3.0 Aging Management Review Results

For those systems, structures and components (SSCs) identified as being subject to an aging management review in Section 2, 10CFR 54.21(a)(3) requires demonstration that the effects of aging will be adequately managed so that their intended function(s) will be maintained consistent with the current licensing basis for the period of extended operation.

This section provides the results of the aging management review of the SSCs determined, during the scoping and screening processes, to be subject to an aging management review. Organization of this section is based on Chapter 3, "Aging Management Review Results," of NUREG-1800, Standard Review Plan for the Review of License Renewal Applications for Nuclear Power Plants (SRP-LR), Revision 1. This section is organized as follows:

- Aging Management of Reactor Vessel, Internals, and Reactor Coolant System (Section 3.1)
- Aging Management of Engineered Safety Features (Section 3.2)
- Aging Management of Auxiliary Systems (Section 3.3)
- Aging Management of Steam and Power Conversion Systems (Section 3.4)
- Aging Management of Containments, Structures, and Component Supports (Section 3.5)
- Aging Management of Electrical and Instrumentation and Controls (Section 3.6)

Results of the aging management reviews (AMRs) are presented in two types of tables:

Table 3.x.1 – where

'3' indicates the table pertains to a Section 3 aging management review,

'x' indicates the section number; and

'1' indicates the first table type.

For example, in the Reactor Vessel, Internals, and Reactor Coolant System section, this table would be numbered 3.1.1 and in the Auxiliary Systems section, this table would be numbered 3.3.1. This table type will be referred to as "Table 1." These tables are derived from the corresponding tables in Chapter 3 of NUREG-1800 and present summary information from the AMRs.

Table 3.x.2-y – where

'3' indicates LRA Section 3;

'x' indicates the section number;

'2' indicates the second table type; and

'y' indicates the specific system, structure or commodity being addressed.

For example, within the Reactor Vessel, Internals, and Reactor Coolant System section, the AMR results for the Reactor Pressure Vessel are presented in Table 3.1.2-1. In the Engineered Safety Features section, the AMR results for the Residual Heat Removal System are presented in Table 3.2.2-1, and the AMR results for the Reactor Core Isolation Cooling System are presented in Table 3.2.2-2. This table type will be referred to as "Table 2." These tables present the results of the AMRs.

Table Description

NUREG-1801, the GALL Report, contains the NRC staff's generic evaluation of existing plant programs. It documents the technical basis for determining where existing programs are adequate without modification and where existing programs should be augmented for the period of extended operation. The evaluation results documented in the report indicate that many of the existing programs are adequate to manage the aging effects for particular components or commodities within the scope of license renewal without change. The GALL Report also contains recommendations on the specific areas for which an existing program 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 tables in this section.

The purpose of Table 1 (refer to Sample Table 1 below) is to provide a summary comparison of specific plant AMR details with the corresponding tables of NUREG-1801 Volume 1. The table is essentially the same as Tables 3.1-1 through 3.6-1 of NUREG-1800, except that the "ID" column has been renamed the "Item Number" column, the "component" column has been expanded to "component/commodity", the "Type" column has been deleted and the "Related Item" column has been replaced by a "Discussion" column. The number in the "Item Number" column is the number in the "ID" column prefixed by the table number to provide the reviewer with a cross-reference from Table 1 to Table 2. The "Discussion" column is used 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 GALL Report assumptions.
- A discussion of how the line is consistent with the corresponding line item in NUREG-1801 Volume 1, when it may appear inconsistent.
- A discussion of how the item is different from the corresponding line item in NUREG-1801 Volume 1, when it may appear to be consistent (e.g., when there is exception taken to an aging management program that is listed in NUREG-1801).

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

Sample Table 1

Table 3.x.1 Summary of Aging Management Programs for __ Evaluated in Chapter __of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.x.1-01					
3.x.1-02					
3.x.1-03					

Table 2 (refer to Sample Table 2 below) provides the detailed results of the aging management reviews for those components/commodities identified in LRA Section 2 as being subject to aging management review. There will be a Table 2 for each system and structure in Section 2 with components/commodities subject to aging management review. Table 2 consists of the following nine columns:

Component/Commodity – The first column identifies the component/commodity types from Section 2 that are subject to aging management review. They are listed in alphabetical order. During the screening process, some components were incorporated into commodity groups based on similarity of their design or materials of construction. Use of commodity groups made it possible to address an entire group of components with a single evaluation. In the aging management reviews described in the following sections, further definition of commodity groups was performed based on design, material, environmental, and functional characteristics in order to disposition an entire group with a single aging management review.

Intended Function – The second column contains the license renewal intended functions (including abbreviations where applicable) for the listed component/commodity types. Definitions and abbreviations of intended functions are contained in Table 2.0-1.

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

Environment – The fourth column lists the environment to which the component/commodity types are exposed. Internal and external service environments are indicated. The internal and external service environments used in the SSES aging management reviews are listed below in Table 3.0-1 and Table 3.0-2, respectively.

Aging Effect Requiring Management – As part of the aging management review process, aging effects requiring management are identified for material and environment combinations. These are listed in column five. The SSES aging management review methodology is based on generic industry guidance for determining aging effects for both mechanical and structural components/commodities based on the materials of construction and applicable environmental conditions. The material and environment-based rules in the industry guidance documents are derived from known age-related degradation mechanisms and industry operating experience. The aging effect determination is supplemented by review of SSES operating experience.

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

NUREG-1801 Volume 2 Item – Each combination of component/commodity type, material, environment, aging effect 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 consistencies. When they are identified, consistencies are documented by noting the appropriate NUREG-1801 Volume 2 item number in column seven of Table 2. If there is no corresponding item number in NUREG-1801 Volume 2, the entry is indicated as not applicable (N/A). Thus, a reviewer can readily identify where there is correspondence between the plant-specific tables and the NUREG-1801 Volume 2 tables.

Table 1 Item – Each combination of component/commodity, material, environment, aging effect 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 column eight of Table 2. If there is no corresponding item in NUREG-1801 Volume 1, this row in column eight is indicated as ‘not applicable’ (N/A). Therefore, the information from the two tables can be correlated.

Notes – In order to realize the full benefit of NUREG-1801, each applicant needs to identify how the information in Table 2 aligns with the information in NUREG-1801 Volume 2. This is accomplished through a series of notes. All notes designated with letters are standard notes that will be the same from application to application throughout the industry. Any additional plant-specific notes will be identified by a number. Plant-specific notes provide information or clarification regarding the aging management review of the Table 2 line item. The generic and plant-specific notes are listed at the end of Sections 3.1 through 3.6. Section 3.1 uses plant-specific notes numbered in the 0100-series (e.g., 0101, 0102, etc.). Section 3.2 uses plant-specific notes numbered in the 0200-series; Section 3.3, in the 0300-series; Section 3.4, in the 0400-series; Section 3.5, in the 0500-series; and Section 3.6, in the 0600-series.

Generic notes A through E indicate that a useful comparison may be made between the Table 2 line item and NUREG-1801. Therefore, items associated with notes A through E will also contain a NUREG-1801 Volume 2 item and a reference to a Table 1 item.

Sample Table 2

Table 3.x.2-y Aging Management Review Results–<System Name>

Component / Commodity	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes

Table Usage

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

Table 2 provides all the aging management review information for the plant, irrespective of any comparisons to NUREG-1801. In a given row in the table, the reviewer can see the intended function, material, environment, aging effect requiring management, and aging management program combination for a component/commodity type within a system or structure. In addition, a referenced item number in column seven will identify any correlation between the information in Table 2 and that in NUREG-1801 Volume 2. The reviewer can refer to the item number in NUREG-1801 Volume 2, if desired, to

verify the correlation. If the column indicates 'not applicable' (N/A), no correspondence to NUREG-1801 Volume 2 was identified. As the reviewer continues across the table from left to right in a row, the next column is labeled Table 1 Item. If there is a reference number to a corresponding row in Table 1, the reviewer can refer to Table 1 to determine how the aging management program for this combination aligns with NUREG-1801. Table 2 provides a reviewer with a means to navigate from the Component/Commodity subject to an aging management review in LRA Section 2 through the evaluation of aging management programs used to manage the effects of aging for the components/ commodities.

Components/commodities in Tables 3.1.2-y, 3.2.2-y, 3.3.2-y, and 3.4.2-y that are nonsafety-related and have a nonsafety-affecting safety (NSAS) function are listed at the end of each table with an intended function of "Structural Integrity".

Table 3.0-1
Internal Service Environments

SSES Environment	Description
Air-Gas (including both dry and moist compressed air and/or gases)	Compressed air is defined to be ambient air that has been filtered and compressed for use in plant equipment. Depending on its use, compressed air may also be dried. Compressed gases may include carbon dioxide, halon, hydrogen, nitrogen, Freon or other refrigeration gases. Such gases are received in bulk and are dry and free of contaminants, except when used in a manner that allows contact with water or condensation, in which case the gas becomes moist. Comparable GALL environments: Condensation or Moist Air, Dried Air, Gas
Fuel Oil	Fuel oil is usually diesel grade number 2 that is used to fuel engines, such as for the emergency diesel generators and diesel-driven fire pumps. Fuel oil is typically stored in tanks that are open to the environment (through vents) and will therefore be exposed to moist air at the surface level. While fuel oil is predominantly an internal environment, external surfaces of mechanical components may be submerged in fuel oil (e.g., transfer pumps). Comparable GALL environments: Fuel Oil

Table 3.0-1 (continued) Internal Service Environments	
SSES Environment	Description
Lubricating Oil	Lubricating oil is typical of oil used in bearings, gear boxes, etc., for lubrication. All lubricating oil environments are assumed to contain some amount of water contamination. While lubricating oil is predominantly an internal environment, external surfaces of mechanical components may be submerged in lubricating oil (e.g., transfer pumps). Comparable GALL environments: Lubricating Oil
N/A (not applicable)	N/A is used for components for which an internal environment is not applicable (e.g., strainer screens, heat exchanger fins, flow elements).
Raw Water	The raw water environment is defined as water from a lake, pond, river or other reservoir that is open to the elements. Raw water is considered to be rough filtered and possibly treated with a biocide or other chemicals. While raw water is predominantly an internal environment, structural components/commodities and the external surface of mechanical components may be submerged in raw water (e.g., in the Spray Pond and ESSW Pumphouse). Also, for the purposes of AMR, the contents of various sumps, tanks and other drainage components are also considered to be raw water environments, as is the potable water environment, since these contents are not treated or controlled by a credited site program and may contain unknown contaminants. These environments will also be evaluated as raw water. Comparable GALL environments: Raw Water
Treated Water	The treated water environment is defined to be filtered and chemically treated demineralized water that may be deaerated, treated with a biocide, antifreeze agent, corrosion inhibitor, dispersant or a combination of these treatments. For license renewal purposes, treated water includes the borated water in the Standby Liquid Control System. This environment includes both the liquid and steam phase of chemically treated water. While treated water is predominantly an internal environment, structural components/commodities and the external surface of mechanical components may be submerged in treated water (e.g., in the suppression pool and/or fuel pool). Comparable GALL environments: Closed Cycle Cooling Water, Closed Cycle Cooling Water >60ºC (>140ºF), Sodium Pentaborate Solution, Steam, Treated Water, Treated Water >60ºC (>140ºF)

Table 3.0-1 (continued)
Internal Service Environments

SSES Environment	Description
Treated Water with Neutron Fluence	The treated water with neutron fluence environment is the same as the treated water environment with the added condition of neutron radiation in excess of $1x10^{17}$ neutrons per square centimeter (n/cm^2). This environment is unique to the region of the reactor pressure vessel immediately around the reactor core and the beltline region of the reactor vessel. Comparable GALL environments: Reactor Coolant and Neutron Flux
Ventilation	For SSES license renewal purposes, a distinction is made between ventilation air and compressed air and gases. Ventilation air is defined as ambient air that is conditioned to maintain a suitable environment for equipment operation or personnel occupancy. Ventilation air may be conditioned by filtering, heating, cooling, dehumidification or some combination. Internal ambient environments found inside components such as piping and tanks that are either vented or otherwise open to the ambient conditions in their location are also included under this environment, as are exhaust gases, such as from a diesel engine. While ventilation is predominantly an internal environment, the external surfaces of mechanical components may be exposed to ventilation (e.g., cooling unit tubes in HVAC systems). Comparable GALL environments: Air – Indoor Uncontrolled, Air – Outdoor, Condensation, Diesel Exhaust

Table 3.0-2
External Service Environments

SSES Environment	Description
Adverse Localized Environment	Environment which could exist in limited plant areas caused by heat, radiation, moisture or voltage in the presence of oxygen. Used for electrical evaluations only. Comparable GALL environments: Adverse Localized Environment
Buried / Below Grade	The buried environment is defined as equipment/components beneath ground level in contact with soil and potentially subject to groundwater. Components that are buried are normally coated and wrapped to prevent the soil and groundwater from contacting the component surface. However, no credit for this coating/wrap is explicitly taken in the identification of aging effects requiring evaluation. For structural evaluations a beneath ground level, environment is referred to as below grade. The below grade environment may be soil, sub-grade or structural backfill with the potential for groundwater. Coatings, if present, are not credited. Comparable GALL environments: Soil, Ground Water/Soil
Embedded	The embedded environment is defined for components that are encased in concrete, which forms a tight seal around the external surfaces of the component. Comparable GALL environments: Concrete
Fuel Oil	Fuel oil is usually diesel grade number 2 that is used to fuel engines, such as for the emergency diesel generators and diesel-driven fire pumps. Fuel oil is typically stored in tanks that are open to the environment (through vents) and will therefore be exposed to moist air at the surface level. While fuel oil is predominantly an internal environment, external surfaces of mechanical components may be submerged in fuel oil (e.g., transfer pumps). Comparable GALL environments: Fuel Oil
Lubricating Oil	Lubricating oil is typical of oil used in bearings, gear boxes, etc., for lubrication. All lubricating oil environments are assumed to contain some amount of water contamination. While lubricating oil is predominantly an internal environment, external surfaces of mechanical components may be submerged in lubricating oil (e.g., transfer pumps). Comparable GALL environments: Lubricating Oil

Table 3.0-2 (continued)
External Service Environments

SSES Environment	Description
N/A (not applicable)	N/A is used for components for which an external environment is not applicable (e.g., tube plugs).
Indoor Air / Protected from Weather	Equipment and components located in buildings and/or structures such that they are protected from the elements are in an indoor air environment. Components in systems with external surface temperatures the same or higher than ambient conditions due to normal system operation are considered to be dry. Components in systems with external surface temperatures below ambient conditions have the potential to be wet due to the formation of condensation. Although nitrogen gas is used to maintain an "inert" atmosphere inside primary containment, the oxygen content may be up to 4% by volume. For conservatism, no distinction will be made between primary containment and other indoor air environments with respect to oxygen content. The evaluation of this environment considers the potential for high temperatures, humidity, and radiation, where applicable, as well as aggressive chemicals on external surfaces and structural components/commodities. Components/Commodities are considered to be sheltered from external weather conditions. For structural evaluations, the indoor environment is referred to as protected from weather. Comparable GALL environments: Air – Indoor Uncontrolled, Condensation or Moist Air
Outdoor Air / Exposed to Weather	Equipment and components located in the outdoor air environment are exposed to heat, cold, various forms of precipitation, and the effects of sunlight. This outdoor air environment is defined as a moist air environment. Components in systems with external surface temperatures the same or higher than ambient conditions due to normal system operation are considered to be mostly dry with occasional short term wetting from precipitation. Components in systems with external surface temperatures below ambient conditions also have the potential for prolonged wetting due to the formation of condensation. For structural evaluations, the outdoor environment is referred to as exposed to weather. SSES is located in an in-land rural environment and is not near major industrial plants, which could raise the possibility of exposure to sulfate or chloride attack. Comparable GALL environments: Air – Outdoor, Condensation or Moist Air

Table 3.0-2 (continued)
External Service Environments

SSES Environment	Description
Raw Water / Exposed to Raw Water	The raw water environment is defined as water from a lake, pond, river or other reservoir that is open to the elements. Raw water is considered to be rough filtered and possibly treated with a biocide or other chemicals. For the purposes of AMR, the contents of various sumps and drain tanks are also considered to be raw water environments, since these contents are not treated or controlled and may contain unknown contaminants. These environments will also be evaluated as raw water. While raw water is predominantly an internal environment, structural components/commodities and the external surface of mechanical components may be submerged in raw water (e.g., in the Spray Pond and ESSW Pumphouse). Comparable GALL environments: Raw Water
Treated Water / Exposed to Treated Water	The treated water environment is defined to be filtered and chemically treated demineralized water that may be deaerated, treated with a biocide, antifreeze agent, corrosion inhibitor, dispersant or a combination of these treatments. For license renewal purposes, treated water includes the borated water in the Standby Liquid Control System. This environment includes both the liquid and steam phase of chemically treated water. While treated water is predominantly an internal environment, structural components/commodities and the external surface of mechanical components may be submerged in treated water (e.g., in the suppression pool and/or fuel pool). Comparable GALL environments: Closed Cycle Cooling Water, Closed Cycle Cooling Water >60ºC (>140ºF), Treated Water, Treated Water >60ºC (>140ºF)
Ventilation	Ventilation air is defined as ambient air that is conditioned to maintain a suitable environment for equipment operation or personnel occupancy. Ventilation air may be conditioned by filtering, heating, cooling, dehumidification or some combination. While ventilation is predominantly an internal environment, the external surfaces of mechanical components may be exposed to ventilation (e.g., cooling unit tubes in HVAC systems). Comparable GALL environments: Air – Indoor Uncontrolled, Condensation

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

3.1.1 Introduction

Section 3.1 provides the results of the aging management reviews (AMRs) for those components identified in Section 2.3.1, Reactor Vessel, Internals, and Reactor Coolant System, as subject to aging management review. The systems or portions of systems are described in the indicated sections.

- Reactor Pressure Vessel (Section 2.3.1.1)
- Reactor Vessel Internals (Section 2.3.1.2)
- Reactor Coolant System Pressure Boundary (Section 2.3.1.3)

Table 3.1.1, Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report, provides the summary of the programs evaluated in NUREG-1801 that are applicable to component / commodity groups in this section.

Note that the results of the AMRs for components included in Section 2.3.1.3 by the nonsafety-affecting safety (NSAS) evaluations are provided in Section 3.3 of this application. The component types (piping and piping components) were compared to NUREG-1801 Chapter VII items.

3.1.2 Results

The following tables summarize the results of the aging management review for systems in the Reactor Vessel, Internals, and Reactor Coolant System area.

Table 3.1.2-1 Aging Management Review Results – Reactor Pressure Vessel

Table 3.1.2-2 Aging Management Review Results – Reactor Vessel Internals

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary

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

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

3.1.2.1.1 Reactor Pressure Vessel

Materials

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

- Carbon Steel
- Carbon Steel with Stainless Steel Cladding
- Low Alloy Steel
- Low Alloy Steel with Stainless Steel Cladding
- Nickel Based Alloy
- Stainless Steel

Environments

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

- Indoor Air
- Treated Water
- Treated Water with Neutron Fluence

Aging Effects Requiring Management

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

- Cracking
- Cracking - Fatigue
- Cracking – Flaw Growth
- Cracking – Stress Corrosion Cracking (SCC)
- Loss of Material
- Reduction in Fracture Toughness

Aging Management Programs

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

- Bolting Integrity Program
- BWR Vessel ID Attachment Welds Program
- BWR Feedwater Nozzle Program
- BWR CRD Return Line Nozzle Program
- BWR Stress Corrosion Cracking Program
- BWR Penetrations Program
- BWR Vessel Internals Program
- BWR Water Chemistry Program
- Inservice Inspection (ISI) Program
- Inservice Inspection (ISI) Program – IWF
- Reactor Head Closure Studs Program
- Reactor Vessel Surveillance Program

3.1.2.1.2 Reactor Vessel Internals

Materials

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

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

Environments

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

- Indoor Air
- Treated Water
- Treated Water with Neutron Fluence

Aging Effects Requiring Management

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

- Cracking
- Cracking - Fatigue
- Loss of Material
- Reduction of Fracture Toughness

Aging Management Programs

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

- BWR Vessel Internals Program
- BWR Water Chemistry Program
- Thermal Aging and Neutron Embrittlement of Cast Austenitic Stainless Steel (CASS) Program
- Inservice Inspection (ISI) Program

3.1.2.1.3 Reactor Coolant System Pressure Boundary

Materials

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

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

Environments

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

- Indoor Air
- Treated Water

Aging Effects Requiring Management

The following aging effects require management for the Reactor Coolant System Pressure Boundary components:

- Cracking
- Cracking - Fatigue
- Loss of Material
- Loss of Material – Flow Accelerated Corrosion (FAC)
- Reduction of Fracture Toughness

Aging Management Programs

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

- Bolting Integrity Program
- BWR Stress Corrosion Cracking (SCC) Program
- BWR Water Chemistry Program
- Closed Cooling Water (CCW) Chemistry Program

- Flow-Accelerated Corrosion (FAC) Program
- Inservice Inspection (ISI) Program
- Main Steam Flow Restrictor Inspection
- Small Bore Class 1 Piping Inspection
- System Walkdown Program

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

For the SSES Reactor Vessel, Internals, and Reactor Coolant System, those items requiring further evaluation are addressed in the following sections.

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 this TLAA is addressed separately in Section 4.3 of the LRA.

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

3.1.2.2.2.1 BWR Top Head and Top Head Nozzles, PWR Steam Generator Shell Assembly

The BWR Water Chemistry Program is supplemented by the Inservice Inspection (ISI) Program for managing loss of material due to general, pitting, and crevice corrosion for the steel reactor vessel upper head and the top head nozzles exposed to reactor coolant. A one-time inspection is not credited.

The BWR Water Chemistry Program in association with the Small Bore Class 1 Piping Inspection manages loss of material due to general, pitting, and crevice corrosion for steel piping and valves less than 4 inches exposed to reactor coolant. The Small Bore Class 1 Piping Inspection is a one-time inspection.

Loss of material for a steam generator shell assembly is only applicable to PWRs.

3.1.2.2.2.2 Isolation Condenser Components

Loss of material for BWR isolation condenser components is not applicable to SSES, since the SSES design does not include an isolation condenser.

3.1.2.2.2.3 Flanges, Nozzles, Penetrations, Pressure Housings, Safe Ends, and Vessel Shells, Heads, and Welds

The BWR Water Chemistry Program is supplemented by the Inservice Inspection (ISI) Program for managing loss of material due to crevice and pitting corrosion for the steel reactor vessel upper head closure flange and shell closure flange with stainless steel cladding exposed to reactor coolant. A one-time inspection is not credited.

The BWR Water Chemistry Program alone is credited for managing loss of material due to crevice and pitting corrosion of the steel reactor vessel shell rings, ID attachments and welds, bottom head, nozzles, safe ends, and CRD stub tubes and housings with stainless steel cladding exposed to reactor coolant. A one-time inspection is not credited.

The BWR Water Chemistry Program in association with the Small Bore Class 1 Piping Inspection or the Inservice Inspection (ISI) Program manages loss of material due to pitting and crevice corrosion for stainless steel components of the reactor coolant system (RCS) pressure boundary exposed to reactor coolant. The Small Bore Class 1 Piping Inspection is a one-time inspection.

3.1.2.2.2.4 PWR Steam Generator Upper and Lower Shell and Transition Cone

The associated items in Table 3.1.1 are applicable to PWRs only.

3.1.2.2.3 Loss of Fracture Toughness due to Neutron Irradiation Embrittlement

3.1.2.2.3.1 Neutron Irradiation Embrittlement TLAA

Certain aspects of neutron irradiation embrittlement are time-limited aging analyses (TLAAs) as defined in 10 CFR 54.3. TLAAs are required to be evaluated in accordance with 10 CFR 54.21(c)(1). The evaluation of this TLAA is addressed separately in Section 4.2 of the LRA.

3.1.2.2.3.2 Reactor Vessel Beltline Shell, Nozzle, and Welds

Reduction in fracture toughness due to radiation embrittlement could occur for reactor vessel beltline region materials exposed to reactor coolant and neutron flux. A reactor vessel materials surveillance program monitors radiation embrittlement of the steel reactor vessel beltline materials with stainless steel cladding. The Reactor Vessel Surveillance Program, and the results of its evaluation for license renewal, are presented in Appendix B of the LRA.

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

3.1.2.2.4.1 BWR Top Head Enclosure Vessel Flange Leak Detection Lines

The reactor vessel flange leak detection line at SSES is a Class 1 line that is normally dry. The stainless steel line is evaluated for a treated water environment and is therefore susceptible to cracking due to stress corrosion cracking. This aging effect is managed with a combination of the BWR Water Chemistry Program and the Small Bore Class 1 Piping Inspection.

3.1.2.2.4.2 Isolation Condenser Components

Cracking of BWR isolation condenser components is not applicable to SSES, since the SSES design does not include an isolation condenser.

3.1.2.2.5 Crack Growth due to Cyclic Loading

The associated items in Table 3.1.1 are applicable to PWRs only.

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

The associated items in Table 3.1.1 are applicable to PWRs only.

3.1.2.2.7 Cracking due to Stress Corrosion Cracking

The associated items in Table 3.1.1 are applicable to PWRs only.

3.1.2.2.8 Cracking due to Cyclic Loading

3.1.2.2.8.1 Stainless Steel BWR Jet Pump Sensing Lines

For SSES, the jet pump instrumentation lines inside the vessel are not subject to aging management review, as they do not perform an intended function. The lines outside of the vessel are part of the RCS pressure boundary and are subject to aging management review for a reactor coolant environment. Cracking of the stainless steel lines external to the vessel is managed with a combination of the BWR Water Chemistry Program and the Small Bore Class 1 Piping Inspection.

3.1.2.2.8.2 Isolation Condenser Components

Cracking of BWR isolation condenser components is not applicable to SSES, since the SSES design does not include an isolation condenser.

3.1.2.2.9 Loss of Preload due to Stress Relaxation

The associated items in Table 3.1.1 are applicable to PWRs only.

3.1.2.2.10 Loss of Material due to Erosion in Steam Generators

The associated items in Table 3.1.1 are applicable to PWRs only.

3.1.2.2.11 Cracking due to Flow-Induced Vibration

Cracking due to flow-induced vibration for SSES stainless steel steam dryers exposed to reactor coolant is managed by a combination of the BWR Vessel Internals Program and the BWR Water Chemistry Program.

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

The associated items in Table 3.1.1 are applicable to PWRs only.

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

The associated items in Table 3.1.1 are applicable to PWRs only.

3.1.2.2.14 Wall Thinning due to Flow-Accelerated Corrosion in Steam Generators

The associated items in Table 3.1.1 are applicable to PWRs only.

3.1.2.2.15 Changes in Dimension due to Void Swelling

The associated items in Table 3.1.1 are applicable to PWRs only.

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

The associated items in Table 3.1.1 are applicable to PWRs only.

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

The associated items in Table 3.1.1 are applicable to PWRs only.

3.1.2.2.18 Quality Assurance for Aging Management of Nonsafety-Related Components

Quality Assurance provisions applicable to license renewal are discussed in Appendix B, Section B.1.3, of the LRA.

3.1.2.3 Time-Limited Aging Analysis

The Time-Limited Aging Analyses (TLAA) identified below are associated with the Reactor Vessel, Internals, and Reactor Coolant System components. The section of the application that contains the TLAA review results is indicated in parentheses.

1. Neutron Irradiation Embrittlement (Section 4.2, Reactor Vessel Neutron Embrittlement)
2. Metal Fatigue (Section 4.3, Metal Fatigue)
3. Main Steam Line Flow Restrictor Erosion (Section 4.7.1, Main Steam Line Flow Restrictor Erosion Analyses)
4. High Energy Line Break (HELB) Locations (Section 4.7.2, High Energy Line Break Cumulative Fatigue Usage Factors)
5. Loss of Preload due to Stress Relaxation of Core Plate Rim Hold Down Bolts (Section 4.7.3, Core Plate Rim Hold-Down Bolts)

3.1.3 Conclusions

The Reactor Vessel, Internals, and Reactor Coolant System components/commodities subject to aging management review have been identified in accordance with 10 CFR54.21. The aging management programs selected to manage the effects of aging for the mechanical components/commodities are identified in the following tables

and Section 3.1.2.1. A description of the aging management programs is provided in Appendix B of this application, along with the demonstration that the identified aging effects will be managed for the period of extended operation.

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

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-01	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. Refer to Section 3.1.2.2.1 for further information.
3.1.1-02	Steel; stainless steel; steel with nickel-alloy or stainless steel cladding; nickel-alloy reactor vessel components: flanges; nozzles; penetrations; 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. Refer to Section 3.1.2.2.1 for further information.
3.1.1-03	Steel; stainless steel; steel with nickel-alloy or stainless steel cladding; nickel-alloy reactor coolant pressure boundary piping, piping components, and piping elements exposed to reactor coolant	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. Refer to Section 3.1.2.2.1 for further information.
3.1.1-04	Steel pump and valve closure bolting	Cumulative fatigue damage	TLAA, evaluated in accordance with 10 CFR 54.21(c) check Code limits for allowable cycles (less than 7000 cycles) of thermal stress range	Yes, TLAA	Not applicable. Cumulative fatigue damage of steel pump and valve closure bolting was not identified as a TLAA for SSES.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-05	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. Refer to Section 3.1.2.2.1 for further information.
3.1.1-06	PWR only				
3.1.1-07	PWR only				
3.1.1-08	PWR only				
3.1.1-09	PWR only				
3.1.1-10	PWR only				

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-11	Steel top head enclosure (without cladding) top head nozzles (vent, top head spray or RCIC, and spare) exposed to reactor coolant	Loss of material due to general, pitting and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	The BWR Water Chemistry Program in association with the Inservice Inspection (ISI) Program is credited to manage loss of material for the reactor vessel upper head dome and closure flange, top head nozzles N6 and N7, and piping and valves ≥ 4 inches. The BWR Water Chemistry Program alone is credited to manage loss of material for nozzles (except N6 and N7), safe ends, and flanges, and also for main steam flow elements. The BWR Water Chemistry Program in association with the Small Bore Class 1 Piping Inspection is credited to manage loss of material for piping and valves < 4 inches. Refer to Section 3.1.2.2.2.1 for further information.
3.1.1-12	PWR only				

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-13	Steel and stainless steel isolation condenser components exposed to reactor coolant	Loss of material due to general (steel only), pitting and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Not applicable, SSES does not use an isolation condenser. Refer to Section 3.1.2.2.2.2 for further information.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-14	Stainless steel, nickel-alloy, and steel with nickel-alloy or stainless steel cladding reactor vessel flanges, nozzles, penetrations, safe ends, vessel shells, heads and welds	Loss of material due to pitting and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	The BWR Water Chemistry Program in association with the Inservice Inspection (ISI) Program is credited to manage loss of material for the stainless steel clad reactor vessel upper head flange and shell closure flange. The BWR Water Chemistry Program alone is credited to manage loss of material for stainless steel, nickel alloy, or stainless steel clad reactor vessel shell rings, ID attachments and welds, bottom heads, nozzles, safe ends, and CRD stud tubes and housings. Loss of material for stainless steel or nickel alloy reactor vessel internals and thermal sleeves is included under this item and credit the BWR Water Chemistry Program in association with the BWR Vessel Internals Program for management. Refer to Section 3.1.2.2.2.3 for further information.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-15	Stainless steel; steel with nickel-alloy or stainless steel cladding; and nickel-alloy reactor coolant pressure boundary components exposed to reactor coolant	Loss of material due to pitting and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	The BWR Water Chemistry Program in association with the Small Bore Class 1 Piping Inspection or the Inservice Inspection (ISI) Program is credited to manage loss of material for stainless steel components of the RCS pressure boundary. This item is consistent with NUREG-1801 where the Small Bore Class 1 Piping Inspection is credited. It is not consistent where the ISI Program is credited. Refer to Section 3.1.2.2.2.3 for further information.
3.1.1-16	PWR only				

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
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 for the reactor vessel beltline shell plates and welds is a TLAA. Refer to Section 3.1.2.2.3.1 for further information.
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	Consistent with NUREG-1801. The Reactor Vessel Surveillance Program is credited to manage reduction in fracture toughness for steel beltline materials with stainless steel cladding. Refer to Section 3.1.2.2.3.2 for further information.
3.1.1-19	Stainless steel and nickel alloy top head enclosure vessel flange leak detection line	Cracking due to stress corrosion cracking and intergranular stress corrosion cracking	A plant-specific aging management program is to be evaluated.	Yes, plant specific	A combination of the BWR Water Chemistry Program and the Small Bore Class 1 Piping Inspection is credited to manage cracking of the flange leak detection lines. Refer to Section 3.1.2.2.4.1 for further information.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-20	Stainless steel isolation condenser components exposed to reactor coolant	Cracking due to stress corrosion cracking and intergranular stress corrosion cracking	Inservice Inspection (IWB, IWC, and IWD), Water Chemistry, and plant-specific verification program	Yes, detection of aging effects is to be evaluated	Not applicable, SSES does not use an isolation condenser. Refer to Section 3.1.2.2.4.2 for further information.
3.1.1-21	PWR only				
3.1.1-22	PWR only				
3.1.1-23	PWR only				
3.1.1-24	PWR only				
3.1.1-25	Stainless steel jet pump sensing line	Cracking due to cyclic loading	A plant-specific aging management program is to be evaluated.	Yes, plant specific	The jet pump sensing lines inside the reactor vessel are not subject to aging management review for SSES. The lines outside of the reactor vessel are part of the RCS pressure boundary and are subject to aging management review. Cracking of these lines is addressed by item 3.1.1-48 of this table. Refer to Section 3.1.2.2.8.1 for further information.
3.1.1-26	Steel and stainless steel isolation condenser components exposed to reactor coolant	Cracking due to cyclic loading	Inservice Inspection (IWB, IWC, and IWD) and plant-specific verification program	Yes, detection of aging effects is to be evaluated	Not applicable, SSES does not use an isolation condenser. Refer to Section 3.1.2.2.8.2 for further information.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-27	PWR only				
3.1.1-28	PWR only				
3.1.1-29	Stainless steel steam dryers exposed to reactor coolant	Cracking due to flow-induced vibration	A plant-specific aging management program is to be evaluated.	Yes, plant specific	A combination of the BWR Vessel Internals Program and the BWR Water Chemistry Program is credited to manage cracking of the steam dryer. Refer to Section 3.1.2.2.11 for further information.
3.1.1-30	PWR only				
3.1.1-31	PWR only				
3.1.1-32	PWR only				
3.1.1-33	PWR only				
3.1.1-34	PWR only				
3.1.1-35	PWR only				
3.1.1-36	PWR only				
3.1.1-37	PWR only				

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-38	Steel (with or without stainless steel cladding) control rod drive return line nozzles exposed to reactor coolant	Cracking due to cyclic loading	BWR CR Drive Return Line Nozzle	No	The BWR CRD Return Line Nozzle Program is credited to manage cracking for the steel with stainless steel cladding nozzle. The program contains an exception. The BWR CRD Return Line Nozzle Program is also credited to manage cracking of a nickel alloy cap and compared to this item.
3.1.1-39	Steel (with or without stainless steel cladding) feedwater nozzles exposed to reactor coolant	Cracking due to cyclic loading	BWR Feedwater Nozzle	No	Consistent with NUREG-1801. The BWR Feedwater Nozzle Program is credited to manage cracking for the unclad steel feedwater nozzles.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-40	Stainless steel and nickel alloy penetrations for control rod drive stub tubes instrumentation, jet pump instrument, standby liquid control, flux monitor, and drain line exposed to reactor coolant	Cracking due to stress corrosion cracking, Intergranular stress corrosion cracking, cyclic loading	BWR Penetrations and Water Chemistry	No	Consistent with NUREG-1801. The BWR Penetrations Program in conjunction with the BWR Water Chemistry Program is credited to manage cracking of nickel alloy and stainless steel materials for nozzles, safe ends, flux monitor housing, and control rod drive stub tubes. The combined programs are also credited to manage cracking of steel nozzles with partial stainless steel cladding.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-41	Stainless steel and nickel alloy piping, piping components, and piping elements greater than or equal to 4 NPS; nozzle safe ends and associated welds	Cracking due to stress corrosion cracking and intergranular stress corrosion cracking	BWR Stress Corrosion Cracking and Water Chemistry	No	Consistent with NUREG-1801. The BWR Stress Corrosion Cracking Program in conjunction with the BWR Water Chemistry Program is credited to manage cracking for stainless steel and nickel alloy safe ends and piping components (including MS flow elements/ restrictors and valve bodies) equal to or greater than 4 inch NPS. The combined programs are also credited to manage cracking of stainless steel pump casings and covers, and weld overlays.
3.1.1-42	Stainless steel and nickel alloy vessel shell attachment welds exposed to reactor coolant	Cracking due to stress corrosion cracking and intergranular stress corrosion cracking	BWR Vessel ID Attachment Welds and Water Chemistry	No	Consistent with NUREG-1801. The BWR Vessel ID Attachment Weld Program in conjunction with the BWR Water Chemistry Program are credited to manage cracking for stainless steel and nickel alloy reactor vessel ID attachments and welds.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-43	Stainless steel fuel supports and control rod drive assemblies control rod drive housing exposed to reactor coolant	Cracking due to stress corrosion cracking and intergranular stress corrosion cracking	BWR Vessel Internals and Water Chemistry	No	Consistent with NUREG-1801 for the control rod drive housings. The BWR Vessel Internals Program in conjunction with the BWR Water Chemistry Program is credited to manage cracking for stainless steel control rod drive housings and fuel support pieces. In addition, the Inservice Inspection (ISI) Program is credited for the control rod drive housings. The orificed and peripheral fuel support pieces are identified as different components but otherwise consistent with NUREG-1801. The combined programs are also credited to manage cracking of stainless steel control rod guide tubes.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-44	Stainless steel and nickel alloy core shroud, core plate, core plate bolts, support structure, top guide, core spray lines, spargers, jet pump assemblies, control rod drive housing, nuclear instrumentation guide tubes	Cracking due to stress corrosion cracking, intergranular stress corrosion cracking, irradiation-assisted stress corrosion cracking	BWR Vessel Internals and Water Chemistry	No	Consistent with NUREG-1801. The BWR Vessel Internals Program in conjunction with the BWR Water Chemistry Program is credited to manage cracking of stainless steel and nickel alloy jet pump assemblies, incore dry tubes, and thermal sleeves for core spray and reactor recirculation nozzles, and stainless steel core shroud, shroud support, core plate, incore guide tubes, core spray line, and top guide components. The combined programs are also credited to manage cracking of stainless steel standby liquid control lines.
3.1.1-45	Steel piping, piping components, and piping elements exposed to reactor coolant	Wall thinning due to flow-accelerated corrosion	Flow-Accelerated Corrosion	No	Consistent with NUREG-1801. The Flow-Accelerated Corrosion (FAC) Program is credited to manage wall thinning for steel piping components.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-46	Nickel alloy core shroud and core plate access hole cover (mechanical covers)	Cracking due to stress corrosion cracking, intergranular stress corrosion cracking, irradiation-assisted stress corrosion cracking	Inservice Inspection (IWB, IWC, and IWD), and Water Chemistry	No	Not applicable. The SSES access hole covers are a welded design, not a mechanical (bolted) design.
3.1.1-47	Stainless steel and nickel-alloy reactor vessel internals exposed to reactor coolant	Loss of material due to pitting and crevice corrosion	Inservice Inspection (IWB, IWC, and IWD), and Water Chemistry	No	Loss of material for stainless steel and nickel alloy components of the reactor vessel internals is addressed under item 3.1.1-14.
3.1.1-48	Steel and stainless steel Class 1 piping, fittings and branch connections < NPS 4 exposed to reactor coolant	Cracking due to stress corrosion cracking, intergranular stress corrosion cracking (for stainless steel only), and 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. A combination of the BWR Water Chemistry Program and the Small Bore Class 1 Piping Inspection is credited to manage cracking of stainless steel piping components. In addition, stainless steel tubing is included under this item and credits the BWR Water Chemistry Program alone to manage cracking.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-49	Nickel alloy core shroud and core plate access hole cover (welded covers)	Cracking due to stress corrosion cracking, intergranular stress corrosion cracking, irradiation-assisted stress corrosion cracking	Inservice Inspection (IWB, IWC, and IWD), Water Chemistry, and, for BWRs with a crevice in the access hole covers, augmented inspection using UT or other demonstrated acceptable inspection of the access hole cover welds	No	Consistent with NUREG-1801 with exceptions. A combination of the BWR Water Chemistry Program and the Inservice Inspection (ISI) Program is credited to manage cracking of nickel alloy and stainless steel access hole covers. The ISI Program contains an exception. The SSES access hole covers were evaluated and determined not susceptible to SCC. The covers are of the non-creviced design. The evaluation concluded that a VT-1 exam every 3rd outage (every 6 years) was adequate for inspection. The stainless steel core shroud is addressed under item 3.1.1-44.
3.1.1-50	High-strength low alloy steel top head closure studs and nuts exposed to air with reactor coolant leakage	Cracking due to stress corrosion cracking and intergranular stress corrosion cracking	Reactor Head Closure Studs	No	Consistent with NUREG-1801. The Reactor Head Closure Studs Program is credited to manage cracking for steel vessel closure bolting.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-51	Cast austenitic stainless steel jet pump assembly castings; orificed fuel support	Loss of fracture toughness due to thermal aging and neutron irradiation embrittlement	Thermal Aging and Neutron Irradiation Embrittlement of CASS	No	Consistent with NUREG-1801. The Thermal Aging and Neutron Embrittlement of Cast Austenitic Stainless Steel (CASS) Program is credited to manage loss of fracture toughness for jet pump assemblies and orificed fuel support pieces formed of CASS material. The Thermal Aging and Neutron Embrittlement of Cast Austenitic Stainless Steel (CASS) Program is also credited to manage loss of fracture toughness for the CASS control rod guide tube bases and core spray line sparger elbows.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**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, with exceptions. The Bolting Integrity Program is credited to manage cracking due to SCC for high strength bolting (yield strength > 150 ksi). With respect to loss of preload, the program takes exception in that, consistent with the ASME code, age-related loss of preload (relaxation, creep and self loosening) is only expected for high temperatures of 700ºF or above and SSES systems operate below this temperature.
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. There are no steel piping, piping components, or piping elements exposed to closed-cycle cooling water in the Reactor Vessel, Internals, and Reactor Coolant System at SSES.
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. There are no copper alloy components in the Class 1 reactor vessel, vessel internals, or RCS pressure boundary for SSES.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**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 Inservice Inspection (ISI) Program is credited to manage loss of fracture toughness for CASS pump casings, pump covers, thermal barriers, and valve bodies. The ISI Program contains an exception. For CASS valve bodies less than 4 inch NPS, the Small Bore Class 1 Piping Inspection is credited to manage loss of fracture toughness. Main steam flow elements / flow restrictors formed of CASS are also compared to this item. The Main Steam Flow Restrictor Inspection is credited to detect loss of fracture toughness for these components.
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. There are no copper alloy components in the Class 1 reactor vessel, vessel internals, or RCS pressure boundary for SSES.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
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	Reduction of fracture toughness for CASS main steam flow restrictors, pump casings, pump covers, thermal barriers, and valve bodies, is addressed under item 3.1.1-55. Reduction of fracture toughness for CASS orificed fuel support pieces, control rod guide tube bases, jet pump assemblies, and core spray line sparger elbows is addressed under item 3.1.1-51. SSES has no other Class 1 piping, piping components, piping elements, or control rod drive housings formed of CASS material.
3.1.1-58	PWR only				
3.1.1-59	PWR only				
3.1.1-60	PWR only				
3.1.1-61	PWR only				
3.1.1-62	PWR only				
3.1.1-63	PWR only				
3.1.1-64	PWR only				

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-65	PWR only				
3.1.1-66	PWR only				
3.1.1-67	PWR only				
3.1.1-68	PWR only				
3.1.1-69	PWR only				
3.1.1-70	PWR only				
3.1.1-71	PWR only				
3.1.1-72	PWR only				
3.1.1-73	PWR only				
3.1.1-74	PWR only				
3.1.1-75	PWR only				
3.1.1-76	PWR only				
3.1.1-77	PWR only				
3.1.1-78	PWR only				
3.1.1-79	PWR only				
3.1.1-80	PWR only				
3.1.1-81	PWR only				
3.1.1-82	PWR only				

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-83	PWR only				
3.1.1-84	PWR only				
3.1.1-85	Nickel alloy piping, piping components, and piping elements exposed to air – indoor uncontrolled (external)	None	None	N/A - No AEM or AMP	Consistent with NUREG-1801. External surfaces of nickel alloy nozzle safe ends and caps exposed to indoor air have no identified aging effects, consistent with this item. External surfaces of nickel alloy incore flux monitor housings and incore dry tubes exposed to indoor air are also included under this item.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**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	N/A - No AEM or AMP	Consistent with NUREG-1801. External surfaces of stainless steel piping, piping components, and piping elements exposed to indoor air have no identified aging effects, consistent with this item. External surfaces of stainless steel control rod drive housings, incore flux monitor housings, and incore dry tubes exposed to indoor air are also included under this item.
3.1.1-87	Steel piping, piping components, and piping elements in concrete	None	None	N/A - No AEM or AMP	Not applicable. There are no components of the Class 1 reactor vessel, reactor internals, or RCS pressure boundary exposed to concrete for SSES.

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Shell and Heads								
Reactor Vessel Upper Head (Dome)	Pressure Boundary	Low Alloy Steel, Unclad	Treated Water (Internal)	Cracking - Flaw Growth	Inservice Inspection (ISI) Program	N/A	N/A	H
				Cracking - Fatigue	TLAA	IV.A1-7	3.1.1-02	A
				Loss of Material	BWR Water Chemistry Program Inservice Inspection (ISI) Program	IV.A1-11	3.1.1-11	E
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G 0101

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Reactor Vessel Upper Head Closure Flange	Pressure Boundary	Low Alloy Steel with SS clad on mating surface	Treated Water (Internal)	Loss of Material (unclad low alloy steel)	BWR Water Chemistry Program Inservice Inspection (ISI) Program	IV.A1-11	3.1.1-11	E
				Cracking - Flaw Growth	Inservice Inspection (ISI) Program	N/A	N/A	H
				Cracking - Fatigue	TLAA	IV.A1-7	3.1.1-02	A
				Loss of Material (cladding)	BWR Water Chemistry Program Inservice Inspection (ISI) Program	IV.A1-8	3.1.1-14	E
				Cracking - SCC (cladding)	BWR Water Chemistry Program	N/A	N/A	H
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G 0101

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Reactor Vessel Shell Closure Flange	Pressure Boundary	Low Alloy Steel with SS clad	Treated Water (Internal)	Cracking - Flaw Growth	Inservice Inspection (ISI) Program	N/A	N/A	H
				Cracking - Fatigue	TLAA	IV.A1.-7	3.1.1-02	A
				Loss of Material (cladding)	BWR Water Chemistry Program Inservice Inspection (ISI) Program	IV.A1-8	3.1.1-14	E
				Cracking - SCC (cladding)	BWR Water Chemistry Program	N/A	N/A	H
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G 0101

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Reactor Vessel Shell Shell Rings	Pressure Boundary	Low Alloy Steel with SS clad	Treated Water (Internal)	Cracking - Flaw Growth	Inservice Inspection (ISI) Program	N/A	N/A	H
				Cracking - Fatigue	TLAA	IV.A1-7	3.1.1-02	A
				Loss of Material (cladding)	BWR Water Chemistry Program	IV.A1-8	3.1.1-14	E
				Cracking - SCC (cladding)	BWR Water Chemistry Program	N/A	N/A	H
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G 0101
Reactor Vessel Shell Beltline Shell Plates Beltline Welds	Pressure Boundary Support	Low Alloy Steel with SS clad	Treated Water with Neutron Fluence (Internal)	Reduction in Fracture Toughness	TLAA	IV.A1-13	3.1.1-17	A
					Reactor Vessel Surveillance Program	IV.A1-14	3.1.1-18	B

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Reactor Vessel Bottom Head	Pressure Boundary	Low Alloy Steel with SS clad	Treated Water (Internal)	Cracking - Flaw Growth	Inservice Inspection (ISI) Program	N/A	N/A	H
				Cracking - Fatigue	TLAA	IV.A1-7	3.1.1-02	A
				Loss of Material (cladding)	BWR Water Chemistry Program	IV.A1-8	3.1.1-14	E
				Cracking - SCC (cladding)	BWR Water Chemistry Program	N/A	N/A	H
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G 0101

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Nozzles								
Nozzles N1 through N16	Pressure Boundary	Low Alloy Steel w/wo SS clad	Treated Water (Internal)	Cracking - Fatigue	TLAA	IV.A1-7	3.1.1-02	A
		Nickel Based Alloy	Indoor Air (External)	None Identified	None Required	N/A	N/A	G 0101
Nozzles N1 Reactor Recirculation Outlets N2 Reactor Recirculation Inlets N5 Core Spray N8 Jet Pump Instruments	Pressure Boundary	Low Alloy Steel with SS clad	Treated Water (Internal)	Cracking - Flaw Growth	Inservice Inspection (ISI) Program	N/A	N/A	H
				Loss of Material (cladding)	BWR Water Chemistry Program	IV.A1-8	3.1.1-14	E
				Cracking - SCC (cladding)	BWR Water Chemistry Program	N/A	N/A	H
Nozzles N3 Main Steam	Pressure Boundary	Low Alloy Steel unclad	Treated Water (Internal)	Cracking - Flaw Growth	Inservice Inspection (ISI) Program	N/A	N/A	H
				Loss of Material	BWR Water Chemistry Program	IV.A1-11	3.1.1-11	E

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Nozzles N4 Feedwater	Pressure Boundary	Low Alloy Steel unclad	Treated Water (Internal)	Cracking - Flaw Growth	BWR Feedwater Nozzle Program	IV.A1-3	3.1.1-39	A
				Loss of Material	BWR Water Chemistry Program	IV.A1-11	3.1.1-11	E
Nozzles N6 Head Spray & Spare N7 Head Vent	Pressure Boundary	Low Alloy Steel unclad	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Inservice Inspection (ISI) Program	IV.A1-11	3.1.1-11	E
				Cracking - Flaw Growth	Inservice Inspection (ISI) Program	N/A	N/A	H
Nozzle N9 CRD return	Pressure Boundary	Low Alloy Steel with SS clad	Treated Water (Internal)	Cracking - Flaw Growth	BWR CRD Return Line Nozzle Program	IV.A1-2	3.1.1-38	B
				Loss of Material (cladding)	BWR Water Chemistry Program	IV.A1-8	3.1.1-14	E
				Cracking - SCC (cladding)	BWR Water Chemistry Program	N/A	N/A	H

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Nozzle N10 Core DP-SLC	Pressure Boundary	Nickel Based Alloy	Treated Water (Internal)	Cracking - Flaw Growth and SCC	BWR Penetrations Program BWR Water Chemistry Program	IV.A1-5	3.1.1-40	B
N11, N12, N16 Instrumentation				Loss of Material	BWR Water Chemistry Program	IV.A1-8	3.1.1-14	E
Nozzle N13 RV Flange leak detection	Pressure Boundary	Nickel Based Alloy	Treated Water (Internal)	Cracking - Flaw Growth and SCC	BWR Penetrations Program BWR Water Chemistry Program	IV.A1-5	3.1.1-40	B
				Loss of Material	BWR Water Chemistry Program	IV.A1-8	3.1.1-14	E

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Nozzle N15 Drain	Pressure Boundary	Low Alloy Steel with partial SS clad	Treated Water (Internal)	Cracking - Flaw Growth	BWR Penetrations Program BWR Water Chemistry Program	IV.A1-5	3.1.1-40	F
				Loss of Material	BWR Water Chemistry Program	IV.A1-11	3.1.1-11	E
				Loss of Material (cladding)	BWR Water Chemistry Program	IV.A1-8	3.1.1-14	E
				Cracking - SCC (cladding)	BWR Water Chemistry Program	N/A	N/A	H

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Safe Ends, Caps, and Flanges								
Safe Ends N1 safe end	Pressure Boundary	Stainless Steel or Nickel Based Alloy	Treated Water (Internal)	Cracking - Fatigue	TLAA	IV.A1-7	3.1.1-02	A
N1B and N2J weld overlays Unit 1 only N2 safe end				Cracking - Flaw Growth and SCC	BWR Stress Corrosion Cracking Program BWR Water Chemistry Program	IV.A1-1	3.1.1-41	A
N5 safe end				Loss of Material	BWR Water Chemistry Program	IV.A1-8	3.1.1-14	E
N8 safe end			Indoor Air (External)	None Identified	None Required	IV.E-1 IV.E-2	3.1.1-85 3.1.1-86	A

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Cap N9 cap	Pressure Boundary	Nickel Based Alloy	Treated Water (Internal)	Cracking - Fatigue	TLAA	IV.A1-7	3.1.1-02	A
				Cracking - Flaw Growth	BWR CRD Return Line Nozzle Program	IV.A1-2	3.1.1-38	F
				Loss of Material	BWR Water Chemistry Program	IV.A1-8	3.1.1-14	E
			Indoor Air (External)	None Identified	None Required	IV.E-1	3.1.1-85	A
Safe End N10 safe end	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking - Fatigue	TLAA	IV.A1-7	3.1.1-02	A
				Cracking - Flaw Growth and SCC	BWR Penetrations Program BWR Water Chemistry Program	IV.A1-5	3.1.1-40	B
				Loss of Material	BWR Water Chemistry Program	IV.A1-8	3.1.1-14	E
			Indoor Air (External)	None Identified	None Required	IV.E-2	3.1.1-86	A

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Safe Ends and flanges	Pressure Boundary	Carbon Steel or Low Alloy Steel	Treated Water (Internal)	Cracking - Fatigue	TLAA	IV.A1-7	3.1.1-02	A
N3 safe ends				Cracking - Flaw Growth	Inservice Inspection (ISI) Program	N/A	N/A	H
N11, N12, N16 safe ends				Loss of Material	BWR Water Chemistry Program	IV.A1-11	3.1.1-11	E
N6, N7 flanges			Indoor Air (External)	None Identified	None Required	N/A	N/A	G, 0101
Safe Ends	Pressure Boundary	Carbon Steel with partial SS clad	Treated Water (Internal)	Cracking - Fatigue	TLAA	IV.A1-7	3.1.1-02	A
N4 safe ends				Cracking - Flaw Growth	Inservice Inspection (ISI) Program	N/A	N/A	H
				Loss of Material	BWR Water Chemistry Program	IV.A1-11	3.1.1-11	E
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G 0101

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Thermal Sleeves								
Thermal Sleeves N2 Reactor Recirculation Inlets	Pressure Boundary	Nickel Based Alloy and Stainless Steel	Treated Water (Internal)	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-13	3.1.1-44	A
				Cracking - Fatigue	TLAA	IV.A1-7	3.1.1-02	A
				Loss of Material	BWR Vessel Internals Program BWR Water Chemistry Program	IV.A1-8	3.1.1-14	E

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Thermal Sleeves N5 Core Spray	Pressure Boundary	Nickel Based Alloy and Stainless Steel	Treated Water (Internal)	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-7	3.1.1-44	A
				Cracking - Fatigue	TLAA	IV.A1-7	3.1.1-02	A
				Loss of Material	BWR Vessel Internals Program BWR Water Chemistry Program	IV.A1-8	3.1.1-14	E

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Attachments and Housings								
Reactor Vessel	Support	Low Alloy Steel	Indoor Air (External)	Cracking - Flaw Growth	Inservice Inspection (ISI) Program	N/A	N/A	J
Stabilizer Brackets				Cracking - Fatigue	TLAA	IV.A1-6	3.1.1-01	C
Reactor Vessel Support	Support	Carbon Steel	Indoor Air (External)	Cracking - Flaw Growth	Inservice Inspection (ISI) Program - IWF	N/A	N/A	H
Skirt				Cracking - Fatigue (skirt only)	TLAA	IV.A1-6	3.1.1-01	A
Ring Girder				Loss of Material	Inservice Inspection (ISI) Program - IWF	N/A	N/A	H
Reactor Vessel Support Bolting	Support	Low Alloy Steel (high strength)	Indoor Air (External)	Cracking - SCC	Inservice Inspection (ISI) Program - IWF	N/A	N/A	H

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Reactor Vessel ID Attachments and Welds shroud support ring pad	Support	Stainless Steel and Nickel Based Alloy	Treated Water (Internal)	Cracking	BWR Vessel ID Attachment Welds Program BWR Water Chemistry Program	IV.A1-12	3.1.1-42	A
shroud support feet pads jet pump riser pads core spray brackets steam dryer holddown brackets guide rod brackets surveillance specimen brackets steam dryer support brackets feedwater support brackets				Loss of Material	BWR Water Chemistry Program	IV.A1-8	3.1.1-14	E

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
CRD stub tubes	Pressure Boundary	Nickel Based Alloy	Treated Water (Internal)	Cracking	BWR Penetrations Program BWR Water Chemistry Program	IV.A1-5	3.1.1-40	B
				Cracking - Fatigue	TLAA	IV.A1-7	3.1.1-02	A
				Loss of Material	BWR Water Chemistry Program	IV.A1-8	3.1.1-14	E
CRD Housings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking	BWR Vessel Internals Program Inservice Inspection (ISI) Program BWR Water Chemistry Program	IV.B1-8	3.1.1-43	A
				Cracking - Fatigue	TLAA	IV.A1-7	3.1.1-02	A
				Loss of Material	BWR Water Chemistry Program	IV.A1-8	3.1.1-14	E
			Indoor Air (External)	None Identified	None Required	IV.E-2	3.1.1-86	C

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Incore Flux Monitor Housings	Pressure Boundary	Stainless Steel or Nickel Based Alloy	Treated Water (Internal)	Cracking	BWR Penetrations Program BWR Water Chemistry Program	IV.A1-5	3.1.1-40	B
				Cracking - Fatigue	TLAA	IV.A1-7	3.1.1-02	A
				Loss of Material	BWR Water Chemistry Program	IV.A1-8	3.1.1-14	E
			Indoor Air (External)	None Identified	None Required	IV.E-1 IV.E-2	3.1.1-85 3.1.1-86	C

Table 3.1.2-1 Aging Management Review Results - Reactor Pressure Vessel								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting								
Vessel Closure Bolting	Pressure Boundary	Low Alloy Steel	Indoor Air (External)	Cracking - SCC	Reactor Head Closure Studs Program	IV.A1-9	3.1.1-50	A
Studs Nuts and Washers				Cracking - Fatigue	TLAA	IV.A1-6	3.1.1-01	C
Other Bolting	Pressure Boundary	Low Alloy Steel	Indoor Air (External)	Loss of Material	Bolting Integrity Program	IV.C1-12	3.1.1-52	B
CRD flanges Incore Housing flanges N6A/B, N7 flanges				Cracking	Bolting Integrity Program	IV.C2-7	3.1.1-52	B, 0107

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Core Support Components								
Shroud Upper Shroud Central Shroud Lower Shroud	Support Floodable Volume	Stainless Steel	Treated Water with Neutron Fluence	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-1	3.1.1-44	A
				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E
				Reduction of Fracture Toughness	BWR Vessel Internals Program	N/A	N/A	H

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Shroud Support Plate, cylinder, and legs	Support	Nickel Based Alloy	Treated Water	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-2	3.1.1-44	A
				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Shroud Support Access hole cover (0°) Access hole cover (180°) Adapter Ring (180° cover)	Support	Stainless Steel and Nickel Based Alloy	Treated Water	Cracking	Inservice Inspection (ISI) Program BWR Water Chemistry Program	IV.B1-5	3.1.1-49	B 0102
				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Core Plate Plate, Beams Rim Bolts / nuts (34), Pins Alignment assemblies Aligner Bolts / nuts	Support	Stainless Steel	Treated Water with Neutron Fluence	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-6	3.1.1-44	A
				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E
				Reduction of Fracture Toughness	BWR Vessel Internals Program	N/A	N/A	H

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Top Guide Beams and Rim	Support	Stainless Steel	Treated Water with Neutron Fluence	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-17	3.1.1-44	A
Alignment Pins				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
Bolts Nuts				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E
Holddown clamps				Reduction of Fracture Toughness	BWR Vessel Internals Program	N/A	N/A	H

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Fuel Support Pieces Orificed	Support	CASS	Treated Water with Neutron Fluence	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1.-8	3.1.1-43	C
				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E
				Reduction of Fracture Toughness	Thermal Aging and Neutron Embrittlement of Cast Austenitic Stainless Steel (CASS) Program	IV-B1-9	3.1.1-51	A

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Fuel Support Pieces Peripheral	Support	Stainless Steel	Treated Water with Neutron Fluence	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-8	3.1.1-43	C
				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E
				Reduction of Fracture Toughness	BWR Vessel Internals Program	N/A	N/A	H

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Control Rod Guide Tubes Tubes	Support	Stainless Steel	Treated Water with Neutron Fluence	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-8	3.1.1-43	C
				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E
				Reduction of Fracture Toughness	BWR Vessel Internals Program	N/A	N/A	H

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Control Rod Guide Tubes Base	Support	CASS	Treated Water	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-8	3.1.1-43	C
				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E
				Reduction of Fracture Toughness	Thermal Aging and Neutron Embrittlement of Cast Austenitic Stainless Steel (CASS) Program	IV.B1-9	3.1.1-51	C

