leakage Boundary	Stainless Steel	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-10	3.3.1-50	B
Strainer Body	Leakage Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Strainer Body	Leakage Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	B
Strainer Body	Leakage Boundary	Gray Cast Iron	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C2-8	3.3.1-85	A
Tanks (Chilled Water Chemical Mix Tank)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Tanks (Chilled Water Chemical Mix Tank)	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	B

Table 3.3.2-22 Service Building Chilled 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
Tanks (Chilled Water Expansion Tank)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Tanks (Chilled Water Expansion Tank)	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	B
Valve Body	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Leakage Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	B
Valve Body	Leakage Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Valve Body	Leakage Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-4	3.3.1-51	I, 2
Valve Body	Leakage Boundary	Copper Alloy with 15% Zinc or More	Closed Cycle Cooling Water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C2-6	3.3.1-84	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. Expansion joints are replaced every 12 years per the Preventative Maintenance Program. As such, they are short-lived components.
2. The aging mechanism of galvanic corrosion does not apply since the material is not in contact with material higher in galvanic series.

Table 3.3.2-23
Spent Fuel Cooling System
Summary of Aging Management Evaluation

Table 3.3.2-23 Spent Fuel Cooling System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Piping and fittings	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A3-8	3.3.1-91	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A3-8	3.3.1-91	A
Pump Casing (Borated Water Recirculation)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Borated Water Recirculation)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A3-8	3.3.1-91	A
Pump Casing (Spent Fuel Coolant)	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A

Table 3.3.2-23 Spent Fuel 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 (Spent Fuel Coolant)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A3-8	3.3.1-91	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Restricting Orifices	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A3-8	3.3.1-91	A
Thermowell	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Thermowell	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A3-8	3.3.1-91	A
Valve Body	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Valve Body	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A3-8	3.3.1-91	A
Valve Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VII.A3-8	3.3.1-91	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:

None

Table 3.3.2-24
Station Blackout and UPS Diesel Generator Systems
Summary of Aging Management Evaluation

Table 3.3.2-24 Station Blackout and UPS Diesel Generator Systems

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Electric Heaters (housing)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Electric Heaters (housing)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Electric Heaters (housing)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Expansion Joints	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Expansion Joints	Pressure Boundary	Carbon Steel	Diesel Exhaust (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.H2-2	3.3.1-18	E, 1
Expansion Joints	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A

Table 3.3.2-24 Station Blackout and UPS Diesel Generator Systems (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Expansion Joints	Pressure Boundary	Stainless Steel	Diesel Exhaust (Internal)	Cracking/Stress Corrosion Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.H2-1	3.3.1-6	E, 1
Expansion Joints	Pressure Boundary	Stainless Steel	Diesel Exhaust (Internal)	Loss of Material/Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.H2-2	3.3.1-18	E, 1
Filter Housing	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Filter Housing	Pressure Boundary	Carbon Steel	Air/Gas - Dry (Internal)	None	None	VII.J-22	3.3.1-98	A
Filter Housing	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Filter Housing	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Flow Element	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Flow Element	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Open-Cycle Cooling Water System (B.2.1.9)	VII.H2-18	3.3.1-80	B
Heat exchanger components (SBO Air Cooler)	Heat Transfer	Carbon Steel	Air/Gas - Dry (Internal)	Reduction of Heat Transfer/Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			H, 6

Table 3.3.2-24 Station Blackout and UPS Diesel Generator Systems (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 components (SBO Air Cooler)	Heat Transfer	Carbon Steel	Raw Water (External)	Reduction of Heat Transfer/Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VIII.G-16	3.4.1-34	B
Heat exchanger components (SBO Air Cooler)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (SBO Air Cooler)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D
Heat exchanger components (SBO Air Cooler)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	D
Heat exchanger components (SBO Jacket Coolant Cooler)	Heat Transfer	Carbon Steel	Closed Cycle Cooling Water	Reduction of Heat Transfer/Fouling	Closed-Cycle Cooling Water System (B.2.1.10)	VII.F1-13	3.3.1-52	B
Heat exchanger components (SBO Jacket Coolant Cooler)	Heat Transfer	Carbon Steel	Raw Water (Internal)	Reduction of Heat Transfer/Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VIII.G-16	3.4.1-34	B
Heat exchanger components (SBO Jacket Coolant Cooler)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (SBO Jacket Coolant Cooler)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.C2-14	3.3.1-47	D

