



Table of Contents

Introduction

Dresden Nuclear Power Station and Quad Cities Nuclear Power Station

Aging Management Review Aid

February 2003

Table of Contents

Aging Management Review Aid

<u>Table No.</u>	<u>Component Group Requiring Aging Management</u>	<u>Page No.</u>
	Introduction	
<u>2.3.1-1</u>	Reactor Vessel	1
<u>2.3.1-2</u>	Reactor Internals	6
<u>2.3.1-5</u>	Reactor Recirculation System	11
<u>2.3.1-6</u>	Reactor Vessel Head Vents	19
<u>2.3.1-7</u>	Nuclear Boiler Instrumentation	21
<u>2.3.1-8</u>	Head Spray System (Dresden Only)	27
<u>2.3.2-1</u>	High Pressure Coolant Injection System	29
<u>2.3.2-2</u>	Core Spray System	43
<u>2.3.2-3</u>	Containment Isolation Components and Primary Containment Piping System	48
<u>2.3.2-4</u>	Reactor Core Isolation Cooling System (Quad Cities Only)	56
<u>2.3.2-5</u>	Isolation Condenser (Dresden Only)	65
<u>2.3.2-6</u>	Residual Heat Removal System (Quad Cities Only)	72
<u>2.3.2-7</u>	Low Pressure Coolant Injection System (Dresden Only)	79
<u>2.3.2-8</u>	Standby Liquid Control System	84
<u>2.3.2-9</u>	Standby Gas Treatment System	89
<u>2.3.2-11</u>	Anticipated Transients Without Scram System	92
<u>2.3.3-1</u>	Refueling Equipment System	93
<u>2.3.3-2</u>	Shutdown Cooling System (Dresden Only)	94
<u>2.3.3-3</u>	Control Rod Drive Hydraulic System	98
<u>2.3.3-4</u>	Reactor Water Cleanup System	104
<u>2.3.3-5</u>	Fire Protection System	107
<u>2.3.3-6</u>	Emergency Diesel Generator and Auxiliaries	116
<u>2.3.3-7</u>	HVAC-Main Control Room	127
<u>2.3.3-8</u>	HVAC-Reactor Building	131
<u>2.3.3-9</u>	ECCS Corner Room HVAC	133
<u>2.3.3-10</u>	SBO Building HVAC	134
<u>2.3.3-11</u>	Station Blackout (diesels and auxiliaries)	135
<u>2.3.3-12</u>	Diesel Generator Cooling Water System	144
<u>2.3.3-13</u>	Diesel Fuel Oil System	154
<u>2.3.3-14</u>	Process Sampling System	158
<u>2.3.3-15</u>	Carbon Dioxide System	160
<u>2.3.3-16</u>	Service Water System	161
<u>2.3.3-17</u>	Reactor Building Closed Cooling Water System	170
<u>2.3.3-18</u>	Turbine Building Closed Cooling Water System	175
<u>2.3.3-19</u>	Makeup Demineralizer System	176
<u>2.3.3-20</u>	Residual Heat Removal Service Water System (Quad Cities Only)	179
<u>2.3.3-21</u>	Containment Cooling Service Water System (Dresden Only)	193
<u>2.3.3-22</u>	Ultimate Heat Sink	202
<u>2.3.3-23</u>	Fuel Pool Cooling and Filter Demineralizer System	204
<u>2.3.3-24</u>	Plant Heating System	205
<u>2.3.3-25</u>	Containment Atmosphere Monitoring System	208
<u>2.3.3-26</u>	Nitrogen Containment Atmosphere Dilution System	210
<u>2.3.3-27</u>	Drywell Nitrogen Inerting System	211
<u>2.3.3-28</u>	Safe Shutdown Makeup Pump System (Quad Cities Only)	213
<u>2.3.4-1</u>	Main Steam	215
<u>2.3.4-2</u>	Feedwater System	222