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Jet Pump Assemblies								
Jet Pump Assemblies Riser pipe Riser elbow Riser brace	Floodable Volume	Stainless Steel	Treated Water with Neutron Fluence	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-13	3.1.1-44	A
Holddown bolts				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
Mixer Throat (Barrel) Restrainer wedges – original				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E
Diffuser shell Diffuser tailpipe Adapter upper rings				Reduction of Fracture Toughness	BWR Vessel Internals Program	N/A	N/A	H

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Jet Pump Assemblies Holddown beam Restrainer Wedges – new Adapter lower rings	Floodable Volume	Nickel Based Alloy	Treated Water with Neutron Fluence	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-13	3.1.1-44	A
				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E
				Reduction of Fracture Toughness	BWR Vessel Internals Program	N/A	N/A	H

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Jet Pump Assemblies Riser Transition Piece	Floodable Volume	CASS	Treated Water with Neutron Fluence	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-13	3.1.1-44	A
Inlet Mixer Elbow				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
Jet Pump Nozzle Mixer Adapter				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E
Restrainer brackets Diffuser collar				Reduction of Fracture Toughness	Thermal Aging and Neutron Embrittlement of Cast Austenitic Stainless Steel (CASS) Program	IV.B1-11	3.1.1-51	A

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Other Internals Items								
SLC Line	Flow Distribution	Stainless Steel	Treated Water	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-7	3.1.1-44	C
				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Incore Guide Tubes	Support	Stainless Steel	Treated Water	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-10	3.1.1-44	A
				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Incore Dry Tubes Source Range Intermediate Range	Pressure Boundary	Stainless Steel and Nickel Based Alloy	Treated Water with Neutron Fluence (Internal)	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-10	3.1.1-44	A 0104
				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E
				Reduction of Fracture Toughness	BWR Vessel Internals Program	N/A	N/A	H
			Indoor Air (External)	None Identified	None Required	IV.E-1 IV.E-2	3.1.1-85 3.1.1-86	C

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Core Spray Lines Piping	Flow Distribution	Stainless Steel	Treated Water	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-7	3.1.1-44	A
T-boxes				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
Spargers Sparger Nozzles Brackets				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Core Spray Lines Sparger Elbows	Flow Distribution	CASS	Treated Water	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-7	3.1.1-44	A
				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E
				Reduction of Fracture Toughness	Thermal Aging and Neutron Embrittlement of Cast Austenitic Stainless Steel (CASS) Program	IV.B1-9	3.1.1-51	C

Table 3.1.2-2 Aging Management Review Results - Reactor Vessel Internals								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Steam Dryer	Structural Integrity	Stainless Steel	Treated Water	Cracking	BWR Vessel Internals Program BWR Water Chemistry Program	IV.B1-16	3.1.1-29	E
				Cracking - Fatigue	TLAA	IV.B1-14	3.1.1-05	A
				Loss of Material	BWR Water Chemistry Program BWR Vessel Internals Program	IV.A1-8	3.1.1-14	E

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary	Low Alloy Steel	Indoor Air (External)	Loss of Material	Bolting Integrity Program	IV.C1-12	3.1.1-52	B
				Cracking	Bolting Integrity Program	IV.C2-7	3.1.1-52	B, 0107
Bolting	Pressure Boundary	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	IV.C2-7	3.1.1-52	B, 0107
Condensing Chamber	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Small Bore Class 1 Piping Inspection	IV.C1-14	3.1.1-15	A 0105
				Cracking - Fatigue	TLAA	IV.C1-15	3.1.1-03	A
				Cracking	BWR Water Chemistry Program Small Bore Class 1 Piping Inspection	IV.C1-1	3.1.1-48	A
			Indoor Air (External)	None Identified	None Required	IV.E-2	3.1.1-86	A

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Driver Mount (reactor recirculation pump)	Pressure Boundary	Carbon Steel	Indoor Air (External)	Loss of Material	System Walkdown Program	N/A	N/A	H 0106
Flow Elements / Restrictors, Main Steam	Throttling	CASS	Treated Water (External)	Loss of Material	BWR Water Chemistry Program Inservice Inspection (ISI) Program	IV.C1-14	3.1.1-15	E
				Cracking - Fatigue	TLAA	IV.C1-15	3.1.1-03	A
				Reduction of Fracture Toughness	Main Steam Flow Restrictor Inspection	IV.C1-3	3.1.1-55	E
				Cracking	BWR SCC Program BWR Water Chemistry Program	IV.C1-9	3.1.1-41	A

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Flow Elements / Restrictors, Main Steam	Throttling	Carbon Steel	Treated Water (External)	Loss of Material	BWR Water Chemistry Program	IV.A1-11	3.1.1-11	D
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	IV.C1-7	3.1.1-45	A
				Cracking - Fatigue	TLAA	IV.C1-15	3.1.1-03	A
Flow orifice < 4 in.	Pressure Boundary Throttling	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Small Bore Class 1 Piping Inspection	IV.C1-14	3.1.1-15	A 0105
				Cracking - Fatigue	TLAA	IV.C1-15	3.1.1-03	A
				Cracking	BWR Water Chemistry Program Small Bore Class 1 Piping Inspection	IV.C1-1	3.1.1-48	A
			Indoor Air (External)	None Identified	None Required	IV.E-2	3.1.1-86	A

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping & Fittings ≥ 4 in.	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Inservice Inspection (ISI) Program	IV.A1-11	3.1.1-11	E
				Loss of Material - FAC	Flow-Accelerated Corrosion (FAC) Program	IV.C1-7	3.1.1-45	A 0103
				Cracking - Fatigue	TLAA	IV.C1-15	3.1.1-03	A
				Cracking	Inservice Inspection (ISI) Program	N/A	N/A	H
			Indoor Air (External)	Loss of Material	System Walkdown Program	N/A	N/A	H, 0106

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping & Fittings ≥ 4 in.	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Inservice Inspection (ISI) Program	IV.C1-14	3.1.1-15	E
				Cracking - Fatigue	TLAA	IV.C1-15	3.1.1-03	A
				Cracking	BWR SCC Program BWR Water Chemistry Program	IV.C1-9	3.1.1-41	A
			Indoor Air (External)	None Identified	None Required	IV.E-2	3.1.1-86	A

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping & Fittings < 4 in.	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Small Bore Class 1 Piping Inspection	IV.A1-11	3.1.1-11	C 0105
				Loss of Material - FAC	Flow-Accelerated Corrosion (FAC) Program	IV.C1-7	3.1.1-45	A 0103
				Cracking - Fatigue	TLAA	IV.C1-15	3.1.1-03	A
				Cracking	Small Bore Class 1 Piping Inspection	N/A	N/A	H
			Indoor Air (External)	Loss of Material	System Walkdown Program	N/A	N/A	H 0106

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping & Fittings < 4 in.	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Small Bore Class 1 Piping Inspection	IV.C1-14	3.1.1-15	A 0105
				Cracking - Fatigue	TLAA	IV.C1-15	3.1.1-03	A
				Cracking	BWR Water Chemistry Program Small Bore Class 1 Piping Inspection	IV.C1-1	3.1.1-48	A
			Indoor Air (External)	None Identified	None Required	IV.E-2	3.1.1-86	A

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping & Fittings	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Small Bore Class 1 Piping Inspection	IV.C1-14	3.1.1-15	A
Flange leak detection lines				Cracking	BWR Water Chemistry Program Small Bore Class 1 Piping Inspection	IV.A1-10	3.1.1-19	E
			Indoor Air (External)	None Identified	None Required	IV.E-2	3.1.1-86	A

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Pump Casing and Cover (reactor recirculation pump)	Pressure Boundary	CASS	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Inservice Inspection (ISI) Program	IV.C1-14	3.1.1-15	E
				Cracking - Fatigue	TLAA	IV.C1-15	3.1.1-03	A
				Reduction of Fracture Toughness	Inservice Inspection (ISI) Program	IV.C1-3	3.1.1-55	B
				Cracking	BWR SCC Program BWR Water Chemistry Program	IV.C1-9	3.1.1-41	A
			Indoor Air (External)	None Identified	None Required	IV.E-2	3.1.1-86	A

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Pump thermal barrier (reactor recirculation pump)	Pressure Boundary	CASS	Treated Water -CCW (Internal)	Loss of Material	CCW Chemistry Program Inservice Inspection (ISI) Program	N/A	N/A	G
				Cracking	BWR SCC Program CCW Chemistry Program	N/A	N/A	H
			Treated Water – RCS (External)	Loss of Material	BWR Water Chemistry Program Inservice Inspection (ISI) Program	IV.C1-14	3.1.1-15	E
				Cracking - Fatigue	TLAA	IV.C1-15	3.1.1-03	A
				Reduction of Fracture Toughness	Inservice Inspection (ISI) Program	IV.C1-3	3.1.1-55	B
				Cracking	BWR SCC Program BWR Water Chemistry Program	IV.C1-9	3.1.1-41	B

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Inservice Inspection (ISI) Program	IV.C1-14	3.1.1-15	E
				Cracking	BWR Water Chemistry Program	IV.C1-1	3.1.1-48	E
			Indoor Air (External)	None Identified	None Required	IV.E-2	3.1.1-86	A

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve bodies ≥ 4 in.	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Inservice Inspection (ISI) Program	IV.A1-11	3.1.1-11	E
				Loss of Material - FAC	Flow-Accelerated Corrosion (FAC) Program	IV.C1-7	3.1.1-45	A 0103
				Cracking - Fatigue	TLAA	IV.C1-15	3.1.1-03	A
				Cracking	Inservice Inspection (ISI) Program	N/A	N/A	H
			Indoor Air (External)	Loss of Material	System Walkdown Program	N/A	N/A	H 0106

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve bodies ≥ 4 in.	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Inservice Inspection (ISI) Program	IV.C1-14	3.1.1-15	E
				Cracking - Fatigue	TLAA	IV.C1-15	3.1.1-03	A
				Cracking	BWR SCC Program BWR Water Chemistry Program	IV.C1-9	3.1.1-41	A
			Indoor Air (External)	None Identified	None Required	IV.E-2	3.1.1-86	A

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve bodies ≥ 4 in.	Pressure Boundary	CASS	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Inservice Inspection (ISI) Program	IV.C1-14	3.1.1-15	E
				Cracking - Fatigue	TLAA	IV.C1-15	3.1.1-03	A
				Reduction of Fracture Toughness	Inservice Inspection (ISI) Program	IV.C1-3	3.1.1-55	B
				Cracking	BWR Water Chemistry Program BWR SCC Program	IV.C1-9	3.1.1-41	A
			Indoor Air (External)	None Identified	None Required	IV.E-2	3.1.1-86	A

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve bodies < 4 in.	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Small Bore Class 1 Piping Inspection	IV.A1-11	3.1.1-11	C 0105
				Loss of Material - FAC	Flow-Accelerated Corrosion (FAC) Program	IV.C1-7	3.1.1-45	A 0103
				Cracking - Fatigue	TLAA	IV.C1-15	3.1.1-03	A
				Cracking	Small Bore Class 1 Piping Inspection	N/A	N/A	H
			Indoor Air (External)	Loss of Material	System Walkdown Program	N/A	N/A	H 0106

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve bodies < 4 in.	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Small Bore Class 1 Piping Inspection	IV.C1-14	3.1.1-15	A 0105
				Cracking - Fatigue	TLAA	IV.C1-15	3.1.1-03	A
				Cracking	BWR Water Chemistry Program Small Bore Class 1 Piping Inspection	IV.C1-1	3.1.1-48	A
			Indoor Air (External)	None Identified	None Required	IV.E-2	3.1.1-86	A

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve bodies < 4 in.	Pressure Boundary	CASS	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Small Bore Class 1 Piping Inspection	IV.C1-14	3.1.1-15	A 0105
				Cracking – Fatigue	TLAA	IV.C1-15	3.1.1-03	A
				Reduction of Fracture Toughness	Small Bore Class 1 Piping Inspection	IV.C1-3	3.1.1-55	E
				Cracking	BWR Water Chemistry Program Small Bore Class 1 Piping Inspection	IV.C1-1	3.1.1-48	A
			Indoor Air (External)	None Identified	None Required	IV.E-2	3.1.1-86	A

Generic Notes:	
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 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
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:	
0101	GALL Chapter IV does not list indoor air as an environment for carbon steel or low alloy steel components such as the vessel shell. This aging management review finds that there is no identified aging effect for these components whose temperature is >212 °F based on their being exposed to indoor air.
0102	The shroud support access hole cover at 180º is formed of stainless steel. For the aging effect under consideration and the credited AMPs, the material is considered to be consistent with the selected GALL item. Therefore, Note B is applicable for both the nickel alloy and the stainless steel covers.

Plant-Specific Notes:	
0103	The aging effect of Loss of Material due to Flow Accelerated Corrosion applies only to the Main Steam and Feedwater piping. Other areas of the Reactor Coolant System Pressure Boundary do not have the conditions necessary for flow accelerated corrosion.
0104	NUREG-1801 Item IV.B1-10 is for dry tubes and guide tubes made of stainless steel. Nickel-based alloy is also considered here in case a future replacement is nickel-based alloy. Because cracking equally affects nickel-based alloy and stainless steel, and would be managed by the same programs, this item was given a Generic Note A.
0105	Several NUREG-1801 Items call for the aging management program of Water Chemistry Control augmented by One-Time Inspection. Here Water Chemistry Control is augmented by the Small Bore Class 1 Piping Inspection, which is a One-Time Inspection program for Class 1 small bore piping. Therefore a note A (or C) was used.
0106	Aging effect is not in NUREG-1801 (Chapter IV). This aging management review finds that the identified aging effect (loss of material when exposed to indoor air) applies only to carbon steel components whose temperature is <212 °F. Other components have no identified aging effect based on exposure to indoor air.
0107	Only high strength bolting (yield strength > 150 ksi) and/or bolting with sulfide containing lubricants, whether carbon or stainless steel, are susceptible to SCC.

3.2 AGING MANAGEMENT OF ENGINEERED SAFETY FEATURES

3.2.1 Introduction

Section 3.2 provides the results of the aging management reviews (AMRs) for those components identified in Section 2.3.2, Engineered Safety Features, as subject to aging management review. The systems or portions of systems are described in the indicated sections of the application.

- Residual Heat Removal (RHR) System (Section 2.3.2.1)
- Reactor Core Isolation Cooling (RCIC) System (Section 2.3.2.2)
- Core Spray System (Section 2.3.2.3)
- High Pressure Coolant Injection (HPCI) System (Section 2.3.2.4)
- Containment and Suppression System (Section 2.3.2.5)
- Containment Atmosphere Control System (Section 2.3.2.6)
- Standby Gas Treatment System (SGTS) (Section 2.3.2.7)

Table 3.2.1, Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report, provides the summary of the programs evaluated in NUREG-1801 that are applicable to component / commodity groups in this section.

3.2.2 Results

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

Table 3.2.2-1 Aging Management Review Results – Residual Heat Removal System

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System

Table 3.2.2-3 Aging Management Review Results – Core Spray System

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System

Table 3.2.2-5 Aging Management Review Results – Containment and Suppression System

Table 3.2.2-6 Aging Management Review Results – Containment Atmosphere Control System

Table 3.2.2-7 Aging Management Review Results – Standby Gas Treatment System

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

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

3.2.2.1.1 Residual Heat Removal System

Materials

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

- Carbon Steel
- Copper Alloy (including Copper-Nickel)
- Nickel Based Alloy
- Stainless Steel

Environments

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

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

Aging Effects Requiring Management

The following aging effects require management for the Residual Heat Removal System components:

- Cracking

- Loss of Material
- Reduction in Heat Transfer

Aging Management Programs

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

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- Lubricating Oil Analysis Program
- Lubricating Oil Inspection
- Piping Corrosion Program
- Selective Leaching Inspection
- Supplemental Piping/Tank Inspection
- System Walkdown Program

3.2.2.1.2 Reactor Core Isolation Cooling System

Materials

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

- Carbon Steel
- Cast Iron
- Copper Alloy (Admiralty Brass, Brass, Bronze)
- Glass
- Stainless Steel

Environments

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

- Indoor Air

- Lubricating Oil
- Treated Water
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Reactor Core Isolation Cooling System components:

- Cracking
- Loss of Material
- Reduction of Heat Transfer

Aging Management Programs

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

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- Flow-Accelerated Corrosion (FAC) Program
- Heat Exchanger Inspection
- Lubricating Oil Analysis Program
- Lubricating Oil Inspection
- Preventive Maintenance Activities – RCIC/HPCI Turbine Casings
- Selective Leaching Inspection
- Supplemental Piping/Tank Inspection
- System Walkdown Program

3.2.2.1.3 Core Spray System

Materials

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

- Carbon Steel
- Copper Alloy
- Stainless Steel

Environments

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

- Indoor Air
- Treated Water

Aging Effects Requiring Management

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

- Cracking
- Loss of Material

Aging Management Programs

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

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- Selective Leaching Inspection
- System Walkdown Program

3.2.2.1.4 High Pressure Coolant Injection System

Materials

The materials of construction for the High Pressure Coolant Injection System components are:

- Carbon Steel
- Cast Iron

- Copper Alloy (Admiralty Brass, Brass, Bronze, Red Brass)
- Glass
- Stainless Steel
- Synthetic Rubber

Environments

The High Pressure Coolant Injection System components are exposed to the following environments:

- Indoor Air
- Lubricating Oil
- Treated Water
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the High Pressure Coolant Injection System components:

- Cracking
- Loss of Material
- Reduction of Heat Transfer

Aging Management Programs

The following aging management programs manage the aging effects for the High Pressure Coolant Injection System components:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- Flow-Accelerated Corrosion (FAC) Program
- Heat Exchanger Inspection
- Lubricating Oil Analysis Program
- Lubricating Oil Inspection
- Preventive Maintenance Activities – RCIC/HPCI Turbine Casings
- Selective Leaching Inspection

- Supplemental Piping/Tank Inspection
- System Walkdown Program

3.2.2.1.5 Containment and Suppression System

Materials

The materials of construction for the Containment and Suppression System components are:

- Carbon Steel
- Stainless Steel

Environments

The Containment and Suppression System components are exposed to the following environments:

- Indoor Air
- Treated Water
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Containment and Suppression System components:

- Loss of Material

Aging Management Programs

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

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- Supplemental Piping/Tank Inspection
- System Walkdown Program

3.2.2.1.6 Containment Atmosphere Control System

Materials

The materials of construction for the Containment Atmosphere Control System components are:

- Carbon Steel
- Stainless Steel

Environments

The Containment Atmosphere Control System components are exposed to the following environments:

- Indoor Air
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Containment Atmosphere Control System components:

- Cracking
- Loss of Material

Aging Management Programs

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

- Bolting Integrity Program
- System Walkdown Program

3.2.2.1.7 Standby Gas Treatment System

Materials

The materials of construction for the Standby Gas Treatment System components are:

- Aluminum Alloy

- Carbon Steel
- Cast Iron
- Copper
- Copper Alloy (Brass)
- Galvanized Steel
- Neoprene
- Stainless Steel

Environments

The Standby Gas Treatment System components are exposed to the following environments:

- Indoor Air
- Raw Water
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Standby Gas Treatment System components:

- Change in Material Properties
- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Standby Gas Treatment System components:

- Bolting Integrity Program
- Fire Water System Program
- Piping Corrosion Program
- Supplemental Piping/Tank Inspection
- System Walkdown Program

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

For the SSES Engineered Safety Feature Systems, those items requiring further evaluation are addressed in the following sections.

3.2.2.2.1 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). The evaluation of this TLAA is addressed separately in Section 4.3 of the LRA.

3.2.2.2.2 Loss of Material / Cladding Breach

The associated items in Table 3.2.1 are applicable to PWRs only.

3.2.2.2.3 Loss of Material Due to Pitting and Crevice Corrosion

3.2.2.2.3.1 Containment Isolation Piping, Piping Components, and Piping Elements – Stagnant Flow Conditions

Containment isolation piping and components were grouped with similar piping having the same material, environment, aging effects, and aging management program(s). As stated in Table 3.2.1, the SSES components matching the description of LRA item number 3.2.1-03 were included in the evaluation of components for LRA item number 3.2.1-05. Refer to Section 3.2.2.2.3.3 for the details of the evaluation of aging management for these components.

3.2.2.2.3.2 Piping, Piping Components, and Piping Elements – Exposed to Soil

As stated in Table 3.2.1, there are no SSES components that compare to LRA item number 3.2.1-04. The ESF Systems contain no buried stainless steel piping or piping components. Therefore, no further evaluation is necessary.

3.2.2.2.3.3 BWR Piping, Piping Components, and Piping Elements – Treated Water

Loss of material due to pitting and crevice corrosion for stainless steel piping components exposed to treated water in ESF Systems is managed by the BWR Water

Chemistry Program and the Chemistry Program Effectiveness Inspection. There are no aluminum piping components subject to aging management review in ESF Systems. The BWR Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the BWR Water Chemistry Program to manage loss of material due to pitting and crevice corrosion through examination of stainless steel ESF components.

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

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

3.2.2.2.3.5 Partially Encased Tanks – Raw Water

As stated in Table 3.2.1, there are no tanks at SSES that compare to LRA item number 3.2.1-07. The ESF Systems contain no outdoor stainless steel tanks. Therefore, no further evaluation is necessary.

3.2.2.2.3.6 Piping, Piping Components, Piping Elements, and Tanks – Internal Condensation

As stated in Table 3.2.1, there are no SSES components that compare to LRA item number 3.2.1-08. Loss of material resulting from condensation on internal surfaces was not identified as an aging effect requiring management for any stainless steel piping, piping component, or tank at SSES. Therefore, no further evaluation is necessary.

3.2.2.2.4 Reduction of Heat Transfer due to Fouling

3.2.2.2.4.1 Heat Exchanger Tubes – Lubricating Oil

For those heat exchangers within the scope of Generic Letter (GL) 89-13 for SSES, the Piping Corrosion Program is credited with managing fouling of heat exchanger tubes

exposed to lubricating oil. For heat exchangers not within the scope of GL 89-13, the Lubricating Oil Analysis Program will manage reduction in heat transfer of heat exchanger tubes exposed to lubricating oil.

3.2.2.2.4.2 Heat Exchanger Tubes – Treated Water

The Heat Exchanger Inspection activity is a one-time inspection that will detect and characterize reduction in heat transfer of stainless steel heat exchanger tubes exposed to treated water.

3.2.2.2.5 Hardening and Loss of Strength due to Elastomer Degradation

The System Walkdown Program is credited with managing degradation due to aging of the visible external surfaces, and in some cases the internal surfaces, of these components.

3.2.2.2.6 Loss of Material Due to Erosion

The associated items in Table 3.2.1 are applicable to PWRs only.

3.2.2.2.7 Loss of Material due to General Corrosion and Fouling

As stated in Table 3.2.1, there are no SSES components that compare to LRA item number 3.2.1-13. The nozzles used for the containment spray cooling mode of RHR are formed of stainless steel. Loss of material due to general corrosion was not identified as an aging effect requiring management for stainless steel piping and components at SSES. The spray lines use stainless steel annubar flow elements (in place of flow orifices). Fouling is not an aging mechanism for flow elements. Therefore, no further evaluation is necessary.

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

3.2.2.2.8.1 BWR Piping, Piping Components, and Piping Elements

Loss of material due to general, pitting, and crevice corrosion for steel piping components exposed to treated water is managed by the BWR Water Chemistry Program and the Chemistry Program Effectiveness Inspection. The BWR Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a

verification of the effectiveness of the BWR Water Chemistry Program to manage loss of material due to general, pitting, and crevice corrosion through examination of steel piping components.

3.2.2.2.8.2 Piping, Piping Components, and Piping Elements – Treated Water

Containment isolation piping and components are grouped with similar piping having the same material, environment, aging effects, and aging management program(s). As stated in Table 3.2.1, the SSES components matching the description of LRA item number 3.2.1-15 are included in the evaluation of components for LRA item number 3.2.1-14. Refer to Section.3.2.2.2.8.1 for the details of the evaluation of aging management for these components.

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

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

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

As stated in Table 3.2.1, there are no SSES components that compare to LRA item number 3.2.1-17. The ESF Systems contain no steel piping and components that are buried or otherwise exposed to soil. Therefore, no further evaluation is necessary.

3.2.2.2.10 Quality Assurance for Aging Management of Nonsafety-Related Components

Quality Assurance provisions applicable to license renewal are discussed in Appendix B, Section B.1.3, of the LRA.

3.2.2.3 Time-Limited Aging Analysis

The Time-Limited Aging Analyses (TLAA) identified below are associated with the Engineered Safety Features Systems components. The section of the application that contains the TLAA review results is indicated in parentheses.

- Metal Fatigue (Section 4.3, Metal Fatigue)

3.2.3 Conclusions

The Engineered Safety Features Systems components/commodities subject to aging management review have been identified in accordance with 10 CFR 54.21. The aging management programs selected to manage the effects of aging for the mechanical components/commodities are identified in the following tables and Section 3.2.2.1. A description of the aging management programs is provided in Appendix B of this application, along with the demonstration that the identified aging effects will be managed for the period of extended operation.

Therefore, based on the demonstration provided in Appendix B, the effects of aging associated with the Engineered Safety Features Systems components/commodities will be managed so that there is reasonable assurance that the intended functions will be maintained consistent with the current licensing basis during the period of extended operation.

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-01	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. Refer to Section 3.2.2.2.1 for further information.
3.2.1-02	PWR Only				
3.2.1-03	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	Stainless steel piping and components are addressed under table item 3.2.1-05. Refer to Section 3.2.2.2.3.1 for further information.
3.2.1-04	Stainless steel piping, piping components, and piping elements exposed to soil	Loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	Yes, plant-specific	Not applicable. There are no stainless steel piping, piping components, or piping elements exposed to soil in the ESF systems for SSES. Refer to Section 3.2.2.2.3.2 for further information.

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-05	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. The BWR Water Chemistry Program in conjunction with the Chemistry Program Effectiveness Inspection is credited to manage loss of material. Refer to Section 3.2.2.2.3.3 for further information.
3.2.1-06	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 Lubricating Oil Analysis Program and the Lubricating Oil Inspection are credited to manage loss of material for stainless steel and copper alloy piping components exposed to lubricating oil. The Lubricating Oil Analysis Program has exceptions. Refer to Section 3.2.2.2.3.4 for further information.

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-07	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. There are no outdoor stainless steel tanks in the ESF systems for SSES. Refer to Section 3.2.2.2.3.5 for further information.
3.2.1-08	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	Not applicable. There are no stainless steel piping, piping components, piping elements, and tank internal surfaces exposed to condensation in the ESF systems for SSES Refer to Section 3.2.2.2.3.6 for further information.

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-09	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	For heat exchangers within the scope of Generic Letter 89-13, the Piping Corrosion Program is credited to manage fouling. Fouling for other heat exchangers is managed by the Lubricating Oil Analysis Program in conjunction with the Lubricating Oil Inspection. This is consistent with NUREG-1801, with exceptions because the Lubricating Oil Analysis Program has exceptions. Refer to Section 3.2.2.2.4.1 for further information.
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	The Heat Exchanger Inspection activity is credited to detect and characterize fouling for stainless steel heat exchanger tubes exposed to treated water. Refer to Section 3.2.2.2.4.2 for further information.

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-11	Elastomer seals and components in standby gas treatment system exposed to air - indoor uncontrolled	Hardening and loss of strength due to elastomer degradation	A plant-specific aging management program is to be evaluated.	Yes, plant-specific	The System Walkdown Program is credited to manage degradation of elastomers in the Standby Gas Treatment System. This item is also used for synthetic rubber flexible hoses in the High Pressure Coolant Injection System exposed to indoor air for which no aging effects were identified as requiring management. Refer to Section 3.2.2.2.5 for further information.
3.2.1-12	PWR Only				
3.2.1-13	Steel drywell and suppression chamber spray system nozzle and flow orifice internal surfaces exposed to air - indoor uncontrolled (internal)	Loss of material due to general corrosion and fouling	A plant-specific aging management program is to be evaluated.	Yes, plant-specific	Not applicable. The nozzles used for containment spray are formed of stainless steel. Stainless steel flow elements are used in place of flow orifices. Refer to Section 3.2.2.2.7 for further information.

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-14	Steel piping, piping components, and piping elements exposed to treated water	Loss of material due to general, pitting, and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801. The BWR Water Chemistry Program in conjunction with the Chemistry Effectiveness Inspection is credited to manage loss of material for steel piping, piping components, and piping elements. Condenser components are also compared to this item. Refer to Section 3.2.2.2.8.1 for further information.
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	Loss of material due to general, pitting, and crevice corrosion for steel containment isolation piping, piping components, and piping elements exposed to treated water is addressed under table item 3.2.1-14. Refer to Section 3.2.2.2.8.2 for further information.

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
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	Consistent with NUREG-1801, with exceptions. The Lubricating Oil Analysis Program and the Lubricating Oil Inspection are credited to manage loss of material for steel piping components exposed to lubricating oil. The Lubricating Oil Analysis Program has exceptions. Refer to Section 3.2.2.2.8.3 for further information.
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. There are no steel piping, piping components, or piping elements exposed to soil in the ESF systems for SSES. Refer to Section 3.2.2.2.9 for further information.

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-18	Stainless steel piping, piping components, and piping elements exposed to treated water >60°C (>140°F)	Cracking due to stress corrosion cracking and intergranular stress corrosion cracking	BWR Stress Corrosion Cracking and Water Chemistry	No	Consistent with NUREG-1801. The BWR Water Chemistry Program is credited to manage cracking of stainless steel tubing in ESF systems. Only tubing in ESF systems was identified as meeting the >140°F criteria for cracking to occur. The BWR Stress Corrosion Cracking Program is applicable only to stainless steel piping (≥ 4”), pump casings, valve bodies, and reactor vessel attachments containing reactor coolant at > 200ºF.
3.2.1-19	Steel piping, piping components, and piping elements exposed to steam or treated water	Wall thinning due to flow-accelerated corrosion	Flow-Accelerated Corrosion	No	Consistent with NUREG-1801. The Flow-Accelerated Corrosion (FAC) Program is credited to manage wall thinning (loss of material) due to flow-accelerated corrosion.
3.2.1-20	Cast austenitic stainless steel (CASS) piping, piping components, and piping elements exposed to treated water (borated or unborated) >250°C (>482°F)	Loss of fracture toughness due to thermal aging embrittlement	Thermal Aging Embrittlement of CASS	No	Not applicable. There are no CASS components in the ESF systems for SSES that are exposed to treated water >250°C (>482°F).

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
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	Consistent with NUREG-1801, with exceptions. The Bolting Integrity Program is credited to manage cracking of high strength (yield strength > 150 ksi) bolting.
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	Refer to table item 3.2.1-23 for discussion.
3.2.1-23	Steel bolting and closure bolting exposed to air – outdoor (external) or air – indoor uncontrolled (external)	Loss of material due to general, pitting, and crevice corrosion	Bolting Integrity	No	Consistent with NUREG-1801, with exceptions. The Bolting Integrity Program is credited to manage loss of material for steel bolting.
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	Aging effect is not applicable. The Bolting Integrity Program is credited to manage the effects of aging on bolting, but takes exception to the management of loss of preload, which is not a plausible aging effect in systems operating below 700ºF.
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. There are no stainless steel piping and piping components in the ESF systems for SSES that are exposed to closed-cycle cooling water >60°C (>140°F).

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	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. There are no steel piping and piping components in the ESF systems for SSES that are exposed to closed-cycle cooling water.
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	The BWR Water Chemistry Program is credited to manage the loss of material for steel heat exchanger components that are exposed to treated water.
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	The BWR Water Chemistry Program is credited to manage the loss of material for stainless steel piping, piping components, and heat exchanger components that are exposed to treated water.
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	The BWR Water Chemistry Program is credited to manage the loss of material for copper alloy piping, piping components, and heat exchanger components that are exposed to treated water.

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	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	The Piping Corrosion Program is credited to manage fouling for copper alloy tubes in heat exchangers within the scope of Generic Letter 89-13. The Heat Exchanger Inspection will detect and characterize fouling of copper alloy tubes for other heat exchangers exposed to a treated water environment in the RCIC and HPCI systems.
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. The System Walkdown Program is credited to manage loss of material for external surfaces of steel components exposed to indoor air. Steel piping components exposed to an internal ventilation environment are also included under this item (the environment is the same, but is internal rather than external). Loss of material for steel condenser components managed by the System Walkdown Program is also included under this item.

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-31 cont'd					This item also includes loss of material due to pitting and crevice corrosion at air/water interfaces for carbon steel piping components in either indoor air or ventilation environments. The Supplemental Piping/Tank Inspection is credited to detect and characterize the effects of aging for these components.
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	The Preventive Maintenance Activities – RCIC/HPCI Turbine Casings is credited to manage loss of material for steel turbine casings and piping components in a ventilation environment. The System Walkdown Program is credited to manage loss of material for steel ventilation system enclosures and for piping components in ventilation environments. The Supplemental Piping/Tank Inspection is credited to detect and characterize loss of material for steel piping components in a ventilation environment.

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	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. The ESF systems include no steel encapsulation components.
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	Loss of material for steel piping, piping components, and turbine casings (HPCI and RCIC systems) exposed to internal condensation is addressed under table item 3.2.1-32.
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	There are no steel containment isolation piping or components exposed to raw water in the ESF systems for SSES. However, this item is applied to loop seal valves exposed to raw water in the SGTS.
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	Consistent with NUREG-1801, with exceptions. The Piping Corrosion Program is credited to manage loss of material for steel heat exchanger components exposed to raw water.
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. There are no stainless steel piping, piping components, or piping elements exposed to raw water in the ESF systems for SSES.

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
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	Not applicable. There are no stainless steel containment isolation piping or components exposed to raw water in the ESF systems for SSES.
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	Consistent with NUREG-1801, with exceptions. The Piping Corrosion Program is credited to manage loss of material for stainless steel heat exchanger components exposed to raw water.
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	Consistent with NUREG-1801, with exceptions. The Piping Corrosion Program is credited to manage fouling for stainless steel heat exchanger tubes exposed to raw water.
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	There are no copper alloy piping and piping components or heat exchanger components in the ESF systems for SSES that are exposed to closed-cycle cooling water. However, this item is applied to copper alloy components exposed to treated water and to lubricating oil.

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
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	Consistent with NUREG-1801. The Selective Leaching Inspection is credited to detect and characterize loss of material due to selective leaching for grey cast iron piping components exposed to a treated water environment (which includes closed cycle cooling water).
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	There are no gray cast iron piping, piping components, or piping elements exposed to soil in the ESF systems for SSES. However, this item is applied to cast iron components that are exposed to lubricating oil.
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. There are no gray cast iron motor coolers exposed to treated water in the ESF systems.
3.2.1-45	PWR Only				
3.2.1-46	PWR Only				
3.2.1-47	PWR Only				
3.2.1-48	PWR Only				
3.2.1-49	PWR Only				

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
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. No aging effects were identified for aluminum in internal and external ventilation (uncontrolled) environment. Aluminum jacketing for insulation exposed to air-indoor uncontrolled (external) is also compared to this item. Refer to Table 3.5.2-10.
3.2.1-51	Galvanized steel ducting exposed to air – indoor controlled (external)	None	None	NA - No AEM or AMP	Consistent with NUREG-1801. Internal surfaces of galvanized steel ductwork, damper housings, and flow element bodies were also compared to this item with no aging effects identified as requiring management in a ventilation (controlled) environment.
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.

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
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. No aging effects requiring management were identified for any internal or external surface of stainless steel and copper alloy piping components in any ESF systems that are exposed to a controlled ventilation environment or an uncontrolled air environment or a ventilation environment. This item is also applied to stainless steel and copper alloy components of heat exchangers, hydrogen recombiners, moisture separators, and housings for dampers, filters, and mist eliminators.
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. There are no steel components exposed to indoor air (controlled) environments in ESF systems. All indoor environments are conservatively considered to be uncontrolled.

Table 3.2.1 Summary of Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of the GALL Report

Item Number	Component/Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-55	Steel and stainless steel piping, piping components, and piping elements in concrete	None	None	NA - No AEM or AMP	Not applicable. There are no steel or stainless steel components embedded in concrete in ESF systems.
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	Not applicable. There are no steel, stainless steel, or copper alloy components in the ESF systems for SSES that are exposed to gas.
3.2.1-57	PWR Only				

Table 3.2.2-1 Aging Management Review Results – Residual Heat Removal System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	V.E-3	3.2.1-21	B, 0202
				Loss of Material	Bolting Integrity Program	V.E-4	3.2.1-23	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	V.E-3	3.2.1-21	B, 0202
Flow Elements, Annubars	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Indoor Air(External)	None Identified	None Required	V.F-12	3.2.1-53	A
Heat Exchangers (1/2E205A/B), Shells and Shell Covers	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	V.D2-7	3.2.1-27	E, 0201
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A

Table 3.2.2-1 Aging Management Review Results – Residual Heat Removal System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (1/2E205A/B), Channels	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	V.D2-8	3.2.1-36	B, 0201
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Heat Exchangers (1/2E205A/B), Tubesheets	Pressure Boundary	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	N/A	N/A	G
		Carbon Steel	Treated Water (External)	Loss of Material	BWR Water Chemistry Program	V.D2-7	3.2.1-27	E, 0201
Heat Exchangers (1/2E205A/B), Tubes	Pressure Boundary, Heat Transfer	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	N/A	N/A	G
				Reduction in Heat Transfer	Piping Corrosion Program	N/A	N/A	G
			Treated Water (External)	Loss of Material	BWR Water Chemistry Program	V.D2-3	3.2.1-29	E
				Reduction in Heat Transfer	Piping Corrosion Program	V.A-11	3.2.1-30	E

Table 3.2.2-1 Aging Management Review Results – Residual Heat Removal System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (1/2E205A/B), Tube Plugs	Pressure Boundary	Nickel Based Alloy	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	N/A	N/A	G
			N/A (External)	N/A	N/A	N/A	N/A	N/A
Motor Oil Coolers (1/2E217A-D), Shells	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	D
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	C

Table 3.2.2-1 Aging Management Review Results – Residual Heat Removal System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Motor Oil Coolers (1/2E217A-D), Tubes	Pressure Boundary, Heat Transfer	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	V.D2-6	3.2.1-39	B
				Reduction in Heat Transfer	Piping Corrosion Program	V.D2-12	3.2.1-40	B
			Lubricating Oil (External)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D1-24	3.2.1-06	D
				Reduction in Heat Transfer	Piping Corrosion Program	V.D2-11	3.2.1-09	E
Orifices	Pressure Boundary, Throttling	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A

Table 3.2.2-1 Aging Management Review Results – Residual Heat Removal System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
				Loss of Material	Supplemental Piping/Tank Inspection	V.D2-2	3.2.1-31	H, 0203

Table 3.2.2-1 Aging Management Review Results – Residual Heat Removal System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
			Treated Water (External)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
Piping	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	Supplemental Piping/Tank Inspection	V.D2-16	3.2.1-32	E, 0203
				Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	C, 0204
			Indoor Air (External)	Loss of Material	Supplemental Piping/Tank Inspection	V.D2-16	3.2.1-32	E, 0203
				Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A

Table 3.2.2-1 Aging Management Review Results – Residual Heat Removal System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Piping	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Pump Casings (1/2P202A-D)	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A

Table 3.2.2-1 Aging Management Review Results – Residual Heat Removal System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Pump Suction Strainers	Pressure Boundary, Filtration	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Treated Water (External)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
Spray Nozzles	Pressure Boundary, Spray	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204, 0205
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A

Table 3.2.2-1 Aging Management Review Results – Residual Heat Removal System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Tubing	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Valve Bodies	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A

Table 3.2.2-1 Aging Management Review Results – Residual Heat Removal System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	C, 0204
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Valve Bodies	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Valve Bodies	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A

Table 3.2.2-1 Aging Management Review Results – Residual Heat Removal System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0209
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A, 0208
Piping and Piping Components	Structural Integrity	Copper Alloy	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	V.D2-21	3.2.1-29	E, 0211
				Loss of Material	Selective Leaching Inspection	V.D2-23	3.2.1-41	A
				Cracking	BWR Water Chemistry Program	N/A	N/A	H, 0216
			Indoor Air (External)	None Identified	None Required	V.F-3	3.2.1-53	A, 0208

Table 3.2.2-1 Aging Management Review Results – Residual Heat Removal System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A, 0211
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A, 0208

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	V.E-3	3.2.1-21	B, 0202
				Loss of Material	Bolting Integrity Program	V.E-4	3.2.1-23	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	V.E-3	3.2.1-21	B, 0202
Filters, Head and Cover	Pressure Boundary	Cast Iron	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Filters, Shell	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Level Gauges	Pressure Boundary	Copper Alloy (Brass)	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-22	3.2.1-06	B
			Indoor Air (External)	None Identified	None Required	V.F-3	3.2.1-53	A
Level Gauges	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Level Gauges	Pressure Boundary	Glass	Lubricating Oil (Internal)	None Identified	None Required	V.F-7	3.2.1-52	A
			Indoor Air (External)	None Identified	None Required	V.F-6	3.2.1-52	A

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Orifices	Pressure Boundary, Throttling	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Orifices	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Orifices	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Orifices	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D1-24	3.2.1-06	B
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Piping	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	V.D2-31	3.2.1-19	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
					Supplemental Piping/Tank Inspection	V.D2-2	3.2.1-31	E, 0203

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
			Treated Water (External)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
Piping	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	Preventive Maintenance Activities – RCIC/HPCI Turbine Casings	V.D2-16	3.2.1-32	E, 0206
					Supplemental Piping/Tank Inspection	V.D2-16	3.2.1-32	E, 0203
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
RCIC Pumps (1/2P203), Casings	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
RCIC Turbine Main Lube Oil Pumps, Casings	Pressure Boundary	Cast Iron	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
RCIC Pump Turbines (1/2S212), Casings	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	Preventive Maintenance Activities – RCIC/HPCI Turbine Casings	V.D2-16	3.2.1-32	E, 0206
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
RCIC Turbine Lube Oil Cooler (1E212), Tubes	Pressure Boundary, Heat Transfer	Copper Alloy (Admiralty Brass)	Treated Water (Internal)	Cracking	Heat Exchanger Inspection	N/A	N/A	H
				Reduction in Heat Transfer	Heat Exchanger Inspection	V.A-11	3.2.1-30	E
				Loss of Material	BWR Water Chemistry Program	V.D2-3	3.2.1-29	E
			Lubricating Oil (External)	Reduction in Heat Transfer	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-9	3.2.1-09	B
				Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-22	3.2.1-06	D

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
RCIC Turbine Lube Oil Cooler (2E212), Tubes	Pressure Boundary, Heat Transfer	Stainless Steel	Treated Water (Internal)	Reduction in Heat Transfer	Heat Exchanger Inspection	V.D2-13	3.2.1-10	E
				Loss of Material	BWR Water Chemistry Program	V.D2-5	3.2.1-28	E
			Lubricating Oil (External)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D1-24	3.2.1-06	D
				Reduction in Heat Transfer	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-11	3.2.1-09	B
RCIC Turbine Lube Oil Cooler (1E212), Tubesheet	Pressure Boundary	Copper Alloy (Bronze)	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	V.D2-3	3.2.1-29	E
			Lubricating Oil (External)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-22	3.2.1-06	D

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
RCIC Turbine Lube Oil Cooler (2E212), Tubesheet	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	V.D2-5	3.2.1-28	E
			Lubricating Oil (External)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D1-24	3.2.1-06	D
RCIC Turbine Lube Oil Cooler (1E212), Shell	Pressure Boundary	Copper Alloy (Admiralty Brass)	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-22	3.2.1-06	D
			Indoor Air (External)	None Identified	None Required	V.F-3	3.2.1-53	C
RCIC Turbine Lube Oil Cooler (2E212), Shell	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D1-24	3.2.1-06	D
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	C

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
RCIC Turbine Lube Oil Cooler (1E212), Channel	Pressure Boundary	Copper Alloy (Bronze)	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	V.D2-3	3.2.1-29	E
			Indoor Air (External)	None Identified	None Required	V.F-3	3.2.1-53	C
RCIC Turbine Lube Oil Cooler (2E212), Channel	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	V.D2-5	3.2.1-28	E
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	C
Rupture Disks, Flanges	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	Preventive Maintenance Activities – RCIC/HPCI Turbine Casings	V.D2-16	3.2.1-32	E, 0206
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Rupture Disks	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Spargers	Spray	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
			Treated Water (External)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
Strainers, Suppression Pool Suction (1/2F401A/B)	Filtration	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Treated Water (External)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tanks (Lube Oil)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	D
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Tubing	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking	BWR Water Chemistry Program	V.D2-29	3.2.1-18	A, 0207
				Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Tubing	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Tubing	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D1-24	3.2.1-06	B
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Valve Bodies	Pressure Boundary	Copper Alloy (Bronze)	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-22	3.2.1-06	B
			Indoor Air (External)	None Identified	None Required	V.F-3	3.2.1-53	A

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Valve Bodies	Pressure Boundary	Cast Iron	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	V.D2-31	3.2.1-19	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Valve Bodies	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	Preventive Maintenance Activities – RCIC/HPCI Turbine Casings	V.D2-16	3.2.1-32	E, 0206
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Condensers – shell (barometric condenser vacuum tank 1/2E209)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	C, 0209
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	C, 0208

Table 3.2.2-2 Aging Management Review Results – Reactor Core Isolation Cooling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0209
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	V.D2-31	3.2.1-19	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A, 0208
Piping and Piping Components – pump casings (1/2P220)	Structural Integrity	Cast Iron	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0209
				Loss of Material	Selective Leaching Inspection	V.D1-20	3.2.1-42	A, 0210
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A, 0208

Table 3.2.2-3 Aging Management Review Results – Core Spray System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	V.E-3	3.2.1-21	B, 0202
				Loss of Material	Bolting Integrity Program	V.E-4	3.2.1-23	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	V.E-3	3.2.1-21	B, 0202
Orifices	Pressure Boundary, Throttling	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A

Table 3.2.2-3 Aging Management Review Results – Core Spray System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.E-7	3.2.1-31	A
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
			Treated Water (External)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201

Table 3.2.2-3 Aging Management Review Results – Core Spray System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Pump Casings, Core Spray Pumps (1/2P206A/B/C/D)	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.E-7	3.2.1-31	A
Strainers (1/2F404A/B/C/D)	Filtration	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Treated Water (External)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A

Table 3.2.2-3 Aging Management Review Results – Core Spray System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Valve Bodies	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.E-7	3.2.1-31	A

Table 3.2.2-3 Aging Management Review Results – Core Spray System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Piping and Piping Components	Structural Integrity	Copper Alloy	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	V.D2-21	3.2.1-29	E, 0211
				Loss of Material	Selective Leaching Inspection	V.D2-23	3.2.1-41	A
				Cracking	BWR Water Chemistry Program	N/A	N/A	H, 0216
			Indoor Air (External)	None Identified	None Required	V.F-3	3.2.1-53	A, 0208

Table 3.2.2-3 Aging Management Review Results – Core Spray System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A, 0211
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A, 0208

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	V.E-3	3.2.1-21	B, 0202
				Loss of Material	Bolting Integrity Program	V.E-4	3.2.1-23	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	V.E-3	3.2.1-21	B, 0202
Orifices	Pressure Boundary, Throttling	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Orifices	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	V.D2-31	3.2.1-19	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
					Supplemental Piping/Tank Inspection	V.D2-2	3.2.1-31	E, 0203

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
			Treated Water (External)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
Piping	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	Preventive Maintenance Activities – RCIC/HPCI Turbine Casings	V.D2-16	3.2.1-32	E, 0206
					Supplemental Piping/Tank Inspection	V.D2-16	3.2.1-32	E, 0203
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Pump Casings, HPCI Pumps (1/2P204)	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Pump Casings, HPCI Booster Pumps (1/2P209)	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Rupture Disks	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	Preventive Maintenance Activities – RCIC/HPCI Turbine Casings	V.D2-16	3.2.1-32	E, 0206
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Rupture Disks	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Spargers	Spray	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
			Treated Water (External)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Strainers, Suppression Pool Suction (1/2F402A/B)	Filtration	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Treated Water (External)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
Tubing	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking	BWR Water Chemistry Program	V.D2-29	3.2.1-18	A, 0207
				Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Turbine Casings, HPCI Pump Turbines (1/2S211)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	Preventive Maintenance Activities – RCIC/HPCI Turbine Casings	V.D2-16	3.2.1-32	E, 0206
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Turbine Gland Cases, HPCI Pump Turbines (1/2S211)	Pressure Boundary	Cast Iron	Ventilation (Internal)	Loss of Material	Preventive Maintenance Activities – RCIC/HPCI Turbine Casings	V.D2-16	3.2.1-32	E, 0206
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0201
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	V.D2-31	3.2.1-19	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Valve Bodies	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	Preventive Maintenance Activities – RCIC/HPCI Turbine Casings	V.D2-16	3.2.1-32	E, 0206
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Filters (1/2F209A/B), Heads and Covers	Pressure Boundary	Cast Iron	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Filters (1/2F209A/B), Shells	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Flexible Connections (Hoses)	Pressure Boundary	Synthetic Rubber	Lubricating Oil (Internal)	None Identified	None Required	N/A	N/A	G
			Indoor Air (External)	None Identified	None Required	V.B-4	3.2.1-11	I

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Coolers, Lube Oil Cooler (1/2E213), Tubes	Pressure Boundary, Heat Transfer	Copper Alloy (Admiralty Brass)	Treated Water (Internal)	Cracking	Heat Exchanger Inspection	N/A	N/A	H
				Loss of Material	BWR Water Chemistry Program	V.D2-3	3.2.1-29	E
				Reduction in Heat Transfer	Heat Exchanger Inspection	V.A-11	3.2.1-30	E
			Lubricating Oil (External)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-22	3.2.1-06	D
				Reduction in Heat Transfer	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-9	3.2.1-09	B

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Coolers, Lube Oil Cooler (1/2E213), Tubesheets	Pressure Boundary	Copper Alloy (Bronze)	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	V.D2-3	3.2.1-29	E
			Lubricating Oil (External)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-22	3.2.1-06	D
Coolers, Lube Oil Cooler (1/2E213), Shells	Pressure Boundary	Copper Alloy (Red Brass)	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-22	3.2.1-06	D
			Indoor Air (External)	None Identified	None Required	V.F-3	3.2.1-53	A
Coolers, Lube Oil Cooler (1/2E213), Channels	Pressure Boundary	Copper Alloy (Bronze)	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	V.D2-3	3.2.1-29	E
			Indoor Air (External)	None Identified	None Required	V.F-3	3.2.1-53	A

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Level Gauges	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Level Gauges	Pressure Boundary	Glass	Lubricating Oil (Internal)	None Identified	None Required	V.F-7	3.2.1-52	A
			Indoor Air (External)	None Identified	None Required	V.F-6	3.2.1-52	A
Orifices	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Orifices	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D1-24	3.2.1-06	B
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Piping	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Pump Casings, Turbine-Driven Main Lube Oil Pumps (1/2P218)	Pressure Boundary	Cast Iron	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Pump Casings, Aux Oil Pumps (1/2P213)	Pressure Boundary	Cast Iron	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Tanks (Lube Oil Reservoirs)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Tubing	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D1-24	3.2.1-06	B
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Copper Alloy (Brass)	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-22	3.2.1-06	B
			Indoor Air (External)	None Identified	None Required	V.F-3	3.2.1-53	A
Valve Bodies	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-30	3.2.1-16	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A
Valve Bodies	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D1-24	3.2.1-06	B
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Condenser shells, barometric condenser vacuum tanks (1/2E210)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	C, 0209
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	C, 0208

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0209
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	V.D2-31	3.2.1-19	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A, 0208

Table 3.2.2-4 Aging Management Review Results – High Pressure Coolant Injection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components – pump casings (1/2P215)	Structural Integrity	Cast Iron	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A, 0209
				Loss of Material	Selective Leaching Inspection	V.D1-20	3.2.1-42	A, 0210
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.D2-2	3.2.1-31	A, 0208

Table 3.2.2-5 Aging Management Review Results – Containment and Suppression System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	V.E-3	3.2.1-21	B, 0202
				Loss of Material	Bolting Integrity Program	V.E-4	3.2.1-23	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	V.E-3	3.2.1-21	B, 0202
Condensing Pots	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A

Table 3.2.2-5 Aging Management Review Results – Containment and Suppression System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Downcomers	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A, 0204
					Supplemental Piping/Tank Inspection	V.B-3	3.2.1-31	E, 0204, 0212
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A
					Supplemental Piping/Tank Inspection	V.B-3	3.2.1-31	E, 0212
Downcomers	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A
			Treated Water (External)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A

Table 3.2.2-5 Aging Management Review Results – Containment and Suppression System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A
Piping	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Piping	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A

Table 3.2.2-5 Aging Management Review Results – Containment and Suppression System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Tubing	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Valve Bodies	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-33	3.2.1-14	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A

Table 3.2.2-5 Aging Management Review Results – Containment and Suppression System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A, 0204
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A
Valve Bodies	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Valve Bodies	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	V.D2-28	3.2.1-05	A
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A

Table 3.2.2-5 Aging Management Review Results – Containment and Suppression System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.A4-11	3.3.1-24	A, 0209
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Piping and Piping Components – pump casings (1/2P229)	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.A4-11	3.3.1-24	A, 0209
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.2.2-6 Aging Management Review Results – Containment Atmosphere Control System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	V.E-3	3.2.1-21	B, 0202
				Loss of Material	Bolting Integrity Program	V.E-4	3.2.1-23	B
Bolting	Pressure Boundary	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	V.E-3	3.2.1-21	B, 0202
Heat Exchangers, Tubes	Pressure Boundary, Heat Transfer	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	C, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	C
Hydrogen Recombiners, Shells	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	C, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	C
Hydrogen Recombiners, Orifice Plates	Throttling	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	C, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	C

Table 3.2.2-6 Aging Management Review Results – Containment Atmosphere Control System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Moisture Separators	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	C, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	C
Piping	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A, 0204
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A
Piping	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Pump Casings (1/2V219A/B)	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Tubing	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A

Table 3.2.2-6 Aging Management Review Results – Containment Atmosphere Control System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A, 0204
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A
Valve Bodies	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A

Table 3.2.2-7 Aging Management Review Results – Standby Gas Treatment System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	V.E-3	3.2.1-21	B, 0202
				Loss of Material	Bolting Integrity Program	V.E-4	3.2.1-23	B
Bolting	Pressure Boundary	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	V.E-3	3.2.1-21	B, 0202
Duct Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Loss of Material	System Walkdown Program	V.B-2	3.2.1-31	A
Damper Housings	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	V.F-1	3.2.1-51	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-1	3.2.1-51	A
Damper Housings	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	C, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	C

Table 3.2.2-7 Aging Management Review Results – Standby Gas Treatment System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Ductwork	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	V.F-1	3.2.1-51	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-1	3.2.1-51	A
Ductwork	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	V.F-1	3.2.1-51	A, 0204
			Ventilation (External)	None Identified	None Required	V.F-1	3.2.1-51	A
Fan Housings (0V109A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	V.B-1	3.2.1-32	E, 0214
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A
Fan Housings (0V201A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	V.B-1	3.2.1-32	E, 0214
			Ventilation (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A, 0214

Table 3.2.2-7 Aging Management Review Results – Standby Gas Treatment System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Filter Housings (0F169A/B)	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	C, 0204, 0213
			Ventilation (External)	None Identified	None Required	V.F-12	3.2.1-53	C, 0213
Filter Housings (0F170A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	V.B-1	3.2.1-32	E, 0213, 0214
			Ventilation (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A, 0213, 0214
Filter Housings (0F171A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	V.B-1	3.2.1-32	E, 0213, 0214
			Ventilation (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A, 0213, 0214
Filter Housings (0F172A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	V.B-1	3.2.1-32	E, 0213, 0214
			Ventilation (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A, 0213, 0214

Table 3.2.2-7 Aging Management Review Results – Standby Gas Treatment System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Mist Eliminator Housings (0F173A/B)	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	C, 0204, 0213
			Ventilation (External)	None Identified	None Required	V.F-12	3.2.1-53	C, 0213
SGTS Filter Unit Enclosure	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	V.B-1	3.2.1-32	E, 0214
					Supplemental Piping/Tank Inspection	V.B-1	3.2.1-32	E, 0215
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A
Flexible Connections (Ductwork)	Pressure Boundary	Neoprene	Ventilation (Internal)	Change in Material Properties	System Walkdown Program	V.B-4	3.2.1-11	E
			Indoor Air (External)	Change in Material Properties	System Walkdown Program	V.B-4	3.2.1-11	E
Flow Elements, Bodies	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	V.F-1	3.2.1-51	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-1	3.2.1-51	A

Table 3.2.2-7 Aging Management Review Results – Standby Gas Treatment System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Flow Elements, Straighteners	Flow Conditioning	Aluminum Alloy	Ventilation (Internal)	None Identified	None Required	V.F-2	3.2.1-50	A
			Ventilation (External)	None Identified	None Required	V.F-2	3.2.1-50	A
Piping (loop seals)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	V.C-5	3.2.1-35	D
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A
Piping	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	Supplemental Piping/Tank Inspection	V.B-1	3.2.1-32	E, 0215
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A
Piping	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	V.B-1	3.2.1-32	E, 0214
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A

Table 3.2.2-7 Aging Management Review Results – Standby Gas Treatment System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Plenums	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	V.B-1	3.2.1-32	E, 0214
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A
Tubing (Fittings)	Pressure Boundary	Copper Alloy (Brass)	Ventilation (Internal)	None Identified	None Required	V.F-3	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-3	3.2.1-53	A
Tubing	Pressure Boundary	Copper	Ventilation (Internal)	None Identified	None Required	V.F-3	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-3	3.2.1-53	A
Tubing	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	V.F-12	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-12	3.2.1-53	A
Valve Bodies	Pressure Boundary	Copper Alloy (Brass)	Ventilation (Internal)	None Identified	None Required	V.F-3	3.2.1-53	A, 0204
			Indoor Air (External)	None Identified	None Required	V.F-3	3.2.1-53	A

Table 3.2.2-7 Aging Management Review Results – Standby Gas Treatment System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies (loop seals)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	V.C-5	3.2.1-35	D
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A
Valve Bodies (deluge)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A
Valve Bodies	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	V.B-1	3.2.1-32	E, 0214
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A
Valve Bodies	Pressure Boundary	Cast Iron	Ventilation (Internal)	Loss of Material	System Walkdown Program	V.B-1	3.2.1-32	E, 0214
			Indoor Air (External)	Loss of Material	System Walkdown Program	V.B-3	3.2.1-31	A

Generic Notes:	
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 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
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:	
0201	This AMP also manages loss of material due to galvanic corrosion.
0202	Only high strength bolting (yield strength > 150 ksi) and/or bolting with sulfide containing lubricants, whether carbon or stainless steel located indoors or outdoors, are susceptible to SCC.
0203	Loss of material due to crevice and/or pitting corrosion is an aging effect requiring management by Supplemental Piping/Tank Inspection, which is a plant-specific program, for carbon steel piping only at the air/water interface in the suppression pool; no other components are exposed to an aggressive indoor air or ventilation environment.
0204	This environment is the same as the GALL environment except that it is an internal rather than an external environment.

Plant-Specific Notes:	
0205	Only the suppression chamber spray nozzles have a spray function that is required to support the system intended function.
0206	This plant-specific AMP applies only to components downstream from the RCIC/HPCI pump turbine steam admission valves that have an environment specified as moist air, which is either condensed and drained to the barometric condensers or vented to the drywells.
0207	Applies only to stainless steel tubing in the steam supply to RCIC/HPCI pump turbine up to the steam admission valves that are maintained at > 140ºF. The BWR Water Chemistry Program manages all applicable aging effects; the BWR Stress Corrosion Cracking program is applicable only to stainless steel piping (≥ 4”), pump casings, valve bodies, and reactor vessel attachments containing reactor coolant at > 200ºF.
0208	Items include the external surface of components (e.g., heat exchanger shells, piping and piping components, and tanks) that do not experience condensation.
0209	The BWR Water Chemistry Program also manages loss of material due to erosion and galvanic corrosion (of susceptible materials such as carbon steel and cast iron). In addition, effectiveness of the BWR Water Chemistry Program is verified by the plant-specific Chemistry Program Effectiveness Inspection.
0210	Gray cast iron (assumed unless otherwise specified) is not addressed in GALL Chapter V items for BWRs, only for PWRs. Item is consistent with PWR item V.D1-20.
0211	The BWR Water Chemistry Program also manages loss of material due to erosion and galvanic corrosion (of susceptible materials such as carbon steel and cast iron).
0212	This plant-specific AMP also manages loss of material due to crevice and/or pitting corrosion at the air/water interface in the suppression pool.
0213	Each individual filter housing within the SGTS Filter Unit enclosure prevents by-pass flow around the filter and provides a flow path through the filter. Therefore, each filter housing has a pressure boundary function that is separate from the pressure boundary function of the enclosure itself.
0214	This AMP will manage loss of material due to general corrosion.
0215	This AMP is a plant-specific program that will manage loss of material due to crevice and/or pitting corrosion and MIC (at the air-water interface in the mist eliminator loop seals), and galvanic corrosion (at contact points with the mist eliminator housing).
0216	Copper alloys with >15% Zn or > 8%Al (assumed unless otherwise specified) are susceptible to cracking in the presence of ammonia, such as may result from organic decay (e.g., microbial activity), and oxidizing conditions (e.g., oxygen > 100 ppb).