Table 3.3.2-24 Station Blackout and UPS Diesel Generator Systems (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 components (SBO Jacket Coolant Cooler)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	D
Heat exchanger components (SBO Lube Oil Cooler)	Heat Transfer	Carbon Steel	Lubricating Oil (External)	Reduction of Heat Transfer/Fouling	Lubricating Oil Analysis (B.2.1.23)	VIII.G-15	3.4.1-10	B
Heat exchanger components (SBO Lube Oil Cooler)	Heat Transfer	Carbon Steel	Lubricating Oil (External)	Reduction of Heat Transfer/Fouling	One-Time Inspection (B.2.1.18)	VIII.G-15	3.4.1-10	B
Heat exchanger components (SBO Lube Oil Cooler)	Heat Transfer	Carbon Steel	Raw Water (Internal)	Reduction of Heat Transfer/Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VIII.G-16	3.4.1-34	B
Heat exchanger components (SBO Lube Oil Cooler)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Heat exchanger components (SBO Lube Oil Cooler)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	B
Heat exchanger components (SBO Lube Oil Cooler)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	B

Table 3.3.2-24 Station Blackout and UPS Diesel Generator Systems (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 components (SBO Lube Oil Cooler)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.C1-19	3.3.1-76	D
Hoses	Pressure Boundary	Rubber	Air - Indoor (External)	Hardening and Loss of Strength/Elastomer Degradation	External Surfaces Monitoring (B.2.1.21)	VII.F1-7	3.3.1-11	E, 3
Hoses	Pressure Boundary	Rubber	Closed Cycle Cooling Water	Hardening and Loss of Strength/Elastomer Degradation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Piping and fittings	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Piping and fittings	Pressure Boundary	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Piping and fittings	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-23	3.3.1-47	B
Piping and fittings	Pressure Boundary	Carbon Steel	Diesel Exhaust (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.H2-2	3.3.1-18	E, 1
Piping and fittings	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B

Table 3.3.2-24 Station Blackout and UPS Diesel Generator Systems (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 Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.H1-10	3.3.1-20	E, 7
Piping and fittings	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Piping and fittings	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Piping and fittings	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Piping and fittings	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.H2-22	3.3.1-76	B
Piping and fittings	Pressure Boundary	Carbon Steel	Soil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VII.H1-9	3.3.1-19	B
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A

Table 3.3.2-24 Station Blackout and UPS Diesel Generator Systems (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 with less than 15% Zinc	Closed Cycle Cooling Water	Loss of Material/Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-8	3.3.1-51	I, 2
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Fuel Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	Fuel Oil Chemistry (B.2.1.16)	VII.H1-3	3.3.1-32	I, 5
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Fuel Oil (Internal)	Loss of Material/Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.H1-3	3.3.1-32	I, 5
Piping and fittings	Pressure Boundary	Copper Alloy with less than 15% Zinc	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)			H, 4
Piping and fittings	Pressure Boundary	Ductile Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.H2-22	3.3.1-76	B
Piping and fittings	Pressure Boundary	Ductile Cast Iron	Soil (External)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Buried Piping and Tanks Inspection (B.2.1.20)	VII.H1-9	3.3.1-19	B
Piping and fittings	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air/Gas - Dry (Internal)	None	None	VII.J-18	3.3.1-98	A
Piping and fittings	Pressure Boundary	Stainless Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.H1-6	3.3.1-32	B
Pump Casing (SBO Diesel Air Coolant Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-24 Station Blackout and UPS Diesel Generator Systems (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 (SBO Diesel Air Coolant Pump)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-23	3.3.1-47	B
Pump Casing (SBO Diesel Clean Fuel Oil Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (SBO Diesel Clean Fuel Oil Pump)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Pump Casing (SBO Diesel Clean Fuel Oil Pump)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Pump Casing (SBO Diesel DC Aux Fuel Oil Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (SBO Diesel DC Aux Fuel Oil Pump)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Pump Casing (SBO Diesel DC Aux Fuel Oil Pump)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B