Table of Contents

Aging Management Review Aid

<u>Table No.</u>	<u>Component Group Requiring Aging Management</u>	<u>Page No.</u>
<u>2.3.4-3</u>	Condensate and Condensate Storage System	226
<u>2.3.4-4</u>	Main Condenser	230
<u>2.3.4-5</u>	Main Turbine and Auxiliary Systems	231
<u>2.3.4-6</u>	Turbine Oil System (In-scope for Quad Cities Only)	232
<u>2.3.4-7</u>	Main Generator and Auxiliaries (In-scope for Quad Cities Only)	233
<u>2.4-1</u>	Primary Containment	234
<u>2.4-2</u>	Reactor Building	242
<u>2.4-3</u>	Main Control Room and Auxiliary Electric Equipment Room	251
<u>2.4-4</u>	Turbine Building	259
<u>2.4-5</u>	Diesel Generator Buildings	265
<u>2.4-6</u>	Station Blackout Building	271
<u>2.4-7</u>	Isolation Condenser Pump House (Dresden Only)	278
<u>2.4-8</u>	Makeup Demineralizer Building (Dresden Only)	282
<u>2.4-9</u>	Radwaste Floor Drain Surge Tank	284
<u>2.4-10</u>	Miscellaneous Foundations	287
<u>2.4-11</u>	Crib House	289
<u>2.4-12</u>	Unit 1 Crib House (Dresden Only)	299
<u>2.4-13</u>	Station Chimney	300
<u>2.4-14</u>	Cranes and Hoists	303
<u>2.4-15</u>	Component Supports	304
<u>2.4-16</u>	Insulation	308
<u>2.5-1</u>	Electrical Commodities	309

Aging Management Review Aid Introduction

Purpose of the Aging Management Review Aid

The purpose of the Aging Management Review Aid is to provide a summary of aging management results for each individual system and structure described in Chapter 2 of the Operating License Renewal Application for Dresden Nuclear Power Station and Quad Cities Nuclear Power Station. This tool combines information found in the License Renewal Application (LRA) with information found in NUREG 1801, "Generic Aging Lessons Learned (GALL) Report". It is intended to assist the aging management review of individual systems and structures. This tool is not considered part of the formal application for license renewal.

Every system and structure description found in Chapter 2 of the LRA includes a table of component groups requiring aging management review. For each system and structure, the Aging Management Review Aid lists the same component groups contained in the Chapter 2 Tables. For each component group, the Aging Management Review Aid provides the component function, material of construction, environment, aging effects, aging mechanism, aging management program, and associated aging management summary in Chapter 3 of the LRA. The Aging Management Review Aid also provides the associated GALL reference to Volume 2 of the Gall.

The information provided in the Aging Management Review Aid needs some clarification as described below.

Component Group/Intended Function

For every system or structure, the Aging Management Review Aid lists all of the associated component groups. The top of every page on the review aid provides the name of the system or structure and includes the associated component table found in chapter 2 of the LRA. The description of the component group listed in the review aid is followed by the intended function for that component group. The description of the component group and the intended function found in the Aging Management Review Aid is the identical to that found in the associated component table in chapter 2 of the LRA. However, the component group description in the reviewers aid does not include the parenthetic comments or site specific designations (Dresden only or Quad Cities only) as found in the LRA. The component group description in the Aging Management Review Aid is repeated for every material included in that component group. The table below provides several examples showing how the component group descriptions differ.

Component Group Descriptions Found in Chapter 2 of the LRA	Component Group Descriptions Found in the Aging Management Review Aid
Isolation Barriers (includes piping and valves)	Isolation Barriers
Isolation Barriers (attached support) (includes piping and valves)	Isolation Barriers (attached support)
Tanks (includes drain pots)	Tanks
Thermowells (Quad Cities only)	Thermowells

Aging Management Review Aid Introduction

Material

The material of construction is provided for each component group. In those instances where the material is evaluated in the GALL, the material description is the same as that found in the associated GALL Reference. If the material for the component group is not addressed in the GALL, the material description matches the material description found in the associated LRA Reference.

Primary Environment

The environment provided for each component group is the Primary Environment. In those instances where a component group has internal and external environments, the “Internal Environment” is the primary environment. In those instances where a component group has only one environment (such as piping supports and closure bolting), the primary environment is the “External Environment”. When a component group has an internal and external environment, only the internal environment is provided in the Aging Management Review Aid. However, the last column of the review aid provides a reference to that section of the LRA that addresses aging management for the associated external environment.