3.3 AGING MANAGEMENT OF AUXILIARY SYSTEMS

3.3.1 Introduction

Section 3.3 provides the results of the aging management reviews (AMRs) for those components identified in Section 2.3.3, Auxiliary Systems, as subject to aging management review. The systems or portions of systems are described in the indicated sections. The Nitrogen and Hydrogen System (Section 2.3.3.16) is not included here as it contains no mechanical components that are subject to aging management review.

- Building Drains Nonradioactive System (Section 2.3.3.1)
- Containment Instrument Gas System (Section 2.3.3.2)
- Control Rod Drive Hydraulic System (Section 2.3.3.3)
- Control Structure Chilled Water System (Section 2.3.3.4)
- Control Structure HVAC Systems (Section 2.3.3.5)
- Cooling Tower System (Section 2.3.3.6)
- Diesel Fuel Oil System (Section 2.3.3.7)
- Diesel Generator Buildings HVAC Systems (Section 2.3.3.8)
- Diesel Generators System (Section 2.3.3.9)
- Domestic Water System (Section 2.3.3.10)
- Emergency Service Water System (Section 2.3.3.11)
- ESSW Pumphouse HVAC System (Section 2.3.3.12)
- Fire Protection System (Section 2.3.3.13)
- Fuel Pool Cooling and Cleanup System and Fuel Pools and Auxiliaries (Section 2.3.3.14)
- Neutron Monitoring System (Section 2.3.3.15)
- Primary Containment Atmosphere Circulation System (Section 2.3.3.17)
- Process and Area Radiation Monitoring System (Section 2.3.3.18)
- Radwaste Liquid System (Section 2.3.3.19)
- Radwaste Solids Handling (Section 2.3.3.20)
- Raw Water Treatment System (Section 2.3.3.21)
- Reactor Building Chilled Water System (Section 2.3.3.22)
- Reactor Building Closed Cooling Water System (Section 2.3.3.23)

- Reactor Building HVAC System (Section 2.3.3.24)
- Reactor Nonnuclear Instrumentation System (Section 2.3.3.25)
- Reactor Water Cleanup System (Section 2.3.3.26)
- RHR Service Water System (Section 2.3.3.27)
- Sampling System (Section 2.3.3.28)
- Sanitary Drainage System (Section 2.3.3.29)
- Service Air System (Section 2.3.3.30)
- Service Water System (Section 2.3.3.31)
- Standby Liquid Control System (Section 2.3.3.32)
- Turbine Building Closed Cooling Water System (Section 2.3.3.33)

In addition, Section 3.3 provides the results of the aging management reviews (AMRs) for those components identified in Section 2.3.1, Reactor Vessel, Internals, and Reactor Coolant System, as subject to aging management review, but that are not part of the reactor coolant pressure boundary (RCPB). The systems or portions of systems are described in the indicated sections.

- Reactor Recirculation System (NSAS Portions) (Section 2.3.1.3)
- Reactor Vessel and Auxiliaries System (NSAS Portions) (Section 2.3.1.3)

Table 3.3.1, Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report, provides the summary of the programs evaluated in NUREG-1801 that are applicable to component / commodity groups in this section.

3.3.2 Results

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

Table 3.3.2-1 Aging Management Review Results – Building Drains Nonradioactive System

Table 3.3.2-2 Aging Management Review Results – Containment Instrument Gas System

Table 3.3.2-3 Aging Management Review Results – Control Rod Drive Hydraulic System

In addition, the following tables summarize the results of the aging management review for reactor coolant components that are not part of the reactor coolant pressure boundary (RCPB), and are not discussed in Chapter IV of NUREG-1801:

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

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

3.3.2.1.1 Building Drains Nonradioactive System

Materials

The materials of construction for the Building Drains Nonradioactive System components/commodities are:

- Carbon Steel
- Cast Iron
- Copper Alloy
- Stainless Steel

Environments

The Building Drains Nonradioactive System components/commodities are exposed to the following environments:

- Indoor Air
- Raw Water

Aging Effects Requiring Management

The following aging effects require management for the Building Drains Nonradioactive System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Building Drains Nonradioactive System components/commodities:

- Area-Based NSAS Inspection
- Bolting Integrity Program
- Selective Leaching Inspection
- System Walkdown Program

3.3.2.1.2 Containment Instrument Gas System

Materials

The materials of construction for the Containment Instrument Gas System components/commodities are:

- Carbon Steel
- Copper Alloy (Brass)
- Glass
- Stainless Steel

Environments

The Containment Instrument Gas System components/commodities are exposed to the following environments:

- Air-Gas
- Indoor Air
- Raw Water
- Treated Water
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Containment Instrument Gas System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Containment Instrument Gas System components/commodities:

- Area-Based NSAS Inspection
- Bolting Integrity Program
- Closed Cooling Water Chemistry Program
- Selective Leaching Inspection
- System Walkdown Program

3.3.2.1.3 Control Rod Drive Hydraulic System

Materials

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

- Aluminum
- Carbon Steel
- Copper Alloy
- Stainless Steel

Environments

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

- Air-Gas
- Indoor Air
- Treated Water
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Control Rod Drive Hydraulic System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

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

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- Selective Leaching Inspection
- System Walkdown Program

3.3.2.1.4 Control Structure Chilled Water System

Materials

The materials of construction for the Control Structure Chilled Water System components/commodities are:

- Carbon Steel
- Cast Iron
- Copper
- Copper Alloy (Admiralty Brass, Brass, and Copper-Nickel)
- Ductile Iron
- Glass
- Stainless Steel

Environments

The Control Structure Chilled Water System components/commodities are exposed to the following environments:

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

Aging Effects Requiring Management

The following aging effects require management for the Control Structure Chilled Water System components/commodities:

- Cracking
- Loss of Material
- Reduction in Heat Transfer

Aging Management Programs

The following aging management programs manage the aging effects for the Control Structure Chilled Water System components/commodities:

- Bolting Integrity Program
- Closed Cooling Water Chemistry Program
- Cooling Units Inspection
- Heat Exchanger Inspection
- Lubricating Oil Analysis Program
- Lubricating Oil Inspection
- Piping Corrosion Program
- Selective Leaching Inspection
- Supplemental Piping/Tank Inspection
- System Walkdown Program

3.3.2.1.5 Control Structure HVAC Systems

Materials

The materials of construction for the Control Structure HVAC Systems components/commodities are:

- Aluminum
- Carbon Steel (including Aluminized Steel)
- Copper
- Copper Alloy (Brass and Red Brass)
- Elastomer (Neoprene/Asbestos and Neoprene/Fiberglass)
- Galvanized Steel
- Stainless Steel

Environments

The Control Structure HVAC Systems components/commodities are exposed to the following environments:

- Indoor Air
- Raw Water
- Treated Water
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Control Structure HVAC Systems components/commodities:

- Cracking
- Loss of Material
- Reduction in Heat Transfer

Aging Management Programs

The following aging management programs manage the aging effects for the Control Structure HVAC Systems components/commodities:

- Bolting Integrity Program
- Closed Cooling Water Chemistry Program
- Cooling Units Inspection
- Fire Water System Program
- System Walkdown Program

3.3.2.1.6 Cooling Tower System

Materials

The materials of construction for the Cooling Tower System components/commodities are:

- Carbon Steel
- Stainless Steel

Environments

The Cooling Tower System components/commodities are exposed to the following environments:

- Buried
- Indoor Air
- Outdoor Air
- Raw Water

Aging Effects Requiring Management

The following aging effects require management for the Cooling Tower System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Cooling Tower System components/commodities:

- Bolting Integrity Program
- Buried Piping and Tanks Inspection Program
- Fire Water System Program
- System Walkdown Program

3.3.2.1.7 Diesel Fuel Oil System

Materials

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

- Carbon Steel
- Cast Iron
- Copper Alloy (Brass, Bronze, and Copper Nickel)
- Elastomer (Synthetic Rubber)

- Glass
- Stainless Steel

Environments

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

- Buried
- Fuel Oil
- Indoor Air
- Raw Water
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Diesel Fuel Oil System components/commodities:

- Cracking
- Loss of Material
- Reduction in Heat Transfer

Aging Management Programs

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

- Bolting Integrity Program
- Buried Piping and Tanks Inspection Program
- Chemistry Program Effectiveness Inspection
- Fuel Oil Chemistry Program
- Piping Corrosion Program
- Selective Leaching Inspection
- Supplemental Piping/Tank Inspection
- System Walkdown Program

3.3.2.1.8 Diesel Generator Buildings HVAC Systems

Materials

The materials of construction for the Diesel Generator Buildings HVAC Systems components/commodities are:

- Carbon Steel
- Elastomer (Neoprene, Neoprene/Asbestos, and Neoprene/Fiberglass)
- Galvanized Steel
- Stainless Steel

Environments

The Diesel Generator Buildings HVAC Systems components/commodities are exposed to the following environments:

- Indoor Air
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Diesel Generator Buildings HVAC Systems components/commodities:

- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Diesel Generator Buildings HVAC Systems components/commodities:

- System Walkdown Program

3.3.2.1.9 Diesel Generators System

Materials

The materials of construction for the Diesel Generators System components / commodities are:

- Aluminum

- Carbon Steel
- Cast Iron
- Copper Alloy (Brass, Bronze, and Copper Nickel)
- Elastomer (Silicon and Synthetic Rubber)
- Galvanized Steel
- Glass
- Nickel Alloy
- Plastic (Lucite and Polycarbonate)
- Stainless Steel

Environments

The Diesel Generators System components/commodities are exposed to the following environments:

- Air-Gas
- Indoor Air
- Lubricating Oil
- Outdoor Air
- Raw Water
- Treated Water
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Diesel Generators System components/commodities:

- Cracking
- Loss of Material
- Reduction in Heat Transfer

Aging Management Programs

The following aging management programs manage the aging effects for the Diesel Generators System components/commodities:

- Bolting Integrity Program

- Closed Cooling Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- Lubricating Oil Analysis Program
- Lubricating Oil Inspection
- Piping Corrosion Program
- Selective Leaching Inspection
- Supplemental Piping/Tank Inspection
- System Walkdown Program

3.3.2.1.10 Domestic Water System

Materials

The materials of construction for the Domestic Water System components/commodities are:

- Carbon Steel
- Copper Alloy
- Glass
- Stainless Steel

Environments

The Domestic Water System components/commodities are exposed to the following environments:

- Indoor Air
- Raw Water

Aging Effects Requiring Management

The following aging effects require management for the Domestic Water System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Domestic Water System components/commodities:

- Area-Based NSAS Inspection
- Bolting Integrity Program
- Selective Leaching Inspection
- System Walkdown Program

3.3.2.1.11 Emergency Service Water System

Materials

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

- Carbon Steel
- Copper Alloy
- Stainless Steel

Environments

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

- Buried
- Indoor Air
- Outdoor Air
- Raw Water

Aging Effects Requiring Management

The following aging effects require management for the Emergency Service Water System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

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

- Area-Based NSAS Inspection
- Bolting Integrity Program
- Buried Piping and Tanks Inspection Program
- Buried Piping Surveillance Program
- Piping Corrosion Program
- Selective Leaching Inspection
- System Walkdown Program

3.3.2.1.12 ESSW Pumphouse HVAC System

Materials

The materials of construction for the ESSW Pumphouse HVAC System components/commodities are:

- Carbon Steel
- Galvanized Steel
- Stainless Steel

Environments

The ESSW Pumphouse HVAC System components/commodities are exposed to the following environments:

- Indoor Air
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the ESSW Pumphouse HVAC System components/commodities:

- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the ESSW Pumphouse HVAC System components/commodities:

- System Walkdown Program

3.3.2.1.13 Fire Protection System

Materials

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

- Carbon Steel
- Cast Iron (including Gray Cast Iron)
- Copper
- Copper Alloy (Brass, Bronze, and Copper-Nickel)
- Ductile Iron (Cement-lined)
- Elastomer (Synthetic Rubber)
- Galvanized Steel
- Stainless Steel
- Teflon

Environments

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

- Air-Gas (including Carbon Dioxide and Halon)
- Buried
- Fuel Oil
- Indoor Air
- Outdoor Air
- Raw Water
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Fire Protection System components/commodities:

- Cracking
- Loss of Material
- Reduction in Heat Transfer

Aging Management Programs

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

- Bolting Integrity Program
- Buried Piping and Tanks Inspection Program
- Chemistry Program Effectiveness Inspection
- Fire Water System Program
- Fuel Oil Chemistry Program
- Selective Leaching Inspection
- System Walkdown Program

3.3.2.1.14 Fuel Pool Cooling and Cleanup System and Fuel Pool and Auxiliaries

Materials

The materials of construction for the Fuel Pool Cooling and Cleanup System and Fuel Pool and Auxiliaries components/commodities are:

- Carbon Steel
- Stainless Steel

Environments

The Fuel Pool Cooling and Cleanup System and Fuel Pool and Auxiliaries components/commodities are exposed to the following environments:

- Embedded
- Indoor Air

- Raw Water
- Treated Water
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Fuel Pool Cooling and Cleanup System and Fuel Pool and Auxiliaries components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Fuel Pool Cooling and Cleanup System and Fuel Pool and Auxiliaries components/commodities:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- Closed Cooling Water Chemistry Program
- Piping Corrosion Program
- Supplemental Piping/Tank Inspection
- System Walkdown Program

3.3.2.1.15 Neutron Monitoring System

Materials

The materials of construction for the Neutron Monitoring System components/commodities are:

- Carbon Steel
- Stainless Steel

Environments

The Neutron Monitoring System components/commodities are exposed to the following environments:

- Air-Gas
- Indoor Air

Aging Effects Requiring Management

The following aging effects require management for the Neutron Monitoring System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Neutron Monitoring System components/commodities:

- Bolting Integrity Program
- System Walkdown Program

3.3.2.1.16 Primary Containment Atmosphere Circulation System

Materials

The materials of construction for the Primary Containment Atmosphere Circulation System components/commodities are:

- Carbon Steel
- Galvanized Steel
- Elastomer (Neoprene and Rubber)
- Stainless Steel

Environments

The Primary Containment Atmosphere Circulation System components/commodities are exposed to the following environments:

- Indoor Air

- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Primary Containment Atmosphere Circulation System components/commodities:

- Change in Material Properties
- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Primary Containment Atmosphere Circulation System components/commodities:

- Bolting Integrity Program
- Cooling Units Inspection
- System Walkdown Program

3.3.2.1.17 Process and Area Radiation Monitoring System

Materials

The materials of construction for the Process and Area Radiation Monitoring System components/commodities are:

- Carbon Steel
- Copper Alloy
- Galvanized Steel
- Stainless Steel

Environments

The Process and Area Radiation Monitoring System components/commodities are exposed to the following environments:

- Indoor Air
- Raw Water
- Treated Water

- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Process and Area Radiation Monitoring System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Process and Area Radiation Monitoring System components/commodities:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- Closed Cooling Water Chemistry Program
- Piping Corrosion Program
- Selective Leaching Inspection
- System Walkdown Program

3.3.2.1.18 Radwaste Liquid System

Materials

The materials of construction for the Radwaste Liquid System components/commodities are:

- Carbon Steel
- Cast Iron
- Stainless Steel

Environments

The Radwaste Liquid System components/commodities are exposed to the following environments:

- Indoor Air

- Raw Water

Aging Effects Requiring Management

The following aging effects require management for the Radwaste Liquid System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

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

- Bolting Integrity Program
- Monitoring and Collection Systems Inspection
- Selective Leaching Inspection
- System Walkdown Program

3.3.2.1.19 Radwaste Solids Handling System

Materials

The materials of construction for the Radwaste Solids Handling System components/commodities are:

- Carbon Steel
- Copper Alloy
- Stainless Steel

Environments

The Radwaste Solids Handling System components/commodities are exposed to the following environments:

- Indoor Air
- Raw Water

Aging Effects Requiring Management

The following aging effects require management for the Radwaste Solids Handling System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Radwaste Solids Handling System components/commodities:

- Area-Based NSAS Inspection
- Bolting Integrity Program
- Selective Leaching Inspection
- System Walkdown Program

3.3.2.1.20 Raw Water Treatment System

Materials

The materials of construction for the Raw Water Treatment System components/commodities are:

- Carbon Steel
- Copper Alloy (Red Brass)
- Gray Cast Iron
- Stainless Steel

Environments

The Raw Water Treatment System components/commodities are exposed to the following environments:

- Buried
- Indoor Air
- Outdoor Air
- Raw Water

Aging Effects Requiring Management

The following aging effects require management for the Raw Water Treatment System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Raw Water Treatment System components/commodities:

- Bolting Integrity Program
- Buried Piping and Tanks Inspection Program
- Fire Water System Program
- Selective Leaching Inspection
- System Walkdown Program

3.3.2.1.21 Reactor Building Chilled Water System

Materials

The materials of construction for the Reactor Building Chilled Water System components/commodities are:

- Carbon Steel
- Cast Iron
- Copper Alloy
- Glass
- Stainless Steel

Environments

The Reactor Building Chilled Water System components/commodities are exposed to the following environments:

- Indoor Air
- Lubricating Oil

- Raw Water
- Treated Water

Aging Effects Requiring Management

The following aging effects require management for the Reactor Building Chilled Water System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Reactor Building Chilled Water System components/commodities:

- Area-Based NSAS Inspection
- Bolting Integrity Program
- Closed Cooling Water Chemistry Program
- Lubricating Oil Analysis Program
- Lubricating Oil Inspection
- Piping Corrosion Program
- Selective Leaching Inspection
- System Walkdown Program

3.3.2.1.22 Reactor Building Closed Cooling Water System

Materials

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

- Carbon Steel
- Cast Iron
- Copper Alloy
- Glass
- Stainless Steel

Environments

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

- Indoor Air
- Raw Water
- Treated Water

Aging Effects Requiring Management

The following aging effects require management for the Reactor Building Closed Cooling Water System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

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

- Bolting Integrity Program
- Closed Cooling Water Chemistry Program
- Piping Corrosion Program
- Selective Leaching Inspection
- System Walkdown Program

3.3.2.1.23 Reactor Building HVAC System

Materials

The materials of construction for the Reactor Building HVAC System components/commodities are:

- Carbon Steel
- Cast Iron
- Copper
- Copper Alloy (Brass, Bronze, and Copper-Nickel)

- Galvanized Steel
- Glass
- Elastomer (Neoprene/Fiberglass)
- Stainless Steel

Environments

The Reactor Building HVAC System components/commodities are exposed to the following environments:

- Air-Gas (Freon)
- Indoor Air
- Raw Water
- Treated Water
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Reactor Building HVAC System components/commodities:

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

Aging Management Programs

The following aging management programs manage the aging effects for the Reactor Building HVAC System components/commodities:

- Bolting Integrity Program
- Closed Cooling Water Chemistry Program
- Cooling Units Inspection
- Piping Corrosion Program
- System Walkdown Program

3.3.2.1.24 Reactor Nonnuclear Instrumentation System

Materials

The materials of construction for the Reactor Nonnuclear Instrumentation System components/commodities are:

- Carbon Steel
- Stainless Steel

Environments

The Reactor Nonnuclear Instrumentation System components/commodities are exposed to the following environments:

- Indoor Air
- Treated Water

Aging Effects Requiring Management

The following aging effects require management for the Reactor Nonnuclear Instrumentation System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Reactor Nonnuclear Instrumentation System components/commodities:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection

3.3.2.1.25 Reactor Water Cleanup System

Materials

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

- Carbon Steel
- Copper Alloy
- Stainless Steel

Environments

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

- Indoor Air
- Treated Water

Aging Effects Requiring Management

The following aging effects require management for the Reactor Water Cleanup System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

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

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- Closed Cooling Water Chemistry Program
- Flow-Accelerated Corrosion (FAC) Program
- Selective Leaching Inspection
- System Walkdown Program

3.3.2.1.26 RHR Service Water System

Materials

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

- Carbon Steel
- Cast Iron
- Copper Alloy
- Stainless Steel

Environments

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

- Buried
- Indoor Air
- Outdoor Air
- Raw Water
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the RHR Service Water System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

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

- Area-Based NSAS Inspection
- Bolting Integrity Program
- Buried Piping and Tanks Inspection Program
- Buried Piping Surveillance Program

- Piping Corrosion Program
- Selective Leaching Inspection
- Supplemental Piping/Tank Inspection
- System Walkdown Program

3.3.2.1.27 Sampling System

Materials

The materials of construction for the Sampling System components/commodities are:

- Carbon Steel
- Copper Alloy
- Stainless Steel
- Teflon

Environments

The Sampling System components/commodities are exposed to the following environments:

- Indoor Air
- Treated Water

Aging Effects Requiring Management

The following aging effects require management for the Sampling System components/commodities:

- Change in Material Properties
- Cracking
- Loss of Material

Aging Management Programs

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

- Bolting Integrity Program

- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- Closed Cooling Water Chemistry Program
- Selective Leaching Inspection
- System Walkdown Program

3.3.2.1.28 Sanitary Drainage System

Materials

The materials of construction for the Sanitary Drainage System components/ commodities are:

- Carbon Steel
- Cast Iron
- Stainless Steel

Environments

The Sanitary Drainage System components/commodities are exposed to the following environments:

- Indoor Air
- Raw Water

Aging Effects Requiring Management

The following aging effects require management for the Sanitary Drainage System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Sanitary Drainage System components/commodities:

- Area-Based NSAS Inspection
- Bolting Integrity Program

- Selective Leaching Inspection
- System Walkdown Program

3.3.2.1.29 Service Air System

Materials

The materials of construction for the Service Air System components/commodities are:

- Carbon Steel
- Stainless Steel

Environments

The Service Air System components/commodities are exposed to the following environments:

- Indoor Air
- Raw Water

Aging Effects Requiring Management

The following aging effects require management for the Service Air System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Service Air System components/commodities:

- Area-Based NSAS Inspection
- Bolting Integrity Program
- System Walkdown Program

3.3.2.1.30 Service Water System

Materials

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

- Carbon Steel
- Copper Alloy
- Stainless Steel

Environments

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

- Indoor Air
- Raw Water

Aging Effects Requiring Management

The following aging effects require management for the Service Water System components/commodities:

- Cracking
- Loss of Material

Aging Management Programs

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

- Area-Based NSAS Inspection
- Bolting Integrity Program
- Piping Corrosion Program
- Selective Leaching Inspection
- System Walkdown Program

3.3.2.1.31 Standby Liquid Control System

Materials

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

- Butyl Rubber
- Carbon Steel
- Stainless Steel

Environments

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

- Air-Gas (Nitrogen)
- Indoor Air
- Treated Water
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Standby Liquid Control System components:

- Cracking
- Loss of Material

Aging Management Programs

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

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- Supplemental Piping/Tank Inspection
- System Walkdown Program

3.3.2.1.32 Turbine Building Closed Cooling Water System

Materials

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

- Carbon Steel
- Stainless Steel

Environments

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

- Indoor Air
- Raw Water
- Treated Water

Aging Effects Requiring Management

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

- Cracking
- Loss of Material

Aging Management Programs

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

- Bolting Integrity Program
- Closed Cooling Water Chemistry Program
- Piping Corrosion Program
- System Walkdown Program

3.3.2.1.33 Reactor Recirculation System (NSAS portions)

Materials

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

- Carbon Steel
- Stainless Steel

Environments

The NSAS components/commodities of the Reactor Recirculation System are exposed to the following environments:

- Indoor Air
- Treated Water

Aging Effects Requiring Management

The following aging effects require management for the NSAS components/commodities of the Reactor Recirculation System:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the NSAS components/commodities of the Reactor Recirculation System:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection

3.3.2.1.34 Reactor Vessel and Auxiliaries System (NSAS portions)

Materials

The materials of construction for the NSAS components/commodities of the Reactor Vessel and Auxiliaries System are:

- Carbon Steel
- Stainless Steel

Environments

The NSAS components/commodities of the Reactor Vessel and Auxiliaries System are exposed to the following environments:

- Indoor Air
- Treated Water

Aging Effects Requiring Management

The following aging effects require management for the NSAS components/commodities of the Reactor Vessel and Auxiliaries System:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the NSAS components/commodities of the Reactor Vessel and Auxiliaries System:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection

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

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

3.3.2.2.1 Cumulative Fatigue Damage

Fatigue is a time-limited aging analysis (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 this TLAA is addressed separately in Section 4.3 of the LRA.

3.3.2.2.2 Reduction of Heat Transfer due to Fouling

As described in Table 3.3.1, there are no SSES components compared to LRA item number 3.3.1-03. For Auxiliary Systems, stainless steel heat exchanger tubes in treated water are evaluated under LRA item number 3.3.1-52. Fouling of stainless steel heat exchanger tubes in treated water is managed by the Closed Cooling Water Chemistry Program. The Closed Cooling Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. Based on review of plant-specific operating experience, the Closed Cooling Water Chemistry Program is effective in managing fouling through control of microorganisms and corrosion products.

3.3.2.2.3 Cracking due to Stress Corrosion Cracking (SCC)

3.3.2.2.3.1 BWR Standby Liquid Control System

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

3.3.2.2.3.2 Heat Exchanger Components

As described in Table 3.3.1, there are no SSES components compared to LRA item number 3.3.1-05. Although the Reactor Water Cleanup regenerative and non-regenerative heat exchangers at SSES are subject to aging management review and

exposed to temperatures above 140°F, the components are carbon steel. Therefore, cracking of these components is not an aging effect requiring management for SSES. Refer to Table 3.3.1, Item 48 for the aging effects that do require management for these components.

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

During normal plant operations, diesel exhaust piping, piping components, and piping elements are exposed to diesel exhaust only when the diesel engine is tested, which occurs infrequently and for short durations. For the remaining time, these components are exposed internally to ambient air, and remain dry. Therefore, cracking due to SCC is not identified as an aging effect requiring management for stainless steel diesel engine exhaust components. Loss of material due to general corrosion is managed by the System Walkdown Program, which is credited for internal surfaces, because the internal environment is essentially the same as the external environment.

3.3.2.2.4 Cracking due to Stress Corrosion Cracking and Cyclic Loading

Per Table 3.3-1 of NUREG-1800, this item (including 3.3.2.2.4.1, 3.3.2.2.4.2, and 3.3.2.2.4.3) applies only to PWRs (table ID 7, 8, and 9).

3.3.2.2.5 Hardening and Loss of Strength due to Elastomer Degradation

3.3.2.2.5.1 Components of Heating and Ventilation Systems

Only the elastomers used in flexible connections in the Reactor Building HVAC and the Primary Containment Atmosphere Circulation System were identified as requiring aging management. Levels of ionizing radiation in the Reactor Building and of ionizing radiation and thermal exposure inside Containment exceeded threshold levels for cracking and changes in material properties. Elastomers in HVAC systems in other buildings do not exceed threshold levels for radiation or temperature. The System Walkdown Program is credited for aging management of elastomers in the Reactor Building HVAC and Primary Containment Atmosphere Circulation systems.

3.3.2.2.5.2 Spent Fuel Cooling and Cleanup Systems

Elastomer linings are not credited by SSES for protection of metallic components. The base metals are evaluated for aging as subject to the fluid environment. Elastomer linings, if present, do not perform an intended function. Therefore, no elastomer linings are identified as subject to aging management review for the SSES Fuel Pool Cooling and Cleanup System or Fuel Pool and Auxiliaries.

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

The high density spent fuel racks at SSES contain a neutron-absorbing medium of natural boron carbide in an aluminum matrix core clad with 1100 series aluminum with the trade name of Boral. The Boral is sealed between two concentric square aluminum tubes referred to as poison cans. The two materials, boron carbide and aluminum, are chemically compatible and ideally suited for long-term use in the radiation, thermal, and chemical environment of the spent fuel pools. Boral does not degrade as a result of long-term exposure to radiation, and Boral is stable, durable, and corrosion resistant. Based on plant-specific operating experience and testing results of Boral sample coupons, reduction of neutron-absorbing capacity and loss of material due to general corrosion are not aging effects requiring management for the SSES spent fuel rack neutron absorbers. However, loss of material due to crevice and pitting can affect the aluminum constituent in Boral; the BWR Water Chemistry Program is credited for aging management.

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

3.3.2.2.7.1 Reactor Coolant Pump Oil Collection System

The SSES primary containment is inerted during normal operation, which meets the requirements of item III.O in 10 CFR 50 Appendix R. This item is not applicable to SSES.

3.3.2.2.7.2 BWR Reactor Water Cleanup and Shutdown Cooling Systems

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

3.3.2.2.7.3 Diesel Exhaust Piping, Piping Components, and Piping Elements

Loss of material due to general corrosion for steel piping components exposed to diesel exhaust is managed by the System Walkdown Program. Loss of material due to corrosion was not identified as an applicable aging effect for the stainless steel diesel

exhaust piping flexible connections and tubing which are located inside the diesel generator buildings. The diesel exhaust system is normally in standby mode and the inside surfaces of the components are dry and not subject to any type of wetting.

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, and crevice corrosion and MIC for steel piping components with coatings buried in soil is managed by the Buried Piping and Tanks Inspection Program. Loss of material for buried steel piping components with damaged coatings and buried in soil is managed by the Buried Piping Surveillance Program.

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

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

Loss of material due to general, pitting, and crevice corrosion and MIC for steel piping components and tanks exposed to fuel oil is managed by the Fuel Oil Chemistry Program. The Fuel Oil Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the Fuel Oil Chemistry Program to manage loss of material due to general, pitting, and crevice corrosion through examination of steel piping components and tanks exposed to fuel oil. Fouling is not identified as an aging effect for fuel oil.

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

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

The Lubricating Oil Analysis Program will also manage reduction in heat transfer due to fouling of heat exchanger tubes exposed to lubricating oil. For those heat exchangers within the scope of Generic Letter 89-13 for SSES, the Piping Corrosion Program is credited with managing fouling of heat exchanger tubes exposed to lubricating oil.

3.3.2.2.10 Loss of Material due to Pitting and Crevice Corrosion

3.3.2.2.10.1 Steel Piping with Elastomer Lining or Stainless Steel Cladding

Elastomer linings are not credited by SSES for protection of metallic components. The base metals are evaluated for aging as subject to the fluid environment. Elastomer linings, if present, do not perform an intended function. Therefore, no elastomer linings are identified as requiring aging management review for Fuel Pool Cooling and Cleanup System components. For SSES, there is no steel piping with stainless steel cladding in the Fuel Pool Cooling and Cleanup System subject to aging management review.

3.3.2.2.10.2 Piping, Piping Components, Piping Elements, and Heat Exchanger Components

Loss of material due to pitting and crevice corrosion for stainless steel heat exchanger components exposed to treated water is managed by the Closed Cooling Water Chemistry Program. The Closed Cooling Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants.

3.3.2.2.10.3 HVAC Piping, Piping Components, and Piping Elements

The Cooling Units Inspection is a one-time inspection that will detect and characterize loss of material due to pitting and crevice corrosion for copper alloy HVAC piping components in an external environment with potential for wetting.

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

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

3.3.2.2.10.5 HVAC Piping, Piping Components, and Piping Elements and Ducting

The Cooling Units Inspection is a one-time inspection credited with detecting and characterizing the condition of aluminum and stainless steel HVAC components exposed to condensation. The System Walkdown Program is credited for managing loss of material due to pitting and crevice corrosion for the external surfaces of stainless steel HVAC components exposed to condensation.

3.3.2.2.10.6 Fire Protection System

Loss of material due to pitting and crevice corrosion is an applicable aging effect only if the materials are exposed to an aggressive environment. The only copper or copper alloy fire protection system piping components exposed to internal ambient environments are spray nozzles and tubing in the halon suppression system and sprinkler heads in deluge systems. The components are open to local ambient air conditions such that condensation will not occur and are not subject to continuous wetting or alternate wetting and drying that would constitute an aggressive environment. Therefore, loss of material due to pitting and crevice corrosion is not an aging effect requiring management for these components at SSES.

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

As described in Table 3.3.1, there were no SSES components compared to LRA item number 3.3.1-29. The only stainless steel piping subject to aging management review for SSES that is exposed to soil is located in the Condensate Transfer and Storage System and is evaluated in the Steam and Power Conversion group for LRA item number 3.4.1-17.

3.3.2.2.10.8 BWR Standby Liquid Control System

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

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

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

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

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

There are no aluminum piping components exposed to fuel oil that are subject to aging management review for SSES. Loss of material due to pitting and crevice corrosion and MIC for stainless steel and copper alloy piping components exposed to fuel oil is managed by the Fuel Oil Chemistry Program. The Fuel Oil Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the Fuel Oil Chemistry Program to manage loss of material due to pitting and crevice corrosion and MIC through examination of stainless steel and copper alloy piping components exposed to fuel oil. Though not credited, the Fire Protection Program provides indirect confirmation of whether degradation of these components has occurred, and that the component intended function is maintained.

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

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

3.3.2.2.13 Loss of Material due to Wear

Wear of elastomer seals and components exposed to air is not identified as an aging effect requiring management for SSES. Loss of material due to wear is the result of relative motion between two surfaces in contact. However, wear occurs during the performance of an active function; as a result of improper design, application or operation; or to a very small degree with insignificant consequences. Therefore, loss of material due to wear is not an aging effect requiring management for elastomers exposed to air indoor uncontrolled at SSES.

3.3.2.2.14 Loss of Material due to Cladding Breach

Loss of material due to cladding breach in PWR charging pump casings is only applicable to PWRs.

3.3.2.2.15 Quality Assurance for Aging Management of Nonsafety-Related Components

Quality Assurance provisions applicable to license renewal are discussed in Appendix B, Section B.1.3, of the LRA.

3.3.2.3 Time-Limited Aging Analysis

The Time-Limited Aging Analyses (TLAA) identified below are associated with the Auxiliary Systems components. The section of the application that contains the TLAA review results is indicated in parentheses.

- Metal Fatigue (Section 4.3, Metal Fatigue)

3.3.3 Conclusions

The Auxiliary System components/commodities having aging effects requiring management have been evaluated, and aging management programs have been selected to manage the aging effects. A description of the aging management programs is provided in Appendix B of this application, along with a demonstration that the identified aging effects will be managed for the period of extended operation.

Therefore, based on the demonstration provided in Appendix B, the effects of aging will be adequately managed so that there is reasonable assurance that the intended functions of Auxiliary System components/commodities will be maintained consistent with the current licensing basis, and that spatial interactions will not result in the loss of any safety-related intended functions, during the period of extended operation.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-01	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	Not applicable. Crane load cycles is not a TLAA for SSES.
3.3.1-02	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 Section 3.3.2.2.1.
3.3.1-03	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	Fouling of stainless steel heat exchanger tubes that are exposed to treated water is evaluated under item number 3.3.1-52. Further evaluation is documented in Section 3.3.2.2.2.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-04	Stainless steel piping, piping components, and piping elements exposed to sodium pentaborate solution >60°C (>140°F)	Cracking due to stress corrosion cracking	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	The normal operating temperature of the Standby Liquid Control System is below 140°F; therefore, cracking due to SCC is not an aging effect requiring management. Further evaluation is documented in Section 3.3.2.2.3.1.
3.3.1-05	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	Stainless steel heat exchanger components exposed to treated water >60°C (>140°F) are evaluated in item 3.3.1-46. Further evaluation is documented in Section 3.3.2.2.3.2.
3.3.1-06	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	Cracking was not identified as an aging effect requiring management for the internal surfaces of stainless steel diesel exhaust components that are normally exposed to ambient air, because they remain relatively dry during normal plant operations. Further evaluation is documented in Section 3.3.2.2.3.3.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-07	PWR Only				
3.3.1-08	PWR Only				
3.3.1-09	PWR Only				
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	This item is not applicable to SSES since it only applies to bolting for components addressed in items 3.3.1-07 through 3.3.1-09 above.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
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 System Walkdown Program is credited to manage degradation of the external surfaces of elastomers in the Reactor Building HVAC System and in the Primary Containment Atmosphere Circulation System. Internal surfaces are not exposed to high temperatures, radiation or ozone; therefore, no aging effects were identified as requiring management for internal surfaces, for which Note I is used. During normal plant operations, elastomers in the Fire Protection System, Diesel Systems, and other HVAC Systems are not exposed to high temperatures, radiation or ozone; therefore, no aging effects were identified as requiring management for these other systems. For these cases, Note I is used. Further evaluation is documented in Section 3.3.2.2.5.1.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
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	Elastomer linings are not credited for protection of metallic components, and are therefore, not subject to AMR. Other elastomers compared to this item, in the Diesel Systems (silicone tube plugs) and in the Standby Liquid Control System (butyl rubber accumulator bladders), are not exposed to high temperatures or radiation; therefore, no aging effects were identified as requiring management. Note I is used. Further evaluation is documented in Section 3.3.2.2.5.2.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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	Based on plant-specific operating experience and testing results, reduction of neutron-absorbing capacity and loss of material due to general corrosion were not identified as aging effects requiring management for SSES spent fuel storage rack neutron absorbers. The BWR Water Chemistry Program is credited to manage loss of material due to crevice and pitting corrosion for Boral spent fuel storage rack neutron absorbers that are exposed to treated water. Refer to Table 3.5.2-2. Further evaluation is documented in Section 3.3.2.2.6.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
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	Consistent with NUREG-1801, with exceptions. The Lubricating Oil Analysis Program and the Lubricating Oil Inspection are credited to manage loss of material for steel piping components exposed to lubricating oil. A Note B or D is applied because the Lubricating Oil Analysis Program has exceptions. Further evaluation is the same as in Sections 3.3.2.2.10.4 and 3.3.2.2.12.2 for copper alloy and stainless steel exposed to lubricating oil, since 3.3.2.2.7.1 is focused on reactor coolant pump oil collection that is not applicable to SSES.
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. The SSES primary containment is inerted during normal operation, which meets the requirements of item III.O in 10CFR50 Appendix R. Further evaluation is documented in Section 3.3.2.2.7.1.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
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. The SSES primary containment is inerted during normal operation, which meets the requirements of item III.O in 10 CFR 50 Appendix R. Further evaluation is documented in Section 3.3.2.2.7.1.

Table 3.3.1	Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report				
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-17	Steel piping, piping components, and piping elements exposed to treated water	Loss of material due to general, pitting, and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801. The BWR Water Chemistry Program and the Chemistry Program Effectiveness Inspection are credited to manage loss of material for steel components that are exposed to treated water. This item is also applicable to accumulators and regenerative heat exchangers, for which Note C is used. This item is also applied for loss of material due to FAC for Reactor Water Cleanup System valve bodies. The Flow-Accelerated Corrosion (FAC) Program is credited to manage loss of material due to FAC, and Note H is used. Further evaluation is documented in Section 3.3.2.2.7.2.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
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 System Walkdown Program is credited to manage loss of material for the internal surfaces of steel diesel exhaust components that are normally exposed to ambient air. Loss of material was not identified as an aging effect requiring management for stainless steel diesel exhaust components (flexible connections), because they remain relatively dry during normal plant operations. Further evaluation is documented in Section 3.3.2.2.7.3.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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	No	Consistent with NUREG-1801, but the AMP includes an exception. The Buried Piping Surveillance Program is credited to manage loss of material for steel piping with damaged coatings that are exposed to soil in the Emergency and RHR Service Water Systems.
			Buried Piping and Tanks Inspection	Yes, detection of aging effects and operating experience are to be further evaluated	Consistent with NUREG-1801, but the AMP includes an exception. The Buried Piping and Tanks Inspection is credited to manage loss of material for steel piping with coatings that are exposed to soil. This item is also applicable to steel tanks that are exposed to soil, for which Note D is used. Further evaluation is documented in Section 3.3.2.2.8.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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 Fuel Oil Chemistry Program and the Chemistry Program Effectiveness Inspection are credited to manage loss of material for steel components that are exposed to fuel oil. Further evaluation is documented in Section 3.3.2.2.9.1.
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	Consistent with NUREG-1801, with exceptions. The Lubricating Oil Analysis Program and the Lubricating Oil Inspection are credited to manage loss of material for steel heat exchanger components exposed to lubricating oil. A Note B is applied because the Lubricating Oil Analysis Program has exceptions. Further evaluation is documented in Section 3.3.2.2.9.2.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
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	Elastomer linings are not credited for protection of metallic components, and are therefore, not subject to AMR. There are no steel with stainless steel cladding piping components that are exposed to treated water or treated borated water in the Auxiliary Systems for SSES. Further evaluation is documented in Section 3.3.2.2.10.1.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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	The Closed Cooling Water Chemistry Program and the Chemistry Program Effectiveness Inspection are credited to manage loss of material for stainless steel heat exchanger components that are exposed to treated water. A Note E is used. There are no steel with stainless steel cladding heat exchanger components that are exposed to treated water in the Auxiliary Systems for SSES. Further evaluation is documented in Section 3.3.2.2.10.2.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
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. The BWR Water Chemistry Program and the Chemistry Program Effectiveness Inspection are credited to manage loss of material for stainless steel and aluminum components exposed to treated water. The BWR Water Chemistry Program is also credited to manage loss of material for spent fuel racks (see Table 3.5.2-2). The BWR Water Chemistry Program is also credited to manage cracking of aluminum components exposed to treated water. This item is also applicable to accumulators and immersion heaters. A Note C is used. Further evaluation is documented in Section 3.3.2.2.10.2.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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	Except as noted, the System Walkdown Program is credited to manage loss of material for copper alloy components (HVAC and non-HVAC) that are exposed to condensation (external). The Cooling Units Inspection is a one-time inspection that will detect and characterize loss of material for copper alloy HVAC heat exchanger components that are exposed to condensation (external). The Selective Leaching Inspection is a one-time inspection that will detect and characterize loss of material due to selective leaching for non-HVAC copper alloy components that are exposed to condensation (external). Note H is used. Further evaluation is documented in Section 3.3.2.2.10.3.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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 Lubricating Oil Analysis Program and the Lubricating Oil Inspection are credited to manage loss of material for copper alloy piping components exposed to lubricating oil. A Note B or D is applied because the Lubricating Oil Analysis Program has exceptions. Further evaluation is documented in Section 3.3.2.2.10.4.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
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 System Walkdown Program, the Cooling Units Inspection, and the Supplemental Piping/Tank Inspection are credited to manage loss of material for stainless steel and aluminum components that are exposed to condensation, for both HVAC and non-HVAC systems. Note C is used for heat exchanger components. The Cooling Units Inspection and the Supplemental Piping/Tank Inspection are one-time inspections that will detect and characterize loss of material. The Cooling Units Inspection will also detect and characterize cracking of aluminum HVAC cooling unit fins, for which Note H is used. Further evaluation is documented in Section 3.3.2.2.10.5.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-28	Copper alloy fire protection piping, piping components, and piping elements exposed to condensation (internal)	Loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	Yes, plant specific	Copper alloy fire protection piping, piping components, and piping elements are not exposed to internal condensation because they are isolated and empty. Further evaluation is documented in Section 3.3.2.2.10.6.
3.3.1-29	Stainless steel piping, piping components, and piping elements exposed to soil	Loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	Yes, plant specific	Not applicable to Auxiliary Systems. Loss of material for stainless steel components that are exposed to soil is evaluated in Table 3.4.1, item 3.4.1-17. Further evaluation is documented in Section 3.3.2.2.10.7.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-30	Stainless steel piping, piping components, and piping elements exposed to sodium pentaborate solution	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. The BWR Water Chemistry Program and the Chemistry Program Effectiveness Inspection are credited to manage loss of material for stainless steel components that are exposed to sodium pentaborate solution, which is evaluated for SSES as a treated water environment. Further evaluation is documented in Section 3.3.2.2.10.8.
3.3.1-31	Copper alloy piping, piping components, and piping elements exposed to treated water	Loss of material due to pitting, crevice, and galvanic corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801. The BWR Water Chemistry Program and the Chemistry Program Effectiveness Inspection are credited to manage loss of material for copper alloy components that are exposed to treated water. Further evaluation is documented in Section 3.3.2.2.11.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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	Consistent with NUREG-1801, with exceptions. The Fuel Oil Chemistry Program and the Chemistry Program Effectiveness Inspection are credited to manage loss of material for stainless steel and copper alloy components that are exposed to fuel oil. There are no aluminum components that are exposed to fuel oil that are subject to AMR. This item is also applicable to copper alloy heat exchanger components that are exposed to fuel oil, for which Note D is used. Though not credited, the Fire Protection Program provides indirect confirmation of whether degradation of engine-driven fire pump fuel oil supply components has occurred, and that the component intended function is maintained. Further evaluation is documented in Section 3.3.2.2.12.1.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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 Lubricating Oil Analysis Program and the Lubricating Oil Inspection are credited to manage loss of material for stainless steel piping components exposed to lubricating oil. A Note B or D is applied because the Lubricating Oil Analysis Program has exceptions. Further evaluation is documented in Section 3.3.2.2.12.2.
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	Loss of material due to wear was not identified as an aging effect requiring management for elastomers. Further evaluation is documented in Section 3.3.2.2.13.
3.3.1-35	PWR Only				

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-36	Boraflex spent fuel storage racks neutron-absorbing sheets exposed to treated water	Reduction of neutron-absorbing capacity due to boraflex degradation	Boraflex Monitoring	No	Not applicable. Boraflex is not used as a neutron absorber for spent fuel racks as SSES. Refer to item 3.3.1-13.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-37	Stainless steel piping, piping components, and piping elements exposed to treated water >60°C (>140°F)	Cracking due to stress corrosion cracking, intergranular stress corrosion cracking	BWR Reactor Water Cleanup System	No	The BWR Water Chemistry Program is credited to manage cracking for stainless steel components of the Reactor Water Cleanup System, such as tubing and orifices, that are exposed to treated water at elevated temperatures (i.e., above 140ºF). This item is also applied for cracking of stainless steel components in the Control Rod Drive Hydraulics, Reactor Vessel and Auxiliaries, Sampling, and Reactor Nonnuclear Instrumentation systems that are exposed to treated water at elevated temperatures. Note E is used. The stainless steel components in these systems are less than 4” diameter, whereas GL 88-01 (and thereby the sited NUREG-1801 program) is focused on stainless steel components 4” diameter or larger.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-38	Stainless steel piping, piping components, and piping elements exposed to treated water >60°C (>140°F)	Cracking due to stress corrosion cracking	BWR Stress Corrosion Cracking and Water Chemistry	No	Cracking of stainless steel components that are exposed to treated water at elevated (> 140ºF) temperatures is evaluated in item 3.3.1-37.
3.3.1-39	Stainless steel BWR spent fuel storage racks exposed to treated water >60°C (>140°F)	Cracking due to stress corrosion cracking	Water Chemistry	No	Cracking due to SCC was not identified as an aging effect requiring management for stainless steel spent fuel storage racks because the temperature of the spent fuel pool is maintained well below 140°F.
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	Not applicable. Steel tanks in the Diesel Fuel Oil System are buried, and not exposed to air – outdoor.
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	Consistent with NUREG-1801, with exceptions. The Bolting Integrity Program is credited to manage cracking of high strength (yield strength > 150 ksi) bolting.
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	Loss of material due to corrosion for steel closure bolting subject to wetting due to leakage is addressed under item 3.3.1-43.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-43	Steel bolting and closure bolting exposed to air – indoor uncontrolled (external) or air – outdoor (External)	Loss of material due to general, pitting, and crevice corrosion	Bolting Integrity	No	Consistent with NUREG-1801, with exceptions. The Bolting Integrity Program is credited to manage loss of material for bolting, other than duct bolting addressed in item 3.3.1-55, that is exposed to wetting from leakage in indoor or outdoor locations.
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	Consistent with NUREG-1801, with exceptions. The Bolting Integrity Program is credited to manage loss of material for bolting, other than duct bolting addressed in item 3.3.1-55, that is exposed to wetting from leakage or condensation in indoor locations.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
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	The Bolting Integrity Program is credited to manage the effects of aging on bolting, but takes exception to the management of loss of preload. For bolted closures, loss of pre-load is generally considered to result from inadequate design or improper assembly (i.e., event driven) that is not related to aging. Loss of preload can occur as a result of stress relaxation. However, stress relaxation is only a concern at temperatures above 700ºF for steel bolting and SSES Auxiliary Systems operate below this temperature threshold. Furthermore, SSES operating experience has not shown instances of self-loosening or gasket creep. Plant-specific operating experience has identified and corrected bolting issues that resulted from improper assembly and maintenance, which is also addressed by the Bolting Integrity Program.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
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 Cooling Water Chemistry Program is credited to manage cracking for stainless steel components that are exposed to closed cycle cooling water >60°C (>140°F). There are no stainless steel clad steel components in the Auxiliary Systems for SSES.
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 Cooling Water Chemistry Program is credited to manage loss of material for steel components that are exposed to closed cycle cooling water.
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	Consistent with NUREG-1801, with exceptions. The Closed Cooling Water Chemistry Program is credited to manage loss of material for steel components that are exposed to treated water, including closed cycle cooling water.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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	Based on a review of SSES operating experience, loss of material due to MIC was not identified as an aging effect requiring management for stainless steel that is exposed to closed cycle cooling water.
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 Cooling Water Chemistry Program is credited to manage loss of material for stainless steel components that are exposed to treated water, including closed cycle cooling water.
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	Consistent with NUREG-1801, with exceptions. The Closed Cooling Water Chemistry Program is credited to manage loss of material for copper and copper alloy components that are exposed to treated water, including closed cycle cooling water. This item is also applicable to cracking of copper alloy components that are exposed to treated water, where Note H is used.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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	The Closed Cooling Water Chemistry Program (diesel jacket water), the Heat Exchanger Inspection (chiller package heat exchangers), and the Cooling Units Inspection (HVAC cooling units) are credited to manage reduction of heat transfer due to fouling of heat exchanger tubes and cooling coils that are exposed to treated water, including closed cycle cooling water. The Cooling Units Inspection and the Heat Exchanger Inspection are one-time inspections that will detect and characterize reduction of heat transfer. For these AMPs, Note E is used.
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	The Area-Based NSAS Inspection is a one-time inspection that will detect and characterize loss of material for steel Service Air System drainage components that are exposed to internal condensation/wetting. Note E is used.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-54	Stainless steel compressed air system piping, piping components, and piping elements exposed to internal condensation	Loss of material due to pitting and crevice corrosion	Compressed Air Monitoring	No	The Area-Based NSAS Inspection is a one-time inspection that will detect and characterize loss of material for stainless steel Containment Instrument Gas System drainage components that are exposed to internal condensation/wetting. Note E is used.
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. The System Walkdown Program is credited to manage loss of material for duct bolting, which is treated as a sub-component (piece part) of the ducting/ductwork that includes a bolted closure(s).

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
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. For steel components of the Fire Protection System, the Fire Water System Program is credited to manage loss of material. Note E is used. This item is also applicable to heater sheaths, for which Note C is used. This item is also applicable to internal surfaces where it was determined that the internal environment is the same as the external environment.
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. The System Walkdown Program is credited to manage loss of material for steel piping and components external surfaces exposed to air – indoor uncontrolled.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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. The System Walkdown Program also manages loss of material due to crevice and/or pitting corrosion due to condensation. This item is also applicable to internal surfaces where it was determined that the internal environment is the same as the external environment. Additionally, the Selective Leaching Inspection is credited to detect and characterize a loss of material on the external surfaces of gray cast iron fire protection components in the presence of condensation. A Note H is used for these cast iron items.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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. The System Walkdown Program is credited to manage loss of material for steel heat exchanger components exposed to air – indoor uncontrolled (external) or air – outdoor (external). This item is also applicable to internal surfaces where it was determined that the internal environment is the same as the external environment. Note C is used.
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	Steel components that are exposed to air – outdoor (external) are evaluated in item 3.3.1-58.
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. Refer to Table 3.5.2-10.
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	Not applicable. There are no aluminum components that are exposed to raw water in the Auxiliary Systems for SSES.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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. For galvanized steel exposed to air – indoor uncontrolled, no aging effects were identified as requiring management; however, the Fire Protection Program in conjunction with the Structures Monitoring Program are credited to manage aging. Refer to Table 3.5.2-10.
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	The Fuel Oil Chemistry Program is credited to manage loss of material for steel fuel oil day tank that is exposed to fuel oil. Though not credited, the Fire Protection Program provides indirect confirmation of whether degradation of these components has occurred, and that the component intended function is maintained.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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	Cracking and spalling were not identified as an aging effects requiring management for reinforced concrete structural fire barriers exposed to air – indoor uncontrolled. Refer to Table 3.5.2-2, Table 3.5.2-3, Table 3.5.2-4, Table 3.5.2-5, Table 3.5.2-6, Table 3.5.2-7, and Table 3.5.2-8.
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	Cracking and spalling were not identified as an aging effects requiring management for reinforced concrete structural fire barriers exposed to air – outdoor. Refer to Table 3.5.2-2, Table 3.5.2-3, Table 3.5.2-4, Table 3.5.2-5, Table 3.5.2-6, Table 3.5.2-7, and Table 3.5.2-8.
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	Loss of material was not identified as an aging effect requiring management for reinforced concrete structural fire barriers exposed to air – indoor uncontrolled or to air – outdoor. Refer to Table 3.5.2-2, Table 3.5.2-3, Table 3.5.2-4, Table 3.5.2-5, Table 3.5.2-6, Table 3.5.2-7, and Table 3.5.2-8.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
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. The Fire Water System Program will manage loss of material for steel piping, piping components, and piping elements that are exposed to raw water.
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 will manage loss of material for stainless steel piping, piping components, and piping elements that are exposed to raw water.
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 will manage loss of material for copper alloy piping, piping components, and piping elements that are exposed to raw water.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-71	Steel piping, piping components, and piping elements exposed to moist air or condensation (Internal)	Loss of material due to general, pitting, and crevice corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	No	The Supplemental Piping/Tank Inspection is a one-time inspection that will detect and characterize loss of material for steel components that are exposed to moist air or condensation (internal). Note E is used.
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	The Cooling Units Inspection is a one-time inspection that will detect and characterize loss of material for steel HVAC components internal surfaces that are exposed to condensation (internal). Note E is used. The System Walkdown Program is credited to manage loss of material for steel components internal surfaces that are exposed to condensation where it was determined that the internal environment is the same as the external environment. Note E is used.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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 Crane Inspection Program is credited to manage loss of material for steel crane structural girders that are protected from weather. Refer to Table 3.5.2-2, Table 3.5.2-4, Table 3.5.2-6, Table 3.5.2-7, Table 3.5.2-8, and Table 3.5.2-10.
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	Loss of material due to wear was not identified as an aging effect requiring management for steel cranes – rails exposed to air – indoor uncontrolled. Refer to Table 3.5.2-2, Table 3.5.2-4, Table 3.5.2-6, Table 3.5.2-7, Table 3.5.2-8, and Table 3.5.2-10.
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	Hardening, loss of strength, and loss of material were not identified as aging effects requiring management for elastomers that are exposed to raw water in the Auxiliary Systems for SSES.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-76	Steel piping, piping components, and piping elements (without lining/coating or with degraded lining/coating) exposed to raw water	Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, fouling, and lining/coating degradation	Open-Cycle Cooling Water System	No	Consistent with NUREG-1801, with exceptions. The Piping Corrosion Program is credited to manage loss of material for steel components that are exposed to raw water. This item is also applicable to steel heat exchanger components and tanks that are exposed to raw water. Note D is used. This item is also applied for steel components that are exposed to untreated and uncontrolled water (raw water). In these cases, the Cooling Units Inspection and the Monitoring and Collection Systems Inspection are one-time inspections, consistent with NUREG-1801, that will detect and characterize loss of material for steel components. Note E is used.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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	Consistent with NUREG-1801, with exceptions. The Piping Corrosion Program is credited to manage loss of material for steel heat exchanger components that are exposed to raw water.
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 Piping Corrosion Program is credited to manage loss of material due to pitting and crevice corrosion for nickel alloy heat exchanger tube plugs. This item is also applicable to component and piping supports (ASME Class 1, 2, 3 and MC) (Table 3.5.2-10), which are managed by the ISI-IWF Program, consistent with NUREG-1801. Note E is used.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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	Consistent with NUREG-1801, with exceptions. The Piping Corrosion Program is also credited to manage loss of material for stainless steel HVAC cooling coils that are exposed to raw water. Note D is used.
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 Piping Corrosion Program is credited to manage loss of material for stainless steel and copper alloy heat exchanger components that are exposed to raw water, which is consistent with NUREG-1801. Note D is used. This item is also applicable to cooling tower basin screens and screen guides, for which the Structures Monitoring Program, consistent with NUREG-1801, is credited (refer to Table 3.5.2-9). Note E is used.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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 Piping Corrosion Program is credited to manage loss of material for copper alloy components that are exposed to raw water.
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	Consistent with NUREG-1801, with exceptions. The Piping Corrosion Program is credited to manage loss of material for copper alloy heat exchanger components that are exposed to raw water.
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 Piping Corrosion Program is credited to manage loss of material for stainless steel and copper alloy heat exchanger tubes that are exposed to raw water.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**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 Inspection is credited to manage loss of material due to selective leaching for copper alloy >15% Zn components that are exposed to raw water or treated water. For certain HVAC heat exchanger components, the Cooling Units Inspection, a one-time inspection, is credited to detect and characterize loss of material due to selective leaching.
3.3.1-85	Gray cast iron piping, piping components, and piping elements exposed to soil, raw water, treated water or closed-cycle cooling water	Loss of material due to selective leaching	Selective Leaching of Materials	No	Consistent with NUREG-1801. The Selective Leaching Inspection is also credited for certain gray cast iron heat exchanger components that are exposed to treated water. Note C is used.
3.3.1-86	Structural steel (new fuel storage rack assembly) exposed to air – indoor uncontrolled (external)	Loss of material due to general, pitting, and crevice corrosion	Structures Monitoring Program	No	Not applicable. New fuel storage rack assemblies for SSES are constructed of aluminum with stainless steel fasteners. Refer to Table 3.5.2-2.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-87	PWR Only				
3.3.1-88	PWR Only				
3.3.1-89	PWR Only				
3.3.1-90	PWR Only				
3.3.1-91	PWR Only				
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. This item is also applied for galvanized steel ducting and ducting components that are exposed to air – indoor uncontrolled. Note C is used.
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.

Table 3.3.1	Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report				
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-94	Stainless steel and nickel alloy piping, piping components, and piping elements exposed to air – indoor uncontrolled (external)	None	None	NA - No AEM or AMP	Consistent with NUREG-1801. This item is also applicable to stainless steel tanks, ducting components, and insulation jacketing that are exposed to air – indoor uncontrolled. Note C is used. This item is also applicable to stainless steel ducting and ducting components, and for air – indoor uncontrolled (internal) where it was determined that the internal environment is the same as the external environment. Note C is used. Stainless steel insulation and insulation jacketing exposed to indoor air (uncontrolled) is also compared to this item. Refer to Table 3.5.2-10.
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. This item is applicable to the new fuel racks (Table 3.5.2-2) that are located inside the watertight new fuel storage vault. Note C is used.