Table 3.3.2-24 Station Blackout and UPS Diesel Generator Systems (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 (SBO Diesel Fuel Oil Fill Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (SBO Diesel Fuel Oil Fill Pump)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Pump Casing (SBO Diesel Fuel Oil Fill Pump)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Pump Casing (SBO Diesel Fuel Transfer Pumps)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (SBO Diesel Fuel Transfer Pumps)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Pump Casing (SBO Diesel Fuel Transfer Pumps)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Pump Casing (SBO Diesel Injection Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-24 Station Blackout and UPS Diesel Generator Systems (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 (SBO Diesel Injection Pump)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Pump Casing (SBO Diesel Jacket Coolant Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (SBO Diesel Jacket Coolant Pump)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-23	3.3.1-47	B
Pump Casing (SBO Engine Driven Fuel Oil Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (SBO Engine Driven Fuel Oil Pump)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Pump Casing (SBO Engine Driven Fuel Oil Pump)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Pump Casing (SBO Main Lube Oil Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-24 Station Blackout and UPS Diesel Generator Systems (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 (SBO Main Lube Oil Pump)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Pump Casing (SBO Main Lube Oil Pump)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Pump Casing (SBO Prelube Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (SBO Prelube Pump)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Pump Casing (SBO Prelube Pump)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Pump Casing (SBO Standby Coolant Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Pump Casing (SBO Standby Coolant Pump)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-23	3.3.1-47	B
Pump Casing (SBO Standby Lube Oil Recirc Pump)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B

Table 3.3.2-24 Station Blackout and UPS Diesel Generator Systems (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 (SBO Standby Lube Oil Recirc Pump)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Pump Casing (SBO Standby Lube Oil Recirc Pump)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Strainer Body	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Strainer Body	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Strainer Body	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Tanks (All Fuel Oil)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Tanks (All Fuel Oil)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Tanks (All Fuel Oil)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.H1-10	3.3.1-20	E, 7

Table 3.3.2-24 Station Blackout and UPS Diesel Generator Systems (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tanks (All Fuel Oil)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Tanks (SBO Air Dryer)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Tanks (SBO Air Dryer)	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VIII.B1-7	3.4.1-30	B
Tanks (SBO Air Receiver)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Tanks (SBO Air Receiver)	Pressure Boundary	Carbon Steel	Air/Gas - Wetted (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VIII.B1-7	3.4.1-30	B
Tanks (SBO Jacket Cooling Expansion Tank)	Pressure Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Tanks (SBO Jacket Cooling Expansion Tank)	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-23	3.3.1-47	B
Thermowell	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Thermowell	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VII.H2-17	3.3.1-33	B
Thermowell	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VII.H2-17	3.3.1-33	B

Table 3.3.2-24 Station Blackout and UPS Diesel Generator Systems (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 Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.I-8	3.3.1-58	B
Valve Body	Pressure Boundary	Carbon Steel	Air/Gas - Dry (Internal)	None	None	VII.J-22	3.3.1-98	A
Valve Body	Pressure Boundary	Carbon Steel	Closed Cycle Cooling Water	Loss of Material/General, Pitting and Crevice Corrosion	Closed-Cycle Cooling Water System (B.2.1.10)	VII.H2-23	3.3.1-47	B
Valve Body	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Fuel Oil Chemistry (B.2.1.16)	VII.H1-10	3.3.1-20	B
Valve Body	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	One-Time Inspection (B.2.1.18)	VII.H1-10	3.3.1-20	B
Valve Body	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	Lubricating Oil Analysis (B.2.1.23)	VIII.G-6	3.4.1-12	D
Valve Body	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion	One-Time Inspection (B.2.1.18)	VIII.G-6	3.4.1-12	D
Valve Body	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Open-Cycle Cooling Water System (B.2.1.9)	VII.H2-22	3.3.1-76	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. NUREG-1801 specifies a plant-specific program. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program is used to manage the aging effect(s) applicable to this component type, material, and environment combination.
2. Galvanic corrosion is not predicted for this component.
3. External Surfaces Monitoring program is used to manage aging effects for rubber hose external surfaces.
4. Loss of material due to pitting, crevice, and microbiologically influenced corrosion are predicted. The Lubricating Oil Analysis program is used to manage these aging effects.
5. Pitting and crevice corrosion are not predicted for this combination, and microbiologically influenced corrosion is predicted for this combination. The Fuel Oil Chemistry and One-Time Inspection Programs are used to manage the aging effects.
6. Reduction of heat transfer due to fouling is predicted for this combination. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program is used to manage the aging effect(s) applicable to this component type, material, and environment combination.
7. Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is substituted to manage aging effects for SBO diesel

dirty fuel oil tank and associated piping only.