In those instances where the material and environment combination for the component group has been evaluated in the GALL, the GALL reference number is provided. The environment description in the review aid is the same as that found in the associated GALL reference. If the material and environment combination for the component group is not addressed in the GALL, the environment description in the review aid matches the description found in the associated LRA reference.

Primary Aging Effect/Mechanism

The primary aging effect/mechanism listed for each component group is associated with the material type and primary environment listed. In those instances where the material and environment combination for the component group has been evaluated in the GALL, the GALL reference number is provided. The aging effect/mechanism listed in the review aid is the same as that found in the GALL reference. If the material and environment combination for the component group is not addressed in the GALL, the aging effect/mechanism matches the description found in the associated LRA reference. In those instances where the aging effect/mechanism is listed as “None”, the reviewer must refer to the primary LRA reference listed for that component group to find an explanation.

A reviewer may find more aging effects/mechanisms in the primary LRA reference section when compared to those found in the Aging Management Review Aid for that component group. The LRA reference is a compilation of aging management results for multiple systems. Not all aging effects/mechanisms listed in the primary LRA reference apply to every system.

Primary Aging Management Program

The primary aging management program listed for each component group is associated with the material type and primary environment listed. In those instances where the material and environment combination for the component group has been evaluated in the GALL, the GALL reference number is provided. The aging management program listed in the review aid is the same as that found in the GALL reference. If the material and environment combination for the component group is not addressed in the GALL, the aging management program matches the description found in the associated LRA reference. In those instances

Aging Management Review Aid

Introduction

where the aging management programs listed as “None”, the reviewer must refer to the primary LRA reference listed for that component group to find an explanation.

GALL Reference

When the material and environment combination for the associated component group has been evaluated in the GALL, the GALL reference number for the primary material and environment combination is provided. In those instances where the material and environment combination for the component group has not been evaluated in the GALL, the word “Non-GALL” will appear.

Primary LRA Reference

For each component group, the Aging Management Review Aid provides a link to the LRA reference associated with the primary environment. In those instances where a component group has internal and external environments, the “Internal Environment” is the primary environment. In those instances where a component group has only one environment (such as piping supports and concrete slabs), the primary environment is the “External Environment”. The reviewer can refer to the primary LRA reference listed for that component group to find additional information.

LRA External Environment Reference

When a component group has an internal and external environment, only the internal environment is provided in the Aging Management Review Aid. However, the last column of the review aid provides a reference to that section of the LRA that addresses aging management for the associated external environment. This column will have an “NA” listed if the components do not have an internal environment. In those instances where the internal and external environments are the identical the same reference number will appear in both the primary LRA Reference column and the External LRA Reference column.

Aging Management Review Aid

Table 2.3.1-1 Component Groups Requiring Aging Management Review - Reactor Vessel

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Air with metal temperature up to 288°C (550°F)	Loss of material/ Wear	Bolting Integrity (B.1.12)	IV.C1.3-e	3.1.1.12	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Air with metal temperature up to 288°C (550°F)	Loss of preload/ Stress relaxation	Bolting Integrity (B.1.12)	IV.C1.3-f	3.1.1.12	NA
Nozzle Safe Ends /Pressure Boundary	Stainless Steel SB-166 (Inconel 182 butter, and Inconel 82 or 182 weld)	Up to 288°C (550°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.A1.4-b	3.1.1.1	NA
Nozzle Safe Ends /Pressure Boundary	Stainless Steel	Up to 288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.A1.4-a	3.1.1.15	NA
Nozzle Safe Ends /Pressure Boundary	Carbon Steel	Up to 288°C (550°F) reactor coolant water	None	None	Non-GALL	3.1.2.60	NA
Nozzles /Pressure Boundary	SA508 Cl2 with or without Stainless Steel Cladding	288°C (550°F) steam	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.A1.3-a	3.1.1.1	NA
Nozzles /Pressure Boundary	SA508 Cl2 with or without Stainless Steel Cladding	Up to 288°C (550°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.A1.3-d	3.1.1.1	NA
Nozzles /Pressure Boundary	SA508 Cl2	Up to 288°C reactor coolant water 5x108 5x109 c/cm2 s	Loss of fracture toughness/ Neutron irradiation embrittlement	Time Limited Aging Analysis evaluated for the period of extended operation	IV.A1.3-e	3.1.1.3	NA
Nozzles /Pressure Boundary	SA508 Cl2 with or without Stainless Steel Cladding	Up to 288°C (550°F) reactor coolant water	Crack initiation and growth/ Cyclic loading	BWR Feedwater Nozzle (B.1.5)	IV.A1.3-b	3.1.1.13	3.1.2.4
Nozzles /Pressure Boundary	SA508 Cl2 with or without Stainless Steel Cladding	Up to 288°C (550°F) reactor coolant water	Crack initiation and growth/ Cyclic loading	BWR Control Rod Drive Return Line Nozzle (B.1.6)	IV.A1.3-c	3.1.1.13	3.1.2.4
Nozzles /Pressure Boundary	SA336 with or without Stainless Steel Cladding	Up to 288°C (550°F) reactor coolant water	None	None	Non-GALL	3.1.2.16	3.1.2.4