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
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. This item is also applicable to certain steel, stainless steel, aluminum, and copper alloy heat exchanger components that are exposed to gas, and to certain steel compressor casings and tanks (including accumulators and separators), aluminum accumulator pistons, and stainless steel accumulators and rupture disks. Note C is used.
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. Although no aging effects are identified as requiring management, the Fire Water System Program will include replacement of sprinkler heads (with 50 years in service/place), regardless of whether aging effects require management.
3.3.1-99	PWR Only				

Table 3.3.2-1 Aging Management Review Results – Building Drains Nonradioactive System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping and Piping Components	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Area-Based NSAS Inspection	N/A	N/A	G, 0351
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349

Table 3.3.2-1 Aging Management Review Results – Building Drains Nonradioactive System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components - pump casings (0P553A-D, 0P567A-B)	Structural Integrity	Cast Iron	Raw Water (Internal)	Loss of Material	Area-Based NSAS Inspection	N/A	N/A	G, 0351
				Loss of Material	Selective Leaching Inspection	N/A	N/A	G
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349
Piping and Piping Components	Structural Integrity	Copper Alloy	Raw Water (Internal)	Loss of Material	Area-Based NSAS Inspection	N/A	N/A	G, 0351
				Loss of Material	Selective Leaching Inspection	N/A	N/A	G, 0351
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G, 0349

Table 3.3.2-2 Aging Management Review Results – Containment Instrument Gas System

Component / Commodity	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping	Pressure Boundary	Stainless Steel	Air-Gas (Nitrogen) (Internal)	None Identified	None Required	VII.J-19	3.3.1-97	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Piping	Pressure Boundary	Stainless Steel	Air-Gas (Dried Air) (Internal)	None Identified	None Required	VII.J-18	3.3.1-98	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-2 Aging Management Review Results – Containment Instrument Gas System

Component / Commodity	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Piping	Pressure Boundary	Carbon Steel	Air-Gas (Dried Air) (Internal)	None Identified	None Required	VII.J-22	3.3.1-98	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Piping	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Tubing	Pressure Boundary	Stainless Steel	Air-Gas (Nitrogen) (Internal)	None Identified	None Required	VII.J-19	3.3.1-97	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Valve Bodies	Pressure Boundary	Stainless Steel	Air-Gas (Nitrogen) (Internal)	None Identified	None Required	VII.J-19	3.3.1-97	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Valve Bodies	Pressure Boundary	Stainless Steel	Air-Gas (Dried Air) (Internal)	None Identified	None Required	VII.J-18	3.3.1-98	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-2 Aging Management Review Results – Containment Instrument Gas System

Component / Commodity	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Valve Bodies	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Heat Exchangers – shells (intercoolers 1/2E2100A/B for compressors 1/2K205A/B)	Structural Integrity	Copper Alloy (Brass)	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D, 0348
				Loss of Material	Selective Leaching Inspection	VII.C2-7	3.3.1-84	A
				Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H, 0347
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G, 0349
Heat Exchangers – shells, channels/ heads (Aftercooler 1/2E214A/B)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-1	3.3.1-48	D, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349

Table 3.3.2-2 Aging Management Review Results – Containment Instrument Gas System

Component / Commodity	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Piping and Piping Components	Structural Integrity	Stainless Steel	Raw Water (Internal)	Loss of Material	Area-Based NSAS Inspection	VII.D-4	3.3.1-54	E, 0350
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0349
Sight Glass/Level Gauge	Structural Integrity	Glass	Raw Water (Internal)	None Identified	None Required	VII.J-11	3.3.1-93	A
			Indoor Air (External)	None Identified	None Required	VII.J-8	3.3.1-93	A
Tanks (1/2T219A&B, 1/2T220A&B)	Structural Integrity	Stainless Steel	Raw Water (Internal)	Loss of Material	Area-Based NSAS Inspection	VII.D-4	3.3.1-54	E, 0350
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0349

Table 3.3.2-3 Aging Management Review Results – Control Rod Drive Hydraulics System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Accumulators (cylinder)	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	C, 0311
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Accumulators (cylinder, end caps)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking	BWR Water Chemistry Program	VII.E3-16	3.3.1.37	E
				Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-15	3.3.1-24	C
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C

Table 3.3.2-3 Aging Management Review Results – Control Rod Drive Hydraulics System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Accumulators (cylinder)	Pressure Boundary	Carbon Steel	Air-Gas (dry) (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Accumulators (cylinder, end caps)	Pressure Boundary	Stainless Steel	Air-Gas (dry) (Internal)	None Identified	None Required	VII.J-19	3.3.1-97	C
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C
Accumulators (piston)	Pressure Boundary	Aluminum	Treated Water (Internal)	Cracking	BWR Water Chemistry Program	VII.E3-7	3.3.1-24	H
				Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-7	3.3.1-24	C
			Air-Gas (dry) (External)	None Identified	None Required	VII.J-2	3.3.1-97	C

Table 3.3.2-3 Aging Management Review Results – Control Rod Drive Hydraulics System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Filters	Pressure Boundary, Filtration	Stainless Steel	Treated Water (Internal)	Cracking	BWR Water Chemistry Program	VII.E3-16	3.3.1-37	E
				Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-15	3.3.1-24	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-3 Aging Management Review Results – Control Rod Drive Hydraulics System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	A, 0311
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Piping	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-3 Aging Management Review Results – Control Rod Drive Hydraulics System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking	BWR Water Chemistry Program	VII.E3-16	3.3.1-37	E
				Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-15	3.3.1-24	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Piping	Pressure Boundary	Stainless Steel	Air-Gas (dry) (Internal)	None Identified	None Required	VII.J-18	3.3.1-98	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Rupture Disks	Pressure Boundary	Stainless Steel	Air-Gas (dry) (Internal)	None Identified	None Required	VII.J-19	3.3.1-97	C
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C

Table 3.3.2-3 Aging Management Review Results – Control Rod Drive Hydraulics System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	A, 0311
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Valve Bodies	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-3 Aging Management Review Results – Control Rod Drive Hydraulics System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking	BWR Water Chemistry Program	VII.E3-16	3.3.1-37	E
				Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-15	3.3.1-24	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Valve Bodies	Pressure Boundary	Stainless Steel	Air-Gas (dry) (Internal)	None Identified	None Required	VII.J-19	3.3.1-97	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	A, 0353
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349

Table 3.3.2-3 Aging Management Review Results – Control Rod Drive Hydraulics System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Copper Alloy	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-9	3.3.1-31	C, 0353
				Loss of Material	Selective Leaching Inspection	VII.E3-11	3.3.1-84	A
				Cracking	BWR Water Chemistry Program	N/A	N/A	H, 0347
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G, 0349
Piping and Piping Components	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-15	3.3.1-24	C, 0353
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Chiller Compressor-Motor (0K112A/B)	Pressure Boundary	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Chiller Compressor-Motor (0K112A/B)	Pressure Boundary	Cast Iron	Air-Gas (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Chiller Condenser (0S117A1/B1) Channel Head	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-5	3.3.1-77	B, 0305
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Chiller Condenser (0S117A1/B1) Shell	Pressure Boundary	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Chiller Condenser (0S117A1/B1) Tubes	Pressure Boundary, Heat Transfer	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-3	3.3.1-82	B, 0306
				Reduction in Heat Transfer	Piping Corrosion Program	VII.C1-6	3.3.1-83	B
			Air-Gas (External)	None Identified	None Required	VII.J-4	3.3.1-97	C
Chiller Condenser (0S117A1/B1) Tube Plugs	Pressure Boundary	Copper Alloy (Copper-Nickel)	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Raw Water (External)	Loss of Material	Piping Corrosion Program	VII.C1-3	3.3.1-82	B, 0306

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Chiller Condenser (0S117A1/B1) Tubesheet	Pressure Boundary	Copper Alloy (Copper-Nickel) Cladding	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-3	3.3.1-82	B, 0306
		Carbon Steel	Air-Gas (External)	None Identified	None Required	VII.J-23	3.3.1-97	C
Chiller Condenser (0S117A2/B2) Channel Head	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-5	3.3.1-77	B, 0305
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Chiller Condenser (0S117A2/B2) Shell	Pressure Boundary	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Chiller Condenser (0S117A2/B2) Tubes	Pressure Boundary, Heat Transfer	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-3	3.3.1-82	B, 0306
				Reduction in Heat Transfer	Piping Corrosion Program	VII.C1-6	3.3.1-83	B
			Air-Gas (External)	None Identified	None Required	VII.J-4	3.3.1-97	C

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Chiller Condenser (0S117A2/B2) Tube Plugs	Pressure Boundary	Copper Alloy (Copper-Nickel)	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Raw Water (External)	Loss of Material	Piping Corrosion Program	VII.C1-3	3.3.1-82	B, 0306
Chiller Condenser (0S117A2/B2) Tubesheet	Pressure Boundary	Copper Alloy (Copper-Nickel) Cladding	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-3	3.3.1-82	B, 0306
		Carbon Steel	Air-Gas (External)	None Identified	None Required	VII.J-23	3.3.1-97	C
Chiller Economizer (0S120A/B)	Pressure Boundary	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Chiller Evaporator (0S118A/B) Channel Head	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-1	3.3.1-48	B, 0307
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Chiller Evaporator (0S118A/B) Shell	Pressure Boundary	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Chiller Evaporator (0S118A/B) Tubes	Pressure Boundary, Heat Transfer	Copper	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D, 0308
				Reduction in Heat Transfer	Heat Exchanger Inspection	VII.C2-2	3.3.1-52	E
			Air-Gas (External)	None Identified	None Required	VII.J-4	3.3.1-97	C
Chiller Evaporator (0S118A/B) Tubesheet	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-1	3.3.1-48	B, 0307
			Air-Gas (External)	None Identified	None Required	VII.J-23	3.3.1-97	C

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Chiller Evaporator (0S118A/B) Tube Plugs	Pressure Boundary	Copper Alloy (Brass)	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Treated Water (External)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D, 0308
				Loss of Material	Selective Leaching Inspection	VII.C2-7	3.3.1-84	A
Chiller Oil Cooler (0S119A/B) Channel Head	Pressure Boundary	Cast Iron	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-1	3.3.1-48	B, 0307
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Chiller Oil Cooler (0S119A/B) Shell	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-5	3.3.1-21	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Chiller Oil Cooler (0S119A/B) Tubes	Pressure Boundary, Heat Transfer	Copper Alloy (Admiralty Brass)	Treated Water (Internal)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D, 0308
				Reduction in Heat Transfer	Heat Exchanger Inspection	VII.C2-2	3.3.1-52	E
			Lubricating Oil (External)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.C2-5	3.3.1-26	D
				Reduction in Heat Transfer	Lubricating Oil Analysis Program Lubricating Oil Inspection	N/A	N/A	H

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Chiller Oil Cooler (0S119A/B) Tubesheet	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-1	3.3.1-48	B, 0307
			Lubricating Oil (External)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-5	3.3.1-21	B
Chiller Oil Cooler (0S119A/B) Tube Plugs	Pressure Boundary	Copper Alloy (Brass)	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Treated Water (External)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D, 0308
				Loss of Material	Selective Leaching Inspection	VII.C2-7	3.3.1-84	A

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Chiller Oil Filter (LF08602A/B, LF08603A/B)	Pressure Boundary, Filtration	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.F1-19	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Chiller Oil Filter (LF08602A/B, LF08603A/B)	Pressure Boundary, Filtration	Cast Iron	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.F1-19	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Chiller Oil Pump (0P122A/B)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.F1-19	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Chiller Oil Pump (0P122A/B)	Pressure Boundary	Cast Iron	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.F1-19	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Chiller Refrigerant Dryer Filter (LF08601A/B)	Pressure Boundary, Filtration	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Chiller Separator (0S114A/B)	Pressure Boundary, Filtration	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0307
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Chiller Separator (0S114A/B)	Pressure Boundary, Filtration	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Piping (Skid-Mounted)	Pressure Boundary	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Piping (Skid-Mounted)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.F1-19	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping (Skid-Mounted)	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0307
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Sight Gauges (Skid-Mounted)	Pressure Boundary	Glass	Lubricating Oil (Internal)	None Identified	None Required	VII.J-10	3.3.1-93	A
			Indoor Air (External)	None Identified	None Required	VII.J-8	3.3.1-93	A
Sight Gauges (Skid-Mounted)	Pressure Boundary	Glass	Air-Gas (Internal)	None Identified	None Required	N/A	N/A	G
			Indoor Air (External)	None Identified	None Required	VII.J-8	3.3.1-93	A
Strainers (Skid-Mounted) (YS08602A/B, YS08604A/B)	Pressure Boundary, Filtration, Throttling	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Strainers (Skid-Mounted) (YS08602A/B, YS08604A/B)	Pressure Boundary, Filtration, Throttling	Stainless Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-19	3.3.1-97	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Strainers (Skid-Mounted) (YS08603A/B)	Pressure Boundary, Filtration	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Strainers (Skid-Mounted) (YS08603A/B)	Pressure Boundary, Filtration	Stainless Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-19	3.3.1-97	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E
Tubing (Skid-Mounted)	Pressure Boundary	Copper	Lubricating Oil (Internal)	None Identified	None Required	VII.C2-5	3.3.1-26	I, 0310
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E
Tubing (Skid-Mounted)	Pressure Boundary	Copper	Air-Gas (Internal)	None Identified	None Required	VII.J-4	3.3.1-97	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies (Skid-Mounted)	Pressure Boundary	Copper Alloy (Brass)	Air-Gas (Internal)	None Identified	None Required	VII.J-4	3.3.1-97	A
			Indoor Air (External)	Loss of Material	Selective Leaching Inspection	N/A	N/A	H
				Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E
Valve Bodies (Skid-Mounted)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.F1-19	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Valve Bodies (Skid-Mounted)	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0307
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Drain Pans, Cooling Units	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Cooling Units Inspection	VII.C1-19	3.3.1-76	E
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Orifices	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0309
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E
Orifices	Pressure Boundary, Throttling	Stainless Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-10	3.3.1-50	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0305
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0307
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Piping	Pressure Boundary	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Cooling Units Inspection	VII.C1-19	3.3.1-76	E, 0341
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Pump Casings (0P162A/B)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-10	3.3.1-50	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Pump Casings (0P171A/B)	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0309
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E
Tanks (0T109A/B)	Pressure Boundary	Carbon Steel	Air-Gas (Moist) (Internal)	Loss of Material	Supplemental Piping/Tank Inspection	VII.H2-21	3.3.1-71	E
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Tanks (0T109A/B, 0T113A/B)	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0307, 0360
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Tubing	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0309
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-10	3.3.1-50	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E
Valve Bodies	Pressure Boundary	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Valve Bodies	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0305
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Valve Bodies	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0307
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304

Table 3.3.2-4 Aging Management Review Results – Control Structure Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345
Piping and Piping Components	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345
Piping and Piping Components – pump casings (0P170A/B)	Structural Integrity	Ductile Iron	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345
Tanks (0T204A/B)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345

Table 3.3.2-5 Aging Management Review Results – Control Structure HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Duct Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-7	3.3.1-55	A

Table 3.3.2-5 Aging Management Review Results – Control Structure HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
H&V Unit, Control Structure (0E146A1/2 & 0E146B1/2) Channels	Pressure Boundary	Copper Alloy (Red Brass)	Treated Water (Internal)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D, 0312
				Loss of Material (selective leaching)	Cooling Units Inspection	VII.F1-9	3.3.1-84	E
			Indoor Air (External)	Loss of Material	Cooling Units Inspection	VII.F1-16	3.3.1-25	E, 0337
H&V Unit, Control Structure (0E146A1/2 & 0E146B1/2) Cooling Coils	Pressure Boundary, Heat Transfer	Copper	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D, 0312
				Reduction in Heat Transfer	Cooling Units Inspection	VII.F1-12	3.3.1-52	E
			Ventilation (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-5 Aging Management Review Results – Control Structure HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
H&V Unit, Control Structure (0E146A1/2 & 0E146B1/2) Fins	Heat Transfer	Aluminum	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Ventilation (External)	Reduction in Heat Transfer	Cooling Units Inspection	N/A	N/A	H
H&V Unit, Control Structure (0E146A1/2 & 0E146B1/2) Housings	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	C
Cooling Unit, Control Room Floor (0E151A1/2 & 0E151B1/2) Channels	Pressure Boundary	Copper Alloy (Red Brass)	Treated Water (Internal)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D, 0312
				Loss of Material (selective leaching)	Cooling Units Inspection	VII.F1-9	3.3.1-84	E
			Indoor Air (External)	Loss of Material	Cooling Units Inspection	VII.F1-16	3.3.1-25	E, 0337

Table 3.3.2-5 Aging Management Review Results – Control Structure HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Cooling Unit, Control Room Floor (0E151A1/2 & 0E151B1/2) Cooling Coils	Pressure Boundary, Heat Transfer	Copper	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D, 0312
				Reduction in Heat Transfer	Cooling Units Inspection	VII.F1-12	3.3.1-52	E
			Ventilation (External)	None Identified	None Required	N/A	N/A	G
Cooling Unit, Control Room Floor (0E151A1/2 & 0E151B1/2) Fins	Heat Transfer	Aluminum	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Ventilation (External)	Reduction in Heat Transfer	Cooling Units Inspection	N/A	N/A	H
Cooling Unit, Control Room Floor (0E151A1/2 & 0E151B1/2) Housings	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	C

Table 3.3.2-5 Aging Management Review Results – Control Structure HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Cooling Unit, Computer Room Floor (0E150A1/2 & 0E150B1/2) Channels	Pressure Boundary	Copper Alloy (Red Brass)	Treated Water (Internal)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D, 0312
				Loss of Material (selective leaching)	Cooling Units Inspection	VII.F1-9	3.3.1-84	E
			Indoor Air (External)	Loss of Material	Cooling Units Inspection	VII.F1-16	3.3.1-25	E, 0337
Cooling Unit, Computer Room Floor (0E150A1/2 & 0E150B1/2) Cooling Coils	Pressure Boundary, Heat Transfer	Copper	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D, 0312
				Reduction in Heat Transfer	Cooling Units Inspection	VII.F1-12	3.3.1-52	E
			Ventilation (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-5 Aging Management Review Results – Control Structure HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Cooling Unit, Computer Room Floor (0E150A1/2 & 0E150B1/2) Fins	Heat Transfer	Aluminum	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Ventilation (External)	Reduction in Heat Transfer	Cooling Units Inspection	N/A	N/A	H
Cooling Unit, Computer Room Floor (0E150A1/2 & 0E150B1/2) Housings	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	C
Damper Housings	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	C
Damper Housings	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C
Duct Heater Housings	Pressure Boundary	Aluminized Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0334, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0334

Table 3.3.2-5 Aging Management Review Results – Control Structure HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Ductwork	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	C
Fan Housings, Control Structure H&V Unit (0V103A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Fan Housings, Control Room Floor Cooling Unit (0V117A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Fan Housings, Computer Room Floor Cooling Unit (0V115A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-5 Aging Management Review Results – Control Structure HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Fan Housings, CREOASS Unit (0V101A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Fan Housings, SGTS Equipment Room H&V Unit (0V118A/B & 0V144A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Fan Housings, Battery Room Exhaust (0V116A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Filter Housings, Control Structure H&V Unit Pre-Filter (0F128A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-5 Aging Management Review Results – Control Structure HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Filter Housings, Control Structure H&V Unit Pre-Filter (0F128A/B)	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C
Filter Housings, Control Room Floor Cooling Unit (0F132A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Filter Housings, Control Room Floor Cooling Unit (0F132A/B)	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C
Filter Housings, Computer Room Floor Cooling Unit (0F131A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-5 Aging Management Review Results – Control Structure HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Filter Housings, Computer Room Floor Cooling Unit (0F131A/B)	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C
Filter Housings, CREOASS Unit (0F123A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Filter Housings, CREOASS Unit (0F123A/B)	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C
Filter Housings, CREOASS Unit HEPA Filter (0F124A/B & 0F126A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-5 Aging Management Review Results – Control Structure HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Filter Housings, CREOASS Unit HEPA Filter (0F124A/B & 0F126A/B)	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C
Filter Housings, CREOASS Unit Charcoal Filters (0F125A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Filter Housings, CREOASS Unit Charcoal Filters (0F125A/B)	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C
Filter Housings, SGTS Equipment Room H&V Unit (0F127A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-5 Aging Management Review Results – Control Structure HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Filter Housings, SGTS Equipment Room H&V Unit (0F127A/B)	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C
Flexible Connections (ductwork)	Pressure Boundary	Neoprene/ Fiberglass	Ventilation (Internal)	None Identified	None Required	VII.F1-7	3.3.1-11	I, 0318
			Indoor Air (External)	None Identified	None Required	VII.F1-7	3.3.1-11	I, 0318
Flexible Connections (ductwork)	Pressure Boundary	Neoprene/ Asbestos	Ventilation (Internal)	None Identified	None Required	VII.F1-7	3.3.1-11	I, 0318
			Indoor Air (External)	None Identified	None Required	VII.F1-7	3.3.1-11	I, 0318
Flow Elements (Air Straighteners)	Flow Conditioning	Aluminum	Ventilation (Internal)	None Identified	None Required	N/A	N/A	G
			N/A (External)	N/A	N/A	N/A	N/A	N/A
Flow Elements (Casings)	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	C

Table 3.3.2-5 Aging Management Review Results – Control Structure HVAC Systems

Component / Commodity	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Flow Elements (Manifolds/ Sensors)	Pressure Boundary, Throttling	Copper	Ventilation (Internal)	None Identified	None Required	N/A	N/A	G
			Ventilation (External)	None Identified	None Required	N/A	N/A	G
Flow Elements (Fittings)	Pressure Boundary	Copper Alloy (Brass)	Ventilation (Internal)	None Identified	None Required	N/A	N/A	G
			Ventilation (External)	None Identified	None Required	N/A	N/A	G
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0311
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Piping	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Tubing	Pressure Boundary	Copper	Ventilation (Internal)	None Identified	None Required	N/A	N/A	G
			Ventilation (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-5 Aging Management Review Results – Control Structure HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Valve Bodies	Pressure Boundary	Copper Alloy (Brass)	Ventilation (Internal)	None Identified	None Required	N/A	N/A	G
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Valve Bodies	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-6 Aging Management Review Results – Cooling Tower System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Bolting	Pressure Boundary	Carbon Steel	Outdoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-1	3.3.1-43	B
Bolting	Pressure Boundary	Stainless Steel	Outdoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
			Buried (External)	Loss of Material	Buried Piping and Tanks Inspection Program	VII.G-25	3.3.1-19	B

Table 3.3.2-6 Aging Management Review Results – Cooling Tower System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0315

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Filter Bodies	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Flexible Connections (Expansion Joints)	Pressure Boundary	Stainless Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-6	3.3.1-32	B
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Flexible Connections (Hoses)	Pressure Boundary	Elastomers (Synthetic Rubber)	Fuel Oil (Internal)	None Identified	None Required	N/A	N/A	G
			Indoor Air (External)	None Identified	None Required	VII.F4-6	3.3.1-11	I, 0318
Heat Exchangers (0E526E) Shells	Pressure Boundary	Copper Alloy (Copper-Nickel)	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-3	3.3.1-32	D, 0325
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (0E526E) Channels & Covers	Pressure Boundary	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-3	3.3.1-82	B, 0326
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Heat Exchangers (0E526E) Tubes	Pressure Boundary, Heat Transfer	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-11	3.3.1-80	D, 0326
				Reduction in Heat Transfer	Piping Corrosion Program	VII.C1-6	3.3.1-83	B
			Fuel Oil (External)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-3	3.3.1-32	D, 0325

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (0E526E) Tubesheet	Pressure Boundary	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-11	3.3.1-80	D, 0326
			Fuel Oil (External)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-3	3.3.1-32	D, 0325
Heat Exchangers (0E526E) Tube Plugs	Pressure Boundary	Copper Alloy (Copper-Nickel)	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Fuel Oil (External)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-3	3.3.1-32	D, 0325
Level Gauges (Day Tank)	Pressure Boundary	Glass	Fuel Oil (Internal)	None Identified	None Required	VII.J-9	3.3.1-93	A
			Indoor Air (External)	None Identified	None Required	VII.J-8	3.3.1-93	A

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Level Gauges (Day Tank)	Pressure Boundary	Glass	Ventilation (Internal)	None Identified	None Required	VII.J-8	3.3.1-93	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-8	3.3.1-93	A
Level Gauges (Day Tank)	Pressure Boundary	Copper Alloy (Brass)	Fuel Oil (Internal)	Cracking	Fuel Oil Chemistry Program	N/A	N/A	H
				Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-3	3.3.1-32	B, 0325
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Level Gauges (Day Tank)	Pressure Boundary	Copper Alloy (Bronze)	Fuel Oil (Internal)	Cracking	Fuel Oil Chemistry Program	N/A	N/A	H
				Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-3	3.3.1-32	B, 0325
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Level Gauges (Day Tank)	Pressure Boundary	Cast Iron	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Level Gauges (Day Tank)	Pressure Boundary	Copper Alloy (Brass)	Ventilation (Internal)	None Identified	None Required	N/A	N/A	G
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Level Gauges (Day Tank)	Pressure Boundary	Copper Alloy (Bronze)	Ventilation (Internal)	None Identified	None Required	N/A	N/A	G
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Level Gauges (Day Tank)	Pressure Boundary	Cast Iron	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Orifices	Pressure Boundary, Throttling	Copper Alloy (Brass)	Fuel Oil (Internal)	Cracking	Fuel Oil Chemistry Program	N/A	N/A	H
				Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-3	3.3.1-32	B, 0325
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Piping	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324
			Fuel Oil (External)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324
			Buried (External)	Loss of Material	Buried Piping and Tanks Inspection Program	VII.H1-9	3.3.1-19	B, 0327
Piping	Pressure Boundary	Stainless Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-6	3.3.1-32	B
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Stainless Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-6	3.3.1-32	B
			Fuel Oil (External)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-6	3.3.1-32	B

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Pump Casings (0P514A-D)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324
			Fuel Oil (External)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324
Pump Casings (0P514E)	Pressure Boundary	Stainless Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-6	3.3.1-32	B
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Pump Casings (0P538A-E)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Pump Casings (0P544A-E)	Pressure Boundary	Cast Iron	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Strainer Bodies	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Strainer Screens	Filtration	Carbon Steel	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Fuel Oil (External)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Strainer Screens	Filtration	Stainless Steel	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Fuel Oil (External)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-6	3.3.1-32	B
Tanks (0T527A-E)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324
			Buried (External)	Loss of Material	Buried Piping and Tanks Inspection Program	VII.H1-9	3.3.1-19	D, 0327

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tanks (0T527A-E)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	Supplemental Piping/Tank Inspection	N/A	N/A	G
			Buried (External)	Loss of Material	Buried Piping and Tanks Inspection Program	VII.H1-9	3.3.1-19	D, 0327
Tanks (0T528A-E)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tanks (0T528A-E)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Tank - Fuel Oil Header (0G501E)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing (and Fittings)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Tubing (and Fittings)	Pressure Boundary	Stainless Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-6	3.3.1-32	B
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing (and Fittings)	Pressure Boundary	Cast Iron	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Tubing (and Fittings)	Pressure Boundary	Copper Alloy (Brass)	Fuel Oil (Internal)	Cracking	Fuel Oil Chemistry Program	N/A	N/A	H
				Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-3	3.3.1-32	B, 0325
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing (and Fittings)	Pressure Boundary	Copper Alloy (Bronze)	Fuel Oil (Internal)	Cracking	Fuel Oil Chemistry Program	N/A	N/A	H
				Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-3	3.3.1-32	B, 0325
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Valve Bodies	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-10	3.3.1-20	B, 0324
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Stainless Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-6	3.3.1-32	B
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Valve Bodies	Pressure Boundary	Copper Alloy (Brass)	Fuel Oil (Internal)	Cracking	Fuel Oil Chemistry Program	N/A	N/A	H
				Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-3	3.3.1-32	B, 0325
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-7 Aging Management Review Results – Diesel Fuel Oil System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Copper Alloy (Bronze)	Fuel Oil (Internal)	Cracking	Fuel Oil Chemistry Program	N/A	N/A	H
				Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.H1-3	3.3.1-32	B, 0325
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-8 Aging Management Review Results – Diesel Generator Buildings HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Duct Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-7	3.3.1-55	A
Damper Housings	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	C
Ductwork	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	C
Fan Housings, DG Buildings Vent Supply (0V512A-D)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Fan Housings, DG 'E' Building Battery Room Exhaust (0V511E)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-8 Aging Management Review Results – Diesel Generator Buildings HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Fan Housings, DG 'E' Building Vent Supply (0V512E1/E2)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Fan Housings, DG 'E' Building Vent Exhaust (0V512E3/E4)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Flexible Connections (ductwork)	Pressure Boundary	Neoprene	Ventilation (Internal)	None Identified	None Required	VII.F4-6	3.3.1-11	I, 0318
			Indoor Air (External)	None Identified	None Required	VII.F4-6	3.3.1-11	I, 0318
Flexible Connections (ductwork)	Pressure Boundary	Neoprene/ Asbestos	Ventilation (Internal)	None Identified	None Required	VII.F4-6	3.3.1-11	I, 0318
			Indoor Air (External)	None Identified	None Required	VII.F4-6	3.3.1-11	I, 0318

Table 3.3.2-8 Aging Management Review Results – Diesel Generator Buildings HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Flexible Connections (ductwork)	Pressure Boundary	Neoprene/ Fiberglass	Ventilation (Internal)	None Identified	None Required	VII.F4-6	3.3.1-11	I, 0318
			Indoor Air (External)	None Identified	None Required	VII.F4-6	3.3.1-11	I, 0318
Tubing	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Diesel Generators System – Lubricating Oil								
Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Filter Bodies	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Flexible Connections (Expansion Joints)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Flexible Connections (Expansion Joints)	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-17	3.3.1-33	B
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Flexible Connections (Hoses)	Pressure Boundary	Elastomers (Synthetic Rubber)	Lubricating Oil (Internal)	None Identified	None Required	N/A	N/A	G
			Indoor Air (External)	None Identified	None Required	VII.F4-6	3.3.1-11	I, 0318

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (0E506A-D) Shells	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	D
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Heat Exchangers (0E506A-D) Channels & Covers	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-5	3.3.1-77	B, 0326
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0304
Heat Exchangers (0E506E) Shells	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	D
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (0E506E) Channels	Pressure Boundary	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-11	3.3.1-80	D, 0326
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F4-12	3.3.1-25	E
Heat Exchangers (0E506E) Covers	Pressure Boundary	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-11	3.3.1-80	D, 0326
		Carbon Steel	Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0304
Heat Exchangers (0E506A-E) Tubes	Pressure Boundary, Heat Transfer	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-11	3.3.1-80	D, 0326
				Reduction in Heat Transfer	Piping Corrosion Program	VII.C1-6	3.3.1-83	B
			Lubricating Oil (External)	Reduction in Heat Transfer	Piping Corrosion Program	N/A	N/A	H

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (0E506A-E) Tubesheet	Pressure Boundary	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-11	3.3.1-80	D, 0326
			Lubricating Oil (External)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-10	3.3.1-26	D
Heat Exchangers (0E506A-E) Tube Plugs	Pressure Boundary	Copper Alloy (Copper-Nickel)	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Lubricating Oil (External)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-10	3.3.1-26	D
Heat Exchangers (0E533A-E) Shells	Pressure Boundary	Aluminum	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	N/A	N/A	G
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (0E533A-E) End Bells	Pressure Boundary	Aluminum	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.A4-2	3.3.1-23	E
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (0E533A-E) Tubes	Pressure Boundary, Heat Transfer	Copper Alloy	Treated Water (Internal)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-8	3.3.1-51	D
				Loss of Material	Selective Leaching Inspection	VII.H2-12	3.3.1-84	A
				Reduction in Heat Transfer	Closed Cooling Water Chemistry Program	VII.C2-2	3.3.1-52	A
			Lubricating Oil (External)	Reduction in Heat Transfer	Lubricating Oil Analysis Program Lubricating Oil Inspection	V.D2-9	3.2.1-9	B

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heaters (0E525A-D) Casings	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	D
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Heaters (0E525E) Casings	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-17	3.3.1-33	D
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C
Heaters (0E525A-D) Sheaths	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.F1-2	3.3.1-56	C, 0302
			Lubricating Oil (External)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	D

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heaters (0E525E) Sheaths	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Lubricating Oil (External)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-17	3.3.1-33	D
Level Gauges (LG03452A-D)	Pressure Boundary	Plastics (Lucite)	Lubricating Oil (Internal)	None Identified	None Required	N/A	N/A	F
			Indoor Air (External)	None Identified	None Required	N/A	N/A	F
Level Gauges (LG03452A-D)	Pressure Boundary	Plastics (Lucite)	Ventilation (Internal)	None Identified	None Required	N/A	N/A	F
			Indoor Air (External)	None Identified	None Required	N/A	N/A	F
Level Gauges (LG03452E)	Pressure Boundary	Plastics (Lucite)	Lubricating Oil (Internal)	None Identified	None Required	N/A	N/A	F
			Indoor Air (External)	None Identified	None Required	N/A	N/A	F
Level Gauges (LG03452E)	Pressure Boundary	Plastics (Lucite)	Ventilation (Internal)	None Identified	None Required	N/A	N/A	F
			Indoor Air (External)	None Identified	None Required	N/A	N/A	F

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Pump Casings (0P532A-D) (0P533A-D) (0P556A-E)	Pressure Boundary	Cast Iron	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Pump Casings (0P532E) (0P533E)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Strainer Bodies	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Strainer Bodies	Pressure Boundary	Cast Iron	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Strainer Bodies	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-17	3.3.1-33	B
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Strainer Screens	Filtration	Stainless Steel	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Lubricating Oil (External)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-17	3.3.1-33	B
Tubing (and Fittings)	Pressure Boundary	Stainless Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-17	3.3.1-33	B
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Tubing (and Fittings)	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing (and Fittings)	Pressure Boundary	Cast Iron	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Tubing (and Fittings)	Pressure Boundary	Copper Alloy (Brass)	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-10	3.3.1-26	B
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Valve Bodies	Pressure Boundary	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Cast Iron	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Diesel Generators System – Jacket Water								
Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Flexible Connections (Expansion Joints)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-10	3.3.1-50	B
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (0E507A-D) Shells	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	D, 0320
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Heat Exchangers (0E507A-D) Channels & Covers	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-22	3.3.1-76	D, 0328
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.H2-3	3.3.1-59	A, 0304
Heat Exchangers (0E507E) Shell	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	D, 0320
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (0E507E) Channels	Pressure Boundary	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-11	3.3.1-80	D, 0326
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E
Heat Exchangers (0E507E) Channel Covers	Pressure Boundary	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-11	3.3.1-80	D, 0326
		Carbon Steel	Indoor Air (External)	Loss of Material	System Walkdown Program	VII.H2-3	3.3.1-59	A, 0304

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (0E507A-D) Tubes	Pressure Boundary, Heat Transfer	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-18	3.3.1-80	D, 0309
				Reduction in Heat Transfer	Piping Corrosion Program	VII.H2-6	3.3.1-83	B
			Treated Water (External)	Loss of Material	Closed Cooling Water Chemistry Program	VII.A4-2	3.3.1-23	E
				Reduction in Heat Transfer	Closed Cooling Water Chemistry Program	VII.C2-3	3.3.1-52	B
Heat Exchangers (0E507A-D) Tubesheet	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-18	3.3.1-80	D, 0309
			Treated Water (External)	Loss of Material	Closed Cooling Water Chemistry Program	VII.A4-2	3.3.1-23	E

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (0E507A-D) Tube Plugs	Pressure Boundary	Stainless Steel	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Treated Water (External)	Loss of Material	Closed Cooling Water Chemistry Program	VII.A4-2	3.3.1-23	E
Heat Exchangers (0E507E) Tubes	Pressure Boundary, Heat Transfer	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-11	3.3.1-80	D, 0326
				Reduction in Heat Transfer	Piping Corrosion Program	VII.C1-6	3.3.1-83	B
			Treated Water (External)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D
				Reduction in Heat Transfer	Closed Cooling Water Chemistry Program	VII.C2-2	3.3.1-52	B

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (0E507E) Tubesheet	Pressure Boundary	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-11	3.3.1-80	D, 0326
			Treated Water (External)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D
Heat Exchangers (0E507E) Tube Plugs	Pressure Boundary	Copper Alloy (Copper-Nickel)	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Treated Water (External)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heaters (0E508A-D) Casings	Pressure Boundary	Galvanized Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	D, 0320
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	C
Heaters Immersion (0E508E) Flanges	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-10	3.3.1-50	B
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heaters Immersion (0E508A-E) Sheaths	Pressure Boundary	Copper Alloy	Ventilation (Internal)	None Identified	None Required	N/A	N/A	G
			Treated Water (External)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D
				Loss of Material	Selective Leaching Inspection	VII.C2-7	3.3.1-84	A
Heaters Immersion (0E508A-D) Sheaths	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Treated Water (External)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-10	3.3.1-50	D
Standpipes, Level Gauges	Pressure Boundary	Glass	Treated Water (Internal)	None Identified	None Required	VII.J-13	3.3.1-93	A
			Indoor Air (External)	None Identified	None Required	VII.J-8	3.3.1-93	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Standpipes, Level Gauges	Pressure Boundary	Glass	Ventilation (Internal)	None Identified	None Required	VII.J-8	3.3.1-93	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-8	3.3.1-93	A
Orifices	Pressure Boundary, Throttling	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	B, 0320
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	B, 0320
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Pump Casings (0P530A-E) (0P531A-E)	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	B, 0320
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Pump Casings (0P557A-E)	Pressure Boundary	Cast Iron	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	B, 0320
				Loss of Material	Selective Leaching Inspection	VII.C2-9	3.3.1-85	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Tanks (0T539A-E)	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	B, 0320
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Tanks (0T539A-E)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing (and Fittings)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-10	3.3.1-50	B
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Tubing (and Fittings)	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	B, 0320
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Tubing (and Fittings)	Pressure Boundary	Copper Alloy (Brass)	Treated Water (Internal)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	B
				Loss of Material	Selective Leaching Inspection	VII.C2-7	3.3.1-84	A
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing (and Fittings)	Pressure Boundary	Copper Alloy (Bronze)	Treated Water (Internal)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	B
				Loss of Material	Selective Leaching Inspection	VII.C2-7	3.3.1-84	A
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Valve Bodies	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	B, 0320
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Copper Alloy (Brass)	Treated Water (Internal)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	B
				Loss of Material	Selective Leaching Inspection	VII.C2-7	3.3.1-84	A
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Valve Bodies	Pressure Boundary	Copper Alloy (Bronze)	Treated Water (Internal)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	B
				Loss of Material	Selective Leaching Inspection	VII.C2-7	3.3.1-84	A
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Diesel Generators System – Intake / Exhaust								
Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Bolting	Pressure Boundary	Carbon Steel	Outdoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-1	3.3.1-43	B
Bolting	Pressure Boundary	Stainless Steel	Outdoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Filter Housings	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	C, 0302
			Outdoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Flexible Connections (Expansion Joints)	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Flexible Connections 0G501E (Seal Boot)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Flexible Connections 0G501E (Seal Boot)	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Heat Exchangers (0E505B-D) Water Boxes	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	D, 0320
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (0E505B-D) Water Boxes	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-22	3.3.1-76	B, 0328
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0304
Heat Exchangers (0E505A&E) Water Boxes	Pressure Boundary	Copper Alloy (Copper-Nickel)	Treated Water (Internal)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Heat Exchangers (0E505A&E) Water Boxes	Pressure Boundary	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-11	3.3.1-80	D, 0326
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (0E505A-E) Heating Core Tubes	Pressure Boundary, Heat Transfer	Copper Alloy (Copper-Nickel)	Treated Water (Internal)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D
				Reduction in Heat Transfer	Closed Cooling Water Chemistry Program	VII.C2-2	3.3.1-52	B
			Ventilation (External)	None Identified	None Required	N/A	N/A	G
Heat Exchangers (0E505A-E) Cooling Core Tubes	Pressure Boundary, Heat Transfer	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-11	3.3.1-80	D, 0326
				Reduction in Heat Transfer	Piping Corrosion Program	VII.C1-6	3.3.1-83	B
			Ventilation (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (0E505B-D) Heating Core Tubesheet	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	D, 0320
			Ventilation (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C
Heat Exchangers (0E505B-D) Cooling Core Tubesheet	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-22	3.3.1-76	B, 0328
			Ventilation (External)	Loss of Material	System Walkdown Program	VII.H2-3	3.3.1-59	C, 0302
Heat Exchangers (0E505A&E) Heating Core Tubesheet	Pressure Boundary	Copper Alloy (Copper-Nickel)	Treated Water (Internal)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D
			Ventilation (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (0E505A&E) Cooling Core Tubesheet	Pressure Boundary	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.H2-11	3.3.1-80	D, 0326
			Ventilation (External)	None Identified	None Required	N/A	N/A	G
Heat Exchangers (0E505A-E) Heating Core Tube Plugs	Pressure Boundary	Nickel Alloys (Monel)	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	N/A	N/A	G
			Ventilation (External)	None Identified	None Required	N/A	N/A	G
Heat Exchangers (0E505A-E) Heating Core Tube Plugs	Pressure Boundary	Elastomers (Silicone)	Treated Water (Internal)	None Identified	None Required	VII.A4-1	3.3.1-12	I, 0332
			Ventilation (External)	None Identified	None Required	VII.F4-6	3.3.1-11	1, 0318
Heat Exchangers (0E505A-E) Cooling Core Tube Plugs	Pressure Boundary	Nickel Alloys (Monel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-13	3.3.1-78	B, 0326
			Ventilation (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers (0E505A-E) Cooling Core Tube Plugs	Pressure Boundary	Elastomers (Silicone)	Raw Water (Internal)	None Identified	None Required	N/A	N/A	G
			Ventilation (External)	None Identified	None Required	VII.F4-6	3.3.1-11	I, 0318
Heat Exchangers (0E505A-E) Fins	Heat Transfer	Aluminum	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Ventilation (External)	None Identified	None Required	N/A	N/A	G
Piping	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.H2-2	3.3.1-18	E, 0329
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Piping	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.H2-2	3.3.1-18	E, 0329
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.I-9	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Silencers (Intake)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Silencers (Exhaust)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.H2-2	3.3.1-18	E, 0329
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Tubing (and Fittings)	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Tubing (and Fittings)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Turbocharger Casings (0G501A-D)	Pressure Boundary	Cast Iron	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Turbocharger Casings (0G501A-D)	Pressure Boundary, Heat Transfer	Cast Iron	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	D, 0320
				Loss of Material	Selective Leaching Inspection	VII.C2-9	3.3.1-85	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Turbocharger Casings (0G501A-D)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Turbocharger Casings (0G501A-D)	Pressure Boundary, Heat Transfer	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	D, 0320
				Reduction in Heat Transfer	Closed Cooling Water Chemistry Program	VII.F4-9	3.3.1-52	B, 0330
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Turbocharger Casings (0G501E)	Pressure Boundary	Cast Iron	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Turbocharger Casings (0G501E)	Pressure Boundary, Heat Transfer	Cast Iron	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	D, 0320
				Loss of Material	Selective Leaching Inspection	VII.C2-9	3.3.1-85	C
				Reduction in Heat Transfer	Closed Cooling Water Chemistry Program	VII.F4-9	3.3.1-52	B, 0330
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Valve Bodies	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Diesel Generators System – Starting Air								
Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Drain Trap Bodies (DT03434A-D)	Pressure Boundary	Stainless Steel	Air-Gas (Internal)	Loss of Material	Supplemental Piping/Tank Inspection	VII.F2-1	3.3.1-27	E
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Filter Bodies	Pressure Boundary	Aluminum	Air-Gas (Internal)	None Identified	None Required	VII.J-2	3.3.1-97	A
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Filters (Sight Levels)	Pressure Boundary	Plastics (Poly-carbonate)	Air-Gas (Internal)	None Identified	None Required	N/A	N/A	F
			Indoor Air (External)	None Identified	None Required	N/A	N/A	F

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Flexible Connections 0G501E (Expansion Joints)	Pressure Boundary	Stainless Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-18	3.3.1-98	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Moisture Separators (0T540A-D)	Pressure Boundary, Water Removal	Carbon Steel	Air-Gas (Internal)	Loss of Material	Supplemental Piping/Tank Inspection	VII.H2-21	3.3.1-71	E
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Orifices	Pressure Boundary, Throttling	Copper Alloy (Bronze)	Air-Gas (Internal)	None Identified	None Required	VII.J-3	3.3.1-98	A
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Piping	Pressure Boundary	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-22	3.3.1-98	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Tanks, Air Receiver (0T535A-E)	Pressure Boundary	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-22	3.3.1-98	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing (and Fittings)	Pressure Boundary	Stainless Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-18	3.3.1-98	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Tubing (and Fittings)	Pressure Boundary	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-22	3.3.1-98	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Valve Bodies	Pressure Boundary	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-22	3.3.1-98	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Valve Bodies	Pressure Boundary	Stainless Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-18	3.3.1-98	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Valve Bodies	Pressure Boundary	Copper Alloy (Bronze)	Air-Gas (Internal)	None Identified	None Required	VII.J-3	3.3.1-98	A
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Nickel Alloys (Nickel-Iron)	Air-Gas (Internal)	None Identified	None Required	N/A	N/A	G
			Indoor Air (External)	None Identified	None Required	VII.J-14	3.3.1-94	A
Diesel Generators System – NSAS Components								
Bolting	Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping and Piping Components	Structural Integrity	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	B, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349
Piping and Piping Components - pump casings (0P598, 0P599)	Structural Integrity	Cast Iron	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components - pump casings (0P596, 0P597)	Structural Integrity	Cast Iron	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	B, 0348
				Loss of Material	Selective Leaching Inspection	VII.C2-8	3.3.1-85	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349
Piping and Piping Components	Structural Integrity	Copper Alloy	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-10	3.3.1-26	B
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Copper Alloy	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-8	3.3.1-51	B, 0348
				Loss of Material	Selective Leaching Inspection	VII.H2-12	3.3.1-84	A
				Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H, 0347
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G, 0349
Sight Glass/Level Gauge	Structural Integrity	Glass	Lubricating Oil (Internal)	None Identified	None Required	VII.J-10	3.3.1-93	A
			Indoor Air (External)	None Identified	None Required	VII.J-8	3.3.1-93	A
Sight Glass/Level Gauge	Structural Integrity	Glass	Treated Water (Internal)	None Identified	None Required	VII.J-13	3.3.1-93	A
			Indoor Air (External)	None Identified	None Required	VII.J-8	3.3.1-93	A

Table 3.3.2-9 Aging Management Review Results – Diesel Generators System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tanks (0T596)	Structural Integrity	Carbon Steel	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Tank (0T597)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.H2-23	3.3.1-47	B, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349

Table 3.3.2-10 Aging Management Review Results – Domestic Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping and Piping Components	Structural Integrity	Copper Alloy	Raw Water (Internal)	Loss of Material	Area-Based NSAS Inspection	N/A	N/A	G, 0344
				Loss of Material	Selective Leaching Inspection	N/A	N/A	G, 0344
				Cracking	Area-Based NSAS Inspection	N/A	N/A	G, 0344
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E, 0354
				Loss of Material	Selective Leaching Inspection	N/A	N/A	G, 0346

Table 3.3.2-10 Aging Management Review Results – Domestic Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tank (2T230)	Structural Integrity	Glass (lining)	Raw Water (Internal)	None Identified	None Required	N/A	N/A	G, 0344
		Carbon Steel	Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345

Table 3.3.2-11 Aging Management Review Results – Emergency Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Outdoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-1	3.3.1-43	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Outdoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316

Table 3.3.2-11 Aging Management Review Results – Emergency Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Orifices	Pressure Boundary, Throttling	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0312
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	E
Orifices	Pressure Boundary, Throttling	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0312
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	E, 0313
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312
			Buried (External)	Loss of Material	Buried Piping and Tanks Inspection Program	VII.C1-18	3.3.1-19	B
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312
			Buried (External)	Loss of Material	Buried Piping Surveillance Program	VII.C1-18	3.3.1-19	B, 0317

Table 3.3.2-11 Aging Management Review Results – Emergency Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314
Piping	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0312
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	E
Pump Casings, Emergency Service Water Pumps (0P504A-D)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312
			Raw Water (External)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312

Table 3.3.2-11 Aging Management Review Results – Emergency Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Pump Casings, Emergency Service Water Pumps (0P504A-D)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314
Tubing	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0312
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	E
Tubing	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0312
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	E, 0313
Valve Bodies	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0311
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314

Table 3.3.2-11 Aging Management Review Results – Emergency Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0311
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314
Valve Bodies	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312
			Buried (External)	Loss of Material	Buried Piping and Tanks Inspection Program	VII.C1-18	3.3.1-19	B
Valve Bodies	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0312
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	E
Valve Bodies	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0312
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	E, 0313

Table 3.3.2-11 Aging Management Review Results – Emergency Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345
Piping and Piping Components	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.I-9	3.3.1-58	A, 0345

Table 3.3.2-11 Aging Management Review Results – Emergency Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Copper Alloy	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-9	3.3.1-81	B
				Loss of Material	Selective Leaching Inspection	VII.C1-10	3.3.1-84	A
				Cracking	Area-Based NSAS Inspection	N/A	N/A	H, 0347
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E, 0354
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H, 0346
Piping and Piping Components	Structural Integrity	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E, 0345

Table 3.3.2-11 Aging Management Review Results – Emergency Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B
			Outdoor Air (External)	Loss of Material	System Walkdown Program	N/A	N/A	G, 0345

Table 3.3.2-12 Aging Management Review Results – ESSW Pumphouse HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Duct Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-7	3.3.1-55	A
Damper Housings	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	C
Ductwork	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	C
Fan Housings, ESW Pump Supply (0V521A-D)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Fan Housings, RHRSW Pump Supply (1/2V506A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-12 Aging Management Review Results – ESSW Pumphouse HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Bolting	Pressure Boundary	Carbon Steel	Outdoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-1	3.3.1-43	B
Bolting	Pressure Boundary	Stainless Steel	Outdoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Flexible Connections (Exhaust)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Flexible Connections (Hoses)	Pressure Boundary	Synthetic Rubber	Fuel Oil (Internal)	None Identified	None Required	N/A	N/A	G
			Indoor Air (External)	None Identified	None Required	VII.F1-7	3.3.1-11	I, 0318
Flexible Connections (Hoses)	Pressure Boundary	Synthetic Rubber	Raw Water (Internal)	None Identified	None Required	N/A	N/A	G
			Indoor Air (External)	None Identified	None Required	VII.F1-7	3.3.1-11	I, 0318
Flexible Connections (Hoses)	Pressure Boundary	Teflon	Raw Water (Internal)	None Identified	None Required	N/A	N/A	F
			Indoor Air (External)	None Identified	None Required	N/A	N/A	F
Heat Exchanger (Shell)	Pressure Boundary	Cast Iron	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-14	3.3.1-85	A
			Indoor Air (External)	Loss of Material	Selective Leaching Inspection	VII.I-11	3.3.1-58	H
				Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchanger (End Covers)	Pressure Boundary	Copper Alloy (Brass or Bronze)	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-12	3.3.1-70	C, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-13	3.3.1-84	C
			Indoor Air (External)	Loss of Material	Selective Leaching Inspection	VII.F1-16	3.3.1-25	H
				Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E
Heat Exchanger (Tubes)	Pressure Boundary, Heat Transfer	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-12	3.3.1-70	C
				Reduction in Heat Transfer	Fire Water System Program	VII.C1-6	3.3.1-83	E
			Raw Water (External)	Loss of Material	Fire Water System Program	VII.G-12	3.3.1-70	C
				Reduction in Heat Transfer	Fire Water System Program	VII.C1-6	3.3.1-83	E

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Hydrants	Pressure Boundary	Cast Iron	Ventilation (Internal)	Loss of Material	Fire Water System Program	VII.F1-2	3.3.1-56	E, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Hydrants	Pressure Boundary	Cast Iron	Ventilation (Internal)	Loss of Material	Fire Water System Program	VII.F1-2	3.3.1-56	E, 0302
			Buried (External)	Loss of Material	Buried Piping and Tanks Inspection Program	VII.G-25	3.3.1-19	B
				Loss of Material	Selective Leaching Inspection	VII.G-15	3.3.1-85	A
Orifices	Pressure Boundary, Throttling	Stainless Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-19	3.3.1-69	A, 0319
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0315
Piping (Exhaust)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Cast Iron	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-14	3.3.1-85	A
			Indoor Air (External)	Loss of Material	Selective Leaching Inspection	VII.I-11	3.3.1-58	H
				Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314
Piping	Pressure Boundary	Ductile Iron (Cement-Lined)	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
			Buried (External)	Loss of Material	Buried Piping and Tanks Inspection Program	VII.G-25	3.3.1-19	B

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Air-Gas (Carbon Dioxide) (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	A
			Buried (External)	Loss of Material	Buried Piping and Tanks Inspection Program	VII.G-25	3.3.1-19	B
Piping	Pressure Boundary	Carbon Steel	Air-Gas (Carbon Dioxide) (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Piping	Pressure Boundary	Cast Iron	Air-Gas (Carbon Dioxide) (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-22	3.3.1-98	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Piping	Pressure Boundary	Copper Alloy (Brass)	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-12	3.3.1-70	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-13	3.3.1-84	A
			Indoor Air (External)	Loss of Material	Selective Leaching Inspection	VII.F1-16	3.3.1-25	H
				Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E
Piping (Exhaust)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-9	3.3.1-58	A, 0302
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.I-9	3.3.1-58	A

Table 3.3.2-13 Aging Management Review Results – Fire Protection System

Component / Commodity	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Piping	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	A
Piping	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	A, 0302
			Outdoor Air (External)	None Identified	None Required	N/A	N/A	G
Pump Casing, Diesel Engine Driven Fire Pump (0P511)	Pressure Boundary	Cast Iron	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-14	3.3.1-85	A
			Indoor Air (External)	Loss of Material	Selective Leaching Inspection	VII.I-11	3.3.1-58	H
				Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Pump Casing, Electric Motor Driven Fire Pump (0P512)	Pressure Boundary	Cast Iron	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-14	3.3.1-85	A
			Indoor Air (External)	Loss of Material	Selective Leaching Inspection	VII.I-11	3.3.1-58	H
				Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314
Spray Nozzles, Carbon Dioxide	Pressure Boundary, Spray	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C
Spray Nozzles, Halon	Pressure Boundary, Spray	Copper Alloy (Brass)	Ventilation (Internal)	None Identified	None Required	N/A	N/A	G
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-13 Aging Management Review Results – Fire Protection System

Component / Commodity	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Spray Nozzles, Halon	Pressure Boundary, Spray	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Sprinkler Heads (Dry Pipe and Pre-Action)	Pressure Boundary, Spray	Copper Alloy (Brass)	Air-Gas (Internal)	None Identified	Fire Water System Program	VII.J-3	3.3.1-98	A, 0322
			Indoor Air (External)	None Identified	Fire Water System Program	N/A	N/A	G, 0322
Sprinkler Heads (Wet Pipe)	Pressure Boundary, Spray	Copper Alloy (Brass)	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-12	3.3.1-70	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-13	3.3.1-84	C
			Indoor Air (External)	Loss of Material	Selective Leaching Inspection	VII.F1-16	3.3.1-25	H
				Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Sprinkler Heads (Deluge)	Pressure Boundary, Spray	Copper Alloy (Brass)	Ventilation (Internal)	None Identified	Fire Water System Program	N/A	N/A	G, 0322
			Indoor Air (External)	None Identified	Fire Water System Program	N/A	N/A	G, 0322
Sprinkler Heads (Deluge)	Pressure Boundary, Spray	Copper Alloy (Brass)	Ventilation (Internal)	None Identified	Fire Water System Program	N/A	N/A	G, 0322
			Outdoor Air (External)	None Identified	Fire Water System Program	N/A	N/A	G, 0322
Sprinkler Heads (Dry Pipe and Pre-Action)	Pressure Boundary, Spray	Copper Alloy (Bronze)	Air-Gas (Internal)	None Identified	Fire Water System Program	VII.J-3	3.3.1-98	A, 0322
			Indoor Air (External)	None Identified	Fire Water System Program	N/A	N/A	G, 0322

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Sprinkler Heads (Wet Pipe)	Pressure Boundary, Spray	Copper Alloy (Bronze)	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-12	3.3.1-70	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-13	3.3.1-84	C
			Indoor Air (External)	Loss of Material	Selective Leaching Inspection	N/A	N/A	H
				Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E
Sprinkler Heads (Deluge)	Pressure Boundary, Spray	Copper Alloy (Bronze)	Ventilation (Internal)	None Identified	Fire Water System Program	N/A	N/A	G, 0322
			Indoor Air (External)	None Identified	Fire Water System Program	N/A	N/A	G, 0322
Sprinkler Heads (Deluge)	Pressure Boundary, Spray	Copper Alloy (Bronze)	Ventilation (Internal)	None Identified	Fire Water System Program	N/A	N/A	G, 0322
			Outdoor Air (External)	None Identified	Fire Water System Program	N/A	N/A	G, 0322

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Strainers	Pressure Boundary, Filtration	Carbon Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314
Strainers	Pressure Boundary, Filtration	Cast Iron	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-14	3.3.1-85	A
			Indoor Air (External)	Loss of Material	Selective Leaching Inspection	VII.I-11	3.3.1-58	H
				Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Strainers	Pressure Boundary, Filtration	Copper Alloy (Brass)	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-12	3.3.1-70	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-13	3.3.1-84	A
			Indoor Air (External)	Loss of Material	Selective Leaching Inspection	VII.F1-16	3.3.1-25	H
				Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E
Strainers	Pressure Boundary, Filtration	Copper Alloy (Bronze)	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-12	3.3.1-70	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-13	3.3.1-84	A
			Indoor Air (External)	Loss of Material	Selective Leaching Inspection	VII.F1-16	3.3.1-25	H
				Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tank, Diesel Oil Day Tank (0T508)	Pressure Boundary	Carbon Steel	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program	VII.G-21	3.3.1-64	B, 0321
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C
Tank, Low Pressure Carbon Dioxide Storage Tank (0T102)	Pressure Boundary	Carbon Steel	Air-Gas (Carbon Dioxide) (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	C
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.I-9	3.3.1-58	C
Tubing	Pressure Boundary	Copper	Fuel Oil (Internal)	Loss of Material	Fuel Oil Chemistry Program Chemistry Program Effectiveness Inspection	VII.G-10	3.3.1-32	B, 0331
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Copper Alloy (Brass)	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-12	3.3.1-70	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-13	3.3.1-84	A
			Indoor Air (External)	Loss of Material	Selective Leaching Inspection	VII.F1-16	3.3.1-25	H
				Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E
Tubing	Pressure Boundary	Copper	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-12	3.3.1-70	A, 0320
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Tubing	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-19	3.3.1-69	A, 0319
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Copper Alloy (Brass)	Air-Gas (Carbon Dioxide) (Internal)	None Identified	None Required	VII.J-4	3.3.1-97	A
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Tubing	Pressure Boundary	Copper	Air-Gas (Carbon Dioxide) (Internal)	None Identified	None Required	VII.J-4	3.3.1-97	A
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Tubing	Pressure Boundary	Copper	Ventilation (Internal)	None Identified	None Required	N/A	N/A	G
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Copper Alloy (Brass)	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-12	3.3.1-70	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-13	3.3.1-84	A
			Indoor Air (External)	Loss of Material	Selective Leaching Inspection	VII.F1-16	3.3.1-25	H
				Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E
Valve Bodies	Pressure Boundary	Copper Alloy (Bronze)	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-12	3.3.1-70	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-13	3.3.1-84	A
			Indoor Air (External)	Loss of Material	Selective Leaching Inspection	VII.F1-16	3.3.1-25	H
				Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314
Valve Bodies	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0315
Valve Bodies	Pressure Boundary	Cast Iron	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-14	3.3.1-85	A
			Indoor Air (External)	Loss of Material	Selective Leaching Inspection	VII.I-11	3.3.1-58	H
				Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-14	3.3.1-85	A
			Indoor Air (External)	Loss of Material	Selective Leaching Inspection	VII.I-11	3.3.1-58	H
				Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314
Valve Bodies	Pressure Boundary	Gray Cast Iron	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-14	3.3.1-85	A
			Buried (External)	Loss of Material	Buried Piping and Tanks Inspection Program	VII.G-25	3.3.1-19	B
				Loss of Material	Selective Leaching Inspection	VII.G-15	3.3.1-85	A

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Copper Alloy (Brass)	Air-Gas (Carbon Dioxide) (Internal)	None Identified	None Required	VII.J-4	3.3.1-97	A
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Valve Bodies	Pressure Boundary	Copper Alloy (Bronze)	Air-Gas (Carbon Dioxide) (Internal)	None Identified	None Required	VII.J-4	3.3.1-97	A
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Valve Bodies	Pressure Boundary	Carbon Steel	Air-Gas (Carbon Dioxide) (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Cast Iron	Air-Gas (Carbon Dioxide) (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Valve Bodies	Pressure Boundary	Copper Alloy (Bronze)	Air-Gas (Halon) (Internal)	None Identified	None Required	VII.J-4	3.3.1-97	A
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Valve Bodies	Pressure Boundary	Carbon Steel	Air-Gas (Halon) (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Valve Bodies	Pressure Boundary	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-22	3.3.1-98	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-13 Aging Management Review Results – Fire Protection System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345

Table 3.3.2-14 Aging Management Review Results – Fuel Pool Cooling and Cleanup System and Fuel Pools and Auxiliaries

Component / Commodity	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Orifices	Pressure Boundary, Throttling	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.A4-11	3.3.1-24	A, 0301
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-14 Aging Management Review Results – Fuel Pool Cooling and Cleanup System and Fuel Pools and Auxiliaries

Component / Commodity	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Orifices	Pressure Boundary, Throttling	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	A, 0301
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Piping	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-14	Aging Management Review Results – Fuel Pool Cooling and Cleanup System and Fuel Pools and Auxiliaries							
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.A4-11	3.3.1-24	A, 0301
			Embedded (External)	None Identified	None Required	VII.J-17	3.3.1-96	A
Piping	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.A4-11	3.3.1-24	A, 0301
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-14 Aging Management Review Results – Fuel Pool Cooling and Cleanup System and Fuel Pools and Auxiliaries

Component / Commodity	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Piping	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.A4-11	3.3.1-24	A, 0301
			Treated Water (External)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.A4-11	3.3.1-24	A, 0301
Piping	Pressure Boundary	Stainless Steel	Ventilation (Internal)	Loss of Material	Supplemental Piping/Tank Inspection	VII.F1-1	3.3.1-27	E, 0303
			Indoor Air (External)	Loss of Material	Supplemental Piping/Tank Inspection	VII.F1-1	3.3.1-27	E, 0303

Table 3.3.2-14 Aging Management Review Results – Fuel Pool Cooling and Cleanup System and Fuel Pools and Auxiliaries

Component / Commodity	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Tanks, Skimmer Surge Tanks (1/2T208)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.A4-11	3.3.1-24	A, 0301
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E
Tanks, Skimmer Surge Tanks (1/2T208)	Pressure Boundary	Stainless Steel	Ventilation (Internal)	Loss of Material	Supplemental Piping/Tank Inspection	VII.F1-1	3.3.1-27	E, 0303
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E
Screens, Skimmer Surge Tanks (1/2T208)	Filtration	Stainless Steel	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Treated Water (External)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.A4-11	3.3.1-24	A, 0301