Table 3.3.2-25
Water Treatment & Distribution System
Summary of Aging Management Evaluation

Table 3.3.2-25 Water Treatment & Distribution System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-2	3.3.1-89	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	Bolting Integrity (B.2.1.7)	VII.I-4	3.3.1-43	A
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air with Borated Water Leakage (External)	Loss of Preload/Thermal Effects, Gasket Creep, and Self-Loosening	Bolting Integrity (B.2.1.7)	VII.I-5	3.3.1-45	A
Electric Heaters (Backup Electric Heaters for RBATs and CWSTs)	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Electric Heaters (Backup Electric Heaters for RBATs and CWSTs)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A

Table 3.3.2-25 Water Treatment & Distribution System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Electric Heaters (Backup Electric Heaters for RBATs and CWSTs)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-4	3.4.1-16	B
Electric Heaters (Backup Electric Heaters for RBATs and CWSTs)	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-4	3.4.1-16	A
Flow Element	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Flow Element	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-19	3.3.1-76	E, 1
Heat exchanger components (Secondary Cooling Coils - Shell)	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	C
Heat exchanger components (Secondary Cooling Coils - Shell)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.E-36	3.4.1-16	B
Heat exchanger components (Secondary Cooling Coils - Shell)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.E-36	3.4.1-16	A
Piping and fittings	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B

Table 3.3.2-25 Water Treatment & Distribution 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 Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-19	3.3.1-76	E, 1
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-11	3.4.1-4	B
Piping and fittings	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-11	3.4.1-4	A
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-9	3.3.1-81	E, 1
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.A-5	3.4.1-15	B
Piping and fittings	Leakage Boundary	Copper Alloy with less than 15% Zinc	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.A-5	3.4.1-15	A
Piping and fittings	Leakage Boundary	PVC	Air - Indoor (External)	None	None			F
Piping and fittings	Leakage Boundary	PVC	Raw Water (Internal)	None	None			F
Piping and fittings	Leakage Boundary	PVC	Treated Water (Internal)	None	None			F
Piping and fittings	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Piping and fittings	Leakage Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-4	3.4.1-16	B

Table 3.3.2-25 Water Treatment & Distribution 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 (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-4	3.4.1-16	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Piping and fittings	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Piping and fittings	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 1
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-4	3.4.1-16	B
Piping and fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-4	3.4.1-16	A
Piping and fittings	Structural Support	Carbon Steel	Air - Outdoor (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.H1-8	3.3.1-60	B
Piping and fittings	Structural Support	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-19	3.3.1-76	E, 1
Pump Casing (Corrosive Waste Sump Pumps)	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Pump Casing (Corrosive Waste Sump Pumps)	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 1

Table 3.3.2-25 Water Treatment & Distribution 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 (Demineralized Water Booster Pump)	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Pump Casing (Demineralized Water Booster Pump)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-4	3.4.1-16	B
Pump Casing (Demineralized Water Booster Pump)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-4	3.4.1-16	A
Pump Casing (Demineralized Water Transfer Pump)	Leakage Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Pump Casing (Demineralized Water Transfer Pump)	Leakage Boundary	Gray Cast Iron	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-11	3.4.1-4	B
Pump Casing (Demineralized Water Transfer Pump)	Leakage Boundary	Gray Cast Iron	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-11	3.4.1-4	A
Pump Casing (Demineralized Water Transfer Pump)	Leakage Boundary	Gray Cast Iron	Treated Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.A3-7	3.3.1-85	A
Pump Casing (Domestic Hot Water Recirculation Pump)	Leakage Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B

Table 3.3.2-25 Water Treatment & Distribution 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 (Domestic Hot Water Recirculation Pump)	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-19	3.3.1-76	E, 1
Pump Casing (Domestic Hot Water Recirculation Pump)	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C2-9	3.3.1-85	A
Pump Casing (Domestic Water Booster Pumps)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Pump Casing (Domestic Water Booster Pumps)	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-19	3.3.1-76	E, 1
Pump Casing (Filtered Water Booster Pump)	Leakage Boundary	Ductile Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Pump Casing (Filtered Water Booster Pump)	Leakage Boundary	Ductile Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-19	3.3.1-76	E, 1
Pump Casing (Makeup Neutralizing Tank Recirculation Pump)	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A

Table 3.3.2-25 Water Treatment & Distribution 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 (Makeup Neutralizing Tank Recirculation Pump)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)			G
Pump Casing (Makeup Neutralizing Tank Recirculation Pump)	Leakage Boundary	Stainless Steel	Raw Water (Internal) > 140 F	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 1
Pump Casing (PWP Demineralized Water Pump)	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Pump Casing (PWP Demineralized Water Pump)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-4	3.4.1-16	B
Pump Casing (PWP Demineralized Water Pump)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-4	3.4.1-16	A
Pump Casing (Reclaimed Water Pump)	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Pump Casing (Reclaimed Water Pump)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-4	3.4.1-16	B
Pump Casing (Reclaimed Water Pump)	Leakage Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-4	3.4.1-16	A
Pump Casing (River Water Pump Lubrication Pumps)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B