Aging Management Review Aid

Table 2.3.1-1 Component Groups Requiring Aging Management Review - Reactor Vessel

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Nozzles /Pressure Boundary	SA508 Cl2 with or without Stainless Steel Cladding	Up to 288°C (550°F) reactor coolant water	None	None	Non-GALL	3.1.2.17	3.1.2.4
Penetrations /Pressure Boundary	Stainless Steel	Up to 288°C (550°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.A1.5-b	3.1.1.1	NA
Penetrations /Pressure Boundary	SB-167	Up to 288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking cyclic loading	BWR Penetrations (B.1.8) and Water Chemistry (B.1.2)	IV.A1.5-a	3.1.1.16	NA
Penetrations /Pressure Boundary	Stainless Steel	Up to 288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking cyclic loading	BWR Penetrations (B.1.8) and Water Chemistry (B.1.2)	IV.A1.5-a	3.1.1.16	NA
Penetrations /Pressure Boundary	Carbon Steel	Up to 288°C (550°F) reactor coolant water	None	None	Non-GALL	3.1.2.58	NA
Penetrations /Pressure Boundary	SA336 or SA-508 Cl 2	Up to 288°C (550°F) reactor coolant water	None	None	Non-GALL	3.1.2.62	NA
Penetrations /Pressure Boundary	SB-166	Up to 288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Penetrations (B.1.8) and Water Chemistry (B.1.2)	Non-GALL	3.1.2.63	NA
Penetrations (Control Rod Drive Stub Tubes) /Structural Support	SB-167	Up to 288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking cyclic loading	BWR Penetrations (B.1.8) and Water Chemistry (B.1.2)	IV.A1.5-a	3.1.1.16	NA
Support Skirts and Attachment Welds /Structural Support	SA533Gr B Welds Low Alloy Steel	Ambient Temperature Air	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.A1.7-a	3.1.1.1	NA

Aging Management Review Aid

Table 2.3.1-1 Component Groups Requiring Aging Management Review - Reactor Vessel

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Support Skirts and Attachment Welds /Structural Support	SA302Gr B Welds Low Alloy Steel	Containment Nitrogen	None	None	Non-GALL	3.1.2.33	NA
Top Head Enclosure (Closure Studs and Nuts) /Pressure Boundary	SA320Gr L43 AISI 4340	Air, leaking reactor coolant water and/or steam at 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Reactor Head Closure Studs (B.1.3)	IV.A1.1-c	3.1.1.8	NA
Top Head Enclosure (Head Flanges) /Pressure Boundary	SA302Gr B, SA533Gr B, SA336 with or without Stainless Steel Cladding	288°C (550°F) steam	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.A1.1-b	3.1.1.1	NA
Top Head Enclosure (Head Flanges) /Pressure Boundary	SA336 with or without Stainless Steel Cladding	288°C (550°F) steam	None	None	Non-GALL	3.1.2.36	NA
Top Head Enclosure (Top Head Nozzles) /Pressure Boundary	SA508 Cl2 with Stainless Steel Cladding	288°C (550°F) steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1), for Class 1 components; and Water Chemistry (B.1.2)	Non-GALL	3.1.2.59	3.1.2.4
Top Head Enclosure (Top Heads) /Pressure Boundary	SA302Gr B with Stainless Steel Cladding	288°C (550°F) steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1), for Class 1 components; and Water Chemistry (B.1.2)	Non-GALL	3.1.2.37	3.1.2.4
Vessel Bottom Heads /Pressure Boundary	SA302Gr B, SA533Gr B with 308 309 308L 309L Cladding	Up to 288°C (550°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.A1.6-a	3.1.1.1	NA
Vessel Bottom Heads /Pressure Boundary	SA302Gr B with 308 309 308L 309L Cladding and Low Alloy Steel Weldments	Up to 288°C (550°F) reactor coolant water	None	None	Non-GALL	3.1.2.54	NA