Table 3.3.2-14	Aging Management Review Results – Fuel Pool Cooling and Cleanup System and Fuel Pools and Auxiliaries							
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.A4-11	3.3.1-24	A, 0301
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Valve Bodies	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	A, 0301
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-14	Aging Management Review Results – Fuel Pool Cooling and Cleanup System and Fuel Pools and Auxiliaries							
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Valve Bodies	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.A4-11	3.3.1-24	A, 0301
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Valve Bodies	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-14	Aging Management Review Results – Fuel Pool Cooling and Cleanup System and Fuel Pools and Auxiliaries							
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Demineralizer/ Eductors - vessel shell (0/1/2F202, 0S261)	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.A4-11	3.3.1-24	A, 0353
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0349
Heat Exchangers/ Coolers - shell (1/2E202A-C)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.A4-3	3.3.1-48	B, 0348, 0353
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349
Heat Exchangers/ Coolers - channel/head (1/2E202A-C)	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-5	3.3.1-77	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345

Table 3.3.2-14 Aging Management Review Results – Fuel Pool Cooling and Cleanup System and Fuel Pools and Auxiliaries								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.A4-11	3.3.1-24	A, 0353
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0349
Piping and Piping Components – pump casings (0P201, 0/1/2P205, 1/2P211A-C)	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.A4-11	3.3.1-24	A, 0353
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0349

Table 3.3.2-14	Aging Management Review Results – Fuel Pool Cooling and Cleanup System and Fuel Pools and Auxiliaries							
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tanks (0T201, 0T202)	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.A4-11	3.3.1-24	A, 0353
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0349

Table 3.3.2-15 Aging Management Review Results – Neutron Monitoring System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping	Pressure Boundary	Carbon Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-22	3.3.1-98	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Piping	Pressure Boundary	Stainless Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-18	3.3.1-98	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Tubing	Pressure Boundary	Stainless Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-18	3.3.1-98	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-15 Aging Management Review Results – Neutron Monitoring System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Stainless Steel	Air-Gas (Internal)	None Identified	None Required	VII.J-18	3.3.1-98	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-16 Aging Management Review Results – Primary Containment Atmosphere Circulation System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Duct Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-7	3.3.1-55	A
Ductwork	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	C
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	C
Damper Housings	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	C
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	C

Table 3.3.2-16 Aging Management Review Results – Primary Containment Atmosphere Circulation System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Flexible Connections (Expansion Joints)	Pressure Boundary	Neoprene	Ventilation (Internal)	Cracking	System Walkdown Program	VII.F3-7	3.3.1-11	E, 0343
				Change in Material Properties	System Walkdown Program	VII.F3-7	3.3.1-11	E, 0343
			Indoor Air (External)	Cracking	System Walkdown Program	VII.F3-7	3.3.1-11	E, 0343
				Change in Material Properties	System Walkdown Program	VII.F3-7	3.3.1-11	E, 0343
Fan Housings	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.F3-3	3.3.1-72	E, 0333
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F3-2	3.3.1-56	A, 0333

Table 3.3.2-16 Aging Management Review Results – Primary Containment Atmosphere Circulation System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Mechanical Sealants	Pressure Boundary	Rubber	Ventilation (Internal)	Cracking	System Walkdown Program	VII.F3-7	3.3.1-11	E, 0343
				Change in Material Properties	System Walkdown Program	VII.F3-7	3.3.1-11	E, 0343
			Indoor Air (External)	Cracking	System Walkdown Program	VII.F3-7	3.3.1-11	E, 0343
				Change in Material Properties	System Walkdown Program	VII.F3-7	3.3.1-11	E, 0343
Unit Cooler Housings	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.F3-3	3.3.1-72	E, 0333
				Loss of Material	Cooling Units Inspection	VII.F3-3	3.3.1-72	E, 0314
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F3-2	3.3.1-56	A, 0304

Table 3.3.2-16 Aging Management Review Results – Primary Containment Atmosphere Circulation System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Unit Cooler Housings	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	C
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	C
Unit Cooler Housings	Pressure Boundary	Stainless Steel	Ventilation (Internal)	Loss of Material	Cooling Units Inspection	VII.F3-1	3.3.1-27	E, 0339
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F3-1	3.3.1-27	E, 0339

Table 3.3.2-17 Aging Management Review Results – Process and Area Radiation Monitoring System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Duct Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-7	3.3.1-55	A
Flow Element Bodies	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	A
Tubing	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-17 Aging Management Review Results – Process and Area Radiation Monitoring System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0358
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349, 0358
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0348, 0358
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349, 0358
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	A, 0301, 0358
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349, 0358

Table 3.3.2-17 Aging Management Review Results – Process and Area Radiation Monitoring System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E, 0345
Piping and Piping Components	Structural Integrity	Copper Alloy	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	B, 0348, 0358
				Loss of Material	Selective Leaching Inspection	VII.C2-7	3.3.1-84	A, 0358
				Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H, 0347
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G, 0349
Tanks (1/2T275B)	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	D, 0358
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0345, 0358

Table 3.3.2-18 Aging Management Review Results – Radwaste Liquid System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Monitoring and Collection Systems Inspection	VII.C1-19	3.3.1-76	E
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-18 Aging Management Review Results – Radwaste Liquid System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Monitoring and Collection Systems Inspection	VII.C1-19	3.3.1-76	E
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Piping and Piping Components	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Monitoring and Collection Systems Inspection	N/A	N/A	G, 0356
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349
Piping and Piping Components - cleanouts and pump casings (1/2P225A/B)	Structural Integrity	Cast Iron	Raw Water (Internal)	Loss of Material	Monitoring and Collection Systems Inspection	N/A	N/A	G, 0356
				Loss of Material	Selective Leaching Inspection	N/A	N/A	G
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349

Table 3.3.2-19 Aging Management Review Results – Radwaste Solids Handling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping and Piping Components	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Area-Based NSAS Inspection	N/A	N/A	G, 0359
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-19 Aging Management Review Results – Radwaste Solids Handling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Copper Alloy	Raw Water (Internal)	Loss of Material	Area-Based NSAS Inspection	N/A	N/A	G, 0359
				Loss of Material	Selective Leaching Inspection	N/A	N/A	G
				Cracking	Area-Based NSAS Inspection	N/A	N/A	G, 0347
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Piping and Piping Components	Structural Integrity	Stainless Steel	Raw Water (Internal)	Loss of Material	Area-Based NSAS Inspection	N/A	N/A	G, 0359
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Tanks (0T203, 1/2T225)	Structural Integrity	Stainless Steel	Raw Water (Internal)	Loss of Material	Area-Based NSAS Inspection	N/A	N/A	G, 0359
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0349

Table 3.3.2-20 Aging Management Review Results – Raw Water Treatment System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
			Buried (External)	Loss of Material	Buried Piping and Tanks Inspection Program	VII.G-25	3.3.1-19	B
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314

Table 3.3.2-20 Aging Management Review Results – Raw Water Treatment System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0315
Standpipe (Internal to 0T523)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
			Raw Water (External)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
Tank, Clarified Water Storage (0T523)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	C, 0315

Table 3.3.2-20 Aging Management Review Results – Raw Water Treatment System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0315
Valve Bodies	Pressure Boundary	Cast Iron	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-24	3.3.1-68	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-14	3.3.1-85	A
			Outdoor Air (External)	Loss of Material	Selective Leaching Inspection	VII.I-11	3.3.1-58	H
				Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0315

Table 3.3.2-20 Aging Management Review Results – Raw Water Treatment System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Copper Alloy (Red Brass)	Raw Water (Internal)	Loss of Material	Fire Water System Program	VII.G-12	3.3.1-70	A, 0320
				Loss of Material	Selective Leaching Inspection	VII.G-13	3.3.1-84	A
			Outdoor Air (External)	Loss of Material	Selective Leaching Inspection	VII.F1-16	3.3.1-25	H
				Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E

Table 3.3.2-21 Aging Management Review Results – Reactor Building Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0307
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Valve Bodies	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-10	3.3.1-50	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E

Table 3.3.2-21 Aging Management Review Results – Reactor Building Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0307
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0304
Chillers - evaporator/ condenser channel/ header, integral piping/tubing (1/2K206A/B)	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-5	3.3.1-77	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345
Chillers - evaporator/ condenser channel/ header, integral piping/tubing (1/2K206A/B)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-1	3.3.1-48	B, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345

Table 3.3.2-21 Aging Management Review Results – Reactor Building Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Chillers (RBCW lube oil cooler channel)	Structural Integrity	Cast Iron	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-1	3.3.1-48	B, 0348
				Loss of Material	Selective Leaching Inspection	VII.C2-8	3.3.1-85	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H, 0346
Chillers (RBCW lube oil cooler shell)	Structural Integrity	Cast Iron	Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis Program Lubricating Oil Inspection	VII.H2-20	3.3.1-14	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345

Table 3.3.2-21 Aging Management Review Results – Reactor Building Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345
Piping and Piping Components – pump casings (1/2P214A/B, 1/2P217A/B)	Structural Integrity	Cast Iron	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B
				Loss of Material	Selective Leaching Inspection	VII.C1-11	3.3.1-85	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H, 0346

Table 3.3.2-21 Aging Management Review Results – Reactor Building Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components – pump casings (1/2P235A/B)	Structural Integrity	Cast Iron	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0348
				Loss of Material	Selective Leaching Inspection	VII.C2-8	3.3.1-85	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H, 0346

Table 3.3.2-21 Aging Management Review Results – Reactor Building Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Copper Alloy	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-9	3.3.1-81	B
				Loss of Material	Selective Leaching Inspection	VII.C1-10	3.3.1-84	A
				Cracking	Area-Based NSAS Inspection	N/A	N/A	H, 0347
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-14	3.3.1-25	E, 0354
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H, 0346

Table 3.3.2-21 Aging Management Review Results – Reactor Building Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Copper Alloy	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	B, 0348
				Loss of Material	Selective Leaching Inspection	VII.C2-6	3.3.1-84	A
				Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H, 0347
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-14	3.3.1-25	E, 0354
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H, 0346
Sight Glass/Level Gauges	Structural Integrity	Glass	Treated Water (Internal)	None Identified	None Required	VII.J-13	3.3.1-93	A
			Indoor Air (External)	None Identified	None Required	VII.J-8	3.3.1-93	A

Table 3.3.2-21 Aging Management Review Results – Reactor Building Chilled Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tanks (1/2T205, 1/2T221, 1/2T224)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345

Table 3.3.2-22 Aging Management Review Results – Reactor Building Closed Cooling Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0301
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Valve Bodies	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0301
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-22 Aging Management Review Results – Reactor Building Closed Cooling Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers/ Coolers – shell (1/2E201A/B)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-1	3.3.1-48	B, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349
Heat Exchangers/ Coolers - channel/head (1/2E201A/B)	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349

Table 3.3.2-22 Aging Management Review Results – Reactor Building Closed Cooling Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components - pump casings (1/2P210A/B)	Structural Integrity	Cast Iron	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0348
				Loss of Material	Selective Leaching Inspection	VII.C2-8	3.3.1-85	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349
Piping and Piping Components	Structural Integrity	Copper Alloy	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	B, 0348
				Loss of Material	Selective Leaching Inspection	VII.C2-6	3.3.1-84	A
				Cracking	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	H, 0347
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G, 0349

Table 3.3.2-22 Aging Management Review Results – Reactor Building Closed Cooling Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-10	3.3.1-50	B, 0348
				Cracking	Closed Cooling Water Chemistry Program	VII.C2-11	3.3.1-46	B, 0357
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Sight Glass/Level Gauge	Structural Integrity	Glass	Treated Water (Internal)	None Identified	None Required	VII.J-13	3.3.1-93	A
			Indoor Air (External)	None Identified	None Required	VII.J-8	3.3.1-93	A
Tanks (1/2T201, 1/2T202)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349

Table 3.3.2-23 Aging Management Review Results – Reactor Building HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Duct Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-7	3.3.1-55	A
Casings, Refrigeration Compressor (2K210A/B)	Pressure Boundary	Cast Iron	Air-Gas (Freon) (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F3-2	3.3.1-56	A
Condenser, Water Cooled (2E297A/B) Channel Heads	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-5	3.3.1-77	B, 0320
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-23 Aging Management Review Results – Reactor Building HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Condenser, Water Cooled (2E297A/B) Shells	Pressure Boundary	Carbon Steel	Air-Gas (Freon) (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Condenser, Water Cooled (2E297A/B) Tubes	Pressure Boundary, Heat Transfer	Copper Alloy (Copper-Nickel)	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-3	3.3.1-82	B, 0320
				Reduction in Heat Transfer	Piping Corrosion Program	VII.C1-6	3.3.1-83	B
			Air-Gas (Freon) (External)	None Identified	None Required	VII.J-4	3.3.1-97	C
Condenser, Water Cooled (2E297A/B) Tubesheets	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-5	3.3.1-77	B, 0320
			Air-Gas (Freon) (External)	None Identified	None Required	VII.J-23	3.3.1-97	C

Table 3.3.2-23 Aging Management Review Results – Reactor Building HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Condenser, Water Cooled (2E297A/B) Tube Plugs	Pressure Boundary	Copper Alloy (Copper-Nickel)	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Raw Water (External)	Loss of Material	Piping Corrosion Program	VII.C1-3	3.3.1-82	B, 0319
Unit Coolers, CSP Pump Room (1/2E231A-D) Cooling Coils	Pressure Boundary, Heat Transfer	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	D, 0319
				Reduction in Heat Transfer	Piping Corrosion Program	VII.C1-7	3.3.1-83	B
			Ventilation (External)	Loss of Material	Cooling Units Inspection	VII.F1-1	3.3.1-27	E
Unit Coolers, CSP Pump Room (1/2E231A-D) Fins	Heat Transfer	Copper	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Ventilation (External)	Reduction in Heat Transfer	Cooling Units Inspection	N/A	N/A	H
Unit Coolers, CSP Pump Room (1/2E231A-D) Housings	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C

Table 3.3.2-23 Aging Management Review Results – Reactor Building HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Unit Coolers, CSP Pump Room (1/2E231A-D) Tube Plugs	Pressure Boundary	Stainless Steel	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Raw Water (External)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	D, 0319
Unit Coolers, HPCI Pump Room (1/2E229A/B) Cooling Coils	Pressure Boundary, Heat Transfer	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	D, 0319
				Reduction in Heat Transfer	Piping Corrosion Program	VII.C1-7	3.3.1-83	B
			Ventilation (External)	Loss of Material	Cooling Units Inspection	VII.F1-1	3.3.1-27	E
Unit Coolers, HPCI Pump Room (1/2E229A/B) Fins	Heat Transfer	Copper	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Ventilation (External)	Reduction in Heat Transfer	Cooling Units Inspection	N/A	N/A	H
Unit Coolers, HPCI Pump Room (1/2E229A/B) Housings	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C

Table 3.3.2-23 Aging Management Review Results – Reactor Building HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Unit Coolers, HPCI Pump Room (1/2E229A/B) Tube Plugs	Pressure Boundary	Stainless Steel	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Raw Water (External)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	D, 0319
Unit Coolers, RCIC Pump Room (1/2E228A/B) Cooling Coils	Pressure Boundary, Heat Transfer	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	D, 0319
				Reduction in Heat Transfer	Piping Corrosion Program	VII.C1-7	3.3.1-83	B
			Ventilation (External)	Loss of Material	Cooling Units Inspection	VII.F1-1	3.3.1-27	E
Unit Coolers, RCIC Pump Room (1/2E228A/B) Fins	Heat Transfer	Copper	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Ventilation (External)	Reduction in Heat Transfer	Cooling Units Inspection	N/A	N/A	H
Unit Coolers, RCIC Pump Room (1/2E228A/B) Housings	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C

Table 3.3.2-23 Aging Management Review Results – Reactor Building HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Unit Coolers, RCIC Pump Room (1/2E228A/B) Tube Plugs	Pressure Boundary	Stainless Steel	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Raw Water (External)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	D, 0319
Unit Coolers, RHR Pump Room (1/2E230A-D) Cooling Coils	Pressure Boundary, Heat Transfer	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	D, 0319
				Reduction in Heat Transfer	Piping Corrosion Program	VII.C1-7	3.3.1-83	B
			Ventilation (External)	Loss of Material	Cooling Units Inspection	VII.F1-1	3.3.1-27	E
Unit Coolers, RHR Pump Room (1/2E230A-D) Fins	Heat Transfer	Copper	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Ventilation (External)	Reduction in Heat Transfer	Cooling Units Inspection	N/A	N/A	H
Unit Coolers, RHR Pump Room (1/2E230A-D) Housings	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C

Table 3.3.2-23 Aging Management Review Results – Reactor Building HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Unit Coolers, RHR Pump Room (1/2E230A-D) Tube Plugs	Pressure Boundary	Stainless Steel	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Raw Water (External)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	D, 0319
Unit Coolers, ECCS and RCIC Pump Rooms (1/2E229A/B, 1/2E230A-D, 1/2E231A-D, 1/2E228A/B) Housings	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	C
Cooling Units, Emergency SWGR and Load Center Rooms (1/2E240A/B) Cooling Coils	Pressure Boundary, Heat Transfer	Copper	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D, 0312
				Reduction in Heat Transfer	Cooling Units Inspection	VII.F1-12	3.3.1-52	E
			Ventilation (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-23 Aging Management Review Results – Reactor Building HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Cooling Units, Emergency SWGR and Load Center Rooms (1/2E240A/B) Housings	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E, 0335
Cooling Units, Emergency SWGR and Load Center Rooms (1/2E240A/B) Drain Pans	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Cooling Units Inspection	VII.F1-3	3.3.1-72	E
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E, 0335
Cooling Units, Emergency SWGR and Load Center Rooms (1E257A/B) Cooling Coils	Pressure Boundary, Heat Transfer	Copper Alloy (Copper-Nickel)	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D, 0312
				Reduction in Heat Transfer	Cooling Units Inspection	VII.F1-12	3.3.1-52	E
			Ventilation (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-23 Aging Management Review Results – Reactor Building HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Cooling Units, Emergency SWGR and Load Center Room (1E257A/B) Housings	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C
Cooling Units, Emergency SWGR and Load Center Room DX Type (2E296A/B) Cooling Coils	Pressure Boundary, Heat Transfer	Copper	Air-Gas (Freon) (Internal)	None Identified	None Required	VII.J-4	3.3.1-97	C
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Cooling Units, Emergency SWGR and Load Center Room DX Type (2E296A/B) Housings	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C

Table 3.3.2-23 Aging Management Review Results – Reactor Building HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Damper Housings	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	C
Ductwork	Pressure Boundary	Galvanized Steel	Ventilation (Internal)	None Identified	None Required	VII.J-6	3.3.1-92	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-6	3.3.1-92	C
Fan Housings, ECCS and RCIC Pump Rooms Unit Coolers (1/2V208A/B, 1/2V209A/B, 1/2V210A-D, 1/2V211A-D)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Fan Housings, Emergency SWGR and Load Center Room Cooling Units (1/2V222A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-23 Aging Management Review Results – Reactor Building HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Filter Housings, Emergency SWGR and Load Center Room Cooling Units (1/2F259A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Filter Housings, Emergency SWGR and Load Center Room Cooling Units (1/2F259A/B)	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	C, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	C
Filter Housings, Unit 2 Emergency SWGR and Load Center Room Cooling System (LF27201A/B)	Pressure Boundary	Carbon Steel	Air-Gas (Freon) (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-23 Aging Management Review Results – Reactor Building HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Flexible Connections (ductwork)	Pressure Boundary	Neoprene/ Fiberglass	Ventilation (Internal)	None Identified	None Required	VII.F3-7	3.3.1-11	I, 0318
			Indoor Air (External)	Change in Material Properties	System Walkdown Program	VII.F3-7	3.3.1-11	A, 0336
				Cracking	System Walkdown Program	VII.F3-7	3.3.1-11	A, 0336
Flexible Connections (piping)	Pressure Boundary	Stainless Steel	Air-Gas (Freon) (Internal)	None Identified	None Required	VII.J-19	3.3.1-97	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Flexible Connections (piping)	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0319
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0320
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-23 Aging Management Review Results – Reactor Building HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Cooling Units Inspection	VII.F1-3	3.3.1-72	E
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	B, 0311
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Piping	Pressure Boundary	Copper	Air-Gas (Freon) (Internal)	None Identified	None Required	VII.J-4	3.3.1-97	A
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Piping	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0302
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-23 Aging Management Review Results – Reactor Building HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Sight Gauges (SG27201A/B, SG27203A/B)	Pressure Boundary	Carbon Steel	Air-Gas (Freon) (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Sight Gauges (SG27201A/B, SG27203A/B)	Pressure Boundary	Glass	Air-Gas (Freon) (Internal)	None Identified	None Required	N/A	N/A	G
			Indoor Air (External)	None Identified	None Required	VII.J-8	3.3.1-93	A
Tanks (2T271A/B)	Pressure Boundary	Carbon Steel	Air-Gas (Freon) (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Tubing	Pressure Boundary	Copper	Air-Gas (Freon) (Internal)	None Identified	None Required	VII.J-4	3.3.1-97	A
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.3.2-23 Aging Management Review Results – Reactor Building HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Copper Alloy (Brass)	Air-Gas (Freon) (Internal)	None Identified	None Required	VII.J-4	3.3.1-97	A
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Valve Bodies	Pressure Boundary	Copper Alloy (Bronze)	Air-Gas (Freon) (Internal)	None Identified	None Required	VII.J-4	3.3.1-97	A
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Valve Bodies	Pressure Boundary	Carbon Steel	Air-Gas (Freon) (Internal)	None Identified	None Required	VII.J-23	3.3.1-97	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Valve Bodies	Pressure Boundary	Stainless Steel	Air-Gas (Freon) (Internal)	None Identified	None Required	VII.J-19	3.3.1-97	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-23 Aging Management Review Results – Reactor Building HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Unit Coolers - drain pan, drain piping	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Cooling Units Inspection	VII.F2-3	3.3.1-72	E, 0352
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-2	3.3.1-56	A, 0345
Unit Coolers - drain pan	Structural Integrity	Stainless Steel	Raw Water (Internal)	Loss of Material	Cooling Units Inspection	VII.F2-1	3.3.1-27	E, 0352
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	E, 0345
Unit Coolers - channels/ heads	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-14	3.3.1-47	D, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345

Table 3.3.2-23 Aging Management Review Results – Reactor Building HVAC System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Unit Coolers - channels/ heads	Structural Integrity	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	D
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	E, 0345
Unit Coolers - channels/ heads	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-10	3.3.1-50	D, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	E, 0345

Table 3.3.2-24 Aging Management Review Results – Reactor Nonnuclear Instrumentation System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking	BWR Water Chemistry Program	VII.E3-16	3.3.1-37	E
				Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E4-14	3.3.1-24	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-24 Aging Management Review Results – Reactor Nonnuclear Instrumentation System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking	BWR Water Chemistry Program	VII.E3-16	3.3.1-37	E
				Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E4-14	3.3.1-24	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Valve Bodies	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking	BWR Water Chemistry Program	VII.E3-16	3.3.1-37	E
				Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E4-14	3.3.1-24	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-25 Aging Management Review Results – Reactor Water Cleanup System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Orifices	Pressure Boundary, Throttling	Stainless Steel	Treated Water (Internal)	Cracking	BWR Water Chemistry Program	VII.E3-16	3.3.1-37	E
				Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-15	3.3.1-24	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-25 Aging Management Review Results – Reactor Water Cleanup System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	A, 0311
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	VII.E3-18	3.3.1-17	H
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Tubing	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	A, 0311
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-25 Aging Management Review Results – Reactor Water Cleanup System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking	BWR Water Chemistry Program	VII.E3-16	3.3.1-37	E
				Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-15	3.3.1-24	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Valve Bodies	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	A, 0311
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	VII.E3-18	3.3.1-17	H
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-25 Aging Management Review Results – Reactor Water Cleanup System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Demineralizer/ Eductors - vessel shell (1/2F203A/B)	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-15	3.3.1-24	C, 0353
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Heat Exchangers/ Coolers - shell (1/2E207A-C)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	C, 0311
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	VIII.D2-8	3.4.1-29	C, 0355
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349

Table 3.3.2-25 Aging Management Review Results – Reactor Water Cleanup System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers/ Coolers - shell (1/2E208A/B, 1/2E239A/B)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.E3-4	3.3.1-48	A, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349
Heat Exchangers/ Coolers - channel/head (1/2E207A-C, 1/2E208A/B)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	C, 0311
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	VIII.D2-8	3.4.1-29	C, 0355
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349

Table 3.3.2-25 Aging Management Review Results – Reactor Water Cleanup System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers/ Coolers - channel/head (1/2E239A/B)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	C, 0311
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	A, 0353
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	VIII.D2-8	3.4.1-29	A, 0355
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349

Table 3.3.2-25 Aging Management Review Results – Reactor Water Cleanup System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components – pump casings (1/2P221A/B, 1/2P222, 1/2P223A/B)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-18	3.3.1-17	A, 0353
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	VIII.D2-8	3.4.1-29	A, 0355
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349

Table 3.3.2-25 Aging Management Review Results – Reactor Water Cleanup System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Copper Alloy	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-9	3.3.1-31	A, 0353
				Loss of Material	Selective Leaching Inspection	VII.E3-11	3.3.1-84	A
				Cracking	BWR Water Chemistry Program	N/A	N/A	H, 0347
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G, 0349

Table 3.3.2-25 Aging Management Review Results – Reactor Water Cleanup System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-15	3.3.1-24	A, 0353
				Cracking	BWR Water Chemistry Program	VII.E3-16	3.3.1-37	E, 0357
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Tanks (1/2T209)	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-15	3.3.1-24	C, 0353
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-26 Aging Management Review Results – RHR Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Orifices	Pressure Boundary, Throttling	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0312
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	E
Orifices	Pressure Boundary, Throttling	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0312
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	E, 0313

Table 3.3.2-26 Aging Management Review Results – RHR Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0311
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312
			Buried (External)	Loss of Material	Buried Piping and Tanks Inspection Program	VII.C1-18	3.3.1-19	B
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312
			Buried (External)	Loss of Material	Buried Piping Surveillance Program	VII.C1-18	3.3.1-19	B, 0317

Table 3.3.2-26 Aging Management Review Results – RHR Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312
			Raw Water (External)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312
Piping	Pressure Boundary, Spray	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0315
Piping	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0315
Piping	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-26 Aging Management Review Results – RHR Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary, Spray	Carbon Steel	Ventilation (Internal)	Loss of Material	Supplemental Piping/Tank Inspection	N/A	N/A	G
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A
Piping	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0312
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	E
Pump Casings, RHR Service Water Pumps (1/2P506A/B)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312
			Raw Water (External)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312
Pump Casings, RHR Service Water Pumps (1/2P506A/B)	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314

Table 3.3.2-26 Aging Management Review Results – RHR Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Pump Casings, Spray Piping Drain Pumps (0P595A/B)	Pressure Boundary	Cast Iron	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B
				Loss of Material (Selective Leaching)	Selective Leaching Inspections	VII.C1-11	3.3.1-85	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A
Pump Casings, Spray Piping Drain Pumps (0P595A/B)	Pressure Boundary	Cast Iron	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A
Tubing	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0312
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	A

Table 3.3.2-26 Aging Management Review Results – RHR Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0312
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	E, 0313
Valve Bodies	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0311
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314
Valve Bodies	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0311
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314
Valve Bodies	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0312
		Carbon Steel	Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0314

Table 3.3.2-26 Aging Management Review Results – RHR Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0312
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	E
Valve Bodies	Pressure Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B, 0312
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	E, 0313
Valve Bodies	Pressure Boundary	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B, 0312
			Buried (External)	Loss of Material	Buried Piping and Tanks Inspection Program	VII.C1-18	3.3.1-19	B
Valve Bodies	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	C, 0302
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A

Table 3.3.2-26 Aging Management Review Results – RHR Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345
Piping and Piping Components	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VII.I-9	3.3.1-58	A, 0345

Table 3.3.2-26 Aging Management Review Results – RHR Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Copper Alloy	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-9	3.3.1-81	B
				Loss of Material	Selective Leaching Inspection	VII.C1-10	3.3.1-84	A
				Cracking	Area-Based NSAS Inspection	N/A	N/A	H, 0347
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E, 0354
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H, 0346
Piping and Piping Components	Structural Integrity	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-1	3.3.1-27	E, 0345

Table 3.3.2-26 Aging Management Review Results – RHR Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Stainless Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-15	3.3.1-79	B
			Outdoor Air (External)	Loss of Material	System Walkdown Program	N/A	N/A	G, 0345

Table 3.3.2-27 Aging Management Review Results – Sampling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Chillers - condenser channel/ header, evaporator shell, integral piping/tubing (1/2K207)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-1	3.3.1-48	B, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345

Table 3.3.2-27 Aging Management Review Results – Sampling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Chillers - condenser channel/ header, evaporator shell, integral piping/tubing (1/2K207)	Structural Integrity	Copper Alloy	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D, 0348
				Loss of Material	Selective Leaching Inspection	VII.C2-7	3.3.1-84	C
				Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H, 0347
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-14	3.3.1-25	E, 0354
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H, 0346

Table 3.3.2-27 Aging Management Review Results – Sampling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Chillers - condenser channel/ header, evaporator shell, integral piping/tubing and tanks (1/2K207)	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-10	3.3.1-50	D, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	C, 0345
Heat Exchangers/ Coolers - channel/head, shell (1/2E224, 1/2E225, 1/2E226A/B, 1/2E233, 1/2E237)	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-10	3.3.1-50	D, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F2-1	3.3.1-27	C, 0345

Table 3.3.2-27 Aging Management Review Results – Sampling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Heat Exchangers/ Coolers - channel/head, shell (1/2E223, 1/2E234A/B, 1/2E235, 1/2E236,1/2E604, 1/2E605)	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-10	3.3.1-50	D, 0348
				Cracking	Closed Cooling Water Chemistry Program	VII.C2-11	3.3.1-46	D, 0357
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0349
Piping and Piping Components	Structural Integrity	Copper Alloy	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	B, 0348
				Loss of Material	Selective Leaching Inspection	VII.C2-7	3.3.1-84	C
				Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H, 0347
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G, 0349

Table 3.3.2-27 Aging Management Review Results – Sampling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-10	3.3.1-50	B, 0348
				Cracking	Closed Cooling Water Chemistry Program	VII.C2-11	3.3.1-46	B, 0357
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0349
Piping and Piping Components	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-15	3.3.1-24	A, 0353
				Cracking	BWR Water Chemistry Program	VII.E3-16	3.3.1-37	E, 0357
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A, 0349

Table 3.3.2-27 Aging Management Review Results – Sampling System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Teflon	Treated Water (Internal)	None Identified	None Required	N/A	N/A	F
			Indoor Air (External)	Change in Material Properties	System Walkdown Program	N/A	N/A	F

Table 3.3.2-28 Aging Management Review Results – Sanitary Drainage System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping and Piping Components	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Area-Based NSAS Inspection	N/A	N/A	G, 0351
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349
Piping and Piping Components	Structural Integrity	Cast Iron	Raw Water (Internal)	Loss of Material	Area-Based NSAS Inspection	N/A	N/A	G, 0351
				Loss of Material	Selective Leaching Inspection	N/A	N/A	G, 0351
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349

Table 3.3.2-29 Aging Management Review Results – Service Air System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.D-1	3.3.1-44	B
Bolting	Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping and Piping Components – associated with drain traps (DT-1510/2510)	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Area-Based NSAS Inspection	VII.D-2	3.3.1-53	E, 0350
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.D-3	3.3.1-57	A

Table 3.3.2-30 Aging Management Review Results – Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping and Piping Components	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345

Table 3.3.2-30 Aging Management Review Results – Service Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Copper Alloy	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-9	3.3.1-81	B
				Loss of Material	Selective Leaching Inspection	VII.C1-10	3.3.1-84	A
				Cracking	Area-Based NSAS Inspection	N/A	N/A	H, 0347
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.F1-16	3.3.1-25	E, 0354
				Loss of Material	Selective Leaching Inspection	N/A	N/A	H, 0346

Table 3.3.2-31 Aging Management Review Results – Standby Liquid Control System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Accumulators (1/2T207A/B), Shell	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E4-17	3.3.1-17	C, 0342
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A
Accumulators (1/2T207A/B), Bladder	Pressure Boundary	Butyl Rubber	Air-Gas (Nitrogen) (Internal)	None Identified	None Required	N/A	N/A	G
			Treated Water (External)	None Identified	None Required	VII.A4-1	3.3.1-12	I, 0323
Bolting	Pressure Boundary	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B

Table 3.3.2-31 Aging Management Review Results – Standby Liquid Control System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E2-1	3.3.1-30	A, 0340
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Pump Casings, SLC Injection Pumps (1/2P208A/B)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E2-1	3.3.1-30	A, 0340
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-31 Aging Management Review Results – Standby Liquid Control System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tanks, SLC Storage Tanks (1/2T204)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E2-1	3.3.1-30	A, 0340
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Tanks, SLC Storage Tanks (1/2T204)	Pressure Boundary	Stainless Steel	Ventilation (Internal)	Loss of Material	Supplemental Piping/Tank Inspection	N/A	N/A	J, 0338
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Tubing	Pressure Boundary	Stainless Steel	Air-Gas (Nitrogen) (Internal)	None Identified	None Required	VII.J-19	3.3.1-97	A
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-31 Aging Management Review Results – Standby Liquid Control System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E2-1	3.3.1-30	A, 0340
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A
Valve Bodies	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E2-1	3.3.1-30	A, 0340
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-32 Aging Management Review Results – Turbine Building Closed Cooling Water System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Heat Exchangers/ Coolers – shells (1/2E123A/B)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-1	3.3.1-48	B, 0348
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-8	3.3.1-58	A, 0349
Heat Exchangers/ Coolers - channels/ heads (1/2E123A/B)	Structural Integrity	Carbon Steel	Raw Water (Internal)	Loss of Material	Piping Corrosion Program	VII.C1-19	3.3.1-76	B
			Indoor Air (External)	Loss of Material	System Walkdown Program	VII.I-11	3.3.1-58	A, 0345

Table 3.3.2-33 Aging Management Review Results – Reactor Recirculation System (NSAS Portions)								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping and Piping Components	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-15	3.3.1-24	A, 0353
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Table 3.3.2-34 Aging Management Review Results – Reactor Vessel and Auxiliaries System (NSAS Portions)								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
				Loss of Material	Bolting Integrity Program	VII.I-4	3.3.1-43	B
Bolting	Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VII.I-3	3.3.1-41	B, 0316
Piping and Piping Components	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VII.E3-15	3.3.1-24	A, 0353
				Cracking	BWR Water Chemistry Program	VII.E3-16	3.3.1-37	E, 0357
			Indoor Air (External)	None Identified	None Required	VII.J-15	3.3.1-94	A

Generic Notes:	
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 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
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:	
0301	AMP manages loss of material due to crevice and/or pitting, galvanic, and general corrosion, and erosion.
0302	This environment is the same as the GALL environment except that it is an internal rather than an external environment.
0303	AMP manages loss of material due to crevice and/or pitting corrosion due to alternate wetting and drying, not condensation, at the air-water interface.
0304	AMP manages loss of material due to crevice and/or pitting, galvanic and general corrosion due to condensation on the external surfaces from lower-than-ambient internal temperatures.

Plant-Specific Notes:	
0305	AMP manages loss of material due to crevice and/or pitting, galvanic and general corrosion, erosion (only for components not located in CSCW Emergency Condenser Cooling Water Subsystem), macrofouling and MIC.
0306	AMP manages loss of material due to crevice and/or pitting corrosion, erosion, macrofouling and MIC.
0307	AMPs manage loss of material due to crevice and/or pitting, galvanic and general corrosion and erosion.
0308	AMP manages loss of material due to crevice and/or pitting and erosion. SSES Closed Cooling Water Chemistry Program also manages loss of material due to galvanic corrosion of susceptible materials such as copper alloy connected to stainless steel.
0309	AMP manages loss of material due to crevice and/or pitting corrosion, macrofouling and MIC.
0310	Copper contains less than 15% zinc, and therefore is not susceptible to loss of material in this environment.
0311	AMP also manages loss of material due to erosion and galvanic corrosion.
0312	AMP also manages loss of material due to erosion.
0313	Loss of material due to crevice and/or pitting corrosion may result from alternate wetting and drying, as well as from condensation; AMP also manages loss of material due to MIC.
0314	AMP also manages loss of material due to crevice, galvanic, and/or pitting corrosion due to condensation.
0315	AMP also manages loss of material due to crevice and/or pitting corrosion due to condensation, water pooling, and/or alternate wetting and drying.
0316	Only high strength bolting (yield strength > 150 ksi) and/or bolting with sulfide containing lubricants, whether carbon or stainless steel located indoors or outdoors, are susceptible to SCC.
0317	AMP is applicable only to the buried portion of the RHRSW/ESW common return header piping for which damaged coatings are known to exist.
0318	Subject components are not exposed to high doses of ionizing radiation or to high temperatures in this environment. They are also not exposed to ultraviolet radiation or ozone. Therefore, there are no aging effects requiring management and the GALL aging effects/mechanisms are not applicable.
0319	AMP also manages loss of material due to MIC.
0320	AMP also manages loss of material due to galvanic corrosion.
0321	AMP also manages loss of material due to galvanic corrosion and MIC. The Fire Protection Program is not required for aging management, but provides opportunities for detection of any degradation during periodic activities.

Plant-Specific Notes:	
0322	In accordance with applicable NFPA codes, the Fire Water System Program will include a sampling inspection of sprinkler heads (by a certified laboratory) or replacement before the end of the 50-year sprinkler head service life (and at 10-year intervals thereafter). Therefore, the Fire Water System Program is credited with aging management for all sprinkler heads, regardless of whether aging effects requiring management have been identified.
0323	Although this component is not an exact match to the referenced GALL item component, it is the same type of component. The component is not exposed to high doses of ionizing radiation or to high temperatures; therefore, there are no aging effects requiring management, i.e., the GALL aging effects/mechanisms for this item are not applicable.
0324	AMP manages loss of material due crevice and/or pitting corrosion, galvanic and general corrosion, and MIC.
0325	AMP manages cracking due to SCC/IGA and loss of material due to crevice and/or pitting and galvanic corrosion, and MIC for brass and bronze level gauges, orifices, tubing (and fittings) and valves. AMP only manages galvanic corrosion and MIC for copper-nickel heat exchanger components.
0326	AMP manages loss of material due to crevice and/or pitting and galvanic corrosion, macrofouling and MIC.
0327	AMP manages loss of material due to crevice and/or pitting, and general corrosion, and MIC for buried piping. AMP manages loss of material due to general corrosion for buried tanks; crevice and/or pitting corrosion and MIC are not applicable aging mechanisms for buried tanks.
0328	AMP manages loss of material due to crevice and/or pitting, galvanic and general corrosion, macrofouling and MIC.
0329	This environment is different than the GALL environment for this item. The diesel exhaust piping is exposed to diesel exhaust gases infrequently and for short durations. Therefore, the normal internal environment for the exhaust piping is ambient air, without exposure to condensation or wetting other than humidity.
0330	This GALL item is for heat exchanger tubes. The turbocharger casing performs the same heat transfer function.
0331	Though not credited, the Fire Protection Program provides indirect confirmation of whether degradation of these components has occurred, and that the component intended function is maintained.
0332	The treated water environment for the subject components is the diesel jacket water system, where the total integrated dose is less than 10^6 rads and the temperature is below 95ºF. Therefore, there are no aging effects requiring management and the aging effects / mechanisms for this GALL item are not applicable.
0333	AMP manages loss of material due to general corrosion, resulting from condensation on the component's external surfaces.
0334	For purposes of AMR and for a conservative identification of aging effects requiring evaluation, aluminized steel components are considered to be constructed of carbon steel; i.e., the protective aluminum coating is assumed not to be present.

Plant-Specific Notes:	
0335	AMP manages loss of material due to crevice and/or pitting corrosion, resulting from condensation on the component's external surfaces.
0336	AMP manages cracking and change in material properties due to ionizing radiation (referred to as hardening and loss of strength/elastomer degradation in GALL).
0337	AMP also manages loss of material due to selective leaching.
0338	The Supplemental Piping/Tank Inspection manages loss of material due to crevice and/or pitting corrosion at the air/water interface within the SLC Storage Tank.
0339	AMP manages loss of material due to crevice and/or pitting corrosion, and applies to both internal and external environments.
0340	The sodium pentaborate solution is evaluated as a treated water environment.
0341	Drain piping associated with cooling unit drain pans.
0342	Wetted surfaces of the carbon steel Nitrogen Accumulators are lined with a phenolic resin or equivalent (e.g. epoxy or rubber). However, no credit is taken for the coating to preclude the effects of aging on the carbon steel surfaces. The SSES BWR Water Chemistry Program will also manage loss of material due to galvanic corrosion.
0343	AMP manages cracking and change in material properties due to ionizing radiation and thermal exposure (referred to as hardening and loss of strength/elastomer degradation in GALL).
0344	The Domestic Water System (potable water service) is evaluated as raw water, since the treatment to maintain safe drinking water for state requirements does not manage aging. Additionally, the presence of ammonia, or lack thereof, needs to be confirmed. However, microbiologically influenced corrosion and fouling are not likely for drinking (potable) water.
0345	SSES System Walkdown Program also manages loss of material due to crevice and pitting corrosion of external surfaces of subject component groups that contain chilled water, raw water, domestic water, or condensation/drainage from unit coolers and may experience condensation (from internal temperatures that are below ambient) during normal plant operations.
0346	Condensation from internal temperatures that are below ambient may conservatively result in selective leaching of external surfaces of gray cast iron (assumed unless otherwise specified) and unihibited copper alloys with > 15% Zinc or > 8% Aluminum (assumed unless otherwise specified), also managed by the selective leaching inspection AMP.
0347	Copper alloys with >15% Zinc or > 8%Aluminum (assumed unless otherwise specified) are susceptible to cracking in the presence of ammonia, such as may result from organic decay (e.g., microbial activity), and oxidizing conditions (e.g., oxygen > 100 ppb).
0348	SSES AMP also manages a loss of material due to erosion and galvanic corrosion (of susceptible materials such as carbon steel and cast iron).

Plant-Specific Notes:	
0349	Items include the external surface of components (e.g., heat exchanger shells, piping and piping components, and tanks) that do not contain chilled water, raw water, domestic water or cooling unit drainage and, therefore, do not experience condensation. For copper alloys, items match GALL items V.F-3 and VIII.I-2 for closed water systems, but no such item exists in GALL (Chapter VII) for closed cooling water auxiliary systems.
0350	Internal condensation for the Service Air and Containment Instrument Gas systems is collected in strainers, drain traps, tanks and associated piping located in the Reactor Building and the collected moisture is conservatively considered as a raw water environment, but does not result in condensation on the external surface of the components. The Area-Based NSAS Inspection is credited here as a plant-specific program to detect and characterize whether, and to what extent, aging has occurred.
0351	Water (and other fluids) contained in drainage piping is considered as a raw water environment and, except for cooling unit drains, does not result in condensation on the external surface of drainage components due to temperatures being approximately the same as ambient. The Area-Based NSAS Inspection is credited here as a plant-specific program for the carbon steel and cast iron drainage components that are not associated with liquid radwate (e.g., sanitary drainage, building drains nonradioactive) or with cooling unit drains addressed in 0352.
0352	The Cooling Units Inspection will detect and characterize whether the various aging mechanisms associated with drainage from nonsafety-related Reactor Building unit coolers (considered a raw water environment) has occurred or is likely to occur.
0353	SSES AMP also manages a loss of material due to erosion for carbon steel, copper alloy and stainless steel, as well as loss of material due to galvanic corrosion of susceptible materials such as carbon steel and cast iron.
0354	The SSES System Walkdown Program manages a loss of material due to condensation on external surfaces of copper alloy components (due to less than ambient internal temperatures).
0355	Items include both steam, such as in the Main Steam and Auxiliary Steam systems, and two-phase treated water, such as in the Feedwater and Reactor Water Cleanup systems.
0356	Uncontrolled drainage in the Radwaste Liquids System is considered to be a raw water environment. The Monitoring and Collection System Inspection is credited here for the liquid radwaste drainage components, both carbon steel and cast iron.

Plant-Specific Notes:	
0357	Applicable to stainless steel valves and tubing in the inlet and outlet lines of the RWCU regenerative heat exchangers (up to FW and non-regenerative heat exchangers) and the RBCCW lines from the RWCU non-regenerative heat exchangers; stainless steel valves and piping in FW lines DBD-1(2)01 and DCD-1(2)19; stainless steel RPV backfill/reference leg tubing and valves; stainless steel instrumentation tubing and valves in the Main Steam System; and stainless steel Sample System components in the reactor area and post-accident sample stations that are connected to process systems (e.g., Feedwater, RWCU, Reactor Recirculation).
0358	Subject NSAS component groups of the Process and Area Radiation Monitoring System, that contain a liquid, include conections to residual heat removal and fuel pool cooling service water discharges (raw water) and to the fuel pool and RBCCW (treated water). By extension, the AMPs that manage the effects of aging for those systems also manage aging in the connected Process and Area Radiation Monitoring System.
0359	Water (with contaminants and/or particulates) associated with RWCU backwash, clean-up and drainage is considered a raw water environment that does not result in condensation on the external surfaces of components due to temperatures being approximately the same as or above ambient. The Area-Based NSAS Inspection is credited here as a plant-specific program and also detects and characterizes a loss of material due to erosion.
0360	The air separators (0T113A/B) are maintained water solid, so there is not air or gas space in the tank.

3.4 AGING MANAGEMENT OF STEAM AND POWER CONVERSION SYSTEMS

3.4.1 Introduction

Section 3.4 provides the results of the aging management reviews (AMRs) for those components identified in Section 2.3.4, Steam and Power Conversion Systems, as subject to aging management review. The systems or portions of systems are described in the indicated sections of the Application. The Reactor Feed Pump Turbines System (Section 2.3.4.10) is not included here as it contains no mechanical components that are subject to aging management review.

- Auxiliary Boiler System (Section 2.3.4.1)
- Bypass Steam System (Section 2.3.4.2)
- Condensate Transfer and Storage System (Section 2.3.4.3)
- Condenser and Air Removal System (Section 2.3.4.4)
- Feedwater System (Section 2.3.4.5)
- Main Steam System (Section 2.3.4.6)
- Main Turbine System (Section 2.3.4.7)
- Makeup Demineralizer System (Section 2.3.4.8)
- Makeup Transfer and Storage System (Section 2.3.4.9)
- Refueling Water Transfer and Storage System (Section 2.3.4.11)

Table 3.4.1, Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report, provides the summary of the programs evaluated in NUREG-1801 that are applicable to component / commodity groups in this section.

3.4.2 Results

The following tables summarize the results of the aging management review for the Steam and Power Conversion Systems.

Table 3.4.2-1 Aging Management Review Results - Auxiliary Boiler System

Table 3.4.2-2 Aging Management Review Results - Bypass Steam System

Table 3.4.2-3 Aging Management Review Results - Condensate Transfer and Storage System

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

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

3.4.2.1.1 Auxiliary Boiler System

Materials

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

- Carbon Steel
- Stainless Steel

Environments

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

- Indoor Air
- Treated Water

Aging Effects Requiring Management

The following aging effects require management for the Auxiliary Boiler System components:

- Cracking
- Loss of Material

Aging Management Programs

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

- Bolting Integrity Program
- BWR Water Chemistry Program
- Flow-Accelerated Corrosion (FAC) Program
- System Walkdown Program

3.4.2.1.2 Bypass Steam System

Materials

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

- Carbon Steel
- Stainless Steel

Environments

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

- Indoor Air
- Treated Water

Aging Effects Requiring Management

The following aging effects require management for the Bypass Steam System components:

- Cracking

Aging Management Programs

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

- Bolting Integrity Program

3.4.2.1.3 Condensate Transfer and Storage System

Materials

The materials of construction for the Condensate Transfer and Storage System components are:

- Carbon Steel
- Cast Austenitic Stainless Steel (CASS)
- Copper Alloy
- Stainless Steel

Environments

The Condensate Transfer and Storage System components are exposed to the following environments:

- Buried
- Indoor Air
- Outdoor Air
- Treated Water
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Condensate Transfer and Storage System components:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Condensate Transfer and Storage System components:

- Bolting Integrity Program
- Buried Piping and Tanks Inspection Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- Condensate and Refueling Water Storage Tanks Inspection
- Selective Leaching Inspection
- Supplemental Piping/Tank Inspection
- System Walkdown Program

3.4.2.1.4 Condenser and Air Removal System

Materials

The materials of construction for the Condenser and Air Removal System components are:

- Carbon Steel
- Rubber
- Stainless Steel

Environments

The Condenser and Air Removal System components are exposed to the following environments:

- Indoor Air
- Raw Water
- Treated Water

Aging Effects Requiring Management

The following aging effects require management for the Condenser and Air Removal System components:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Condenser and Air Removal System components:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Flow Accelerated Corrosion (FAC) Program
- System Walkdown Program

3.4.2.1.5 Feedwater System

Materials

The materials of construction for the Feedwater System components are:

- Carbon Steel
- Stainless Steel

Environments

The Feedwater System components are exposed to the following environments:

- Indoor Air
- Treated Water
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Feedwater System components:

- Cracking
- Loss of Material

Aging Management Programs

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

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- Flow-Accelerated Corrosion (FAC) Program
- System Walkdown Program

3.4.2.1.6 Main Steam System

Materials

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

- Alloy Steel
- Aluminum
- Carbon Steel
- Stainless Steel

Environments

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

- Air-Gas (dry)
- Indoor Air
- Treated Water
- Ventilation

Aging Effects Requiring Management

The following aging effects require management for the Main Steam System components:

- Cracking
- Loss of Material

Aging Management Programs

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

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- Flow-Accelerated Corrosion (FAC) Program
- Supplemental Piping/Tank Inspection
- System Walkdown Program

3.4.2.1.7 Main Turbine System

Materials

The materials of construction for the Main Turbine System components are:

- Carbon Steel
- Stainless Steel

Environments

The Main Turbine System components are exposed to the following environments:

- Indoor Air
- Treated Water

Aging Effects Requiring Management

The following aging effects require management for the Main Turbine System components:

- Cracking
- Loss of Material

Aging Management Programs

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

- Bolting Integrity Program
- BWR Water Chemistry Program
- Flow-Accelerated Corrosion (FAC) Program
- System Walkdown Program

3.4.2.1.8 Makeup Demineralizer System

Materials

The materials of construction for the Makeup Demineralizer System components are:

- Carbon Steel
- Stainless Steel

Environments

The Makeup Demineralizer System components are exposed to the following environments:

- Indoor Air
- Treated Water

Aging Effects Requiring Management

The following aging effects require management for the Makeup Demineralizer System components:

- Cracking

- Loss of Material

Aging Management Programs

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

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- System Walkdown Program

3.4.2.1.9 Makeup Transfer and Storage System

Materials

The materials of construction for the Makeup Transfer and Storage System components are:

- Carbon Steel
- Stainless Steel

Environments

The Makeup Transfer and Storage System components are exposed to the following environments:

- Indoor Air
- Outdoor Air
- Treated Water

Aging Effects Requiring Management

The following aging effects require management for the Makeup Transfer and Storage System components:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Makeup Transfer and Storage System components:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- System Walkdown Program

3.4.2.1.10 Refueling Water Transfer and Storage System

Materials

The materials of construction for the Refueling Water Transfer and Storage System components are:

- Carbon Steel
- Stainless Steel

Environments

The Refueling Water Transfer and Storage System components are exposed to the following environments:

- Indoor Air
- Outdoor Air
- Treated Water

Aging Effects Requiring Management

The following aging effects require management for the Refueling Water Transfer and Storage System components:

- Cracking
- Loss of Material

Aging Management Programs

The following aging management programs manage the aging effects for the Refueling Water Transfer and Storage System components:

- Bolting Integrity Program
- BWR Water Chemistry Program
- Chemistry Program Effectiveness Inspection
- Condensate and Refueling Water Storage Tanks Inspection
- System Walkdown Program

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

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

3.4.2.2.1 Cumulative Fatigue Damage

Fatigue is a time-limited aging analysis (TLAA) as defined in 10 CFR 54.3. TLAAs are required to be evaluated in accordance with 10 CFR 54.21(c)(1). There are no TLAAs identified for cumulative fatigue damage in the Steam and Power Conversion System for SSES. Therefore, no further evaluation is required.

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

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

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

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

There are no steel components exposed to a lubricating oil environment that are subject to aging management review for the Steam and Power Conversion Systems at SSES.

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

As described in Table 3.4.1, there are no SSES components compared to LRA item number 3.4.1-08. The only steam and power conversion components exposed to raw water and subject to aging management review are the stainless steel tubes inside the main condenser. The intended function of the condenser components is to provide a plate-out and hold-up volume for fission products that may have passed through a closed main steam isolation valve (MSIV). This intended function will not be impacted by a loss of tube material due to corrosion or fouling; therefore, the tubes do not require aging management review.

3.4.2.2.4 Reduction of Heat Transfer due to Fouling

3.4.2.2.4.1 Heat Exchanger Tubes – Treated Water

There are no heat exchanger tubes with a heat transfer function exposed to treated water and subject to aging management review for Steam and Power Conversion System components for SSES.

3.4.2.2.4.2 Heat Exchanger Tubes – Lubricating Oil

There are no heat exchanger tubes exposed to lubricating oil and subject to aging management review in the Steam and Power Conversion System for SSES.

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

3.4.2.2.5.1 Piping, Piping Components, and Piping Elements - Soil

There are no steel piping components or tanks exposed to soil and subject to aging management review in the Steam and Power Conversion Systems for SSES.

3.4.2.2.5.2 Heat Exchanger Components – Lubricating Oil

There are no steel heat exchanger components exposed to lubricating oil and subject to aging management review in the Steam and Power Conversion Systems for SSES.

3.4.2.2.6 Cracking due to Stress Corrosion Cracking (SCC)

Cracking due to SCC for stainless steel piping components exposed to treated water or steam in the Steam and Power Conversion Systems is managed by the BWR Water Chemistry Program. The BWR Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the BWR Water Chemistry Program to manage cracking due to SCC through examination of stainless steel piping components exposed to treated water or steam.

3.4.2.2.7 Loss of Material due to Pitting and Crevice Corrosion

3.4.2.2.7.1 Piping, Piping Components, Piping Elements, Tanks, and Heat Exchanger Components

There are no aging effects identified for aluminum piping components subject to aging management review in the Steam and Power Conversion System. Loss of material due to pitting and crevice corrosion for stainless steel piping components and tanks, and copper alloy piping components, exposed to treated water in the Steam and Power Conversion System is managed by the BWR Water Chemistry Program. The BWR Water Chemistry Program manages aging effects through periodic monitoring and control of contaminants. The Chemistry Program Effectiveness Inspection will provide a verification of the effectiveness of the BWR Water Chemistry Program to manage loss of material due to pitting and crevice corrosion through examination of stainless steel piping components and tanks, and copper alloy piping components, exposed to treated water.

3.4.2.2.7.2 Piping, Piping Components, Piping Elements - Soil

Loss of material due to pitting and crevice corrosion for stainless steel piping components exposed to soil is managed by the Buried Piping and Tanks Inspection Program.

3.4.2.2.7.3 Piping, Piping Components, Piping Elements – Lubricating Oil

There are no copper alloy piping components exposed to lubricating oil and subject to aging management review in the Steam and Power Conversion Systems for SSES.

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

There are no stainless steel piping or heat exchanger components exposed to lubricating oil and subject to aging management review in the Steam and Power Conversion Systems for SSES.

3.4.2.2.9 Loss of Material due to General, Pitting, Crevice, and Galvanic Corrosion

There are no steel heat exchanger components exposed to treated water and subject to aging management review in the Steam and Power Conversion Systems for SSES.

3.4.2.2.10 Quality Assurance for Aging Management of Nonsafety-Related Components

Quality Assurance provisions applicable to license renewal are discussed in Appendix B, Section B.1.3, of the LRA.

3.4.2.3 Time-Limited Aging Analysis

The Time-Limited Aging Analyses (TLAA) identified below are associated with the Steam and Power Conversion Systems components. The section of the application that contains the TLAA review results is indicated in parentheses.

- Metal Fatigue (Section 4.3, Metal Fatigue)

3.4.3 Conclusions

The Steam and Power Conversion System components/commodities subject to aging management review have been identified in accordance with 10 CFR 54.21. The aging management programs selected to manage the effects of aging for the mechanical components/commodities are identified in the following tables and Section 3.4.2.1. A description of the aging management programs is provided in Appendix B of this application, along with the demonstration that the identified aging effects will be managed for the period of extended operation.

Therefore, based on the demonstration provided in Appendix B, the effects of aging associated with the Steam and Power Conversion System components / commodities will be managed so that there is reasonable assurance that the intended functions will be maintained consistent with the current licensing basis during the period of extended operation.

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.4.1-01	Steel piping, piping components, and piping elements exposed to steam or treated water	Cumulative fatigue damage	TLAA, evaluated in accordance with 10 CFR 54.21(c)	Yes, TLAA	Fatigue is a TLAA. Refer to Section 3.4.2.2.1 for further information.
3.4.1-02	Steel piping, piping components, and piping elements exposed to 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	Steel piping, piping components, and piping elements exposed to steam were evaluated as a treated water environment (both liquid and steam phases) and are addressed under table item 3.4.1-04. Refer to Section 3.4.2.2.2.1 for further information.
3.4.1-03	PWR Only				

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.4.1-04	Steel piping, piping components, and piping elements exposed to treated water	Loss of material due to general, pitting and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801. A combination of the BWR Water Chemistry Program and the Chemistry Program Effectiveness Inspection is credited to manage loss of material for steel components exposed to treated water (both liquid and steam phases). In addition, the specified combination of programs is credited to manage loss of material due to erosion and galvanic corrosion (at connections to dissimilar metals) for steel components exposed to treated water. Refer to Section 3.4.2.2.2.1 for further information.
3.4.1-05	Steel heat exchanger components exposed to treated water	Loss of material due to general, pitting, crevice, and galvanic corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Not applicable. There are no steel heat exchanger components that are subject to AMR and exposed to treated water in the steam and power conversion system for SSES. Refer to Section 3.4.2.2.9 for further information.

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.4.1-06	Steel and stainless steel tanks exposed to treated water	Loss of material due to general (steel only) pitting and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801. A combination of the BWR Water Chemistry Program and the Chemistry Program Effectiveness Inspection is credited to manage loss of material for steel tanks exposed to treated water. Refer to Section 3.4.2.2.2.1 for further information for steel tanks. Refer to Section 3.4.2.2.7.1 for further information for stainless steel tanks.
3.4.1-07	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. There are no steel components that are subject to AMR and exposed to lubricating oil in the steam and power conversion system for SSES. Refer to Section 3.4.2.2.2.2 for further information.

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.4.1-08	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	Plant specific	Yes, plant specific	Not applicable. The only steam and power conversion components exposed to raw water are the main condenser tubes, which are stainless steel. Refer to Section 3.4.2.2.3 for further information.
3.4.1-09	Stainless steel and copper alloy 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. There are no heat exchanger tubes exposed to treated water in the steam and power conversion system that perform an intended function of heat transfer. Refer to Section 3.4.2.2.4.1 for further information.
3.4.1-10	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	Not applicable. There are no heat exchanger tubes that are subject to AMR and exposed to lubricating oil in the steam and power conversion system for SSES. Refer to Section 3.4.2.2.4.2 for further information.

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.4.1-11	Buried steel piping, piping components, piping elements, and tanks (with or without coating or wrapping) 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	Not applicable. There are no steel components exposed to soil in the steam and power conversion system. Refer to Section 3.4.2.2.5.1 for further information.
3.4.1-12	Steel heat exchanger components exposed to lubricating oil	Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion	Lubricating Oil Analysis and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Not applicable. There are no steel heat exchanger components that are subject to AMR and exposed to lubricating oil in the steam and power conversion system for SSES. Refer to Section 3.4.2.2.5.2 for further information.

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.4.1-13	Stainless steel piping, piping components, piping elements exposed to steam	Cracking due to stress corrosion cracking	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Consistent with NUREG-1801. A combination of the BWR Water Chemistry Program and the Chemistry Program Effectiveness Inspection is credited to manage cracking for stainless steel components exposed to treated water (liquid and steam phases) greater than 140ºF. Cracking of stainless steel spargers is also managed by a combination of the BWR Water Chemistry Program and the Chemistry Program Effectiveness Inspection and is included under this item. Note C is used. Refer to Section 3.4.2.2.6 for further information.
3.4.1-14	Stainless steel piping, piping components, piping elements, tanks, and heat exchanger components exposed to treated water >60°C (>140°F)	Cracking due to stress corrosion cracking	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	Cracking of stainless steel components exposed to treated water (liquid and steam phases) is addressed under table item 3.4.1-13 above. Refer to Section 3.4.2.2.6 for further information.