Table 3.3.2-25 Water Treatment & Distribution 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 (River Water Pump Lubrication Pumps)	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-19	3.3.1-76	E, 1
Tanks (Carbon Filters)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Tanks (Carbon Filters)	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-19	3.3.1-76	E, 1
Tanks (Cation/Anion/Mixed Bed Demineralizer Tanks)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Tanks (Cation/Anion/Mixed Bed Demineralizer Tanks)	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-19	3.3.1-76	E, 1
Tanks (Demineralized Water Storage Tank)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Tanks (Demineralized Water Storage Tank)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.E-40	3.4.1-6	B

Table 3.3.2-25 Water Treatment & Distribution 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 (Demineralized Water Storage Tank)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.E-40	3.4.1-6	A
Tanks (Domestic Water Heater)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Tanks (Domestic Water Heater)	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-19	3.3.1-76	E, 1
Tanks (Domestic Water Heater)	Leakage Boundary	Copper Alloy with 15% Zinc or More	Air - Indoor (External)	None	None	VIII.I-2	3.4.1-41	A
Tanks (Domestic Water Heater)	Leakage Boundary	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-9	3.3.1-81	E, 1
Tanks (Domestic Water Heater)	Leakage Boundary	Copper Alloy with 15% Zinc or More	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C2-7	3.3.1-84	A
Tanks (Domestic Water Tank)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Tanks (Domestic Water Tank)	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-19	3.3.1-76	E, 1
Tanks (Makeup Demineralizer Neutralizing Tank)	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B

Table 3.3.2-25 Water Treatment & Distribution 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 (Makeup Demineralizer Neutralizing Tank)	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-19	3.3.1-76	E, 1
Tanks (Reclaimed Water Pressure Tank)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Tanks (Reclaimed Water Pressure Tank)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-5	3.3.1-59	D
Tanks (Reclaimed Water Pressure Tank)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.E-40	3.4.1-6	B
Tanks (Reclaimed Water Pressure Tank)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.E-40	3.4.1-6	A
Tanks (Reclaimed Water Storage Tank)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/Boric Acid Corrosion	Boric Acid Corrosion (B.2.1.4)	VII.I-10	3.3.1-89	A
Tanks (Reclaimed Water Storage Tank)	Leakage Boundary	Carbon Steel	Air with Borated Water Leakage (External)	Loss of Material/General, Pitting and Crevice Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.G-5	3.3.1-59	D
Tanks (Reclaimed Water Storage Tank)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.E-40	3.4.1-6	B

Table 3.3.2-25 Water Treatment & Distribution 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 (Reclaimed Water Storage Tank)	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.E-40	3.4.1-6	A
Valve Body	Leakage Boundary	Carbon Steel	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Valve Body	Leakage Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-19	3.3.1-76	E, 1
Valve Body	Leakage Boundary	Gray Cast Iron	Air - Indoor (External)	Loss of Material/General Corrosion	External Surfaces Monitoring (B.2.1.21)	VII.D-3	3.3.1-57	B
Valve Body	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/General, Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	VII.C1-19	3.3.1-76	E, 1
Valve Body	Leakage Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.2.1.19)	VII.C2-9	3.3.1-85	A
Valve Body	Leakage Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Valve Body	Leakage Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A
Valve Body	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 1
Valve Body	Pressure Boundary	Stainless Steel	Air - Indoor (External)	None	None	VII.J-15	3.3.1-94	A
Valve Body	Pressure Boundary	Stainless Steel	Air with Borated Water Leakage (External)	None	None	VII.J-16	3.3.1-99	A

Table 3.3.2-25 Water Treatment & Distribution 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	Raw Water (Internal)	Loss of Material/Pitting, Crevice, and Microbiologically Influenced Corrosion, and Fouling	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.22)	V.C-3	3.2.1-38	E, 1
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry (B.2.1.2)	VII.E1-20	3.3.1-90	A
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	One-Time Inspection (B.2.1.18)	VIII.B1-4	3.4.1-16	B
Valve Body	Pressure Boundary	Stainless Steel	Treated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry (B.2.1.2)	VIII.B1-4	3.4.1-16	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. Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components is substituted to manage these aging effects with this material in a raw water environment.