Aging Management Review Aid

Table 2.3.1-1 Component Groups Requiring Aging Management Review - Reactor Vessel

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Vessel Shell Attachment Welds /Structural Support	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Vessel ID Attachment Welds (B.1.4) and Water Chemistry (B.1.2)	IV.A1.2-e	3.1.1.14	NA
Vessel Shells /Pressure Boundary	SA302Gr B, SA533Gr B, SA336 with Stainless Steel Cladding	288°C (550°F) steam	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.A1.2-a	3.1.1.1	NA
Vessel Shells /Pressure Boundary	SA302Gr B, SA533Gr B with 308 309 308L 309L Cladding	288°C (550°F) reactor coolant water 5x10E8 - 5x10E9 n/cm2·s	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.A1.2-b	3.1.1.1	NA
Vessel Shells /Pressure Boundary	SA533Gr B with 308 309 308L 309L Cladding Low Alloy Steel Weldments	288°C (550°F) reactor coolant water 5x10E8 - 5x10E9 n/cm2·s	Loss of fracture toughness/ Neutron irradiation embrittlement	Time Limited Aging Analysis evaluated for the period of extended operation	IV.A1.2-c	3.1.1.3	3.1.2.4
Vessel Shells /Pressure Boundary	SA302Gr B with 308 309 308L 309L Cladding	288°C (550°F) reactor coolant water 5x10E8 - 5x10E9 n/cm2·s	Loss of fracture toughness/ Neutron irradiation embrittlement	Reactor Vessel Surveillance (B.1.22)	IV.A1.2-d	3.1.1.4	3.1.2.4
Vessel Shells /Pressure Boundary	SA533Gr B with 308 309 308L 309L Cladding Low Alloy Steel Weldments	288°C (550°F) reactor coolant water 5x10E8 - 5x10E9 n/cm2·s	Loss of fracture toughness/ Neutron irradiation embrittlement	Reactor Vessel Surveillance (B.1.22)	IV.A1.2-d	3.1.1.4	3.1.2.4
Vessel Shells /Pressure Boundary	SA302Gr B with 308 309 308L 309L Cladding and Low Alloy Steel Weldments	288°C (550°F) steam	None	None	Non-GALL	3.1.2.55	3.1.2.4
Vessel Shells /Pressure Boundary	SA336 with Stainless Steel Cladding	288°C (550°F) steam	None	None	Non-GALL	3.1.2.56	3.1.2.4
Vessel Shells /Pressure Boundary	SA533Gr B with 308 309 308L 309L Cladding Low Alloy Steel Weldments	288°C (550°F) steam	None	None	Non-GALL	3.1.2.57	3.1.2.4

Aging Management Review Aid

Table 2.3.1-1 Component Groups Requiring Aging Management Review - Reactor Vessel

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Vessel Shells /Pressure Boundary	SA302Gr B with 308 309 308L 309L Cladding and Low Alloy Steel Weldments	288°C (550°F) reactor coolant water 5x10E8 - 5x10E9 n/cm2·s	None	None	Non-GALL	3.1.2.61	3.1.2.4

Aging Management Review Aid

Table 2.3.1-2 Component Groups Requiring Aging Management Review - Reactor Internals