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.4.1-15	Aluminum and copper alloy 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. A combination of the BWR Water Chemistry Program and the Chemistry Program Effectiveness Inspection is credited to manage loss of material for copper alloy piping and piping components exposed to treated water. There are no aluminum components exposed to treated water in the steam and power conversion system for SSES. Refer to Section 3.4.2.2.7.1 for further information.
3.4.1-16	Stainless steel piping, piping components, and piping elements; tanks, and 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. A combination of the BWR Water Chemistry Program and the Chemistry Program Effectiveness Inspection is credited to manage loss of material for stainless steel piping, piping components, and piping elements exposed to treated water. Refer to Section 3.4.2.2.7.1 for further information.

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.4.1-17	Stainless steel piping, piping components, and piping elements exposed to soil	Loss of material due to pitting and crevice corrosion	Plant specific	Yes, plant specific	The Buried Piping and Tanks Inspection Program is credited as a plant-specific program to manage loss of material (including that due to MIC) for stainless steel piping exposed to soil. Refer to Section 3.4.2.2.7.2 for further information.
3.4.1-18	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	Not applicable. There are no copper alloy piping, piping components or piping elements that are subject to AMR and exposed to lubricating oil in the steam and power conversion system for SSES. Refer to Section 3.4.2.2.7.3 for further information.

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.4.1-19	Stainless steel piping, piping components, piping elements, and heat exchanger components 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	Not applicable. There are no stainless steel piping, piping components, piping elements or heat exchanger components that are subject to AMR and exposed to lubricating oil in the steam and power conversion system for SSES. Refer to Section 3.4.2.2.8 for further information.
3.4.1-20	Steel tanks exposed to air – outdoor (external)	Loss of material/ general, pitting, and crevice corrosion	Aboveground Steel Tanks	No	Consistent with NUREG-1801. The System Walkdown Program is credited to manage loss of material for carbon steel tanks exposed to outdoor air (for external surfaces) and the Condensate and Refueling Water Storage Tank Inspection is credited to detect and characterize loss of material for carbon steel tanks (Condensate and Refueling Water Storage Tanks) exposed to outdoor air, at the base and underneath the tank (where water could collect).

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.4.1-21	High-strength steel closure bolting exposed to air with steam or water leakage	Cracking due to cyclic loading, stress corrosion cracking	Bolting Integrity	No	Consistent with NUREG-1801, with some exceptions. The Bolting Integrity Program is credited to manage cracking of high strength (yield strength > 150 ksi) bolting.
3.4.1-22	Steel bolting and closure bolting exposed to air with steam or water leakage, air – outdoor (external) or air – indoor uncontrolled (external);	Loss of material due to general, pitting and crevice corrosion; loss of preload due to thermal effects, gasket creep, and self-loosening	Bolting Integrity	No	Consistent with NUREG-1801, with some exceptions. The Bolting Integrity Program is credited to manage loss of material for bolting that is exposed to wetting from leakage in indoor or outdoor locations. The Bolting Integrity Program includes an exception for the management of loss of preload which only becomes an age-related failure consideration at extremely high temperatures (> 700ºF).
3.4.1-23	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	Cracking of stainless steel piping, piping components, and piping elements is addressed under the treated water environment in table item 3.4.1-13.

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.4.1-24	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. There are no steel heat exchanger components that are subject to AMR and exposed to treated (closed cycle cooling) water in the steam and power conversion system for SSES.
3.4.1-25	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	Not applicable. There are no stainless steel components exposed to closed cycle cooling water in the steam and power conversion system for SSES that are subject to AMR.
3.4.1-26	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. There are no copper alloy components exposed to closed cycle cooling water in the steam and power conversion system for SSES that are subject to AMR.
3.4.1-27	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	Not applicable. There are no heat exchanger tubes exposed to closed cycle cooling water in the steam and power conversion system for SSES that are subject to AMR.

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.4.1-28	Steel external surfaces exposed to air – indoor uncontrolled (external), condensation (external) or air outdoor (external)	Loss of material due to general corrosion	External Surfaces Monitoring	No	Consistent with NUREG-1801. The System Walkdown Program is credited to manage loss of material for external steel surfaces in indoor and outdoor environments. This also includes crevice and pitting corrosion on external surfaces in indoor environments due to condensation from the source (Condensate and Refueling Water Storage Tanks) being located outdoors. In addition, this item is applied for steel piping components in the Feedwater System, where surface temperatures are above 212ºF (moisture is eliminated) and general corrosion is not a concern. A Note I is used.

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.4.1-29	Steel piping, piping components, and piping elements exposed to steam or treated water	Wall thinning due to flow-accelerated corrosion	Flow-Accelerated Corrosion	No	Consistent with NUREG-1801. The Flow-Accelerated Corrosion (FAC) Program is credited to manage loss of material due to flow-accelerated corrosion (FAC) for steel piping and piping components. The Flow-Accelerated Corrosion Program is also credited to manage loss of material due to FAC for attached steel condenser shells and turbine casings. A Note C is used.
3.4.1-30	Steel piping, piping components, and piping elements exposed to air outdoor (internal) or condensation (internal)	Loss of material due to general, pitting, and crevice corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	No	A different program is used. The Supplemental Piping / Tank Inspection is credited to detect and characterize loss of material for steel piping components and tanks in a ventilation environment (ambient air), with a focus on the air-water interface inside the tank.

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.4.1-31	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. Only the main condenser in the steam and power conversion system contains steel components that are subject to AMR and exposed to raw water. No aging effects were identified that could affect the intended function of ICTM Volume for these components.
3.4.1-32	Stainless steel and copper alloy piping, piping components, and piping elements exposed to raw water	Loss of material due to pitting, crevice, and microbiologically influenced corrosion	Open-Cycle Cooling Water System	No	Not applicable. Only the main condenser in the steam and power conversion system contains stainless steel components that are subject to AMR and exposed to raw water. No aging effects were identified that could affect the intended function of ICTM Volume for these components. There are no copper alloy components that are subject to AMR and exposed to raw water in the steam and power conversion system for SSES.

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.4.1-33	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. The only steam and power conversion components exposed to raw water and subject to AMR are the stainless steel main condenser tubes. No aging effects were identified that could affect the intended function of ICTM Volume for these components.
3.4.1-34	Steel, 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	Not applicable. The only steam and power conversion components exposed to raw water and subject to AMR are the stainless steel main condenser tubes. These tubes, however, do not perform a heat transfer function for license renewal.
3.4.1-35	Copper alloy >15% Zn piping, piping components, and piping elements exposed to closed cycle cooling water, raw water or treated water	Loss of material due to selective leaching	Selective Leaching of Materials	No	Consistent with NUREG-1801. The Selective Leaching Inspection is credited to detect and characterize loss of material due to selective leaching of copper alloy piping and piping components exposed to treated water.

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.4.1-36	Gray cast iron piping, piping components, and piping elements exposed to soil, treated water or raw water	Loss of material due to selective leaching	Selective Leaching of Materials	No	Not applicable. There are no gray cast iron piping, piping, components or piping elements that are subject to AMR and exposed to soil, treated water or raw water in the steam and power conversion system for SSES.
3.4.1-37	Steel, stainless steel, and nickel-based alloy piping, piping components, and piping elements exposed to steam	Loss of material due to pitting and crevice corrosion	Water Chemistry	No	Consistent with NUREG-1801. The BWR Water Chemistry Program is credited to manage loss of material for steel and stainless steel piping, piping components, and piping elements exposed to treated water (liquid and steam phases). The BWR Water Chemistry Program is also credited to manage loss of material for stainless steel spargers exposed to treated water (liquid and steam phases) and steel condenser shells and turbine casings under this item. Note C is used.
3.4.1-38	PWR Only				
3.4.1-39	PWR Only				

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.4.1-40	Glass piping elements exposed to air, lubricating oil, raw water, and treated water	None	None	NA - No AEM or AMP	Not applicable. There are no glass piping elements in the steam and power conversion system for SSES.
3.4.1-41	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. No aging effects were identified for stainless steel or copper alloy piping, piping components or piping elements exposed to indoor air. Stainless steel piping exposed to an internal ventilation (ambient air) environment is also included in this item with no aging effects identified. No aging effects were identified for stainless steel accumulators and tanks exposed to indoor air and included in this item. A Note C is used.
3.4.1-42	Steel piping, piping components, and piping elements exposed to air – indoor controlled (external)	None	None	NA - No AEM or AMP	Not applicable. For SSES, indoor environments are considered to be uncontrolled.
3.4.1-43	Steel and stainless steel piping, piping components, and piping elements in concrete	None	None	NA - No AEM or AMP	No applicable. There are no components in the steam and power conversion system for SSES embedded in concrete.

Table 3.4.1 Summary of Aging Management Programs for Steam and Power Conversion Systems Evaluated in Chapter VIII of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.4.1-44	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. No aging effects were identified for steel, stainless steel, or aluminum piping, piping components, or piping elements in a gas environment. No aging effects were identified for steel actuator housings or stainless steel accumulators exposed to gas and included under this item. A Note C is used.

Table 3.4.2-1 Aging Management Review Results – Auxiliary Boiler System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
				Loss of Material	Bolting Integrity Program	VIII.H-4	3.4.1-22	B
Bolting	Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	VIII.B2-3	3.4.1-37	A
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	VIII.B2-4	3.4.1-29	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A

Table 3.4.2-2 Aging Management Review Results – Bypass Steam System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	ICTM Volume	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
				Loss of Material	Bolting Integrity Program	VIII.H-4	3.4.1-22	B
Bolting	ICTM Volume	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
Valve Bodies	ICTM Volume	Carbon Steel	Treated Water (Internal)	None Identified	None Required	N/A	N/A	I, 0406
			Indoor Air (External)	None Identified	None Required	N/A	N/A	I, 0406

Table 3.4.2-3 Aging Management Review Results – Condensate Transfer and Storage System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
				Loss of Material	Bolting Integrity Program	VIII.H-4	3.4.1-22	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Outdoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
				Loss of Material	Bolting Integrity Program	VIII.H-1	3.4.1-22	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Outdoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404

Table 3.4.2-3 Aging Management Review Results – Condensate Transfer and Storage System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Orifices	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-29	3.4.1-16	A
			Indoor Air (External)	None Identified	None Required	VIII.I-10	3.4.1-41	A
Piping	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-29	3.4.1-16	A
			Outdoor Air (External)	None Identified	None Required	N/A	N/A	G
Piping	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	N/A	N/A	G
			Outdoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.4.2-3 Aging Management Review Results – Condensate Transfer and Storage System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-29	3.4.1-16	A
			Buried (External)	Loss of Material	Buried Piping and Tanks Inspection Program	VIII.E-28	3.4.1-17	E, 0408
Piping	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-29	3.4.1-16	A
			Indoor Air (External)	None Identified	None Required	VIII.I-10	3.4.1-41	A

Table 3.4.2-3 Aging Management Review Results – Condensate Transfer and Storage System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-33	3.4.1-04	A, 0403
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A, 0410
Pumps (0P155A/B), Casings	Pressure Boundary	CASS	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-29	3.4.1-16	A
			Indoor Air (External)	None Identified	None Required	VIII.I-10	3.4.1-41	A

Table 3.4.2-3 Aging Management Review Results – Condensate Transfer and Storage System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tanks (0T522A/B)	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-40	3.4.1-06	A, 0403
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-8	3.4.1-28	A
					Condensate and Refueling Water Storage Tanks Inspection	VIII.E-39	3.4.1-20	E, 0411
Tanks (0T522A/B)	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	Supplemental Piping/Tank Inspection	VIII.B1-6	3.4.1-30	E
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-8	3.4.1-28	A

Table 3.4.2-3 Aging Management Review Results – Condensate Transfer and Storage System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tanks (1/2T274)	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-40	3.4.1-16	A
			Indoor Air (External)	None Identified	None Required	VIII.I-10	3.4.1-41	C
Tanks (1/2T274)	Pressure Boundary	Stainless Steel	Ventilation (Internal)	Loss of Material	Supplemental Piping/Tank Inspection	N/A	N/A	G
			Indoor Air (External)	None Identified	None Required	VIII.I-10	3.4.1-41	C
Tubing	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-29	3.4.1-16	A
			Outdoor Air (External)	None Identified	None Required	N/A	N/A	G

Table 3.4.2-3 Aging Management Review Results – Condensate Transfer and Storage System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	N/A	N/A	G
			Outdoor Air (External)	None Identified	None Required	N/A	N/A	G
Valve Bodies	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	Supplemental Piping/Tank Inspection	VIII.B1-6	3.4.1-30	E
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-8	3.4.1-28	A
Valve Bodies	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	N/A	N/A	G
			Outdoor Air (External)	None Identified	None Required	N/A	N/A	G
Valve Bodies	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-33	3.4.1-04	A, 0403
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-8	3.4.1-28	A

Table 3.4.2-3 Aging Management Review Results – Condensate Transfer and Storage System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-29	3.4.1-16	A
			Outdoor Air (External)	None Identified	None Required	N/A	N/A	G
Valve Bodies	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-33	3.4.1-04	A, 0403
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A, 0410

Table 3.4.2-3 Aging Management Review Results – Condensate Transfer and Storage System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-29	3.4.1-16	A
			Indoor Air (External)	None Identified	None Required	VIII.I-10	3.4.1-41	A
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-33	3.4.1-04	A, 0415
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A

Table 3.4.2-3 Aging Management Review Results – Condensate Transfer and Storage System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-33	3.4.1-04	A, 0415
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-8	3.4.1-28	A
Piping and Piping Components	Structural Integrity	Copper Alloy	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.A-5	3.4.1-15	A, 0415
				Loss of Material	Selective Leaching Inspection	VIII.E-21	3.4.1-35	A
				Cracking	BWR Water Chemistry Program	N/A	N/A	G, 0414
			Indoor Air (External)	None Identified	None Required	VIII.I-2	3.4.1-41	A

Table 3.4.2-4 Aging Management Review Results – Condenser and Air Removal System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	ICTM Volume / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
				Loss of Material	Bolting Integrity Program	VIII.H-4	3.4.1-22	B
Bolting	ICTM Volume / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
Condensers (Shell) – 1(2)E108A	ICTM Volume / Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	VIII.B2-3	3.4.1-37	C, 0403, 0409
					Flow-Accelerated Corrosion (FAC) Program	VIII.B2-4	3.4.1-29	C, 0409
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A, 0409
Condensers (Shell) – 1(2)E108B & 1(2)E108C	ICTM Volume	Carbon Steel	Treated Water (Internal)	None Identified	None Required	N/A	N/A	I, 0406
			Indoor Air (External)	None Identified	None Required	N/A	N/A	I, 0406

Table 3.4.2-4 Aging Management Review Results – Condenser and Air Removal System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Condensers (Tubes)	ICTM Volume	Stainless Steel	Raw Water (Internal)	None Identified	None Required	N/A	N/A	I, 0406
			Treated Water (External)	None Identified	None Required	N/A	N/A	I, 0406
Condensers (Tubesheet)	ICTM Volume	Carbon Steel	Raw Water (Internal)	None Identified	None Required	N/A	N/A	I, 0406
			Treated Water (External)	None Identified	None Required	N/A	N/A	I, 0406
Condensers (Tube Plugs)	ICTM Volume	Stainless Steel	N/A (Internal)	N/A	N/A	N/A	N/A	N/A
			Raw Water (External)	None Identified	None Required	N/A	N/A	I, 0406
Condensers (Inlet/Outlet Water Boxes)	ICTM Volume	Carbon Steel	Raw Water (Internal)	None Identified	None Required	N/A	N/A	I, 0406
			Indoor Air (External)	None Identified	None Required	N/A	N/A	I, 0406
Flexible Connections (Expansion Joints)	ICTM Volume	Rubber	Treated Water (Internal)	None Identified	None Required	N/A	N/A	I, 0406
			Indoor Air (External)	None Identified	None Required	N/A	N/A	I, 0406
Piping	ICTM Volume	Carbon Steel	Treated Water (Internal)	None Identified	None Required	N/A	N/A	I, 0406
			Indoor Air (External)	None Identified	None Required	N/A	N/A	I, 0406

Table 3.4.2-5 Aging Management Review Results – Feedwater System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Pressure Boundary / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
				Loss of Material	Bolting Integrity Program	VIII.H-4	3.4.1-22	B
Bolting	Pressure Boundary / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404

Table 3.4.2-5 Aging Management Review Results – Feedwater System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.D2-7	3.4.1-04	A, 0412
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	VIII.D2-8	3.4.1-29	A
			Indoor Air (External)	None Identified	None Required	VIII.H-7	3.4.1-28	I, 0413
Piping	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VIII.I-10	3.4.1-41	A, 0402
			Indoor Air (External)	None Identified	None Required	VIII.I-10	3.4.1-41	A

Table 3.4.2-5 Aging Management Review Results – Feedwater System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.D2-7	3.4.1-04	A, 0412
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	VIII.D2-8	3.4.1-29	A
			Indoor Air (External)	None Identified	None Required	VIII.H-7	3.4.1-28	I, 0413
Valve Bodies	Pressure Boundary	Stainless Steel	Ventilation (Internal)	None Identified	None Required	VIII.I-10	3.4.1-41	A, 0402
			Indoor Air (External)	None Identified	None Required	VIII.I-10	3.4.1-41	A

Table 3.4.2-5 Aging Management Review Results – Feedwater System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.D2-7	3.4.1-04	A, 0415
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	VIII.D2-8	3.4.1-29	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A

Table 3.4.2-5 Aging Management Review Results – Feedwater System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.D2-4	3.4.1-16	A, 0415
				Cracking	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.B2-1	3.4.1-13	A, 0407
			Indoor Air (External)	None Identified	None Required	VIII.I-10	3.4.1-41	A

Table 3.4.2-6 Aging Management Review Results – Main Steam System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Accumulators	Pressure Boundary	Stainless Steel	Air-Gas (dry) (Internal)	None Identified	None Required	VIII.I-12	3.4.1-44	C
			Indoor Air (External)	None Identified	None Required	VIII.I-10	3.4.1-41	C
Actuator Housings	Pressure Boundary	Carbon Steel	Air-Gas (dry) (Internal)	None Identified	None Required	VIII.I-15	3.4.1-44	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A
Bolting	Pressure Boundary / Structural Integrity / ICTM Volume	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
				Loss of Material	Bolting Integrity Program	VIII.H-4	3.4.1-22	B
Bolting	Pressure Boundary / Structural Integrity / ICTM Volume	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404

Table 3.4.2-6 Aging Management Review Results – Main Steam System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Flexible Connections (Hoses)	Pressure Boundary	Stainless Steel	Air-Gas (dry) (Internal)	None Identified	None Required	VIII.I-12	3.4.1-44	A
			Indoor Air (External)	None Identified	None Required	VIII.I-10	3.4.1-41	A
Orifices	Pressure Boundary, Throttling	Stainless Steel	Treated Water (Internal)	Cracking	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.B2-1	3.4.1-13	A
				Loss of Material	BWR Water Chemistry Program	VIII.B2-2	3.4.1-37	A
			Indoor Air (External)	None Identified	None Required	VIII.I-10	3.4.1-41	A
Piping	Pressure Boundary	Stainless Steel	Air-Gas (dry) (Internal)	None Identified	None Required	VIII.I-12	3.4.1-44	A
			Indoor Air (External)	None Identified	None Required	VIII.I-10	3.4.1-41	A

Table 3.4.2-6 Aging Management Review Results – Main Steam System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	Supplemental Piping/Tank Inspection	N/A	N/A	G 0401, 0402
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A
Piping	Pressure Boundary	Carbon (or Alloy) Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	VIII.B2-3	3.4.1-37	A, 0403
					Flow-Accelerated Corrosion (FAC) Program	VIII.B2-4	3.4.1-29	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A
				Loss of Material	Supplemental Piping/Tank Inspection	VIII.H-7	3.4.1-28	E, 0401
Piping	ICTM Volume	Carbon Steel	Treated Water (Internal)	None Identified	None Required	N/A	N/A	I, 0406
			Indoor Air (External)	None Identified	None Required	N/A	N/A	I, 0406

Table 3.4.2-6 Aging Management Review Results – Main Steam System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping	ICTM Volume / Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	VIII.B2-3	3.4.1-37	A, 0403, 0409
					Flow-Accelerated Corrosion (FAC) Program	VIII.B2-4	3.4.1-29	A, 0409
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A, 0409
Piping	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	VIII.B2-3	3.4.1-37	A, 0405
			Treated Water (External)	Loss of Material	BWR Water Chemistry Program	VIII.B2-3	3.4.1-37	A, 0405

Table 3.4.2-6 Aging Management Review Results – Main Steam System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Spargers	Spray	Stainless Steel	Treated Water (Internal)	Cracking	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.B2-1	3.4.1-13	C
				Loss of Material	BWR Water Chemistry Program	VIII.B2-2	3.4.1-37	C
			Treated Water (External)	Cracking	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.B2-1	3.4.1-13	C
				Loss of Material	BWR Water Chemistry Program	VIII.B2-2	3.4.1-37	C

Table 3.4.2-6 Aging Management Review Results – Main Steam System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Tubing	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Cracking	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.B2-1	3.4.1-13	A
				Loss of Material	BWR Water Chemistry Program	VIII.B2-2	3.4.1-37	A
			Indoor Air (External)	None Identified	None Required	VIII.I-10	3.4.1-41	A
Valve Bodies	Pressure Boundary	Stainless Steel	Air-Gas (dry) (Internal)	None Identified	None Required	VIII.I-12	3.4.1-44	A
			Indoor Air (External)	None Identified	None Required	VIII.I-10	3.4.1-41	A

Table 3.4.2-6 Aging Management Review Results – Main Steam System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary, ICTM Volume	Carbon (or Alloy) Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	VIII.B2-3	3.4.1-37	A, 0403
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	VIII.B2-4	3.4.1-29	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A
Valve Bodies	ICTM Volume / Structural Integrity	Carbon (or Alloy) Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	VIII.B2-3	3.4.1-37	A, 0403, 0409
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	VIII.B2-4	3.4.1-29	A, 0409
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A, 0409
Valve Bodies	ICTM Volume	Carbon Steel	Treated Water (Internal)	None Identified	None Required	N/A	N/A	I, 0406
			Indoor Air (External)	None Identified	None Required	N/A	N/A	I, 0406

Table 3.4.2-6 Aging Management Review Results – Main Steam System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve Bodies	Pressure Boundary	Carbon Steel	Ventilation (Internal)	Loss of Material	Supplemental Piping/Tank Inspection	N/A	N/A	G, 0402
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A
Valve Bodies	Pressure Boundary	Aluminum	Air-Gas (dry) (Internal)	None Identified	None Required	VIII.I-1	3.4.1-44	A
			Indoor Air (External)	None Identified	None Required	N/A	N/A	G
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	VIII.B2-3	3.4.1-37	A
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	VIII.B2-4	3.4.1-29	A
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A

Table 3.4.2-6 Aging Management Review Results – Main Steam System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	VIII.B2-2	3.4.1-37	A
				Cracking	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.B2-1	3.4.1-13	A, 0407, 0415
			Indoor Air (External)	None Identified	None Required	VIII.I-10	3.4.1-41	A

Table 3.4.2-7 Aging Management Review Results - Main Turbine System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	ICTM Volume / Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
				Loss of Material	Bolting Integrity Program	VIII.H-4	3.4.1-22	B
Bolting	ICTM Volume / Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
Turbine Casings (low pressure)	ICTM Volume	Carbon Steel	Treated Water (Internal)	None Identified	None Required	N/A	N/A	I, 0406
			Indoor Air (External)	None Identified	None Required	N/A	N/A	I, 0406
Turbine Casings (high pressure) - 1(2)G101-HPT	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program	VIII.B2-3	3.4.1-37	C, 0403
				Loss of Material	Flow-Accelerated Corrosion (FAC) Program	VIII.B2-4	3.4.1-29	C
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A

Table 3.4.2-8 Aging Management Review Results – Makeup Demineralizer System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
				Loss of Material	Bolting Integrity Program	VIII.H-4	3.4.1-22	B
Bolting	Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-33	3.4.1-04	A, 0415
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A

Table 3.4.2-9 Aging Management Review Results – Makeup Transfer and Storage System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
				Loss of Material	Bolting Integrity Program	VIII.H-4	3.4.1-22	B
Bolting	Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
Bolting	Structural Integrity	Carbon Steel	Outdoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
				Loss of Material	Bolting Integrity Program	VIII.H-1	3.4.1-22	B
Bolting	Structural Integrity	Stainless Steel	Outdoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404

Table 3.4.2-9 Aging Management Review Results – Makeup Transfer and Storage System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-33	3.4.1-04	A, 0415
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-33	3.4.1-04	A, 0415
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-8	3.4.1-28	A

Table 3.4.2-10 Aging Management Review Results – Refueling Water Transfer and Storage System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Bolting	Structural Integrity	Carbon Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
				Loss of Material	Bolting Integrity Program	VIII.H-4	3.4.1-22	B
Bolting	Structural Integrity	Stainless Steel	Indoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
Bolting	Structural Integrity	Carbon Steel	Outdoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404
				Loss of Material	Bolting Integrity Program	VIII.H-1	3.4.1-22	B
Bolting	Structural Integrity	Stainless Steel	Outdoor Air (External)	Cracking	Bolting Integrity Program	VIII.H-3	3.4.1-21	B, 0404

Table 3.4.2-10 Aging Management Review Results – Refueling Water Transfer and Storage System								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Piping and Piping Components	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-33	3.4.1-04	A, 0415
			Indoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-7	3.4.1-28	A
Tank (0T501)	Structural Integrity	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program Chemistry Program Effectiveness Inspection	VIII.E-40	3.4.1-06	A, 0415
			Outdoor Air (External)	Loss of Material	System Walkdown Program	VIII.H-8	3.4.1-28	A
				Loss of Material	Condensate and Refueling Water Storage Tanks Inspection	VIII.E-39	3.4.1-20	A, 0411

Generic Notes:	
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 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
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:	
0401	AMP manages loss of material due to crevice and/or pitting corrosion on the inside surface of SRV discharge piping at air/water interface in the suppression pool, and also, on the outside surface of SRV discharge piping at air/water interface in the suppression pool.
0402	This environment is the same as the GALL environment except that it is an internal rather than an external environment.
0403	AMP manages loss of material due to crevice and/or pitting, galvanic and general corrosion, and erosion.
0404	Only high strength bolting (yield strength > 150 ksi) and/or bolting with sulfide containing lubricants, whether carbon or stainless steel located indoors or outdoors, are susceptible to SCC.

Plant-Specific Notes:	
0405	AMP only applies to inside and outside surface of SRV discharge piping below the suppression pool water level, and manages loss of material due to crevice and/or pitting, galvanic and general corrosion.
0406	The assumption is made for license renewal that the occurrence of any aging effects results in minimal impact to the overall volume and surface area associated with the MSIV Leakage ICTM functions of hold-up and plate-out (ICTM Volume), and does not adversely affect the successful performance of this component intended function. This assumption is supported by the fact that vacuum is maintained on the condenser during normal plant operation, and any leakage that enters the condenser post-accident is subsequently released to the atmosphere. Any age-related degradation that impacts normal plant operations would be indicated by a loss of vacuum and be resolved well before any significant impact to the available volume and surface area is experienced (For example, Condenser inleakage is typically tracked and reported as Off-gas Flow Rate in support of normal plant operation) . Therefore, since the successful performance of the ICTM function will not be realistically prevented by any age-related degradation, there are no aging effects requiring management for any components of the steam systems if the only component intended function is ICTM Volume.
0407	Applicable to stainless steel valves and piping in feedwater lines DBD-1(2)01 and DCD-1(2)19; stainless steel instrumentation tubing and valves in the Main Steam System; and stainless steel Sample System components in the reactor area and post-accident sample stations that are connected to process systems (e.g., Feedwater). In addition, effectiveness of the credited BWR Water Chemistry Program in managing cracking due to SCC is verified by the plant-specific Chemistry Program Effectiveness Inspection.
0408	AMP manages loss of material due to crevice and/or pitting corrosion, and MIC.
0409	Certain components (e.g., main steam piping and valve bodies, and high pressure condenser shell) support both the ICTM Volume function, as well as providing support/anchorage for connected safety-related components, and thereby provide structural integrity. It is the structural integrity function of these components which requires aging management.
0410	AMP manages loss of material due to crevice and/or pitting and galvanic corrosion (resulting from exposure to condensation), and general corrosion.
0411	The specified program will detect and characterize the occurrence of a loss of material due to crevice and/or pitting, and general corrosion at the base (and underneath) of the Condensate Storage Tanks and the Refueling Water Storage Tank, from water pooling/collection.
0412	This aging management program also manages loss of material due to erosion.
0413	External surface temperature for this component type is > 100ºC (212ºF), therefore no moisture is present to promote aging.
0414	Copper alloys with greater than 15 percent Zinc or greater than 8 percent Aluminum (assumed unless otherwise specified) are susceptible to cracking in the presence of ammonia, such as may result from organic decay (e.g., microbial activity), and oxidizing conditions (e.g., oxygen greater than 100 ppb).

Plant-Specific Notes:	
0415	SSES program also manages a loss of material due to erosion for carbon steel, copper alloy and stainless steel, as well as loss of material due to galvanic corrosion of susceptible materials such as carbon steel and cast iron.

3.5 AGING MANAGEMENT OF CONTAINMENTS, STRUCTURES, AND COMPONENT SUPPORTS

3.5.1 Introduction

Section 3.5 provides the results of the aging management reviews (AMRs) for those structural components and commodities identified in Section 2.4, Scoping and Screening Results - Structures, subject to aging management review. The structures or structural commodities are described in the indicated sections.

- Primary Containment (Section 2.4.1)
- Reactor Building (Section 2.4.2)
- Engineered Safeguards Service Water Pumphouse and Spray Pond (Section 2.4.3)
- Circulating Water Pumphouse and Water Treatment Building (Section 2.4.4)
- Control Structure (Section 2.4.5)
- Diesel Generator 'A, B, C, and D' Building (Section 2.4.6)
- Diesel Generator 'E' Building (Section 2.4.7)
- Turbine Building (Section 2.4.8)
- Yard Structures (Section 2.4.9)
- Bulk Commodities (Section 2.4.10)

Table 3.5.1, Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report, provides the summary of the programs evaluated in NUREG-1801 that are applicable to structural component and commodity groups in this section.

3.5.2 Results

The following tables summarize the results of the aging management review for Containments, Structures, and Component Supports.

Table 3.5.2-1 Aging Management Review Results - Primary Containment

Table 3.5.2-2 Aging Management Review Results - Reactor Building

Table 3.5.2-3 Aging Management Review Results - Engineered Safeguards Service Water Pumphouse and Spray Pond

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

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

3.5.2.1.1 Primary Containment

Materials

Primary Containment components subject to aging management review are constructed of the following materials:

- Aluminum
- Carbon Steel
- Concrete
- Galvanized Steel
- Lead
- Stainless Steel

Materials for bulk commodity components are addressed in Section 3.5.2.1.10.

Environments

Primary Containment components subject to aging management review are exposed to the following environments:

- Below grade
- Exposed to treated water
- Protected from weather

Environments for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Effects Requiring Management

The following aging effects associated with Primary Containment components require management:

- Loss of material

Aging effects requiring management for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Management Programs

The following programs are credited for managing the effects of aging on Primary Containment components:

- BWR Water Chemistry Program
- Containment Leakage Rate Test Program
- Inservice Inspection Program – IWE
- Inservice Inspection Program – IWF
- Inservice Inspection Program – IWL
- Structures Monitoring Program

Aging management programs for bulk commodity components are addressed in Section 3.5.2.1.10.

3.5.2.1.2 Reactor Building

Materials

Reactor Building components subject to aging management review are constructed of the following materials:

- Aluminum
- Boral
- Carbon Steel
- Concrete
- Concrete blocks
- Galvanized Steel
- Stainless Steel

Materials for bulk commodity components are addressed in Section 3.5.2.1.10.

Environments

Reactor Building components subject to aging management review are exposed to the following environments:

- Below grade
- Exposed to treated water
- Exposed to weather
- Protected from weather

Environments for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Effects Requiring Management

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

- Cracking
- Loss of material

Aging effects requiring management for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Management Programs

The following programs are credited for managing the effects of aging on Reactor Building components:

- BWR Water Chemistry Program
- Crane Inspection Program
- Fire Protection Program
- Leak Chase Channel Monitoring Activities
- Masonry Wall Program
- Structures Monitoring Program

Aging management programs for bulk commodity components are addressed in Section 3.5.2.1.10.

3.5.2.1.3 Engineered Safeguards Service Water (ESSW) Pumphouse and Spray Pond

Materials

ESSW Pumphouse and Spray Pond components subject to aging management review are constructed of the following materials:

- Carbon Steel
- Concrete
- Earthen
- Galvanized Steel
- Stainless Steel

Materials for bulk commodity components are addressed in Section 3.5.2.1.10.

Environments

ESSW Pumphouse and Spray Pond components subject to aging management review are exposed to the following environments:

- Below grade
- Exposed to raw water

- Exposed to weather
- Protected from weather

Environments for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Effects Requiring Management

The following aging effects associated with ESSW Pumphouse and Spray Pond components require management:

- Cracking
- Loss of form
- Loss of material

Aging effects requiring management for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Management Programs

The following programs are credited for managing the effects of aging on ESSW Pumphouse and Spray Pond components:

- Fire Protection Program
- Structures Monitoring Program
- RG 1.127 Water-Control Structures Inspection

Aging management programs for bulk commodity components are addressed in Section 3.5.2.1.10.

3.5.2.1.4 Circulating Water Pumphouse and Water Treatment Building

Materials

Circulating Water Pumphouse and Water Treatment Building components subject to aging management review are constructed of the following materials:

- Carbon Steel
- Concrete
- Concrete Blocks
- Galvanized Steel

Materials for bulk commodity components are addressed in Section 3.5.2.1.10.

Environments

Circulating Water Pumphouse and Water Treatment Building components subject to aging management review are exposed to the following environments:

- Below grade
- Exposed to weather
- Protected from weather

Environments for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Effects Requiring Management

The following aging effects associated with Circulating Water Pumphouse and Water Treatment Building components require management:

- Cracking
- Loss of material

Aging effects requiring management for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Management Programs

The following programs are credited for managing the effects of aging on Circulating Water Pumphouse and Water Treatment Building components:

- Crane Inspection Program
- Fire Protection Program
- Masonry Wall Program
- Structures Monitoring Program

Aging management programs for bulk commodity components are addressed in Section 3.5.2.1.10.

3.5.2.1.5 Control Structure

Materials

Control Structure components subject to aging management review are constructed of the following materials:

- Arboron Laminate Panels
- Carbon Steel
- Concrete
- Concrete Blocks
- Galvanized Steel

Materials for bulk commodity components are addressed in Section 3.5.2.1.10.

Environments

Control Structure components subject to aging management review are exposed to the following environments:

- Below grade
- Exposed to weather
- Protected from weather

Environments for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Effects Requiring Management

The following aging effects associated with Control Structure components require management:

- Cracking
- Loss of material

Aging effects requiring management for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Management Programs

The following programs are credited for managing the effects of aging on Control Structure components:

- Fire Protection Program

- Masonry Wall Program
- Structures Monitoring Program

Aging management programs for bulk commodity components are addressed in Section 3.5.2.1.10.

3.5.2.1.6 Diesel Generator 'A, B, C, and D' Building

Materials

Diesel Generator 'A, B, C, and D' Building components subject to aging management review are constructed of the following materials:

- Carbon Steel
- Concrete
- Concrete Blocks
- Galvanized Steel

Materials for bulk commodity components are addressed in Section 3.5.2.1.10.

Environments

Diesel Generator 'A, B, C, and D' Building components subject to aging management review are exposed to the following environments:

- Below grade
- Exposed to weather
- Protected from weather

Environments for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Effects Requiring Management

The following aging effects associated with Diesel Generator 'A, B, C, and D' Building components require management:

- Cracking
- Loss of material

Aging effects requiring management for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Management Programs

The following programs are credited for managing the effects of aging on Diesel Generator 'A, B, C, and D' Building components:

- Crane Inspection Program
- Fire Protection Program
- Masonry Wall Program
- Structures Monitoring Program

Aging management programs for bulk commodity components are addressed in Section 3.5.2.1.10.

3.5.2.1.7 Diesel Generator 'E' Building

Materials

Diesel Generator 'E' Building components subject to aging management review are constructed of the following materials:

- Carbon Steel
- Concrete

Materials for bulk commodity components are addressed in Section 3.5.2.1.10.

Environments

Diesel Generator 'E' Building components subject to aging management review are exposed to the following environments:

- Below grade
- Exposed to weather
- Protected from weather

Environments for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Effects Requiring Management

The following aging effects associated with Diesel Generator 'E' Building components require management:

- Loss of material

Aging effects requiring management for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Management Programs

The following programs are credited for managing the effects of aging on Diesel Generator 'E' Building components:

- Crane Inspection Program
- Fire Protection Program
- Structures Monitoring Program

Aging management programs for bulk commodity components are addressed in Section 3.5.2.1.10.

3.5.2.1.8 Turbine Building

Materials

Turbine Building components subject to aging management review are constructed of the following materials:

- Carbon Steel
- Concrete
- Concrete Blocks
- Galvanized Steel
- Stainless Steel
- Urethane

Materials for bulk commodity components are addressed in Section 3.5.2.1.10.

Environments

Turbine Building components subject to aging management review are exposed to the following environments:

- Below grade
- Exposed to weather
- Protected from weather

Environments for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Effects Requiring Management

The following aging effects associated with Turbine Building components require management:

- Change in material properties
- Cracking
- Loss of material

Aging effects requiring management for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Management Programs

The following programs are credited for managing the effects of aging on Turbine Building components:

- Crane Inspection Program
- Fire Protection Program
- Masonry Wall Program
- Structures Monitoring Program

Aging management programs for bulk commodity components are addressed in Section 3.5.2.1.10.

3.5.2.1.9 Yard Structures

Materials

Yard components subject to aging management review are constructed of the following materials:

- Carbon Steel
- Concrete
- Concrete (structural backfill)
- Galvanized Steel
- Stainless Steel

Materials for bulk commodity components are addressed in Section 3.5.2.1.10.

Environments

Yard components subject to aging management review are exposed to the following environments:

- Below grade
- Buried
- Exposed to raw water
- Exposed to weather
- Protected from weather

Environments for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Effects Requiring Management

The following aging effects associated with yard components require management:

- Cracking
- Loss of material

Aging effects requiring management for bulk commodity components are addressed in Section 3.5.2.1.10.

Aging Management Programs

The following programs are credited for managing the effects of aging on yard components:

- Structures Monitoring Program

Aging management programs for bulk commodity components are addressed in Section 3.5.2.1.10.

3.5.2.1.10 Bulk Commodities

Materials

Bulk commodity components subject to aging management review are constructed of the following materials:

- Acoustic Ceiling Tiles
- Aluminum
- Built-up Roofing
- Calcium Silicate
- Carbon Steel
- Ceramic
- Ceramic Fibers
- Concrete
- Elastomer
- Galvanized Steel
- Glass Fibers
- Grout
- Gypsum Boards
- Pryocrete
- Rubber
- Silicon
- Stainless Steel

- Thermolag

Environments

Bulk commodity components subject to aging management review are exposed to the following environments:

- Below grade
- Exposed to raw water
- Exposed to treated water
- Exposed to weather
- Protected from weather

Aging Effects Requiring Management

The following aging effects associated with bulk commodity components require management:

- Change in material properties
- Cracking
- Delamination
- Loss of material
- Separation

Aging Management Programs

The following programs are credited for managing the effects of aging on bulk commodity components:

- BWR Water Chemistry Program
- Crane Inspection Program
- Fire Protection Program
- Inservice Inspection Program – IWF
- Structures Monitoring Program

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

For the SSES Containments, Structures, and Component Supports, those items requiring further evaluation are addressed in the following sections.

3.5.2.2.1 PWR and BWR Containments

3.5.2.2.1.1 Aging of Inaccessible Concrete Areas

The SSES Primary Containments are GE BWR Mark II types. The Primary Containment base foundation slabs are reinforced concrete founded on competent bedrock, are not subject to flowing water and are completely contained within the Reactor Building; therefore, except for the below-grade portions of the base foundation slabs, they are not subject to aging effects associated with an exposed to weather environment.

The below-grade environment at SSES is non-aggressive (Chlorides < 500 ppm, Sulfates <1500 ppm, and pH > 5.5) and has been confirmed by water chemistry analysis results. Sampling results from 2004 and 2005 indicated groundwater pH minimum value of 5.9, chloride content maximum value of 26 ppm, and sulfate content maximum value of 96 ppm.

Primary Containment concrete is designed in accordance with American Concrete Institute (ACI) 318-71 and constructed in accordance with ACI 301-72. Concrete constructed to these criteria has a low water-to-cement ratio of less than 0.50 and an air entrainment between 3 and 6% and provides a good quality dense concrete with a low permeability, which meets the intent of ACI 201.2R-77. (Note: SSES does not specify a water-to-cement ratio for concrete, but the FSAR states, “In lieu of establishing limits on water-to-cement ratio, the concrete is proportioned and mixed so as to be placed at specified slumps.” The slump working limit at point of placement specified in SSES specification yields concrete with low water-to-cement ratio which results in good freeze-thaw and sulfate resistance.)

The SSES Primary Containment concrete is not exposed to an aggressive environment and the design and construction of the SSES concrete is in accordance with accepted ACI Standards, thereby precluding aggressive chemical attack and embedded steel corrosion aging mechanisms.

Therefore, increases in porosity and permeability, cracking, loss of material (spalling, scaling) due to aggressive chemical attack, and cracking, loss of bond, and loss of material (spalling, scaling) due to corrosion of embedded steel are not applicable for SSES Primary Containment concrete in inaccessible areas.

The absence of concrete aging effects is confirmed under the Inservice Inspection (ISI) Program – IWL.

3.5.2.2.1.2 Cracks and Distortion due to Increased Stress Levels from Settlement; Reduction of Foundation Strength; Cracking and Differential Settlement due to Erosion of Porous Concrete Subfoundations, if Not Covered by Structures Monitoring Program

SSES does not employ a de-watering system in any of the site structures for control of settlement. The Primary Containment base foundation slabs rest on competent bedrock and no settlement has been experienced. The Primary Containment base foundation slabs are not constructed of porous concrete below-grade and are not subject to flowing water.

Therefore, cracks and distortion due to increased stress levels from settlement, and reduction of foundation strength, cracking, and differential settlement due to erosion of porous concrete are not applicable to SSES Primary Containment concrete subfoundations.

3.5.2.2.1.3 Reduction of Strength and Modulus of Concrete Structures due to Elevated Temperature

ASME Code, Section III, Division 2, Subsection CC indicates that aging due to elevated temperature exposure is not significant as long as concrete general area temperatures do not exceed 150°F and local area temperatures do not exceed 200°F. During normal operation, areas within Primary Containment are within these temperature limits. The temperature data for SSES Primary Containments from 2000 to 2005 indicates that the temperature was maintained below 135°F consistently during normal operation. This is below the 150ºF threshold for these aging effects to be applicable.

Piping contained in the Primary Containment is not in direct contact with concrete and the concrete temperature surrounding hot penetrations such as the main steam line penetrations is maintained at less than 200ºF. Consequently, localized hot spots on concrete are not expected from exposure to adjacent piping.

Therefore, reduction of strength and modulus of concrete due to elevated temperature are not aging effects requiring management for SSES Primary Containment concrete components.

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

Loss of material due to corrosion in steel elements of accessible areas is managed by the Inservice Inspection (ISI) Program – IWE and Containment Leakage Rate Test Program.

Loss of material due to corrosion in steel elements of inaccessible areas is not significant based on the following.

Primary Containment concrete is designed in accordance with ACI 318-71 and constructed in accordance with ACI 301-72. Concrete constructed to these criteria has a low water-to-cement ratio of less than 0.50 and an air entrainment between 3 and 6% and provides a good quality dense concrete with a low permeability, which meets the intent of ACI 201.2R-77. (Note: SSES does not specify a water-to-cement ratio for concrete, but the FSAR states, "In lieu of establishing limits on water-to-cement ratio, the concrete is proportioned and mixed so as to be placed at specified slumps." The slump working limit at point of placement specified in SSES specification yields concrete with low water-to-cement ratio which results in good freeze-thaw and sulfate resistance.)

The SSES GE BWR Mark II concrete Primary Containments are located within the Reactor Buildings and are protected from weather. The Primary Containments consist of an upper drywell and a lower suppression pool. SSES Primary Containments do not have boron reactivity control. The drywell and the suppression pool atmospheres are inerted with nitrogen during normal operation. These are all positive influences for limiting loss of material due to corrosion in accessible and inaccessible areas.

The SSES containment liner design is not conducive for moisture entering between the carbon steel liner that is anchored to the 6-foot concrete containment wall, and there are no floor-to-containment moisture seal barriers in SSES Primary Containment design; therefore, it is not susceptible to moisture entering into any crevices between the containment liner and drywell floor. The concrete drywell floor has an anchored carbon steel liner that is welded to the containment liner. The drywell head lower flange is supported and anchored to the top of the containment wall. The reactor cavity refueling seal plate is a continuous 1-inch thick plate connected to the drywell head lower flange and the refueling bellow. The drywell head lower flange and the reactor cavity refueling seal plate form a barrier to prevent water from entering the drywell and between the containment liner plate and containment concrete wall during refueling. The suppression chamber is a steel lined full-circle annular pool located below the drywell floor.

As a result of the design features indicated above, significant corrosion of inaccessible areas of the Primary Containments is not expected.

The continued monitoring of the drywell for loss material due to general, pitting, and crevice corrosion through the Inservice Inspection (ISI) Program – IWE and Containment Leakage Rate Test Program provide reasonable assurance that loss of material in inaccessible areas of the drywell is insignificant and will be detected prior to a loss of an intended function.

3.5.2.2.1.5 Loss of Prestress due to Relaxation, Shrinkage, Creep, and Elevated Temperature

SSES Primary Containments are GE BWR Mark II design constructed of reinforced concrete. There are no prestressed tendons associated with the SSES Primary Containment design.

As a result of SSES Primary Containment design, loss of prestress forces due to relaxation, shrinkage, creep and elevated temperature is not an aging effect applicable to SSES Primary Containments.

3.5.2.2.1.6 Cumulative Fatigue Damage

This NUREG-1801 discussion involves metal fatigue of steel elements, such as, containment penetration sleeves and bellows, vent lines, vent line bellows, vent header, and downcomers. The SSES containment design includes penetrations, hatches, drywell head, downcomer vents, safety relief valve (SRV) discharge piping, and SRV quenchers. SSES containment process line penetrations are of welded steel construction without expansion bellows, gaskets or sealing compounds and are an integral part of the construction.

TLAA are evaluated in accordance with 10 CFR 54.21(c) as documented in Section 4 of the application. Fatigue TLAA are evaluated as documented in Section 4.6.

3.5.2.2.1.7 Cracking due to Stress Corrosion Cracking (SCC)

Stress corrosion cracking (SCC) requires a combination of a corrosive environment, susceptible materials, and high tensile stresses.

The Primary Containment penetrations at SSES are of welded steel construction without expansion bellows, gaskets or sealing compounds and are an integral part of the construction. SSES penetration sleeves, vent headers and downcomers are fabricated from carbon steel.

(1) SCC is not an applicable aging effect for SSES Primary Containment penetration sleeves, vent line headers, and downcomers because they are carbon steel components not susceptible to SCC.

(2) To be susceptible to SCC, stainless steel must be subject to both high temperature (>140°F) and an aggressive chemical environment. SCC is not an applicable aging effect for dissimilar metal welds in the SSES Primary Containment penetration sleeves since the welds are located inside the Primary Containment drywell and/or outside the drywell (within the Reactor Building), and are not subject to an aggressive chemical environment.

The Primary Containment is designed to permit appropriate periodic inspection of all penetrations. The design includes provisions for periodic testing at containment design pressure of the leaktightness of pressure containing or leakage limiting boundaries, such as air locks, door seals, penetrations, drywell head, and access hatches.

A review of SSES Operating Experience (OE) indicates that cracking due to SCC has not been a concern for steel containment pressure boundary. As a result, cracking due to SCC is not applicable for the SSES Primary Containments pressure boundaries.

For the steel elements of containment that are part of the IWE pressure boundary; both the Inservice Inspection (ISI) Program - IWE and the Containment Leakage Rate Test Program are used to monitor for degradation.

3.5.2.2.1.8 Cracking due to Cyclic Loading

SSES penetrations do not use expansion bellows, and penetration sleeves are fabricated of carbon steel.

Cracking of metal components owing to cyclic loads is a potential aging effect. However, the AMR, as supported by operating experience, concluded that cyclic loading from plant heatups and cooldowns, containment testing, and from system vibration was very low or limited in numbers of cycles; and, therefore, additional methods of detecting postulated cracking are not warranted. Note that the cyclic loading of steel elements has been analyzed as a TLAA; refer to Section 3.5.2.2.1.6 above.

For the steel elements of containment that are part of the IWE pressure boundary; both the Inservice Inspection (ISI) Program - IWE and the Containment Leakage Rate Test Program are used to monitor for degradation. A review of SSES OE indicates that cracking due to cyclic loading has not been a concern for steel containment pressure boundary components.

3.5.2.2.1.9 Loss of Material (Scaling, Cracking, and Spalling) due to Freeze-Thaw

SSES Primary Containments are GE BWR Mark II design constructed of reinforced concrete located within the Reactor Buildings. Loss of material (scaling, cracking, and spalling) due to freeze-thaw is applicable only to concrete containments exposed to weather.

Therefore, loss of material (scaling, cracking, and spalling) due to freeze-thaw is not an aging effect applicable to SSES Primary Containments.

3.5.2.2.1.10 Cracking due to Expansion and Reaction with Aggregate, and Increase in Porosity and Permeability due to Leaching of Calcium Hydroxide

Primary Containment concrete is designed in accordance with ACI 318-71 and constructed in accordance with ACI 301-72. Concrete constructed to these criteria has a low water-to-cement ratio of less than 0.50 and an air entrainment between 3 and 6% and provides a good quality dense concrete with a low permeability, which meets the intent of ACI 201.2R-77. SSES specification requires that the potential reactivity of aggregates be acceptable based on testing in accordance with American Society for Testing and Materials (ASTM) C-289 “Potential Reactivity of Aggregate” and C-295 “Petrographic Examination.” SSES specification for concrete prohibits the use of calcium chloride in the concrete mix design. (Note: SSES does not specify a water-to-cement ratio for concrete, but the FSAR states, “In lieu of establishing limits on water-to-cement ratio, the concrete is proportioned and mixed so as to be placed at specified slumps.” The slump working limit at point of placement specified in SSES specification yields concrete with low water-to-cement ratio which results in good freeze-thaw and sulfate resistance.)

Leaching of calcium hydroxide from reinforced concrete becomes significant only if the concrete is exposed to flowing water.

The SSES Primary Containment concrete is not exposed to flowing water and the design and construction of the SSES Primary Containment concrete is in accordance with accepted ACI Standards, thereby precluding expansion and reaction with aggregate and leaching of calcium hydroxide aging mechanisms.

Therefore, cracking due to expansion and reaction with aggregate, and increase in porosity and permeability due to leaching of calcium hydroxide are not aging effects requiring management for primary concrete components.

The absence of concrete aging effects is confirmed under the Inservice Inspection (ISI) Program – IWL.

3.5.2.2.2 Safety-Related and Other Structures and Component Supports

3.5.2.2.2.1 Aging of Structures Not Covered by Structures Monitoring Program

The Structures Monitoring Program is credited for aging management of these effects/mechanisms for the affected concrete structures and structural components, in accordance with the current NRC position, even if the aging management review did not identify aging effects requiring management. Additional discussion of specific aging effects/mechanisms follows.

(1) Cracking, loss of bond, and loss of material (spalling, scaling) due to corrosion of embedded steel for Groups 1-5, 7, 9 structures

SSES concrete is designed in accordance with ACI 318-71 and constructed in accordance with ACI 301-72. Concrete constructed to these criteria has a low water-to-cement ratio of less than 0.50 and an air entrainment between 3 and 6% and provides a good quality dense concrete with a low permeability, which meets the intent of ACI 201.2R-77. (Note: SSES does not specify a water-to-cement ratio for concrete, but the FSAR states, “In lieu of establishing limits on water-to-cement ratio, the concrete is proportioned and mixed so as to be placed at specified slumps.” The slump working limit at point of placement specified in SSES specification yields concrete with low water-to-cement ratio which results in good freeze-thaw and sulfate resistance.)

The below-grade environment at SSES is non-aggressive (Chlorides < 500 ppm, Sulfates <1500 ppm, and pH > 5.5) and has been confirmed by water chemistry analysis results. Sampling results from 2004 and 2005 indicated groundwater pH minimum value of 5.9, chloride content maximum value of 26 ppm, and sulfate content maximum value of 96 ppm.

The SSES concrete components below grade are not exposed to an aggressive environment and the design and construction of the SSES concrete is in accordance with accepted ACI Standards, thereby precluding embedded steel corrosion aging mechanism.

Therefore, cracking, loss of bond, and loss of material (spalling, scaling) due to corrosion of embedded steel are not aging effects requiring management for SSES concrete structure components.

(2) Increase in porosity and permeability, cracking, loss of material (spalling, scaling) due to aggressive chemical attack for Groups 1-5, 7, 9 structures

SSES concrete is designed in accordance with ACI 318-71 and constructed in accordance with ACI 301-72. Concrete constructed to these criteria has a low water-to-cement ratio of less than 0.50 and an air entrainment between 3 and 6% and provides a

good quality dense concrete with a low permeability, which meets the intent of ACI 201.2R-77. (Note: SSES does not specify a water-to-cement ratio for concrete, but the FSAR states, "In lieu of establishing limits on water-to-cement ratio, the concrete is proportioned and mixed so as to be placed at specified slumps." The slump working limit at point of placement specified in SSES specification yields concrete with low water-to-cement ratio which results in good freeze-thaw and sulfate resistance.)

The below-grade environment at SSES is non-aggressive (Chlorides < 500 ppm, Sulfates <1500 ppm, and pH > 5.5) and has been confirmed by water chemistry analysis results. Sampling results from 2004 and 2005 indicated groundwater pH minimum value of 5.9, chloride content maximum value of 26 ppm, and sulfate content maximum value of 96 ppm.

The SSES concrete components below grade are not exposed to an aggressive environment and the design and construction of the SSES concrete is in accordance with accepted ACI Standards, thereby precluding aggressive chemical attack aging mechanism.

Therefore, increase in porosity and permeability, cracking, loss of material (spalling, scaling) due to aggressive chemical attack are not aging effects requiring management for concrete structure components below grade.

However, as described in Appendix B of the LRA, the Structures Monitoring Program will include review of site ground water and raw water pH, chlorides, and sulfates in order to validate that the below-grade environment remains non-aggressive during the period of extended operation.

(3) Loss of material due to corrosion for Groups 1-5, 7, 8 structures

The Structures Monitoring Program is credited for aging management of loss of material due to corrosion for SSES Groups 1-5, 7 and 8 structures.

(4) Loss of material (spalling, scaling) and cracking due to freeze-thaw for Groups 1-3, 5, 7-9 structures

SSES is located in an area where weathering conditions are considered severe (weathering index >500 day-inch/yr). SSES structures are designed with proper drainage and slope such that ponding or prolonged exposure to standing water on concrete surfaces is not significant.

SSES concrete is designed in accordance with ACI 318-71 and constructed in accordance with ACI 301-72. Concrete constructed to these criteria has a low water-to-cement ratio of less than 0.50 and an air entrainment between 3 and 6% and provides a good quality dense concrete with a low permeability, which meets the intent of ACI 201.2R-77. (Note: SSES does not specify a water-to-cement ratio for concrete, but the

FSAR states, “In lieu of establishing limits on water-to-cement ratio, the concrete is proportioned and mixed so as to be placed at specified slumps.” The slump working limit at point of placement specified in SSES specification yields concrete with low water-to-cement ratio which results in good freeze-thaw and sulfate resistance.)

The design and construction of the SSES concrete is in accordance with accepted ACI Standards that preclude freeze-thaw aging mechanism.

Therefore, loss of material (spalling, scaling) and cracking due to freeze-thaw are not aging effects requiring management for SSES concrete structure components.

(5) Cracking due to expansion and reaction with aggregates for Groups 1-5, 7-9 structures

SSES concrete is designed in accordance with ACI 318-71 and constructed in accordance with ACI 301-72. Concrete constructed to these criteria has a low water-to-cement ratio of less than 0.50 and an air entrainment between 3 and 6% and provides a good quality dense concrete with a low permeability, which meets the intent of ACI 201.2R. SSES specification requires that the potential reactivity of aggregates be acceptable based on testing in accordance with ASTM C-289 “Potential Reactivity of Aggregate” and C-295 “Petrographic Examination.” SSES specification for concrete prohibits the use of calcium chloride in the concrete mix design. (Note: SSES does not specify a water-to-cement ratio for concrete, but the FSAR states, “In lieu of establishing limits on water-to-cement ratio, the concrete is proportioned and mixed so as to be placed at specified slumps.” The slump working limit at point of placement specified in SSES specification yields concrete with low water-to-cement ratio which results in good freeze-thaw and sulfate resistance.)

The design and construction of the SSES concrete is in accordance with accepted ACI Standards that preclude expansion and reaction with aggregate aging mechanism.

Therefore, cracking due to expansion and reaction with aggregates is not an aging effect requiring management for SSES concrete structure components.

(6) Cracks and distortion due to increased stress levels from settlement for Groups 1-3, 5-9 structures

Reinforced concrete mat foundations have been provided for all structures at SSES and their foundations rest on competent bedrock except for the ESSW Pumphouse, which is supported by natural soil. The ESSW Pumphouse total differential settlement experienced in the past 20 years is well within the permissible limits for this type of structure and no settlement has manifested itself via cracked walls or cracked foundations. A systematic monitoring program was instituted to study the settlement performance of the ESSW Pumphouse using permanent bench marks and settlement pins. Survey readings were carried out for four years and the ESSW Pumphouse had

not experienced any significant settlement. No settlement has been experienced for other SSES in-scope structures. SSES does not employ a de-watering system in any of the site structures for control of settlement.

Therefore, cracks and distortion due to increased stress levels from settlement are not aging effects requiring management for SSES concrete structure components.

(7) Reduction in foundation strength, cracking, differential settlement due to erosion of porous concrete subfoundation for Groups 1-3, 5-9 structures

The concrete foundations at SSES are not constructed with porous concrete and are not subject to flowing water. SSES does not employ a de-watering system at any of the site structures for control of settlement.

Therefore, reduction in foundation strength, cracking, and differential settlement due to erosion of porous concrete subfoundations are not aging effects requiring management for SSES concrete foundations.

(8) Lock up due to wear could occur for Lubrite® radial beam seats in BWR drywell, RPV support shoes for PWR with nozzle supports, steam generator supports, and other sliding support bearings and sliding support surfaces

Lubrite® plates are not used in SSES in-scope structural components.

Lock-up due to wear is not an aging effect requiring management at SSES.

Aging degradations of support designed with or without sliding connections are managed by the Inservice Inspection (ISI) Program – IWF and/or the Structures Monitoring Program.

3.5.2.2.2.2 Aging Management of Inaccessible Areas

3.5.2.2.2.2.1 Below-Grade Inaccessible Concrete Areas – Freeze-Thaw

SSES is located in an area in which weathering conditions are considered severe (weathering index >500 day-inch/yr). SSES structures are designed with proper drainage and slope such that ponding or prolonged exposure to standing water on concrete surfaces is not significant.

SSES concrete is designed in accordance with ACI 318-71 and constructed in accordance with ACI 301-72. Concrete constructed to these criteria has a low water-to-cement ratio of less than 0.50 and an air entrainment between 3 and 6% and provides a

good quality dense concrete with a low permeability, which meets the intent of ACI 201.2R-77. (Note: SSES does not specify a water-to-cement ratio for concrete, but the FSAR states, "In lieu of establishing limits on water-to-cement ratio, the concrete is proportioned and mixed so as to be placed at specified slumps." The slump working limit at point of placement specified in SSES specification yields concrete with low water-to-cement ratio which results in good freeze-thaw and sulfate resistance.)

The design and construction of the SSES concrete is in accordance with accepted ACI Standards that preclude freeze-thaw aging mechanism.

Therefore, loss of material (spalling, scaling) and cracking due to freeze-thaw are not aging effects requiring management for SSES below-grade inaccessible concrete components.

The Structures Monitoring Program is credited for aging management of these effects/mechanisms for the affected concrete structures and structural components, in accordance with the current NRC position, even if the aging management review did not identify aging effects requiring management. The Structures Monitoring Program will include examination of exposed concrete for age-related degradation when a below-grade concrete component becomes accessible through excavation as described in Appendix B of the LRA.

3.5.2.2.2.2.2 Below-Grade Inaccessible Concrete Areas – Expansion and Reaction with Aggregates

SSES concrete is designed in accordance with ACI 318-71 and constructed in accordance with ACI 301-72. Concrete constructed to these criteria has a low water-to-cement ratio of less than 0.50 and an air entrainment between 3 and 6% and provides a good quality dense concrete with a low permeability, which meets the intent of ACI 201.2R. SSES specification requires that the potential reactivity of aggregates be acceptable based on testing in accordance with ASTM C-289 "Potential Reactivity of Aggregate" and C-295 "Petrographic Examination." SSES specification for concrete prohibits the use of calcium chloride in the concrete mix design. (Note: SSES does not specify a water-to-cement ratio for concrete, but the FSAR states, "In lieu of establishing limits on water-to-cement ratio, the concrete is proportioned and mixed so as to be placed at specified slumps." The slump working limit at point of placement specified in SSES specification yields concrete with low water-to-cement ratio which results in good freeze-thaw and sulfate resistance.)

The design and construction of the SSES concrete is in accordance with accepted ACI Standards, thereby precluding expansion and reaction with aggregate aging mechanism.

Therefore, cracking due to expansion and reaction with aggregates is not an aging effect requiring management for SSES below-grade inaccessible concrete components.

The Structures Monitoring Program is credited for aging management of these effects/mechanisms for the affected concrete structures and structural components, in accordance with the current NRC position, even if the aging management review did not identify aging effects requiring management. The Structures Monitoring Program will include examination of exposed concrete for age-related degradation when a below-grade concrete component becomes accessible through excavation as described in Appendix B of the LRA.

3.5.2.2.2.2.3 Below-Grade Inaccessible Concrete Areas – Settlement and Erosion

Reinforced concrete mat foundations have been provided for all structures at SSES and their foundations rest on competent bedrock except for the ESSW Pumphouse, which is supported by natural soil. The ESSW Pumphouse total differential settlement experienced in the past 20 years is well within the permissible limits for this type of structure and no settlement has manifested itself via cracked walls or cracked foundations. A systematic monitoring program was instituted to study the settlement performance of the ESSW Pumphouse using permanent bench marks and settlement pins. Survey readings were carried out for four years and the ESSW Pumphouse had not experienced any significant settlement. No settlement has been experienced for other SSES in-scope structures. SSES does not employ a de-watering system in any of the site structures for control of settlement. SSE base foundation slabs are not constructed of porous concrete below grade and are not subject to flowing water.

Therefore, cracks and distortion due to increased stress levels from settlement and reduction of foundation strength, cracking, and differential settlement due to erosion of porous concrete subfoundations are not aging effects requiring management for SSES below-grade inaccessible concrete components.

The Structures Monitoring Program is credited for aging management of these effects/mechanisms for the affected concrete structures and structural components, in accordance with the current NRC position, even if the aging management review did not identify aging effects requiring management. The Structures Monitoring Program will include examination of exposed concrete for age-related degradation when a below-grade concrete component becomes accessible through excavation as described in Appendix B of the LRA.

3.5.2.2.2.2.4 Below-Grade Inaccessible Concrete Areas – Aggressive Chemical Attack and Corrosion of Embedded Steel

SSES concrete is designed in accordance with ACI 318-71 and constructed in accordance with ACI 301-72. Concrete constructed to these criteria has a low water-to-cement ratio of less than 0.50 and an air entrainment between 3 and 6% and provides a good quality dense concrete with a low permeability, which meets the intent of ACI 201.2R-77. (Note: SSES does not specify a water-to-cement ratio for concrete, but the FSAR states, "In lieu of establishing limits on water-to-cement ratio, the concrete is proportioned and mixed so as to be placed at specified slumps." The slump working limit at point of placement specified in SSES specification yields concrete with low water-to-cement ratio which results in good freeze-thaw and sulfate resistance.)

The below-grade environment at SSES is non-aggressive (Chlorides < 500 ppm, Sulfates <1500 ppm, and pH > 5.5) and has been confirmed by water chemistry analysis results. Sampling results from 2004 and 2005 indicated groundwater pH minimum value of 5.9, chloride content maximum value of 26 ppm, and sulfate content maximum value of 96 ppm.

The SSES concrete components below grade are not exposed to an aggressive environment and the design and construction of the SSES concrete is in accordance with accepted ACI Standards, thereby precluding aggressive chemical attack and embedded steel corrosion aging mechanisms.

Therefore, increase in porosity and permeability, cracking, loss of material (spalling, scaling) due to aggressive chemical attack; and cracking, loss of bond, and loss of material (spalling, scaling) due to corrosion of embedded steel are not aging effects requiring management for SSES below-grade inaccessible concrete components.

The Structures Monitoring Program is credited for aging management of these effects/mechanisms for the affected concrete structures and structural components, in accordance with the current NRC position, even if the aging management review did not identify aging effects requiring management. The Structures Monitoring Program will include review of site ground water and raw water pH, chlorides, and sulfates in order to validate that the below-grade environment remains non-aggressive during the period of extended operation and will include examination of exposed concrete for age-related degradation when a below-grade concrete component becomes accessible through excavation as described in Appendix B of the LRA.

3.5.2.2.2.2.5 Below-Grade Inaccessible Concrete Areas – Leaching of Calcium Hydroxide

SSES concrete is designed in accordance with ACI 318-71 and constructed in accordance with ACI 301-72. Concrete constructed to these criteria has a low water-to-cement ratio of less than 0.50 and an air entrainment between 3 and 6% and provides a good quality dense concrete with a low permeability, which meets the intent of ACI 201.2R-77. (Note: SSES does not specify a water-to-cement ratio for concrete, but the FSAR states, "In lieu of establishing limits on water-to-cement ratio, the concrete is proportioned and mixed so as to be placed at specified slumps." The slump working limit at point of placement specified in SSES specification yields concrete with low water-to-cement ratio which results in good freeze-thaw and sulfate resistance.)

Leaching of calcium hydroxide from reinforced concrete becomes significant only if the concrete is exposed to flowing water.

The SSES concrete components below grade are not exposed to flowing water and the design and construction of the SSES concrete is in accordance with accepted ACI Standards, thereby precluding leaching of calcium hydroxide aging mechanism.

Therefore, increase in porosity and permeability and loss of strength due to leaching of calcium hydroxide are not aging effects requiring management for SSES below-grade inaccessible concrete components.

3.5.2.2.2.3 Reduction of Strength and Modulus of Concrete Structures due to Elevated Temperature

SSES in-scope concrete structures and concrete components are not exposed to temperature limits associated with aging degradation due to elevated temperature. The general air temperatures in SSES safety-related and other structures are maintained below the 150ºF threshold for these aging effects to be applicable.

Piping contained in these structures is not in direct contact with concrete and the concrete temperature surrounding hot penetrations such as the main steam line penetrations in the main steam tunnel is maintained at less than 200ºF. Consequently, localized hot spots on concrete are not expected from exposure to adjacent piping.

Therefore, reduction of strength and modulus of concrete due to elevated temperatures are not aging effects requiring management for SSES concrete components.

3.5.2.2.2.4 Aging Management of Inaccessible Areas for Group 6 Structures

3.5.2.2.2.4.1 Below-Grade Inaccessible Concrete Areas

The RG1.127 Water-Control Structures Inspection is credited for aging management of these effects/mechanisms for the affected concrete structures and structural components, in accordance with the current NRC position, even if the aging management review did not identify aging effects requiring management. Corrosion of structural steel components is addressed by the Structures Monitoring Program. Additional discussion of specific aging effects follows.

The concrete-lined Spray Pond is constructed by excavation and is not subject to catastrophic failure. As part of the RG1.127 Water-Control Structures Inspection, groundwater elevation is measured periodically to monitor seepage from the Spray Pond and to assure that elevated groundwater beneath the Spray Pond cannot undermine its support precluding liquefaction potential per the SSES Technical Requirement Manual. This ensures the structural integrity of the Spray Pond (limiting cracking of the concrete liner due to hydrostatic uplift) is maintained and the Spray Pond is capable of providing enough cooling water to safely shut down and cool down both reactors, without the addition of makeup water, for 30 days concurrent with design basis events.

The below-grade environment at SSES is non-aggressive (Chlorides < 500 ppm, Sulfates <1500 ppm, and pH > 5.5) and has been confirmed by water chemistry analysis results. Sampling results from 2004 and 2005 indicated groundwater pH minimum value of 5.9, chloride content maximum value of 26 ppm, and sulfate content maximum value of 96 ppm.

Raw water sampling results from 2004 and 2005 indicated raw water pH minimum value of 7.2, chloride content maximum value of 48 ppm, and sulfate content maximum value of 70 ppm. For the Cooling Tower Basins, which are credited for impounding water supply as a secondary source relied upon during a Fire Protection regulated event, the raw water sampling results from 2004 and 2005 are pH minimum value of 7.2, chloride content maximum value of 197 ppm, and sulfate content maximum value of 397 ppm.

SSES concrete is designed in accordance with ACI 318-71 and constructed in accordance with ACI 301-72. Concrete constructed to these criteria has a low water-to-cement ratio of less than 0.50 and an air entrainment between 3 and 6% and provides a good quality dense concrete with a low permeability, which meets the intent of ACI 201.2R-77. (Note: SSES does not specify a water-to-cement ratio for concrete, but the FSAR states, “In lieu of establishing limits on water-to-cement ratio, the concrete is proportioned and mixed so as to be placed at specified slumps.” The slump working

limit at point of placement specified in SSES specification yields concrete with low water-to-cement ratio which results in good freeze-thaw and sulfate resistance.)

The SSES Spray Pond concrete is not exposed to an aggressive environment and the design and construction of the SSES concrete is in accordance with accepted ACI Standards, thereby precluding aggressive chemical attack and embedded steel corrosion aging mechanisms.

Therefore, increase in porosity and permeability, cracking, loss of material (spalling, scaling)/aggressive chemical attack; and cracking, loss of bond, and loss of material (spalling, scaling)/corrosion of embedded steel are not aging effects requiring management for SSES Spray Pond concrete.

In addition, loss of material due to abrasion or cavitation is not an aging effect requiring management for concrete components exposed to raw water because the Spray Pond water does not contain abrasive material and flow velocity to the ESSW Pumphouse is much less than the cavitation threshold for open channel flows. Water flow velocity through ESW pump chambers is less than the cavitation threshold for closed conduit flow.

The absence of concrete aging effects is confirmed under the RG1.127 Water-Control Structures Inspection, as described in Appendix B of the LRA.

3.5.2.2.2.4.2 Below-Grade Inaccessible Concrete Areas – Freeze-Thaw

Loss of material (spalling, scaling) and cracking due to freeze-thaw are aging effects requiring management for concrete components exposed to raw water because the concrete located in the ESSW Pumphouse, Spray Pond, and the Cooling Tower Basins may become saturated and, therefore, could be susceptible to freeze-thaw. The RG 1.127 Water-Control Structures Inspection is credited to monitor for degradation of the Spray Pond and the ESSW Pumphouse. The Structures Monitoring Program is credited to monitor for degradation of the Cooling Tower Basins.

3.5.2.2.2.4.3 Below-Grade Inaccessible Reinforced Concrete Areas

SSES concrete is designed in accordance with ACI 318-71 and constructed in accordance with ACI 301-72. Concrete constructed to these criteria has a low water-to-cement ratio of less than 0.50 and an air entrainment between 3 and 6% and provides a good quality dense concrete with a low permeability, which meets the intent of ACI 201.2R-77. SSES specification requires that the potential reactivity of aggregates be acceptable based on testing in accordance with ASTM C-289 “Potential Reactivity of

Aggregate" and C-295 "Petrographic Examination." SSES specification for concrete prohibits the use of calcium chloride in the concrete mix design. (Note: SSES does not specify a water-to-cement ratio for concrete, but the FSAR states, "In lieu of establishing limits on water-to-cement ratio, the concrete is proportioned and mixed so as to be placed at specified slumps." The slump working limit at point of placement specified in SSES specification yields concrete with low water-to-cement ratio which results in good freeze-thaw and sulfate resistance.)

Leaching of calcium hydroxide from reinforced concrete becomes significant only if the concrete is exposed to flowing water.

The SSES water-control structures are exposed to flowing water, however the design and construction of the SSES concrete is in accordance with accepted ACI Standards, thereby precluding expansion and reaction with aggregate and leaching of calcium hydroxide aging mechanisms.

Therefore, cracking due to expansion and reaction with aggregate, and increase in porosity and permeability, and loss of strength due to leaching of calcium hydroxide are not aging effects requiring management for SSES below-grade concrete structures.

The RG 1.127 Water-Control Structures Inspection is credited for aging management of these effects/mechanisms for the affected concrete structures and structural components, in accordance with the current NRC position, even if the aging management review did not identify aging effects requiring management.

3.5.2.2.2.5 Cracking due to Stress Corrosion Cracking and Loss of Material due to Pitting and Crevice Corrosion

No tanks with stainless steel liners are included in the structural aging management reviews. Tanks subject to aging management review are evaluated with their respective mechanical systems.

3.5.2.2.2.6 Aging of Supports Not Covered by Structures Monitoring Program

(1) Loss of material due to general and pitting corrosion for Groups B2-B5 supports

Loss of material due to general and pitting corrosion for Groups B2-B5 supports is managed by the Structures Monitoring Program.

(2) Reduction in concrete anchor capacity due to degradation of the surrounding concrete, for Groups B1-B5 supports

Cracking due to fatigue that causes a reduction in concrete anchor capacity is not an aging effect requiring management because SSES concrete support components are not subject to significant cyclic loading. Reinforced concrete components of the structure are designed by the strength method per ACI 318 and ACI 349 and structural steel components are designed by the working stress method per American Institute of Steel Construction (AISC) specification, which have good low cycle fatigue properties. Vibratory and rotating equipment at SSES are typically supported by cast-in-place, through bolts or grouted-in anchors. For equipment designed with grouted-in anchors that experience vibratory loads, the allowable loads are taken at 50% of the specified allowable loads given in the specification and a minimum of two nuts are used. For equipment designed with expansion anchors that experience vibratory loads, the allowable loads are taken at 50% of the specified allowable loads given in the specification and design standard document. Since SSES specified the maximum design stress level to be less than 50% of static strength, cracking due to fatigue at locations of grouted-in or expansion anchors is not an aging effect requiring management.

The Structures Monitoring Program is credited for aging management of these effects/mechanisms for the affected concrete structures and structural components, in accordance with the current NRC position, even if the aging management review did not identify aging effects requiring management.

(3) Reduction/loss of isolation function due to degradation of vibration isolation elements for Group B4 supports

Degradation of vibration isolation elements for Group B4 supports is managed by the Structures Monitoring Program.

3.5.2.2.2.7 Cumulative Fatigue Damage Due to Cyclic Loading

TLAA are evaluated in accordance with 10 CFR 54.21(c) as documented in Section 4 of this application. During the process of identifying TLAA in the SSES current licensing basis, no fatigue analyses were identified for component support members, anchor bolts, and welds for Groups B1.1, B1.2, and B1.3.

3.5.2.2.3 Quality Assurance for Aging Management of Nonsafety-Related Components

Quality Assurance provisions applicable to license renewal are discussed in Appendix B, Section B.1.3, of the LRA.

3.5.2.3 Time-Limited Aging Analysis

The Time-Limited Aging Analyses (TLAA) identified below are associated with the Containments, Structures, and Component Supports commodities. The section of the application that contains the TLAA review results is indicated in parentheses.

- Metal Fatigue (Section 4.6, Containment Liner Plate, Metal Containments, and Penetrations Fatigue Analyses)

3.5.3 Conclusions

The Containments, Structures, and Component Supports subject to aging management review have been identified in accordance with the criteria of 10 CFR 54.21. The aging management programs selected to manage the effects of aging on structural components and commodities are identified in the following tables and Section 3.5.2.1. A description of the aging management programs is provided in Appendix B of this application, along with the demonstration that the identified aging effects will be managed for the period of extended operation.

Therefore, based on the demonstrations provided in Appendix B, the effects of aging associated with the Containments, Structures, and Component Supports will be managed such that there is reasonable assurance that the intended functions will be maintained consistent with the current licensing basis during the period of extended operation.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
PWR Concrete (Reinforced and Prestressed) and Steel Containments BWR Concrete and Steel (Mark I, II, and III) Containments					
3.5.1-01	Concrete elements: walls, dome, basemat, ring girder, buttresses, containment (as applicable)	Aging of accessible and inaccessible concrete areas due to aggressive chemical attack, and corrosion of embedded steel	ISI (IWL) and for inaccessible concrete, an examination of representative samples of below-grade concrete, and periodic monitoring of groundwater, if the environment is non-aggressive. A plant specific program is to be evaluated if environment is aggressive.	Yes, plant-specific, if the environment is aggressive	The SSES Primary Containment concrete is not exposed to an aggressive environment and the design and construction of the SSES concrete is in accordance with accepted ACI Standards, thereby precluding aggressive chemical attack and embedded steel corrosion aging mechanisms. For discussion see Section 3.5.2.2.1.1.
3.5.1-02	Concrete elements; All	Cracks and distortion due to increased stress levels from settlement	Structures Monitoring Program. If a de-watering system is relied upon for control of settlement, then the licensee is to ensure proper functioning of the de-watering system through the period of extended operation.	Yes, if not within the scope of the applicant's structures monitoring program or a de-watering system is relied upon	SSES does not employ a de-watering system in any of the site structures for control of settlement. The Primary Containment base foundation slabs rest on competent bedrock and no settlement has been experienced; therefore, this aging mechanism is not applicable. For discussion see Section 3.5.2.2.1.2.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.5.1-03	Concrete elements: foundation, sub-foundation	Reduction in foundation strength, cracking, differential settlement due to erosion of porous concrete subfoundation	Structures Monitoring Program If a de-watering system is relied upon for control of erosion of cement from porous concrete subfoundations, then the licensee is to ensure proper functioning of the de-watering system through the period of extended operation.	Yes, if not within the scope of the applicant's structures monitoring program or a de-watering system is relied upon	The Primary Containment base foundation slabs are not constructed of porous concrete below-grade and are not subject to flowing water, thereby precluding these aging effects/mechanisms. For discussion see Section 3.5.2.2.1.2.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-04	Concrete elements: dome, wall, basemat, ring girder, buttresses, containment, concrete fill-in annulus (as applicable)	Reduction of strength and modulus of concrete due to elevated temperature	A plant-specific aging management program is to be evaluated	Yes, plant-specific if temperature limits are exceeded	The temperature data for SSES Primary Containments from 2000 to 2005 indicates that the temperature was maintained below 135°F consistently during normal operation. Piping contained in the Primary Containment is not in direct contact with concrete and the concrete temperature surrounding hot penetrations is maintained at less than 200ºF. These are below the threshold temperatures for these aging effects to be applicable. For discussion see Section 3.5.2.2.1.3.
3.5.1-05	Steel elements: Drywell; torus; drywell head; embedded shell and sand pocket regions; drywell support skirt; torus ring girder; downcomers; liner plate, ECCS suction header, support skirt, region shielded by diaphragm floor, suppression chamber (as applicable)	Loss of material due to general, pitting and crevice corrosion	ISI (IWE), and10 CFR Part 50, Appendix J.	Yes, if corrosion is significant for inaccessible areas	Consistent with NUREG-1801. Loss of material due to corrosion in steel elements is managed by the Inservice Inspection (ISI) Program – IWE and Containment Leakage Rate Test Program. For discussion see Section 3.5.2.2.1.4.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.5.1-06	Steel elements: steel liner, liner anchors, integral attachments	Loss of material due to general, pitting and crevice corrosion	ISI (IWE), and 10 CFR Part 50, Appendix J.	Yes, if corrosion is significant for inaccessible areas	Loss of material due to corrosion in steel elements is managed by the Inservice Inspection (ISI) Program – IWE and Containment Leakage Rate Test Program. For discussion see Section 3.5.2.2.1.4.
3.5.1-07	Prestressed containment tendons	Loss of prestress due to relaxation, shrinkage, creep, and elevated temperature	TLAA, evaluated in accordance with 10 CFR 54.21(c)	Yes, TLAA	Not applicable for SSES. SSES Primary Containments are GE BWR Mark II design constructed of reinforced concrete. There are no prestressed tendons associated with the SSES Primary Containment design. For discussion see Section 3.5.2.2.1.5.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-08	Steel and stainless steel elements: vent line, vent header, vent line bellows; downcomers;	Cumulative fatigue damage (CLB fatigue analysis exists)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	Yes, TLAA	TLAA are evaluated in accordance with 10 CFR 54.21(c) as documented in Section 4 of the application. Fatigue TLAA are evaluated as documented in Section 4.6. For discussion see Section 3.5.2.2.1.6.
3.5.1-09	Steel, stainless steel elements, dissimilar metal welds: penetration sleeves, penetration bellows; suppression pool shell, unbraced downcomers	Cumulative fatigue damage (CLB fatigue analysis exists)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	Yes, TLAA	TLAA are evaluated in accordance with 10 CFR 54.21(c) as documented in Section 4 of the application. Fatigue TLAA are evaluated as documented in Section 4.6. For discussion see Section 3.5.2.2.1.6.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-10	Stainless steel penetration sleeves, penetration bellows, dissimilar metal welds	Cracking due to stress corrosion cracking	ISI (IWE) and 10 CFR Part 50, Appendix J, and additional appropriate examinations/evaluations for bellows assemblies and dissimilar metal welds.	Yes, detection of aging effects is to be evaluated	The Primary Containment penetrations at SSES are of welded steel construction without expansion bellows, gaskets or sealing compounds and are an integral part of the construction. SSES penetration sleeves, vent headers and downcomers are fabricated from carbon steel. A review of SSES operating experience indicates that cracking due to Stress Corrosion Cracking (SCC) has not been a concern for steel containment pressure boundary. Cracking due to SCC is not applicable for the SSES Primary Containments pressure boundaries. For discussion see Section 3.5.2.2.1.7.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-11	Stainless steel vent line bellows,	Cracking due to stress corrosion cracking	ISI (IWE) and 10 CFR Part 50, Appendix J, and additional appropriate examination/evaluation for bellows assemblies and dissimilar metal welds.	Yes, detection of aging effects is to be evaluated	Not applicable for SSES. SSES Primary Containments are GE BWR Mark II design constructed of reinforced concrete. There are no stainless steel vent line bellows associated with the SSES Primary Containment design. For discussion see Section 3.5.2.2.1.7.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-12	Steel, stainless steel elements, dissimilar metal welds: penetration sleeves, penetration bellows; suppression pool shell, unbraced downcomers	Cracking due to cyclic loading	ISI (IWE) and 10 CFR Part 50, Appendix J, and supplemented to detect fine cracks	Yes, detection of aging effects is to be evaluated	SSES penetrations do not use expansion bellows and penetration sleeves are fabricated of carbon steel. SSES AMR, as supported by operating experience, concluded that cyclic loading from plant heatups and cooldowns, containment testing, and from system vibration was very low or limited in numbers of cycles; therefore, additional methods of detecting postulated cracking are not warranted. This aging effect/mechanism is not applicable. For discussion see Section 3.5.2.2.1.8.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.5.1-13	Steel, stainless steel elements, dissimilar metal welds: torus; vent line; vent header; vent line bellows; downcomers	Cracking due to cyclic loading	ISI (IWE) and 10 CFR Part 50, Appendix J, and supplemented to detect fine cracks	Yes, detection of aging effects is to be evaluated	SSES aging management review, as supported by operating experience, concluded that cyclic loading from plant heatups and cooldowns, containment testing, and from system vibration was very low or limited in numbers of cycles; therefore, additional methods of detecting postulated cracking are not warranted. This aging effect/mechanism is not applicable. For discussion see Section 3.5.2.2.1.8.
3.5.1-14	Concrete elements: dome, wall, basemat ring girder, buttresses, containment (as applicable)	Loss of material (Scaling, cracking, and spalling) due to freeze-thaw	ISI (IWL). Evaluation is needed for plants that are located in moderate to severe weathering conditions (weathering index >100 day-inch/yr) (NUREG-1557).	Yes, for inaccessible areas of plants located in moderate to severe weathering conditions	Not applicable for SSES. SSES Primary Containments are GE BWR Mark II design constructed of reinforced concrete located within the Reactor Building. For discussion see Section 3.5.2.2.1.9.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-15	Concrete elements: walls, dome, basemat, ring girder, buttresses, containment, concrete fill-in annulus (as applicable)	Cracking due to expansion and reaction with aggregate; increase in porosity, permeability due to leaching of calcium hydroxide	ISI (IWL) for accessible areas. None for inaccessible areas if concrete was constructed in accordance with the recommendations in ACI 201.2R.	Yes, if concrete was not constructed as stated for inaccessible areas	Cracking due to expansion and reaction with aggregate, and increase in porosity and permeability due to leaching of calcium hydroxide are not aging effects requiring management for primary concrete components. The absence of concrete aging effects is confirmed under the Inservice Inspection (ISI) Program – IWL. For discussion see Section 3.5.2.2.1.10.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-16	Seals, gaskets, and moisture barriers	Loss of sealing and leakage through containment due to deterioration of joint seals, gaskets, and moisture barriers (caulking, flashing, and other sealants)	ISI (IWE) and 10 CFR Part 50, Appendix J	No	The aging effects cited in the NUREG-1801 item are a consequence of cracking and change in material properties aging effects. Seals and gaskets for personnel airlock, equipment hatch and CRD hatch are evaluated with the host component. See item 3.5.1-17. There are no floor-to-containment moisture seal barriers in SSES Primary Containment design. For discussion see Section 3.5.2.2.1.4.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.5.1-17	Personnel airlock, equipment hatch and CRD hatch locks, hinges, and closure mechanisms	Loss of leak tightness in closed position due to mechanical wear of locks, hinges and closure mechanisms	10 CFR Part 50, Appendix J and Plant Technical Specifications	No	Consistent with NUREG-1801. Locks, hinges and closure mechanisms are evaluated with the host component. The personnel airlock, equipment hatch and CRD hatch are managed by the Containment Leakage Rate Test Program and the Inservice Inspection Program – IWE. Plant Technical Specification ensures Primary Containment is operable and that access airlocks maintain leak tightness in the closed position.
3.5.1-18	Steel penetration sleeves and dissimilar metal welds; personnel airlock, equipment hatch and CRD hatch	Loss of material due to general, pitting, and crevice corrosion	ISI (IWE) and 10 CFR Part 50, Appendix J.	No	Consistent with NUREG-1801. The listed components are managed by the Containment Leakage Rate Test Program and the Inservice Inspection Program – IWE.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.5.1-19	Steel elements: stainless steel suppression chamber shell (inner surface)	Cracking due to stress corrosion cracking	ISI (IWE) and 10 CFR Part 50, Appendix J	No	A review of SSES operating experience indicates that cracking due to Stress Corrosion Cracking (SCC) has not been a concern for steel containment pressure boundary. Cracking due to SCC is not applicable for the SSES Primary Containments pressure boundaries. For discussion see Section 3.5.2.2.1.7.
3.5.1-20	Steel elements: suppression chamber liner (interior surface)	Loss of material due to general, pitting, and crevice corrosion	ISI (IWE) and 10 CFR Part 50, Appendix J	No	Consistent with NUREG-1801. The listed components are managed by the Containment Leakage Rate Test Program and the Inservice Inspection Program – IWE. In addition, the BWR Water Chemistry Program is credited with the elimination of excessive chlorides and sulfates from the water.
3.5.1-21	Steel elements: drywell head and downcomer pipes	Fretting or lock up due to mechanical wear	ISI (IWE)	No	SSES plant operating experience has not identified fretting or lock up due to mechanical wear for the drywell head and downcomer pipes.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-22	Prestressed containment: tendons and anchorage components	Loss of material due to corrosion	ISI (IWL)	No	Not applicable for SSES. SSES is not a prestressed containment. There are no tendons associated with the SSES Primary Containment design.
Safety-Related and Other Structures; and Component Supports					
3.5.1-23	All Groups except Group 6: interior and above grade exterior concrete	Cracking, loss of bond, and loss of material (spalling, scaling) due to corrosion of embedded steel	Structures Monitoring Program	Yes, if not within the scope of the applicant's structures monitoring program	The Structures Monitoring Program is credited for aging management of these effects/mechanisms for the affected concrete structural components, in accordance with the current NRC position, even if the aging management review did not identify aging effects requiring management. For discussion see Section 3.5.2.2.2.1.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-24	All Groups except Group 6: interior and above grade exterior concrete	Increase in porosity and permeability, cracking, loss of material (spalling, scaling) due to aggressive chemical attack	Structures Monitoring Program	Yes, if not within the scope of the applicant's structures monitoring program	The Structures Monitoring Program is credited for aging management of these effects/mechanisms for the affected concrete structural components, in accordance with the current NRC position, even if the aging management review did not identify aging effects requiring management. For discussion see Section 3.5.2.2.2.1.
3.5.1-25	All Groups except Group 6: steel components: all structural steel	Loss of material due to corrosion	Structures Monitoring Program. If protective coatings are relied upon to manage the effects of aging, the structures monitoring program is to include provisions to address protective coating monitoring and maintenance.	Yes, if not within the scope of the applicant's structures monitoring program	Consistent with NUREG-1801. The Structures Monitoring Program is credited for aging management of these effects/mechanisms. Protective coatings are not relied upon to manage the effects of aging at SSES. For discussion see Section 3.5.2.2.2.1.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-26	All Groups except Group 6: accessible and inaccessible concrete: foundation	Loss of material (spalling, scaling) and cracking due to freeze-thaw	Structures Monitoring Program. Evaluation is needed for plants that are located in moderate to severe weathering conditions (weathering index >100 day-inch/yr) (NUREG-1557).	Yes, if not within the scope of the applicant's structures monitoring program Or for inaccessible areas of plants located in moderate to severe weathering conditions	The Structures Monitoring Program is credited for aging management of these effects/mechanisms for the affected concrete structural components, in accordance with the current NRC position, even if the aging management review did not identify aging effects requiring management. For discussion see Section 3.5.2.2.2.1. For discussion see Section 3.5.2.2.2.2.1.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-27	All Groups except Group 6: accessible and inaccessible interior/exterior concrete	Cracking due to expansion due to reaction with aggregates	Structures Monitoring Program. None for inaccessible areas if concrete was constructed in accordance with the recommendations in ACI 201.2R-77.	Yes, if not within the scope of the applicant's structures monitoring program Or concrete was not constructed as stated for inaccessible areas	The Structures Monitoring Program is credited for aging management of these effects/mechanisms for the affected concrete structural components, in accordance with the current NRC position, even if the aging management review did not identify aging effects requiring management. For discussion see Section 3.5.2.2.2.1. For discussion see Section 3.5.2.2.2.2.2.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-28	Groups 1-3, 5-9: All	Cracks and distortion due to increased stress levels from settlement	Structures Monitoring Program. If a de-watering system is relied upon for control of settlement, then the licensee is to ensure proper functioning of the de-watering system through the period of extended operation.	Yes, if not within the scope of the applicant's structures monitoring program Or a de-watering system is relied upon	The Structures Monitoring Program is credited for aging management of these effects/mechanisms for the affected concrete structural components, in accordance with the current NRC position, even if the aging management review did not identify aging effects requiring management. For discussion see Section 3.5.2.2.2.1. For discussion see Section 3.5.2.2.2.2.3.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-29	Groups 1-3, 5-9: foundation	Reduction in foundation strength, cracking, differential settlement due to erosion of porous concrete subfoundation	Structures Monitoring Program. If a de-watering system is relied upon for control of settlement, then the licensee is to ensure proper functioning of the de-watering system through the period of extended operation.	Yes, if not within the scope of the applicant's structures monitoring program Or a de-watering system is relied upon	The Structures Monitoring Program is credited for aging management of these effects/mechanisms for the affected concrete structural components, in accordance with the current NRC position, even if the aging management review did not identify aging effects requiring management. For discussion see Section 3.5.2.2.2.1. For discussion see Section 3.5.2.2.2.2.3.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.5.1-30	Group 4: Radial beam seats in BWR drywell; RPV support shoes for PWR with nozzle supports; Steam generator supports	Lock-up due to wear	ISI (IWF) or Structures monitoring Program	Yes, if not within the scope of ISI or structures monitoring program	Lubrite® plates are not used in SSES in-scope structural components. Lock-up due to wear is not an aging effect requiring management at SSES. Aging degradation of supports designed with or without sliding connections are managed by the Inservice Inspection (ISI) Program – IWF and/or the Structures Monitoring Program. For discussion see Section 3.5.2.2.2.1.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.5.1-31	Groups 1-3, 5, 7-9: below-grade concrete components, such as exterior walls below grade and foundation	Increase in porosity and permeability, cracking, loss of material (spalling, scaling) / aggressive chemical attack; Cracking, loss of bond, and loss of material (spalling, scaling)/ corrosion of embedded steel	Structures Monitoring Program; Examination of representative samples of below-grade concrete, and periodic monitoring of groundwater, if the environment is non-aggressive. A plant specific program is to be evaluated if environment is aggressive.	Yes, plant-specific, if environment is aggressive	The Structures Monitoring Program is credited for aging management of these effects/mechanisms for the affected concrete structural components, in accordance with the current NRC position, even if the aging management review did not identify aging effects requiring management. The Structures Monitoring Program will include review of site ground water and raw water pH, chlorides, and sulfates in order to validate that the below-grade environment remains non-aggressive during the period of extended operation and will include examination of exposed concrete for age-related degradation when a below-grade concrete component becomes accessible through excavation. For discussion see Section 3.5.2.2.2.2.4.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-32	Groups 1-3, 5, 7-9: exterior above and below grade reinforced concrete foundations	Increase in porosity and permeability, and loss of strength due to leaching of calcium hydroxide	Structures monitoring Program for accessible areas. None for inaccessible areas if concrete was constructed in accordance with the recommendations in ACI 201.2R-77.	Yes, if concrete was not constructed as stated for inaccessible areas	SSES concrete is not exposed to flowing water, therefore these aging effects/ mechanisms do not require management for SSES below-grade inaccessible concrete structural components. For discussion see Section 3.5.2.2.2.5.
3.5.1-33	Groups 1-5: concrete	Reduction of strength and modulus of concrete due to elevated temperature	A plant-specific aging management program is to be evaluated	Yes, plant-specific if temperature limits are exceeded	SSES in-scope concrete structures and concrete components are not exposed to temperature limits associated with aging degradation due to elevated temperature. For discussion see Section 3.5.2.2.2.3.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-34	Group 6: Concrete; all	Increase in porosity and permeability, cracking, loss of material due to aggressive chemical attack; cracking, loss of bond, loss of material due to corrosion of embedded steel	Inspection of Water-Control Structures or FERC/US Army Corps of Engineers dam inspections and maintenance programs and for inaccessible concrete, an examination of representative samples of below-grade concrete, and periodic monitoring of groundwater, if the environment is non-aggressive. A plant specific program is to be evaluated if environment is aggressive.	Yes, plant-specific if environment is aggressive	The SSES Group 6 structures concrete is not exposed to an aggressive environment and the design and construction of the SSES concrete is in accordance with accepted ACI Standards, thereby precluding aggressive chemical attack and embedded steel corrosion aging mechanisms. The absence of concrete aging effects is confirmed under the RG 1.127 Water-Control Structures Inspection. For discussion see Section 3.5.2.2.2.4.1.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-35	Group 6: exterior above and below grade concrete foundation	Loss of material (spalling, scaling) and cracking due to freeze-thaw	Inspection of Water-Control Structures or FERC/US Army Corps of Engineers dam inspections and maintenance programs. Evaluation is needed for plants that are located in moderate to severe weathering conditions (weathering index >100 day-inch/yr) (NUREG-1557).	Yes, for inaccessible areas of plants located in moderate to severe weathering conditions	Consistent with NUREG-1801. The RG 1.127 Water-Control Structures Inspection is credited for aging management of these effects/mechanisms. Loss of material (spalling, scaling) and cracking due to freeze-thaw are aging effects requiring management for concrete components exposed to raw water because the concrete may become saturated and therefore could be susceptible to freeze-thaw. For discussion see Section 3.5.2.2.2.4.2.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.5.1-36	Group 6: all accessible/ inaccessible reinforced concrete	Cracking due to expansion/ reaction with aggregates	Accessible areas: Inspection of Water-Control Structures or FERC/US Army Corps of Engineers dam inspections and maintenance programs. None for inaccessible areas if concrete was constructed in accordance with the recommendations in ACI 201.2R-77.	Yes, if concrete was not constructed as stated for inaccessible areas	The design and construction of the SSES concrete is in accordance with accepted ACI Standards, thereby precluding expansion and reaction with aggregate aging mechanism. The absence of concrete aging effects is confirmed under the RG 1.127 Water-Control Structures Inspection. For discussion see Section 3.5.2.2.2.4.3.
3.5.1-37	Group 6: exterior above and below grade reinforced concrete foundation interior slab	Increase in porosity and permeability, loss of strength due to leaching of calcium hydroxide	For accessible areas, inspection of Water-Control Structures or FERC/US Army Corps of Engineers dam inspections and maintenance programs. None for inaccessible areas if concrete was constructed in accordance with the recommendations in ACI 201.2R-77.	Yes, if concrete was not constructed as stated for inaccessible areas	The design and construction of the SSES concrete is in accordance with accepted ACI Standards, thereby precluding leaching of calcium hydroxide aging mechanisms. The absence of concrete aging effects is confirmed under the RG 1.127 Water-Control Structures Inspection. For discussion see Section 3.5.2.2.2.4.3.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.5.1-38	Groups 7, 8: Tank liners	Cracking due to stress corrosion cracking; loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated	Yes, plant specific	No tanks with stainless steel liners are included in the structural aging management reviews. Tanks subject to aging management review are evaluated with their respective mechanical systems.
3.5.1-39	Support members; welds; bolted connections; support anchorage to building structure	Loss of material due to general and pitting corrosion	Structures Monitoring Program	Yes, if not within the scope of the applicant's structures monitoring program	Consistent with NUREG-1801. Loss of material due to general and pitting corrosion for Groups B2-B5 supports is managed by the Structures Monitoring Program. For discussion see Section 3.5.2.2.2.6.
3.5.1-40	Building concrete at locations of expansion and grouted anchors; grout pads for support base plates	Reduction in concrete anchor capacity due to local concrete degradation/ service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program	Yes, if not within the scope of the applicant's structures monitoring program	The Structures Monitoring Program is credited for aging management of these effects/mechanisms for the affected concrete structural components, in accordance with the current NRC position, even if the aging management review did not identify aging effects requiring management. For discussion see Section 3.5.2.2.2.6.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.5.1-41	Vibration isolation elements	Reduction or loss of isolation function/ radiation hardening, temperature, humidity, sustained vibratory loading	Structures Monitoring Program	Yes, if not within the scope of the applicant's structures monitoring program	Consistent with NUREG-1801. Degradation of vibration isolation elements for Group B4 supports is managed by the Structures Monitoring Program. For discussion see Section 3.5.2.2.2.6.
3.5.1-42	Groups B1.1, B1.2, and B1.3: support members: anchor bolts, welds	Cumulative fatigue damage (CLB fatigue analysis exists)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	Yes, TLAA	No fatigue analyses were identified for component support members, anchor bolts, and welds for Groups B1.1, B1.2, and B1.3. For discussion see Section 3.5.2.2.2.7.
3.5.1-43	Groups 1-3, 5, 6: all masonry block walls	Cracking due to restraint shrinkage, creep, and aggressive environment	Masonry Wall Program	No	Consistent with NUREG-1801. Masonry block walls are managed by the Masonry Wall Program.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-44	Group 6 elastomer seals, gaskets, and moisture barriers	Loss of sealing due to deterioration of seals, gaskets, and moisture barriers (caulking, flashing, and other sealants)	Structures Monitoring Program	No	Consistent with NUREG-1801. Elastomeric components for Groups 1-3, 5, 6 structures are managed by the Structures Monitoring Program. Seals with a fire barrier intended function are managed by the Fire Protection Program. Loss of sealing is not considered as an aging effect but rather a consequence of elastomer degradation. This effect may be caused by cracking and/or change in material properties for elastomeric material.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-45	Group 6: exterior above and below grade concrete foundation; interior slab	Loss of material due to abrasion, cavitation	Inspection of Water-Control Structures or FERC/US Army Corps of Engineers dam inspections and maintenance	No	Loss of material due to abrasion or cavitation is not an aging effect requiring management for concrete components exposed to raw water because the Spray Pond water does not contain abrasive material and flow velocity to the ESSW Pumphouse is much less than the cavitation threshold for open channel flows. Water flow velocity through ESW pump chambers is less than the cavitation threshold for closed conduit flow. The absence of concrete aging effects is confirmed under the RG 1.127 Water-Control Structures Inspection. For discussion see Section 3.5.2.2.2.4.1.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.5.1-46	Group 5: Fuel pool liners	Cracking due to stress corrosion cracking; loss of material due to pitting and crevice corrosion	Water Chemistry and monitoring of spent fuel pool water level in accordance with technical specifications and leakage from the leak chase channels.	No	Consistent with NUREG-1801. Fuel pool liners are managed by the BWR Water Chemistry Program, monitoring of spent fuel pool water level in accordance with Technical Specifications, and Leak Chase Channel Monitoring Activities. Cracking due to stress corrosion cracking (SCC) is not an aging effect requiring management because SCC occurs through the combination of high stress (both applied and residual tensile stresses), a corrosive environment and temperature, which are not found in the spent fuel pool or the fuel shipping cask storage pool. The spent fuel pool and the fuel shipping cask storage pool water temperature is below the 140°F threshold during normal operation.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.5.1-47	Group 6: all metal structural members	Loss of material due to general (steel only), pitting and crevice corrosion	Inspection of Water-Control Structures or FERC/US Army Corps of Engineers dam inspections and maintenance. If protective coatings are relied upon to manage aging, protective coating monitoring and maintenance provisions should be included.	No	Consistent with NUREG-1801. Metal structural components within Group 6 structures are managed by the RG 1.127 Water-Control Structures Inspection.
3.5.1-48	Group 6: earthen water control structures - dams, embankments, reservoirs, channels, canals, and ponds	Loss of material, loss of form due to erosion, settlement, sedimentation, frost action, waves, currents, surface runoff, Seepage	Inspection of Water-Control Structures or FERC/US Army Corps of Engineers dam inspections and maintenance programs	No	The earthen embankments associated with the Spray Pond are managed by the RG 1.127 Water-Control Structures Inspection.
3.5.1-49	Support members; welds; bolted connections; support anchorage to building structure	Loss of material/ general, pitting, and crevice corrosion	Water Chemistry and ISI(IWF)	No	Consistent with NUREG-1801. The listed structural components exposed to treated water are managed by the Inservice Inspection Program – IWF and the BWR Water Chemistry Program.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-50	Groups B2, and B4: galvanized steel, aluminum, stainless steel support members; welds; bolted connections; support anchorage to building structure	Loss of material due to pitting and crevice corrosion	Structures Monitoring Program	No	Consistent with NUREG-1801. The listed structural components are managed by the Structures Monitoring Program.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report

Item Number	Component / Commodity	Aging Effect / Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.5.1-51	Group B1.1: high strength low-alloy bolts	Cracking due to stress corrosion cracking; loss of material due to general corrosion	Bolting Integrity	No	The internal environment of in-scope structures does not contain aggressive chemicals or contaminants under normal operating conditions. Therefore, the environmental conditions necessary for Stress Corrosion Cracking (SCC) to occur do not exist. The specified yield strength of structural bolting materials used at SSES are all below the threshold of >150 ksi for SCC to occur. Therefore, high strength structural bolting at SSES is not susceptible to SCC. Structural bolts are not highly preloaded such that tensile stresses exceed the yield strength of the material. Review of plant specific operating experience identified no occurrences of SCC on high strength structural bolting. Therefore cracking due to SCC is not an aging effect requiring management for threaded fasteners.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-52	Groups B2, and B4: sliding support bearings and sliding support surfaces	Loss of mechanical function due to corrosion, distortion, dirt, overload, fatigue due to vibratory and cyclic thermal loads	Structures Monitoring Program	No	Not applicable for SSES. There are no in-scope supports that are constructed of fluoropolymer materials or lubrite sliding surfaces. However, aging degradations of Groups B2 and B4 supports designed with or without sliding connections are managed by the Structures Monitoring Program. The inspection criteria for supports within the programs effectively envelope misalignment and accumulation of debris.
3.5.1-53	Groups B1.1, B1.2, and B1.3: support members: welds; bolted connections; support anchorage to building structure	Loss of material due to general and pitting corrosion	ISI (IWF)	No	Consistent with NUREG-1801. The listed structural components are managed by the Inservice Inspection Program – IWF.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-54	Groups B1.1, B1.2, and B1.3: Constant and variable load spring hangers; guides; stops;	Loss of mechanical function due to corrosion, distortion, dirt, overload, fatigue due to vibratory and cyclic thermal loads	ISI (IWF)	No	Loss of mechanical function due to the listed mechanisms is not an aging effect identified at SSES. Proper design prevents distortion, overload, and fatigue due to vibratory and cyclic thermal loads. However, aging degradations on Groups B1.1, B1.2, and B1.3 constant and variable load spring hangers; guides; stops are managed by the Inservice Inspection (ISI) Program – IWF. The inspection criteria for supports within the programs effectively envelope misalignment and accumulation of debris.
3.5.1-55	PWR Only				

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-56	Groups B1.1, B1.2, and B1.3: Sliding surfaces	Loss of mechanical function due to corrosion, distortion, dirt, overload, fatigue due to vibratory and cyclic thermal loads	ISI (IWF)	No	Not applicable for SSES. There are no in-scope structural component supports that are constructed of fluoropolymer materials or lubrite sliding surfaces. However, aging degradations of Groups B1.1, B1.2, and B1.3 supports designed with or without sliding connections are managed by the Inservice Inspection (ISI) Program – IWF. The inspection criteria for supports within the programs effectively envelope misalignment and accumulation of debris.
3.5.1-57	Groups B1.1, B1.2, and B1.3: Vibration isolation elements	Reduction or loss of isolation function/ radiation hardening, temperature, humidity, sustained vibratory loading	ISI (IWF)	No	Not applicable for SSES. There were no Groups B1.1, B1.2, and B1.3 vibration isolation elements identified at SSES.

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-58	Galvanized steel and aluminum support members; welds; bolted connections; support anchorage to building structure exposed to air - indoor uncontrolled	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.
3.5.1-59	Stainless steel support members; welds; bolted connections; support anchorage to building structure	None	None	NA - No AEM or AMP	Consistent with NUREG-1801.

Table 3.5.2-1 Aging Management Review Results - Primary Containment								
Component / Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Containment Liner	EN, PB, SSR	Carbon Steel	Protected from weather	Loss of material	ISI-IWE Containment Leakage Rate Test Program	II.B2.2-10	3.5.1-05	A, 0502
Control Rod Drive (CRD) Removal Hatch	EN, PB, SSR	Carbon Steel	Protected from weather	Loss of material	ISI-IWE	II.B4-6	3.5.1-18	A
					Containment Leakage Rate Test Program	II.B4-5	3.5.1-17	A
						II.B4-6	3.5.1-18	A
					Plant Technical Specification	II.B4-5	3.5.1-17	A, 0507
Drywell Floor Liner	EN, PB, SSR	Carbon Steel	Protected from weather	Loss of material	ISI-IWE Containment Leakage Rate Test Program	II.B2.2-10	3.5.1-05	A, 0502
Drywell Head	EN, PB, MB, SSR	Carbon Steel	Protected from weather	Loss of material	ISI-IWE Containment Leakage Rate Test Program	II.B2.2-10	3.5.1-05	A

Table 3.5.2-1 Aging Management Review Results - Primary Containment								
Component / Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Penetrations (Mechanical and Electrical, Primary Containment boundary)	PB, SSR	Carbon Steel	Protected from weather	Loss of material	ISI-IWE Containment Leakage Rate Test Program	II.B4-1	3.5.1-18	A, 0506
		Stainless Steel	Protected from weather	None	ISI-IWE Containment Leakage Rate Test Program	N/A	N/A	I, 0501, 0506
Permanent Drywell Shielding	SHD, SNS	Carbon Steel/ Lead	Protected from weather	Loss of material	Structures Monitoring Program	III.A4-5	3.5.1-25	A, 0509
Personnel Airlock and Equipment Hatches	EN, MB, PB, SSR	Carbon Steel	Protected from weather	Loss of material	ISI-IWE	II.B4-6	3.5.1-18	A
					Containment Leakage Rate Test Program	II.B4-5	3.5.1-17	A
						II.B4-6	3.5.1-18	A
					Plant Technical Specification	II.B4-5	3.5.1-17	A, 0507

Table 3.5.2-1 Aging Management Review Results - Primary Containment								
Component / Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Reactor Pedestal Liner	EN, FLB, SSR	Carbon Steel	Protected from weather	Loss of material	ISI-IWE Containment Leakage Rate Test Program	II.B2.2-12	3.5.1-20	C
			Exposed to treated water	Loss of material	ISI-IWE Containment Leakage Rate Test Program BWR Water Chemistry Program	II.B2.2-12	3.5.1-20	C, 0508
Reactor Shield Doors	EN, SHD, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A4-5	3.5.1-25	A
Reactor Shield Wall Inner and Outer Plates	EN, SHD, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A4-5	3.5.1-25	A
Reactor Vessel Thermal Insulation	SSR	Stainless Steel/ Aluminum	Protected from weather	None	None	III.B1.1-6 III.B1.1-9	3.5.1-58 3.5.1-59	C C

Table 3.5.2-1 Aging Management Review Results - Primary Containment								
Component / Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Refueling Bellows	FLB, SSR	Stainless Steel	Protected from weather	None	None	III.B1.1-9	3.5.1-59	C, 0504
Refueling Seal Plate	FLB, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A4-5	3.5.1-25	A
Refueling Seal Lead Shield Plates	SHD	Stainless Steel/ Lead	Protected from weather	None	None	III.B1.1-9	3.5.1-59	C, 0505
Seismic Truss and Seismic Stabilizer	SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B5-7	3.5.1-39	A
Structural Steel: Beams, Columns, Plates, and Trusses (includes welds and bolted connections)	EN, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A4-5	3.5.1-25	A
		Galvanized Steel	Protected from weather	None	None	III.B1.1-7	3.5.1-58	C
Suppression Chamber Access Hatches	EN, MB, PB, SSR	Carbon Steel	Protected from weather	Loss of material	ISI-IWE Containment Leakage Rate Test Program	II.B2.2-10	3.5.1-05	C

Table 3.5.2-1 Aging Management Review Results - Primary Containment								
Component / Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Suppression Chamber Columns	SSR	Carbon Steel	Protected from weather	Loss of material	ISI-IWE Containment Leakage Rate Test Program	II.B2.2-12	3.5.1-20	C
			Exposed to treated water	Loss of material	ISI-IWE Containment Leakage Rate Test Program BWR Water Chemistry Program	II.B2.2-12	3.5.1-20	C, 0508

Table 3.5.2-1 Aging Management Review Results - Primary Containment								
Component / Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Suppression Chamber Liner	EN, HS, PB, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	ISI-IWE Containment Leakage Rate Test Program	II.B2.2-12	3.5.1-20	A
			Exposed to treated water	Loss of material	ISI-IWE Containment Leakage Rate Test Program BWR Water Chemistry Program	II.B2.2-12	3.5.1-20	A, 0508
Containment Wall	EN, EXP, FLB, MB, SSR, SRE	Concrete	Protected from weather	None	ISI-IWL Structures Monitoring Program	N/A	N/A	I, 0501
Drywell Floor	EN, FLB, MB, SSR, SRE	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Drywell Sumps	DF, FLB, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501

Table 3.5.2-1 Aging Management Review Results - Primary Containment								
Component / Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Foundation	EN, EXP, FLB, SSR, SRE	Concrete	Below grade	None	ISI-IWL Structures Monitoring Program	N/A	N/A	I, 0501
Reactor Pedestal	EN, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Reactor Shield Wall	EN, SHD, MB, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Suppression Chamber	EN, EXP, FLB, HS, SSR, SRE	Concrete	Protected from weather	None	ISI-IWL Structures Monitoring Program	N/A	N/A	I, 0501

1 Refer to Table 2.0-1 for intended function descriptions.

Table 3.5.2-2 Aging Management Review Results - Reactor Building

Component / Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Blowout Panels	PB, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A2-12	3.5.1-25	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.A2-12	3.5.1-25	A
		Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7	3.5.1-50	C
Cranes, including Bridge and Trolley, Rails, and Girders	SNS, SSR	Carbon Steel	Protected from weather	Loss of material	Crane Inspection Program	VII.B-3	3.3.1-73	A
Floor Decking	EN, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A2-12	3.5.1-25	A
		Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C

Table 3.5.2-2 Aging Management Review Results - Reactor Building								
Component / Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Fuel Shipping Cask Storage Pool Gates	SSR	Stainless Steel	Exposed to treated water	Loss of material	BWR Water Chemistry Program Spent Fuel Pool Water Monitoring per Tech Spec Leak Chase Channel Monitoring Activities	III.A5-13	3.5.1-46	C, 0514
Fuel Shipping Cask Storage Pool Liner	SSR	Stainless Steel	Exposed to treated water	Loss of material	BWR Water Chemistry Program Spent Fuel Pool Water Monitoring per Tech Spec Leak Chase Channel Monitoring Activities	III.A5-13	3.5.1-46	A, 0513

Table 3.5.2-2 Aging Management Review Results - Reactor Building								
Component / Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Metal Siding	EN, PB, SSR	Carbon Steel	Exposed to weather	Loss of material	Structures Monitoring Program	III.A2-12	3.5.1-25	A
			Protected from weather	Loss of material	Structures Monitoring Program	III.A2-12	3.5.1-25	A
New Fuel Racks	EN, SSR	Aluminum/ Stainless Steel fasteners	Protected from weather	None	None	III.B5-5 VII.J-1	3.5.1-59 3.3.1-95	C, 0511 C, 0511
New Fuel Storage Vault Watertight Covers	EN, FLB, SSR	Carbon Steel/ Stainless Steel/ Aluminum	Protected from weather	Loss of material	Structures Monitoring Program	III.A2-12	3.5.1-25	A, 0512
Reactor Well and Steam Dryer and Separator Storage Pool Gates	SSR	Stainless Steel	Protected from weather	None	None	III.B5-5	3.5.1-59	C

Table 3.5.2-2 Aging Management Review Results - Reactor Building								
Component / Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Reactor Well and Steam Dryer and Separator Storage Pool Liners	SSR	Stainless Steel	Protected from weather	None	None	III.B5-5	3.5.1-59	C
Roof Decking	EN, PB, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A2-12	3.5.1-25	A
		Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C
Spent Fuel Pool Gates	SSR	Stainless Steel	Exposed to treated water	Loss of material	BWR Water Chemistry Program Spent Fuel Pool Water Monitoring per Tech Spec Leak Chase Channel Monitoring Activities	III.A5-13	3.5.1-46	C, 0514

Table 3.5.2-2 Aging Management Review Results - Reactor Building								
Component / Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Spent Fuel Pool Liners	SSR	Stainless Steel	Exposed to treated water	Loss of material	BWR Water Chemistry Program Spent Fuel Pool Water Monitoring per Tech Spec Leak Chase Channel Monitoring Activities	III.A5-13	3.5.1-46	A, 0513
Spent Fuel Pool Racks	SSR	Aluminum	Exposed to treated water	Loss of material	BWR Water Chemistry Program	VII.A4-5	3.3.1-24	C, 0515
Spent Fuel Rack Neutron Absorbers	SHD, SSR	Boral	Exposed to treated water	Loss of material	BWR Water Chemistry Program	VII.A2-3	3.3.1-13	E 0510
Structural Steel: Beams, Columns, Plates, and Trusses (includes welds and bolted connections)	EN, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A2-12	3.5.1-25	A
		Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C
Sump Liners	SNS	Stainless Steel	Protected from weather	None	None	III.B5-5	3.5.1-59	C

Table 3.5.2-2 Aging Management Review Results - Reactor Building								
Component / Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Exterior Precast Concrete Panels (above grade)	EN, SSR	Concrete	Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Exterior Walls (above grade)	EN, FLB, MB, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Exterior Walls (below grade)	EN, FLB, SSR	Concrete	Below grade	None	Structures Monitoring Program	N/A	N/A	I, 0501
Foundations	EN, EXP, FLB, SSR	Concrete	Below grade	None	Structures Monitoring Program	N/A	N/A	I, 0501
Masonry Block Walls	EN, FB, SHD, SNS, SRE, SSR	Concrete Blocks	Protected from weather	Cracking	Masonry Wall Program	III.A2-11	3.5.1-43	A
					Fire Protection Program	III.A2-11	3.5.1-43	E, 0516
New Fuel Storage Vault	EN, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Reactor Well Shield Plugs	EN, SHD, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501

Table 3.5.2-2 Aging Management Review Results - Reactor Building

Component / Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Reinforced Concrete: Walls, floors, and ceilings	EN, FB, FLB, HELB, MB, PB, PW, SHD, SNS, SRE, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
					Fire Protection Program	N/A	N/A	I, 0501
Sumps	SNS	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501

1 Refer to Table 2.0-1 for intended function descriptions.

Table 3.5.2-3 Aging Management Review Results - Engineered Safeguards Service Water Pumphouse and Spray Pond

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Bulkhead Closure Plates	SSR	Galvanized Steel	Exposed to raw water	Loss of material	RG 1.127 Water-Control Structures Inspection	III.A6-11	3.5.1-47	A, 0517
Bulkhead Fixed Screens	SSR	Stainless Steel	Exposed to raw water	Loss of material	RG 1.127 Water-Control Structures Inspection	III.A6-11	3.5.1-47	A
Bulkhead Screen Guides	SSR	Stainless Steel	Exposed to raw water	Loss of material	RG 1.127 Water-Control Structures Inspection	III.A6-11	3.5.1-47	A
Roof and Floor Decking	EN, SSR	Carbon Steel	Protected from weather	Loss of material	RG 1.127 Water-Control Structures Inspection	III.A6-11	3.5.1-47	A
		Galvanized Steel	Protected from weather	None	None	III.B1.1-7	3.5.1-58	C

Table 3.5.2-3	Aging Management Review Results - Engineered Safeguards Service Water Pumphouse and Spray Pond							
Component/ Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Structural Steel: Beams, Columns, Plates, and Trusses (includes welds and bolted connections)	EN, SSR	Carbon Steel	Protected from weather	Loss of material	RG 1.127 Water-Control Structures Inspection	III.A6-11	3.5.1-47	A
		Galvanized Steel	Protected from weather	None	None	III.B1.1-7	3.5.1-58	C
Trash Racks	SNS	Galvanized Steel	Exposed to raw water	Loss of material	RG 1.127 Water-Control Structures Inspection	III.A6-11	3.5.1-47	A, 0517
Earthen Embankment	FLB, SNS	Earthen	Exposed to weather	Loss of form	RG 1.127 Water-Control Structures Inspection	III.A6-9	3.5.1-48	G
Exterior Walls (above grade)	EN, FLB, MB, SSR	Concrete	Exposed to weather	None	RG 1.127 Water-Control Structures Inspection	N/A	N/A	I, 0501
Exterior Walls (below grade)	EN, FLB, SSR	Concrete	Below grade	None	RG 1.127 Water-Control Structures Inspection	N/A	N/A	I, 0501

Table 3.5.2-3 Aging Management Review Results - Engineered Safeguards Service Water Pumphouse and Spray Pond

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Foundations	EN, FLB, SSR	Concrete	Below grade	None	RG 1.127 Water-Control Structures Inspection	N/A	N/A	I, 0501
Overflow Weir and Chamber	FLB, SSR	Concrete	Exposed to raw water	Loss of material Cracking	RG 1.127 Water-Control Structures Inspection	III.A6-5	3.5.1-35	A, 0503
Pump Intake Chambers	SSR	Concrete	Exposed to raw water	Loss of material Cracking	RG 1.127 Water-Control Structures Inspection	III.A6-5	3.5.1-35	A, 0503
Reinforced Concrete: Walls, floors, and ceilings	EN, FB, FLB, MB, SSR, SRE	Concrete	Protected from weather	None	RG 1.127 Water-Control Structures Inspection Fire Protection Program	N/A N/A	N/A N/A	I, 0501 I, 0501
Roof Slabs	EN, MB, SSR	Concrete	Exposed to weather	None	RG 1.127 Water-Control Structures Inspection	N/A	N/A	I, 0501

Table 3.5.2-3 Aging Management Review Results - Engineered Safeguards Service Water Pumphouse and Spray Pond

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Spray Pond Emergency Spillway	FLB, SSR	Concrete	Exposed to raw water	Loss of material Cracking	RG 1.127 Water-Control Structures Inspection	III.A6-5	3.5.1-35	A, 0503
Spray Pond Liner	EN, HS, MB, SCW, SSR	Concrete	Exposed to raw water	Loss of material Cracking	RG 1.127 Water-Control Structures Inspection	III.A6-5	3.5.1-35	A, 0503
			Exposed to weather	None	RG 1.127 Water-Control Structures Inspection	N/A	N/A	I, 0501
Spray Pond Riser Concrete Encasements	EN, MB, SSR	Concrete	Exposed to raw water	Loss of material Cracking	RG 1.127 Water-Control Structures Inspection	III.A6-5	3.5.1-35	A, 0503
			Exposed to weather	None	RG 1.127 Water-Control Structures Inspection	N/A	N/A	I, 0501
Sumps	SNS	Concrete	Protected from weather	None	RG 1.127 Water-Control Structures Inspection	N/A	N/A	I, 0501

1 Refer to Table 2.0-1 for intended function descriptions.

Table 3.5.2-4 Aging Management Review Results - Circulating Water Pumphouse and Water Treatment Building								
Component/ Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Battery Racks	SRE	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
Cranes, including Bridge and Trolley, Rails, and Girders	SRE	Carbon Steel	Protected from weather	Loss of material	Crane Inspection Program	VII.B-3	3.3.1-73	A
Floor Decking	EN, SRE	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
		Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C
Metal Siding	EN, SRE	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
		Carbon Steel	Exposed to weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
Roof Decking	EN, SRE	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
		Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C

Table 3.5.2-4 Aging Management Review Results - Circulating Water Pumphouse and Water Treatment Building								
Component/ Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Structural Steel: Beams, Columns, Plates, and Trusses (includes welds and bolted connections)	EN, SRE	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
		Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C
Exterior Precast Concrete Panels (above grade)	EN, SRE	Concrete	Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Exterior Walls (above grade)	EN, FLB, SRE	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Exterior Walls (below grade)	EN, FLB, SRE	Concrete	Below grade	None	Structures Monitoring Program	N/A	N/A	I, 0501
Foundations	EN, FLB, SRE	Concrete	Below grade	None	Structures Monitoring Program	N/A	N/A	I, 0501

Table 3.5.2-4 Aging Management Review Results - Circulating Water Pumphouse and Water Treatment Building								
Component/ Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Masonry Block Walls	EN, FB, FLB, SRE	Concrete Blocks	Protected from weather	Cracking	Masonry Wall Program	III.A3-11	3.5.1-43	A
					Fire Protection Program	III.A3-11	3.5.1-43	E, 0516
Reinforced Concrete: Walls, floors, and ceilings	EN, FB, FLB, SRE	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
					Fire Protection Program	N/A	N/A	I, 0501
Sumps	SRE	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501

1 Refer to Table 2.0-1 for intended function descriptions.

Table 3.5.2-5 Aging Management Review Results - Control Structure

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Battery Racks	SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A1-12	3.5.1-25	A
Control Room Ceiling	SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A1-12	3.5.1-25	A
Floor Decking	EN, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A1-12	3.5.1-25	A
		Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C
Power Generation Control Complex (PGCC) Flooring	EN, SNS	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A1-12	3.5.1-25	A
		Arboron Laminate Panels	Protected from weather	None	None	N/A	N/A	J, 0518
Structural Steel: Beams, Columns, Plates, and Trusses (includes welds and bolted connections)	EN, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A1-12	3.5.1-25	A
		Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C

Table 3.5.2-5 Aging Management Review Results - Control Structure

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Exterior Walls (above grade)	EN, EXP, FLB, MB, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Exterior Walls (below grade)	EN, EXP, FLB, SSR	Concrete	Below grade	None	Structures Monitoring Program	N/A	N/A	I, 0501
Foundations	EN, EXP, FLB, SSR	Concrete	Below grade	None	Structures Monitoring Program	N/A	N/A	I, 0501
Masonry Block Walls	EN, FB, FLB, PB, SHD, SNS, SRE, SSR	Concrete Blocks	Protected from weather	Cracking	Masonry Wall Program	III.A1-11	3.5.1-43	A
					Fire Protection Program	III.A1-11	3.5.1-43	E, 0516
Reinforced Concrete: Walls, floors, and ceilings	EN, FB, FLB, MB, PB, SHD, SNS, SRE, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
					Fire Protection Program	N/A	N/A	I, 0501

Table 3.5.2-5 Aging Management Review Results - Control Structure

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Roof Slabs	EN, FLB, MB, RP, SSR	Concrete	Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501

1 Refer to Table 2.0-1 for intended function descriptions.

Table 3.5.2-6 Aging Management Review Results - Diesel Generator 'A, B, C, and D' Building								
Component/ Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Cranes, including Bridge and Trolley, Rails, and Girders	SNS, SSR	Carbon Steel	Protected from weather	Loss of material	Crane Inspection Program	VII.B-3	3.3.1-73	A
Floor Decking	EN, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
		Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C
Metal Siding	EN, SSR	Carbon Steel	Exposed to weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
Structural Steel: Beams, Columns, Plates, and Trusses (includes welds and bolted connections)	EN, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
		Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C
Diesel Generator Exhaust Plenums	EN, MB, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501

Table 3.5.2-6 Aging Management Review Results - Diesel Generator 'A, B, C, and D' Building								
Component/ Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Diesel Generator Intake Plenums	EN, MB, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Exterior Precast Concrete Panels (above grade)	EN, SSR	Concrete	Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Exterior Walls (above grade)	EN, EXP, FLB, MB, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Exterior Walls (below grade)	EN, FLB, SSR	Concrete	Below grade	None	Structures Monitoring Program	N/A	N/A	I, 0501
Foundations	EN, EXP, FLB, SSR	Concrete	Below grade	None	Structures Monitoring Program	N/A	N/A	I, 0501
Masonry Block Walls	EN, FB, FLB, SRE, SSR	Concrete Blocks	Protected from weather	Cracking	Masonry Wall Program	III.A3-11	3.5.1-43	A
					Fire Protection Program	III.A3-11	3.5.1-43	E, 0516

Table 3.5.2-6 Aging Management Review Results - Diesel Generator 'A, B, C, and D' Building								
Component/ Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Reinforced Concrete: Walls, floors, and ceilings	EN, FB, FLB, MB, SRE, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
					Fire Protection Program	N/A	N/A	I, 0501
Roof Slabs	EN, FLB, MB, SSR	Concrete	Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Sumps	SNS	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501

1 Refer to Table 2.0-1 for intended function descriptions.

Table 3.5.2-7 Aging Management Review Results - Diesel Generator 'E' Building								
Component/ Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Battery Racks	SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
Cranes, including Bridge and Trolley, Rails, and Girders	SNS, SSR	Carbon Steel	Protected from weather	Loss of material	Crane Inspection Program	VII.B-3	3.3.1-73	A
Metal Siding	EN, SSR	Carbon Steel	Exposed to weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
Diesel Generator Exhaust Plenums	EN, MB, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Diesel Generator Intake Plenums	EN, MB, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Exterior Walls (above grade)	EN, FLB, MB, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501

Table 3.5.2-7 Aging Management Review Results - Diesel Generator 'E' Building								
Component/ Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Exterior Walls (below grade)	EN, FLB, SSR	Concrete	Below grade	None	Structures Monitoring Program	N/A	N/A	I, 0501
Foundations	EN, FLB, SSR	Concrete	Below grade	None	Structures Monitoring Program	N/A	N/A	I, 0501
Reinforced Concrete: Walls, floors, and ceilings	EN, FB, FLB, MB, SRE, SSR	Concrete	Protected from weather	None	Structures Monitoring Program Fire Protection Program	N/A N/A	N/A N/A	I, 0501 I, 0501
Roof Slabs	EN, FLB, MB, SSR	Concrete	Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Sumps	SNS	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501

1 Refer to Table 2.0-1 for intended function descriptions.

Table 3.5.2-8 Aging Management Review Results - Turbine Building								
Component/ Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Blowout Panels	PB, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
		Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C
Cranes, including Bridge and Trolley, Rails, and Girders	SNS	Carbon Steel	Protected from weather	Loss of material	Crane Inspection Program	VII.B-3	3.3.1-73	A
Floor Decking	EN, SRE, SNS	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
		Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C
Metal Siding	EN, SRE, SNS	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
		Carbon Steel	Exposed to weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A

Table 3.5.2-8 Aging Management Review Results - Turbine Building

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Roof Decking	EN, SRE, SNS	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
		Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C
Structural Steel: Beams, Columns, Plates, and Trusses (includes welds and bolted connections)	EN, SRE, SNS	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
		Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C
Sump Liners	SNS	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
		Stainless Steel	Protected from weather	None	None	III.B5-5	3.5.1-59	C
Turbine Generator Pedestal Structural Bearing Pads	EN, SNS	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B4-10	3.5.1-39	A
		Urethane	Protected from weather	Cracking Change in material properties	Structures Monitoring Program	III.B4-12	3.5.1-41	A, 0519

Table 3.5.2-8 Aging Management Review Results - Turbine Building

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Exterior Precast Concrete Panels (above grade)	EN, SNS, SRE	Concrete	Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Exterior Walls (above grade)	EN, EXP, FLB, SNS, SRE	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Exterior Walls (below grade)	EN, EXP, FLB, SNS, SRE	Concrete	Below grade	None	Structures Monitoring Program	N/A	N/A	I, 0501
Foundations	EN, EXP, FLB, SNS, SRE	Concrete	Below grade	None	Structures Monitoring Program	N/A	N/A	I, 0501
Main Steam Tunnels	EN, FLB, MB, SHD, SNS	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Masonry Block Walls	EN, FB, FLB, SHD, SNS, SRE	Concrete Blocks	Protected from weather	Cracking	Masonry Wall Program	III.A3-11	3.5.1-43	A
					Fire Protection Program	III.A3-11	3.5.1-43	E, 0516

Table 3.5.2-8 Aging Management Review Results - Turbine Building								
Component/ Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Reinforced Concrete: Walls, floors, and ceilings	EN, FB, FLB, SHD, SNS, SRE	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
					Fire Protection Program	N/A	N/A	I, 0501
Shield Plugs	EN, SHD, SNS, SRE	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Sumps	SNS	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Turbine Generator Pedestals	EN, SNS	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501

1 Refer to Table 2.0-1 for intended function descriptions.

Table 3.5.2-9 Aging Management Review Results - Yard Structures

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Cooling Tower Basin Outlet Screen Guides	SRE	Stainless Steel	Exposed to raw water	Loss of material	Structures Monitoring Program	VII.H2-18	3.3.1-80	E, 0520
Cooling Tower Basin Outlet Screens	SRE	Stainless Steel	Exposed to raw water	Loss of material	Structures Monitoring Program	VII.H2-18	3.3.1-80	E, 0520
Disconnect Switch Support Towers	EN, SNS, SRE	Carbon Steel	Exposed to weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
		Galvanized Steel	Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7	3.5.1-50	C
Manhole Covers	EN, MB, SNS, SRE	Carbon Steel	Exposed to weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
		Galvanized Steel	Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7	3.5.1-50	C
Transmission Towers	EN, SNS, SRE	Galvanized Steel	Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7	3.5.1-50	C

Table 3.5.2-9 Aging Management Review Results - Yard Structures

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Valve Vault and Instrument Pit Hatches	EN, MB, SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.A3-12	3.5.1-25	A
		Galvanized Steel	Protected from weather	None	None	III.B1.1-7	3.5.1-58	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7	3.5.1-50	C
Condensate Storage Tank (CST) Retention Basins	FLB, SNS	Concrete	Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Cooling Tower Basins	SRE	Concrete	Exposed to raw water	Loss of material Cracking	Structures Monitoring Program	III.A6-5	3.5.1-35	E, 0503
			Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501

Table 3.5.2-9 Aging Management Review Results - Yard Structures

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Cooling Tower Basin Outlet Structures	EN, SRE	Concrete	Exposed to raw water	Loss of material Cracking	Structures Monitoring Program	III.A6-5	3.5.1-35	E, 0503
			Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Diesel Generator (DG) Fuel Oil Tank Foundations	SRE, SSR	Concrete (structural backfill)	Below grade/ Buried	None	Structures Monitoring Program	N/A	N/A	I, 0501
Diesel Generator (DG) Fuel Oil Tank Vaults	EN, MB, SRE, SSR	Concrete	Below grade	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Ductbanks	EN, MB, SRE, SSR	Concrete (structural backfill)	Below grade/ Buried	None	Structures Monitoring Program	N/A	N/A	I, 0501

Table 3.5.2-9 Aging Management Review Results - Yard Structures								
Component/ Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Manholes	EN, MB, SRE, SSR	Concrete	Below grade	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Exposed to raw water	Loss of material Cracking	Structures Monitoring Program	III.A6-5	3.5.1-35	G, 0521
Outdoor Tank Foundations: Condensate Storage Tank (CST), Clarified Water Storage Tank (CWST), Refueling Water Storage Tank (RWST)	EN, SNS, SRE	Concrete	Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501

Table 3.5.2-9 Aging Management Review Results - Yard Structures

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Piping Trenches	EN, MB, SNS, SRE, SSR	Concrete (structural backfill)	Below grade/ Buried	None	Structures Monitoring Program	N/A	N/A	I, 0501
Transformer/ Disconnect Switch Foundations (SBO and ESS)	EN, SNS, SRE	Concrete	Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Valve Vaults and Instrument Pits	EN, FLB, MB, SNS, SRE, SSR	Concrete	Below grade	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Exposed to raw water	Loss of material Cracking	Structures Monitoring Program	III.A6-5	3.5.1-35	G, 0521

1 Refer to Table 2.0-1 for intended function descriptions.

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Steel and Other Metals								
Anchorage / Embedments	SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B2-10 III.B3-7 III.B4-10 III.B5-7	3.5.1-39	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-10 III.B3-7 III.B4-10 III.B5-7	3.5.1-39	A
			Exposed to raw water	Loss of material	Structures Monitoring Program	III.A6-11	3.5.1-47	E, 0526
Anchorage / Embedments	SNS, SRE, SSR	Galvanized Steel	Protected from weather	None	None	III.B2-5 III.B3-3 III.B4-5 III.B5-3	3.5.1-58	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7 III.B4-7	3.5.1-50	A
			Exposed to raw water	Loss of material	Structures Monitoring Program	III.A6-11	3.5.1-47	E, 0526

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities								
Component/ Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Anchorage / Embedments	SNS, SRE, SSR	Stainless Steel	Protected from weather	None	None	III.B2-8 III.B3-5 III.B4-8 III.B5-5	3.5.1-59	A
			Exposed to weather	None	None	III.B2-7 III.B4-7	3.5.1-50	I, 0522
Cable Tray and Conduit Supports	SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B2-10	3.5.1-39	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-10	3.5.1-39	A
			Exposed to raw water	Loss of material	Structures Monitoring Program	III.A6-11	3.5.1-47	E, 0526
Cable Tray and Conduit Supports	SNS, SRE, SSR	Galvanized Steel	Protected from weather	None	None	III.B2-5	3.5.1-58	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7	3.5.1-50	A
			Exposed to raw water	Loss of material	Structures Monitoring Program	III.A6-11	3.5.1-47	E, 0526

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Cable Trays and Conduits	EN, FB, SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B2-10	3.5.1-39	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-10	3.5.1-39	C
			Exposed to raw water	Loss of material	Structures Monitoring Program	III.A6-11	3.5.1-47	E, 0526
Cable Trays and Conduits	EN, FB, SNS, SRE, SSR	Galvanized Steel	Protected from weather	None	None	III.B2-5	3.5.1-58	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7	3.5.1-50	C
			Exposed to raw water	Loss of material	Structures Monitoring Program	III.A6-11	3.5.1-47	E, 0526

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Component and Piping Supports (ASME Class 1, 2, 3 and MC)	SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	ISI-IWF	III.B1.1-13 III.B1.2-10 III.B1.3-10	3.5.1-53	A
			Exposed to weather	Loss of material	ISI-IWF	III.B1.1-13 III.B1.2-10 III.B1.3-10	3.5.1-53	A
			Exposed to treated water	Loss of material	ISI-IWF BWR Water Chemistry Program	III.B1.1-11	3.5.1-49	A
			Exposed to raw water	Loss of material	Structures Monitoring Program	III.A6-11	3.5.1-47	E

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Component and Piping Supports (ASME Class 1, 2, 3 and MC)	SNS, SRE, SSR	Galvanized Steel	Protected from weather	None	None	III.B1.1-7 III.B1.2-5 III.B1.3-5	3.5.1-58	A
			Exposed to weather	Loss of material	ISI-IWF	III.B2-7 III.B4-7	3.5.1-50	E
			Exposed to treated water	Loss of material	ISI-IWF BWR Water Chemistry Program	III.B1.1-11	3.5.1-49	A
			Exposed to raw water	Loss of material	Structures Monitoring Program	III.A6-11	3.5.1-47	E
Component and Piping Supports (ASME Class 1, 2, 3 and MC)	SNS, SRE, SSR	Stainless Steel	Protected from weather	None	None	III.B1.1-9 III.B1.2-7 III.B1.3-7	3.5.1-59	A
			Exposed to weather	None	None	III.B2-7 III.B4-7	3.5.1-50	I, 0522
			Exposed to treated water	Loss of material	ISI-IWF BWR Water Chemistry Program	III.B1.1-11	3.5.1-49	A
			Exposed to raw water	Loss of material	ISI-IWF	VII.C3-7	3.3.1-78	E, 0523

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Damper Framing (in-wall)	SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B2-10	3.5.1-39	A
		Galvanized Steel	Protected from weather	None	None	III.B2-5	3.5.1-58	C
Electrical and Instrument Panels and Enclosures	EN, SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B3-7	3.5.1-39	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-10	3.5.1-39	C
		Galvanized Steel	Protected from weather	None	None	III.B3-3	3.5.1-58	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7	3.5.1-50	C

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Equipment Component Supports	SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B2-10 III.B3-7 III.B4-10 III.B5-7	3.5.1-39	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-10 III.B3-7 III.B4-10 III.B5-7	3.5.1-39	A
			Exposed to raw water	Loss of material	Structures Monitoring Program	III.A6-11	3.5.1-47	E, 0526
Equipment Component Supports	SNS, SRE, SSR	Galvanized Steel	Protected from weather	None	None	III.B2-5 III.B3-3 III.B4-5 III.B5-3	3.5.1-58	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7 III.B4-7	3.5.1-50	A
			Exposed to raw water	Loss of material	Structures Monitoring Program	III.A6-11	3.5.1-47	E, 0526

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Equipment Component Supports	SNS, SRE, SSR	Stainless Steel	Protected from weather	None	None	III.B2-8 III.B3-5 III.B4-8 III.B5-5	3.5.1-59	A
			Exposed to weather	None	None	III.B2-7 III.B4-7	3.5.1-50	I, 0522
Fire Doors	FB, SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Fire Protection Program	VII.G-3	3.3.1-63	B
					Structures Monitoring Program	III.B4-10	3.5.1-39	C
			Exposed to weather	Loss of material	Fire Protection Program	VII.G-4	3.3.1-63	B
					Structures Monitoring Program	III.B4-10	3.5.1-39	C

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Fire Doors	FB, SNS, SRE, SSR	Galvanized Steel	Protected from weather	None	Fire Protection Program	VII.G-3	3.3.1-63	I, 0501
					Structures Monitoring Program	III.B4-5	3.5.1-58	C
			Exposed to weather	Loss of material	Fire Protection Program	VII.G-4	3.3.1-63	B
					Structures Monitoring Program	III.B4-7	3.5.1-50	C
Flood, Pressure, and Specialty Doors	FB, FLB, MB, PB, SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B4-10	3.5.1-39	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B4-10	3.5.1-39	C
Flood, Pressure, and Specialty Doors	FB, FLB, MB, PB, SNS, SRE, SSR	Galvanized Steel	Protected from weather	None	None	III.B4-5	3.5.1-58	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B4-7	3.5.1-50	C

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Hatches	EN, FB, FLB, MB, PB, SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B4-10	3.5.1-39	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B4-10	3.5.1-39	C
		Galvanized Steel	Protected from weather	None	None	III.B4-5	3.5.1-58	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B4-7	3.5.1-50	C
HELB Barriers	HELB, PW, SNS, SSR	Aluminum	Protected from weather	None	None	III.B5-2	3.5.1-58	C
		Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B5-7	3.5.1-39	C
		Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C
HVAC Duct Supports	SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B2-10	3.5.1-39	A
		Galvanized Steel	Protected from weather	None	None	III.B2-5	3.5.1-58	A

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Instrument Racks and Frames	SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B3-7	3.5.1-39	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B3-7	3.5.1-39	C
		Galvanized Steel	Protected from weather	None	None	III.B3-3	3.5.1-58	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7	3.5.1-50	C
Long Term Scaffolding Platforms	SNS	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B5-7	3.5.1-39	C
		Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C
Monorails, Hoists and Miscellaneous Cranes	SNS	Carbon Steel	Protected from weather	Loss of material	Crane Inspection Program	VII.B-3	3.3.1-73	A

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Penetrations (Mechanical and Electrical, non Primary Containment boundary)	EN, FB, FLB, PB, SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B2-10	3.5.1-39	C
Pipe Supports	SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B2-10 III.B4-10	3.5.1-39	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-10 III.B4-10	3.5.1-39	A
			Exposed to raw water	Loss of material	Structures Monitoring Program	III.A6-11	3.5.1-47	E, 0526
Pipe Supports	SNS, SRE, SSR	Galvanized Steel	Protected from weather	None	None	III.B2-5 III.B4-5	3.5.1-58	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7 III.B4-7	3.5.1-50	A
			Exposed to raw water	Loss of material	Structures Monitoring Program	III.A6-11	3.5.1-47	E, 0526

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Pipe Supports	SNS, SRE, SSR	Stainless Steel	Protected from weather	None	None	III.B2-8 III.B4-8	3.5.1-59	A
			Exposed to weather	None	None	III.B2-7 III.B4-7	3.5.1-50	I, 0522
Stair, Ladder, Platform, and Grating Supports	SNS, SRE	Aluminum	Protected from weather	None	None	III.B5-2	3.5.1-58	A
			Exposed to weather	None	None	III.B4-7	3.5.1-50	I, 0522
Stair, Ladder, Platform, and Grating Supports	SNS, SRE	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B5-7	3.5.1-39	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B5-7	3.5.1-39	A
Stair, Ladder, Platform, and Grating Supports	SNS, SRE	Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7	3.5.1-50	A
Stairs, Ladders, Platforms, and Gratings	SNS, SRE	Aluminum	Protected from weather	None	None	III.B5-2	3.5.1-58	C
			Exposed to weather	None	None	III.B4-7	3.5.1-50	I, 0522

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Stairs, Ladders, Platforms, and Gratings	SNS, SRE	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B5-7	3.5.1-39	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B5-7	3.5.1-39	C
Stairs, Ladders, Platforms, and Gratings	SNS, SRE	Galvanized Steel	Protected from weather	None	None	III.B5-3	3.5.1-58	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7	3.5.1-50	C
Tube Track Supports	SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B2-10	3.5.1-39	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-10	3.5.1-39	A
		Galvanized Steel	Protected from weather	None	None	III.B2-5	3.5.1-58	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7	3.5.1-50	A

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Tube Tracks	SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B2-10	3.5.1-39	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-10	3.5.1-39	C
		Galvanized Steel	Protected from weather	None	None	III.B2-5	3.5.1-58	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7	3.5.1-50	C
Vents and Louvers	FB, SNS, SRE, SSR	Aluminum	Protected from weather	None	None	III.B2-4	3.5.1-58	C
			Exposed to weather	None	None	III.B2-7	3.5.1-50	I, 0522
		Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B2-10	3.5.1-39	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-10	3.5.1-39	C
		Galvanized Steel	Protected from weather	None	None	III.B2-5	3.5.1-58	C
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7	3.5.1-50	C

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Vibration Isolators	SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B4-10	3.5.1-39	C
Threaded Fasteners								
Anchor Bolts	SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B2-10 III.B3-7 III.B4-10 III.B5-7	3.5.1-39	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-10 III.B3-7 III.B4-10 III.B5-7	3.5.1-39	A
			Exposed to raw water	Loss of material	Structures Monitoring Program	III.A6-11	3.5.1-47	E, 0526
Anchor Bolts	SNS, SRE, SSR	Galvanized Steel	Protected from weather	None	None	III.B2-5 III.B3-3 III.B4-5 III.B5-3	3.5.1-58	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7 III.B4-7	3.5.1-50	A
			Exposed to raw water	Loss of material	Structures Monitoring Program	III.A6-11	3.5.1-47	E, 0526

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities								
Component/ Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Anchor Bolts	SNS, SRE, SSR	Stainless Steel	Protected from weather	None	None	III.B2-8 III.B3-5 III.B4-8 III.B5-5	3.5.1-59	A
			Exposed to weather	None	None	III.B2-7 III.B4-7	3.5.1-50	I, 0522
Anchor Bolts (ASME Class 1, 2, 3 and MC Supports Bolting)	SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	ISI-IWF	III.B1.1-13 III.B1.2-10 III.B1.3-10	3.5.1-53	A
			Exposed to weather	Loss of material	ISI-IWF	III.B1.1-13 III.B1.2-10 III.B1.3-10	3.5.1-53	A
			Exposed to treated water	Loss of material	ISI-IWF BWR Water Chemistry Program	III.B1.1-11	3.5.1-49	A

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Anchor Bolts (ASME Class 1, 2, 3 and MC Supports Bolting)	SNS, SRE, SSR	Galvanized Steel	Protected from weather	None	None	III.B1.1-7 III.B1.2-5 III.B1.3-5	3.5.1-58	A
			Exposed to weather	Loss of material	ISI-IWF	III.B2-7 III.B4-7	3.5.1-50	E
			Exposed to treated water	Loss of material	ISI-IWF BWR Water Chemistry Program	III.B1.1-11	3.5.1-49	A
Anchor Bolts (ASME Class 1, 2, 3 and MC Supports Bolting)	SNS, SRE, SSR	Stainless Steel	Protected from weather	None	None	III.B1.1-9 III.B1.2-7 III.B1.3-7	3.5.1-59	A
			Exposed to weather	None	None	III.B2-7 III.B4-7	3.5.1-50	I, 0522
			Exposed to treated water	Loss of material	ISI-IWF BWR Water Chemistry Program	III.B1.1-11	3.5.1-49	A

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Expansion Anchors	SNS, SRE, SSR	Carbon Steel	Protected from weather	Loss of material	Structures Monitoring Program	III.B2-10 III.B3-7 III.B4-10 III.B5-7	3.5.1-39	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-10 III.B3-7 III.B4-10 III.B5-7	3.5.1-39	A
			Exposed to raw water	Loss of material	Structures Monitoring Program	III.A6-11	3.5.1-47	E, 0526
Expansion Anchors	SNS, SRE, SSR	Galvanized Steel	Protected from weather	None	None	III.B2-5 III.B3-3 III.B4-5 III.B5-3	3.5.1-58	A
			Exposed to weather	Loss of material	Structures Monitoring Program	III.B2-7 III.B4-7	3.5.1-50	A
			Exposed to raw water	Loss of material	Structures Monitoring Program	III.A6-11	3.5.1-47	E, 0526

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities								
Component/ Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Expansion Anchors	SNS, SRE, SSR	Stainless Steel	Protected from weather	None	None	III.B2-8 III.B3-5 III.B4-8 III.B5-5	3.5.1-59	A
			Exposed to weather	None	None	III.B2-7 III.B4-7	3.5.1-50	I, 0522
Concrete Components								
Equipment Pads	SNS, SRE, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Flood Curbs	FLB, SNS, SRE, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
Hatches	EN, FB, FLB, MB, PB, SHD, SNS, SRE, SSR	Concrete	Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities								
Component/ Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Support Pedestals	SNS, SRE, SSR	Concrete	Below grade	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Protected from weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Exposed to weather	None	Structures Monitoring Program	N/A	N/A	I, 0501
			Exposed to raw water	Loss of material Cracking	Structures Monitoring Program	III.A6-5	3.5.1-35	E, 0503
Elastomeric Components								
Building Pressure Boundary Sealant	PB, SNS, SSR	Elastomer	Protected from weather	Cracking Change in material properties	Structures Monitoring Program	III.A6-12	3.5.1-44	C, 0525

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Compressible Joints and Seals	EXP, FLB, SNS	Elastomer	Protected from weather	Cracking Change in material properties	Structures Monitoring Program	III.A6-12	3.5.1-44	C, 0525
			Exposed to weather	Cracking Change in material properties	Structures Monitoring Program	III.A6-12	3.5.1-44	C, 0525
Expansion Bellows (Non containment pressure boundary)	EXP, SNS	Rubber	Below grade	None	None	N/A	N/A	J
Expansion Bellows (Non containment pressure boundary)	SNS	Rubber	Exposed to weather	Cracking Change in material properties	Structures Monitoring Program	III.A6-12	3.5.1-44	C, 0525
Reactor Cavity Seal Rings	FLB, SSR	Elastomer	Protected from weather	Cracking Change in material properties	Structures Monitoring Program	III.A6-12	3.5.1-44	C, 0525

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Roof Membrane	FLB, SNS	Elastomer / Built-up Roofing	Protected from weather	Cracking Change in material properties	Structures Monitoring Program	III.A6-12	3.5.1-44	C, 0525
			Exposed to weather	Cracking Change in material properties	Structures Monitoring Program	III.A6-12	3.5.1-44	C, 0525
Waterproofing Membrane	FLB, SNS	Elastomer	Below grade	None	None	N/A	N/A	J
Waterstops	FLB, SNS	Elastomer	Below grade	None	None	N/A	N/A	J
			Protected from weather (within walls, floors or foundations)	None	None	N/A	N/A	J
Fire Barrier Commodities								
Fire Wraps	FB, SNS, SRE, SSR	Acoustic ceiling tiles, gypsum boards, ceramic fibers, Thermolag	Protected from weather	None	None	N/A	N/A	J

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities								
Component/ Commodity	**Intended Function[1]**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Fire Stops	FB, FLB, PB, SNS, SRE, SSR	Silicone Elastomer	Protected from weather	Cracking/ Delamination/ Separation Change in material properties	Fire Protection Program	VII.G-1	3.3.1-61	B, 0524
Fireproofing	FB, SNS, SRE, SSR	Pryocrete, Grout	Protected from weather	None	None	N/A	N/A	J
Insulating Materials								
Insulation	Insulation	Calcium silicate, fiberglass, Flexible “Min-K” (ceramic), woven glass fiber, ceramic fiber	Protected from weather	None	None	N/A	N/A	J
Insulation	Insulation	Stainless Steel (reflective metal)	Protected from weather	None	None	VII.J-15	3.3.1-94	C, 0527
Insulation	Insulation Jacket Integrity	Aluminum	Protected from weather	None	None	V.F-2	3.2.1-50	C
Insulation	Insulation Jacket Integrity	Aluminum	Exposed to weather	None	None	N/A	N/A	J

Table 3.5.2-10 Aging Management Review Results - Bulk Commodities

Component/ Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Insulation	Insulation Jacket Integrity	Stainless Steel	Protected from weather	None	None	VII.J-15	3.3.1-94	C

1 Refer to Table 2.0-1 for intended function descriptions.

Generic Notes:	
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 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
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:	
0501	No applicable aging effects have been identified for the component type. However, the identified AMP will be used to confirm the absence of significant aging effects for the period of extended operation.
0502	GALL item II.B2.2-10 indicates the moisture barrier, at the junction where the shell or liner becomes embedded, is subject to aging management activities in accordance with ASME Section XI, Subsection IWE requirements. SSES drywell floor is steel lined. There are no concrete to metal moisture barriers therefore the GALL text regarding moisture barrier is not applicable.
0503	The GALL item for freeze-thaw does not list exposed to raw water environment for water-control structures. Freeze-thaw may be possible near the water line. This environment is both exposed to weather and exposed to raw water; therefore environment is considered a match. The identified AMP is used to manage aging effects for the period of extended operation.
0504	The refueling stainless steel bellows perform their functions during refueling preventing water from entering the drywell. The bellows are not subjected to cyclic loading during refueling. The normal environment experienced by the refueling bellows is warm, dry air, with short periods of demineralized water contact during refueling.
0505	Fixed and removable boxed lead shield plates are installed on top of the seal plates for radiation shielding purpose during refueling. 1/2 or 1 inch thick lead sheets are stacked and are enclosed in a stainless steel welded box. The lead sheets within the welded box have no applicable aging effects.
0506	The process line penetrations are of welded steel construction without expansion bellows, gaskets or sealing compounds. Containment piping and mechanical penetrations do not contain thermal insulation.
0507	Plant Technical Specification ensures Primary Containment is operable and that access airlocks maintain leak tightness in the closed position.
0508	In addition to ISI-IWE and Containment Leakage Rate Test Program as AMP, the BWR Water Chemistry Program is credited with the elimination of excessive chlorides and sulfates from the water.
0509	Lead shielding has no applicable aging effects requiring management.
0510	The listed AMP is a plant specific AMP for this item. SSES plant specific AMR concluded Boral does not require aging management for the period of extended operation for its neutron absorbing function; aging management for loss of material of its aluminum constituent is required.

Plant-Specific Notes:	
0511	The new fuel storage racks are located in a dry mild environment inside the watertight new fuel storage vault. The new fuel storage racks are made from aluminum with stainless steel fasteners. The use of stainless steel fasteners in aluminum to avoid detrimental galvanic corrosion in a predominantly air environment, is a recommended practice and has been used successfully for many years by the aluminum industry.
0512	The new fuel storage vault cover system includes carbon steel leak tight removable covers, aluminum grating, and 1 inch thick stainless steel barrier plates. Loss of material aging effect is associated with the carbon steel cover, which is the limiting component. Stainless steel and aluminum protected from weather have no aging effects requiring management.
0513	The AMP manages loss of material due to crevice and/or pitting corrosion. Cracking due to SCC is not applicable.
0514	The gates have the same material and experience the same environment as the spent fuel pool liner. The BWR Water Chemistry Program manages loss of material due to crevice and/or pitting corrosion. Cracking due to SCC is not applicable. Since the gates are part of the fuel pool water containment boundary, monitoring of fuel pool level and leak chase channels activities also indirectly manage this component.
0515	This GALL item specifies the AMP is to be augmented by an “One-Time Inspection.” Augmented One-time inspection is not applicable to the spent fuel pool since it is not considered a low flow or stagnant flow area. Also, GALL Chapter VII.A2 Spent Fuel Storage does not require Water Chemistry to be augmented by a “One-Time Inspection.” Augmented inspection applies to piping, piping components, and piping elements, not the spent fuel racks.
0516	Masonry walls with a Fire Barrier (FB) intended function receive additional inspection as part of the Fire Protection Program.
0517	Due to the conditions typically prevalent in raw water environments and the resulting eventual deterioration of protective coatings, galvanized steel exposed to a raw water environment is conservatively expected to experience the same aging effects as carbon steel.
0518	The Arboron flooring system panels consist of cellulose based laminate impregnated with thermosetting resins. They are used as raised floor and are located in a mild temperature and humidity controlled environment. SSES plant specific evaluation concluded no aging management is required for Arboron flooring panels.
0519	SSES AMR concluded cracking and change in material properties are aging effects requiring management for this component. The GALL item lists reduction or loss of isolation function due to radiation hardening, temperature, humidity, sustained vibratory loading. The AMP is the same.
0520	Component is different; NUREG-1801 line item represents the closest material, environment and aging effect combination.

Plant-Specific Notes:	
0521	The GALL does not list exposed to raw water environment for this component type. SSES operating experience has shown cases of water accumulating in manholes. Therefore, aging mechanisms pertaining to raw water environments are also applicable within manholes, valve vaults, and instrument pits. The identified AMP is used to manage aging effects for the period of extended operation.
0522	The GALL item lists loss of material as an aging effect. This aging effect was determined not applicable since SSES is located in an in-land rural environment and is not exposed to aggressive environmental conditions. Component external surfaces are not continuously wetted or exposed to an aggressive ambient environment (such as a saltwater atmosphere, sulfur dioxide, etc.) or industrial locations.
0523	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. The GALL does not list exposed to raw water environment for support components. The identified AMP is used to manage aging effects for the period of extended operation.
0524	Ionizing radiation is an applicable aging mechanism for elastomers located in areas where the radiation exceeds threshold. Ionizing radiation mechanism does not apply to elastomers located in mild radiation areas.
0525	The GALL lists loss of sealing aging effect for elastomer. Loss of sealing is not considered as an aging effect but rather a consequence of elastomer degradation. This effect may be caused by cracking and/or change in material properties for elastomeric material. Note C is used since the GALL item is intended for Group 6 - water-control structures' components, the line item covers all in-scope structures.
0526	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. SSES operating experience has shown cases of water accumulating in manholes. Therefore, aging mechanisms pertaining to raw water environments are also applicable within manholes, valve vaults, and instrument pits.
0527	Insulation inside the Primary Containment drywell was evaluated for impact on Emergency Core Cooling (ECCS) suction strainers. The strainers were modified to accommodate postulated debris loads, including insulation.

3.6 AGING MANAGEMENT OF ELECTRICAL AND INSTRUMENTATION AND CONTROLS

3.6.1 Introduction

Section 3.6 provides the results of the aging management reviews (AMRs) for those components/commodities identified in Section 2.5, Scoping and Screening Results – Electrical and Instrumentation and Control Systems, subject to aging management review. The components/commodities subject to aging management review are:

- Non-EQ Insulated Cables and Connections
- Metal-Enclosed Bus (non-segregated)
- High-Voltage Insulators
- Transmission Conductors and Connections

Table 3.6.1, Summary of Aging Management Programs for Electrical and I&C Components Evaluated in Chapter VI of the GALL Report, provides the summary of the programs evaluated in NUREG-1801 that are applicable to component / commodity groups in this section.

3.6.2 Results

The following table summarizes the results of the aging management review for the components/commodities in the Electrical and I&C Systems area:

Table 3.6.2-1 Aging Management Review Results - Electrical and I&C Components

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

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

3.6.2.1.1 Non-EQ Insulated Cables and Connections

The Non-EQ Insulated Cables and Connections commodity group was subdivided for aging management review into the following categories:

- Non-EQ Insulated Cables and Connections
- Non-EQ Low-Current Instrument Cables and Connections
- Non-EQ Medium Voltage Power Cables
- Non-EQ Electrical Cable Connections (Metallic Parts)
- Fuse Holders (Insulation, Metallic Clamp)

Materials

The materials of construction for the Insulated Cables and Connections are:

- I&C Cable Insulation
  - EP, EPDM, EPR, Hypalon, Kapton, Silicone Rubber, Teflon (FEP), Tefzel, XLP, XLPE, XLPO
- Power Cable Insulation
  - EP, EPR, HTK (Kerite), Hypalon, Silicone Rubber, XLP, XLPE, XLPO
- Connections (Insulation)
  - EPDM, EPR, Kapton, Melamine, Nylon, Phenolic, XLP, XLPE, XLPO
- All Cable and Connections (Conductors/Connections)
  - Various Metals

Environments

The Non-EQ Insulated Cables and Connections are exposed to the following environments (adverse localized environments of):

- Heat, Oxygen
- Radiation, Oxygen
- Moisture and Voltage Stress

Aging Effects Requiring Management

Based on analysis of the 60-year service limiting environments for the insulating materials, aging effects were identified for some non-EQ insulated cables and connections. Certain non-EQ, inaccessible medium-voltage cables that are exposed to wetting also have aging effects associated with the moisture and voltage stress

involved. The aging effects requiring management that are assumed for all the Non-EQ Cables and Connections exposed to adverse localized environments are the following:

- Reduced Insulation Resistance
- Electrical Failure (breakdown of insulation)

NUREG-1801, Section XI.E6, addresses the metallic parts of electrical cable connections (such as splices, lugs, connectors, and terminal blocks), and also highlights the following aging stressors: thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion, and oxidation.

Based on the evaluation of the stressors identified in NUREG-1801, Section XI.E6, and the operating and service conditions of the metallic parts of the electrical cable connections at SSES, there are no aging effects requiring management identified for SSES. However, to provide reasonable assurance that the function of the metallic parts of the electrical cable connections is maintained through the period of extended operation, SSES will implement an aging management program to follow the recommendation of NUREG-1801, Section XI.E6.

Aging Management Programs

The following aging management programs manage the aging effects for the Non-EQ Cables and Connections components:

- Non-EQ Electrical Cables and Connections Visual Inspection Program
- Non-EQ Cables and Connections Used in Low-Current Instrumentation Circuits Program
- Non-EQ Inaccessible Medium-Voltage Cables Program
- Non-EQ Electrical Cable Connections Program

3.6.2.1.2 Metal-Enclosed Bus (non-segregated)

The Metal-Enclosed Bus (non-segregated) commodity group was subdivided for aging management review into the following categories:

- Metal-Enclosed Bus, Non-Segregated (Bus and Connections)
- Metal Enclosed Bus, Non-Segregated (Enclosure Assemblies)
- Metal-Enclosed Bus, Non-Segregated (Insulation and Insulators)

Materials

The materials of construction for the Metal-Enclosed Bus components are:

- Aluminum
- Steel
- Galvanized Steel
- Copper
- Porcelain
- Fiberglass
- PVC
- Noryl (elastomer)
- Caulk (elastomer - enclosures)

Environments

The Metal-Enclosed Bus components are exposed to the following environments:

- Indoor/Outdoor Air

Aging Effects Requiring Management

The following aging effects require management for the Metal-Enclosed Bus components:

- Loosening of Bolted Connections / Thermal Cycling and Ohmic Heating
- Hardening and Loss of Strength / Elastomeric Degradation
- Reduced Insulation Resistance
- Electrical Failure (breakdown of insulation)

Aging Management Programs

The following aging management programs manage the aging effects for the Metal-Enclosed Bus components:

- Metal-Enclosed Bus Inspection Program

3.6.2.1.3 High-Voltage Insulators

Materials

The materials of construction for the High-Voltage Insulators are:

- Porcelain
- Metal
- Cement

Environments

The High-Voltage Insulators are exposed to the following environment:

- Outdoor Air

Aging Effects Requiring Management

The following aging effects require management for the High-Voltage Insulator components:

- None Identified (See Section 3.6.2.2.2)

Aging Management Programs

Because there are no aging effects requiring management, there are no aging management programs required for the High-Voltage Insulators.

3.6.2.1.4 Transmission Conductors and Connections

Materials

Transmission conductors are Type ACSR (aluminum conductor steel reinforced). The materials of construction for the Transmission Conductor and Connection components are:

- Aluminum
- Galvanized Steel

Environments

The Transmission Conductor and Connection components are exposed to the following environment:

- Outdoor Air

Aging Effects Requiring Management

The following aging effects require management for the Transmission Conductor and Connection components:

- None Identified (See Section 3.6.2.2.3)

Aging Management Programs

Because there are no aging effects requiring management identified, there are no aging management programs required for the Transmission Conductors and Connections.

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

For the SSES Electrical and I&C components, the items which require further evaluation (as detailed in NUREG-1801) are addressed in the following sections.

3.6.2.2.1 Electrical Equipment Subject to Environmental Qualification

Environmental qualification is a time-limited aging analysis (TLAA) as defined in 10 CFR 54.3. TLAAs are required to be evaluated in accordance with 10 CFR 54.21(c)(1). The evaluation of this TLAA is addressed separately in Section 4.4 of the LRA.

3.6.2.2.2 Degradation of Insulator Quality due to Presence of Any Salt Deposits and Surface Contamination, and Loss of Material due to Mechanical Wear

There are no aging effects identified that require aging management for the high-voltage insulators subject to aging management review for SSES. Due to its inland location, salt spray from the ocean is not of concern at SSES. The rural location of SSES provides for minimal contamination from industrial effluents. The buildup of surface contaminants is gradual and is periodically washed away by rainfall. Therefore, contamination is not identified as an aging mechanism. The high-voltage insulators within the scope of license renewal for SSES are connected to rigid components, such

that significant movement is not considered as a stressor, and wear is not identified as an aging mechanism.

3.6.2.2.3 Loss of Material due to Wind-Induced Abrasion and Fatigue, Loss of Conductor Strength due to Corrosion, and Increased Resistance of Connection due to Oxidation or Loss of Pre-Load

There is no switchyard bus within the scope of license renewal for SSES. For the transmission conductors and connections subject to aging management review for SSES, there are no aging effects identified that require aging management. The effects of wind do not require aging management as the sections of transmission conductor in the scope of license renewal are short in length, rigid, and connected to rigid components.

Loss of conductor strength due to corrosion of the transmission conductor is not identified as an aging effect due to ample design margin and a minimal corrosion process at the rural location of SSES. Connection resistance is not identified as a stressor based on the use of good bolting practices and review of site operating experience.

EPRI 1003057, the License Renewal Electrical Handbook, concludes that the most prevalent aging mechanism contributing to loss of conductor strength of ACSR (aluminum conductor steel reinforced) transmission conductors is corrosion. For ACSR conductors, degradation begins as a loss of zinc from the galvanized steel core wires. Corrosion rates depend largely on air quality, which involves suspended particles in the air, SO_2 concentration, rain, fog chemistry, and other weather conditions. Corrosion of ACSR conductors is a very slow process that is even slower in rural areas with less air pollution. SSES is located in a rural area in north-central Pennsylvania where airborne particle concentrations are comparatively low.

Tests performed by Ontario Hydroelectric showed a 30% composite loss of conductor strength for an 80 year-old sample of an ACSR conductor (due to corrosion). With respect to the Ontario Hydroelectric study, the National Electrical Safety Code (NESC) requires that tension on installed conductors be a maximum of 60% of the ultimate conductor strength and that consideration for ice, wind, and temperature be included in the design. The discussion in EPRI 1003057 demonstrates that with a 30% loss of conductor strength, there is still margin between the NESC requirements and the actual conductor strength. Because the SSES transmission conductor design and installation meet the NESC requirements, the Ontario Hydroelectric study is considered to bound the SSES configuration.

Therefore, based on the expected low corrosion rates due to plant location and the margins included in the design, corrosion of the transmission conductors is not considered a significant aging effect for the period of extended operation.

Increased connection resistance is not identified as an aging effect requiring management. Bolted connections associated with the transmission conductors employ the use of good bolting practices consistent with the recommendations of EPRI 1003471, "Electrical Connector Application Guidelines". Bolting hardware is selected to be compatible with the lugs used on the transmission conductors and Belleville washers are used to compensate for temperature changes and to maintain proper tightness. The review of site operating experience revealed no bolted connection failures associated with transmission conductors at SSES.

3.6.2.2.4 Quality Assurance for Aging Management of Nonsafety-Related Components

Quality Assurance provisions applicable to license renewal are discussed in Appendix B, Section B.1.3, of the LRA.

3.6.2.3 Aging Management Review Results Not Consistent with NUREG-1801

3.6.2.3.1 Fuse Holders (Not Part of a Larger Assembly) – Metallic Clamp

Twenty fuse boxes (containing only fuses and terminal blocks) were identified within the license renewal scope for SSES. Sixteen contain power and control fuses in the plant direct current (DC) power systems and four contain 6-amp fuses associated with the control room emergency lighting system. Of these twenty, none contain fuses that are pulled from their metallic clamps more than once per year. Therefore, none of these specified fuse holders has a metallic clamp that will exhibit the aging mechanisms/ effects of fatigue and/or frequent manipulation listed in NUREG-1801, Item VI.A-8. The other aging mechanisms/ effects detailed in NUREG-1801, Item VI.A-8 (ohmic heating, thermal cycling, electrical transients, vibration, chemical contamination, corrosion, and oxidation) are addressed in the following paragraphs.

The fuse holders are located in metallic electrical boxes (terminal boxes) which have covers that protect the interior of the box from the environment. The boxes are not exposed to weather (they are located indoors at SSES); they are not exposed to chemical contamination or spills (and such occurrences would be event-driven situations in any case); they are not exposed to mechanical stresses inside the boxes; and (due to the SSES location in rural PA) they are not operated in an environment of industrial pollution or salt deposition. Therefore, chemical contamination, corrosion, and oxidation are not applicable aging effects for the metallic clamps of the fuse holders within the license renewal scope at SSES.

With respect to electrical transients and ohmic heating, these fuses are not heavily loaded and do not experience frequent electrical and thermal cycling. The power fuses with bolted connections use Belleville washers to maintain good electrical contact in the event of any differential thermal expansion. In addition, since the power fuses are removed once every 4 to 6 years during battery surveillances, the bolted connections are not subject to loosening from long-term age related degradation. With respect to vibration, it is an induced aging mechanism (from equipment such as compressors, pumps, fans, etc.). Because the electrical boxes are mounted on walls, vibration is not an applicable aging mechanism. Wear and fatigue for the metallic clamp are caused by repeated removal and insertion of fuses. By design, these fuses are not removed more than once per year; therefore, fatigue due to frequent manipulation does not apply. Therefore, electrical transients, ohmic heating, vibration, and fatigue are not applicable aging mechanism/effects for the metallic clamps of the fuse holders within the license renewal scope at SSES.

3.6.2.4 Time-Limited Aging Analysis

The Time-Limited Aging Analysis (TLAA) identified below is associated with the Electrical and I&C System components. The section of the application that contains the TLAA review results is indicated in parentheses.

- Environmental Qualification (Section 4.4, Environmental Qualification of Electrical Equipment)

3.6.3 Conclusions

The Electrical and I&C components/commodities subject to aging management have been identified in accordance with 10 CFR 54.21. The aging management programs selected to manage the effects of aging for the electrical components/commodities are identified in the following tables and Section 3.6.2.1. A description of the aging management programs is provided in Appendix B of this application, along with the demonstration that the identified aging effects will be managed for the period of extended operation.

Therefore, based on the demonstration provided in Appendix B, the effects of aging associated with the Electrical and I&C components/commodities will be managed so that there is reasonable assurance that the intended functions will be maintained consistent with the current licensing basis during the period of extended operation.

Table 3.6.1 Summary of Aging Management Programs for Electrical and I&C Components Evaluated in Chapter VI of the GALL Report

Item Number	Component / Commodity	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.6.1-01	Electrical equipment subject to 10 CFR 50.49 environmental qualification (EQ) requirements	Degradation due to various aging mechanisms	Environmental Qualification of Electrical Components	Yes, TLAA	This TLAA is further evaluated in Section 4.4. Further evaluation is documented in Section 3.6.2.2.1.
3.6.1-02	Electrical cables, connections, and fuse holders (insulation) not subject to 10 CFR 50.49 EQ requirements	Reduced insulation resistance and electrical failure due to various physical, thermal, radiolytic, photolytic, and chemical mechanisms	Electrical Cables and Connections Not Subject to 10 CFR 50.49 EQ Requirements	No	Consistent with NUREG-1801.
3.6.1-03	Conductor insulation for electrical cables and connections used in instrumentation circuits not subject to 10 CFR 50.49 EQ requirements that are sensitive to reduction in conductor insulation resistance (IR)	Reduced insulation resistance and electrical failure due to various physical, thermal, radiolytic, photolytic, and chemical mechanisms	Electrical Cables and Connections Used in Instrumentation Circuits Not Subject to 10 CFR 50.49 EQ Requirements	No	Consistent with NUREG-1801.
3.6.1-04	Conductor insulation for inaccessible medium-voltage (2 kV to 15 kV) cables (e.g., installed in conduit or direct buried) not subject to 10 CFR 50.49 EQ requirements	Localized damage and breakdown of insulation leading to electrical failure due to moisture intrusion, water trees	Inaccessible Medium-Voltage Cables Not Subject to 10 CFR 50.49 EQ Requirements	No	Consistent with NUREG-1801.

Table 3.6.1 Summary of Aging Management Programs for Electrical and I&C Components Evaluated in Chapter VI of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.6.1-05	PWR Only				
3.6.1-06	Fuse Holders (Not Part of a Larger Assembly): Fuse Holders – metallic clamp	Fatigue due to ohmic heating, thermal cycling, electrical transients, frequent manipulation, vibration, chemical contamination, corrosion, and oxidation	Fuse Holders	No	The aging effects detailed in NUREG-1801 are not applicable for this item at SSES. None of the fuse holders that are within the scope of license renewal contain fuses that are frequently manipulated, and inspection of a sample of the in-scope fuse boxes showed that conditions are clean and dry, with no corrosion or moisture intrusion. Additional information for this item is presented in Section 3.6.2.3.1.
3.6.1-07	Metal-enclosed bus – Bus/connections	Loosening of bolted connections due to thermal cycling and ohmic heating	Metal-Enclosed Bus	No	Consistent with NUREG-1801.
3.6.1-08	Metal-enclosed bus – Insulation/insulators	Reduced insulation resistance and electrical failure due to various physical, thermal, radiolytic, photolytic, and chemical mechanisms	Metal-Enclosed Bus	No	Consistent with NUREG-1801.

Table 3.6.1 Summary of Aging Management Programs for Electrical and I&C Components Evaluated in Chapter VI of the GALL Report					
Item Number	**Component / Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.6.1-09	Metal-enclosed bus – Enclosure assemblies	Loss of material due to general corrosion	Structures Monitoring Program	No	At SSES, in addition to steel and galvanized steel enclosures, aluminum enclosures are also used.
3.6.1-10	Metal-enclosed bus – Enclosure Assemblies	Hardening and loss of strength due to elastomer degradation	Structures Monitoring Program	No	For SSES, this aging effect will be managed by the Metal-Enclosed Bus Inspection Program. Additional information is documented in Table 3.6.2-1.
3.6.1-11	High-Voltage Insulators	Degradation of insulation quality due to the presence of any salt deposits and surface contamination; Loss of material caused by mechanical wear due to wind blowing on transmission conductors	A plant-specific aging management program is to be evaluated	Yes, plant-specific	Further evaluation is documented in Section 3.6.2.2.2.

Table 3.6.1 Summary of Aging Management Programs for Electrical and I&C Components Evaluated in Chapter VI of the GALL Report

Item Number	Component / Commodity	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.6.1-12	Transmission conductors and connections; Switchyard bus and connections	Loss of material due to wind-induced abrasion and fatigue; Loss of conductor strength due to corrosion, increased resistance of connection due to oxidation or loss of pre-load	A plant-specific aging management program is to be evaluated	Yes, plant-specific	Further evaluation is documented in Section 3.6.2.2.3. Switchyard bus and connections are not in the LR scope for SSES.
3.6.1-13	Cable connections – Metallic parts	Loosening of bolted connections due to thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion, and oxidation	Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	No	Consistent with NUREG-1801.
3.6.1-14	Fuse Holders (Not Part of a Larger Assembly) – Insulation Material	None	None	N/A – No AEM or AMP	Consistent with NUREG-1801.

Table 3.6.2-1 Aging Management Review Results - Electrical and I&C Components								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Non-EQ Insulated Cables and Connections	Conduct Electricity	Various Organic Polymers (see Note 0601)	Adverse localized environment caused by heat, radiation, or moisture in the presence of oxygen	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure / degradation of organics (thermal / thermoxidative) radiolysis and photolysis (UV-sensitive materials only) or organics; radiation-induced oxidation, and moisture intrusion	Non-EQ Electrical Cables and Connections Visual Inspection Program	VI.A-2	3.6.1-2	A 0602

Table 3.6.2-1 Aging Management Review Results - Electrical and I&C Components								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Non-EQ Low-Current Instrument Cables	Conduct Electricity	Various Organic Polymers (see Note 0601)	Adverse localized environment caused by heat, radiation, or moisture in the presence of oxygen	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure / degradation of organics (thermal / thermoxidative) radiolysis and photolysis (UV-sensitive materials only) or organics; radiation-induced oxidation, and moisture intrusion	Non-EQ Cables and Connections Used in Low-Current Instru-mentation Circuits Program	VI.A-3	3.6.1-3	A 0602

Table 3.6.2-1 Aging Management Review Results - Electrical and I&C Components								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Medium-Voltage Power Cables	Conduct Electricity	Various Organic Polymers (see Note 0601)	Adverse localized environment caused by exposure to moisture and voltage	Localized damage and breakdown of insulation leading to electrical failure / moisture intrusion, water trees	Non-EQ Inaccessible Medium-Voltage Cables Program	VI.A-4	3.6.1-4	A 0602
Cable Connections (Metallic Parts)	Conduct Electricity	Various Metals used for Electrical Contact	Air – indoor and outdoor	Loosening of bolted connections due to thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion, and oxidation	Non-EQ Electrical Cable Connections Program	VI.A-1	3.6.1-13	A

Table 3.6.2-1 Aging Management Review Results - Electrical and I&C Components								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Fuse Holders: Insulation	Conduct Electricity	Various Organic Polymers (see Note 0601)	Adverse localized environment caused by heat, radiation, or moisture in the presence of oxygen or a >60-year service limiting temperature	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure / degradation (thermal / thermoxidative) of organics / thermoplastics; radiation-induced oxidation, and moisture intrusion	Non-EQ Electrical Cables and Connections Visual Inspection Program	VI.A-6	3.6.1-2	A 0608
Fuse Holders: Insulation	Conduct Electricity	Various Organic Polymers (see Note 0601)	Air – indoor (uncontrolled) (Internal / External)	None Identified	None Required	VI.A-7	3.6.1-14	A

Table 3.6.2-1 Aging Management Review Results - Electrical and I&C Components								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Fuse Holders: Metallic Clamp	Conduct Electricity	Copper Alloy	Indoor Air	None Identified	None Required	VI.A-8	3.6.1-6	I 0603
Metal-Enclosed Bus, non-segregated (bus & connections)	Conduct Electricity	Aluminum, Copper	Indoor Air / Outdoor Air	Loosening of bolted connections / thermal cycling and ohmic heating	Metal-Enclosed Bus Inspection Program	VI.A-11	3.6.1-7	A 0604
Metal-Enclosed Bus, non-segregated (Enclosure Assemblies)	Support	Elastomers	Indoor Air / Outdoor Air	Hardening and the loss of strength / elastomer degradation	Metal-Enclosed Bus Inspection Program	VI.A-12	3.6.1-10	E 0606

Table 3.6.2-1 Aging Management Review Results - Electrical and I&C Components								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Metal-Enclosed Bus, non-segregated (Enclosure Assemblies)	Support	Aluminum, Steel, Galvanized Steel	Indoor Air / Outdoor Air	Loss of Material / General Corrosion	Structures Monitoring Program	VI.A-13	3.6.1-9	F 0607
Metal-Enclosed Bus, non-segregated (Insulation & Insulators)	Insulation	Porcelain, Various Organic Polymers	Indoor Air / Outdoor Air	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure / degradation (thermal / thermoxidative) of organics / thermoplastics; radiation-induced oxidation; moisture/debris intrusion, and ohmic heating	Metal-Enclosed Bus Inspection Program	VI.A-14	3.6.1-8	A

Table 3.6.2-1 Aging Management Review Results - Electrical and I&C Components								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Transmission Conductors and Connections	Conduct Electricity	Aluminum, Galvanized Steel	Outdoor Air	None Identified	None Required	VI.A-16	3.6.1-12	I 0605
High-Voltage Insulators	Insulation	Porcelain, Metal, Cement	Outdoor Air	None Identified	None Required	VI.A-9, VI.A-10	3.6.1-11	I 0609

Generic Notes:	
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 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
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:	
0601	The organic materials include the following: EP, EPDM, EPR, HT Kerite, Hypalon, Kapton, Melamine, Noryl, Nylon, Phenolic, Silicone Rubber, Teflon/FEP, Tefzel, XLP, XLPE, and XLPO. The materials for the fuse holders are similar to those for terminal blocks (nylon and phenolic). The actual clip or holder is metallic, typically copper.
0602	The block for non-EQ insulated cables and connections covers the entire commodity group and addresses cables, terminal blocks, fuse holders (just the insulating base), splices, and connectors. The cable grouping includes the medium-voltage cables subject to water treeing, and low-current instrumentation circuits subject to loss of insulation resistance due to heat and/or radiation. The AMPs for non-EQ insulated cables and connections include four programs (to meet GALL XI.E1, E2, E3, and E6) requirements). The E1 program provides for a visual inspection of accessible non-EQ cables and connections. The E2 program (to address low-current instrumentation cable) will focus on Nuclear Instrumentation and Radiation Monitoring circuits. The E3 program addresses medium-voltage cables subject to water treeing (wetted cables). The E2 and E3 programs involve circuit testing. The E6 program provides for testing of the metallic parts of electrical cable connections using thermography.
0603	A total of 145 fuse boxes (containing only fuses and/or terminal blocks) were identified for SSES. Of these 145 boxes, 20 contain fuses that are in the scope of license renewal. However, none of these boxes contain fuses that are pulled from their metallic clamps more than once per year. Therefore, none of these fuse holders has a metallic clamp that will exhibit the aging mechanisms/effects of fatigue and/or frequent manipulation listed in GALL Item VI.A-8. The other aging mechanisms/effects detailed in GALL VI.A-8 (ohmic heating, thermal cycling, electrical transients, vibration, chemical contamination, corrosion, and oxidation) are addressed in Section 3.6.2.3.1. Inspection of a sample of the fuse boxes showed that conditions are clean and dry, with no corrosion or moisture intrusion.
0604	The bus-to-bus bolted connections are covered with insulation or sealant (the use of tape is described in the vendor manual for connections where an insulated boot cannot be utilized).
0605	The transmission conductors identified as in the license renewal scope at SSES are very short segments (approximately 12-22 feet) which connect the Start-Up Transformers T10 and T20 to their respective motor-operated air break switches 1R105 and 2R105. These switches constitute the boundary points for the SBO license renewal boundary. The segments of transmission conductor are not subject to aging management because they do not exhibit aging mechanisms/effects. An aging management program at SSES is not required.
0606	The inspection of the metal-enclosed bus enclosure assembly elastomers will be performed as part of the metal-enclosed bus inspection program. The elastomers will be inspected when the covers of the various bus enclosure sections are removed. The Structures Monitoring Program will address the metallic portion of the enclosure assembly, and will also address the structural supports for the various bus assemblies.
0607	In addition to steel and galvanized steel, SSES uses aluminum enclosures as well.

Plant-Specific Notes:	
0608	Inspection of a sample of the fuse boxes within the scope of license renewal at SSES showed that conditions are clean and dry, with no corrosion or moisture intrusion found.
0609	Regarding the aging mechanisms for the high-voltage insulators: salt spray on the high-voltage insulators is not of concern at SSES, due to its inland location. There is minimal contamination due to industrial effluents because of the rural location of SSES. The buildup of surface contaminants is gradual and is washed away by rainfall. Therefore, contamination is not identified as an aging mechanism. The high-voltage insulators identified within the scope of license renewal for SSES are connected to rigid components, such that significant movement is not considered a stressor, and wear is not identified as an aging mechanism.