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Access Hole Covers (Mechanical) /Pressure Boundary	Alloy 600	288°C (550°F) high-purity water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking irradiation-assisted stress corrosion cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1), for Class 1 components; and Water Chemistry (B.1.2)	IV.B1.1-e	3.1.1.18	NA
Access Hole Covers (Welded) /Pressure Boundary	Alloy 600 Alloy 182 Welds	288°C (550°F) high-purity water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking irradiation-assisted stress corrosion cracking	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.B1.1-d	3.1.1.18	NA
Control Rod Drive Housings /Pressure Boundary	Stainless Steel	Up to 288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.5-c	3.1.1.17	3.1.1.17
Control Rod Drive Housings /Structural Support	Stainless Steel	Up to 288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.5-c	3.1.1.17	3.1.1.17
Control Rod Guide Tubes /Structural Support	Stainless Steel	Up to 288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.5-c	3.1.1.17	3.1.1.17
Core Plates /Structural Support	Stainless Steel	288°C (550°F) high-purity water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.B1.1-c	3.1.1.1	NA
Core Plates and Bolts /Structural Support	Stainless Steel	288°C (550°F) high-purity water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking irradiation-assisted stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.1-b	3.1.1.17	NA

Aging Management Review Aid

Table 2.3.1-2 Component Groups Requiring Aging Management Review - Reactor Internals

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Core Shrouds (Upper, Central, Lower) /Structural Support	Stainless Steel	288°C (550°F) high-purity water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking irradiation-assisted stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.1-a	3.1.1.17	NA
Core Spray Lines and Spargers /Pressure Boundary	Stainless Steel	288°C (550°F) high-purity water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.B1.3-b	3.1.1.1	NA
Core Spray Lines and Spargers /Pressure Boundary	Stainless Steel	288°C (550°F) high-purity water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking irradiation-assisted stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.3-a	3.1.1.17	3.1.1.17
Core Spray Lines and Spargers /Spray	Stainless Steel	288°C (550°F) high-purity water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.B1.3-b	3.1.1.1	NA
Core Spray Lines and Spargers /Spray	Stainless Steel	288°C (550°F) high-purity water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking irradiation-assisted stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.3-a	3.1.1.17	3.1.1.17
Core Spray Lines and Spargers /Structural Support	Stainless Steel	288°C (550°F) high-purity water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.B1.3-b	3.1.1.1	NA
Core Spray Lines and Spargers /Structural Support	Stainless Steel	288°C (550°F) high-purity water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking irradiation-assisted stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.3-a	3.1.1.17	3.1.1.17

Aging Management Review Aid

Table 2.3.1-2 Component Groups Requiring Aging Management Review - Reactor Internals

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Incore Instrumentation Dry Tubes and Guide Tubes /Pressure Boundary	Stainless Steel	288°C (550°F) high-purity water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.B1.6-b	3.1.1.1	NA
Incore Instrumentation Dry Tubes and Guide Tubes /Pressure Boundary	Stainless Steel	288°C (550°F) high-purity water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking irradiation-assisted stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.6-a	3.1.1.17	3.1.1.17
Jet Pump Assemblies (Does not include Sensing Lines) /Pressure Boundary	Stainless Steel, Ni Alloy X 750	288°C (550°F) high-purity water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.B1.4-b	3.1.1.1	NA
Jet Pump Assemblies (Does not include Sensing Lines) /Pressure Boundary	Ni Alloy X 750	288°C (550°F) high-purity water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking irradiation-assisted stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.4-a	3.1.1.17	3.1.1.17
Jet Pump Assemblies (Does not include Sensing Lines) /Pressure Boundary	Stainless Steel	288°C (550°F) high-purity water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking irradiation-assisted stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.4-a	3.1.1.17	3.1.1.17
Jet Pump Assemblies (Does not include Sensing Lines) /Pressure Boundary	Cast Austenitic Stainless Steel	288°C (550°F) high-purity water	Loss of fracture toughness/ Thermal aging and neutron irradiation embrittlement	Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) (B.1.10)	IV.B1.4-c	3.1.1.19	3.1.1.17

Aging Management Review Aid

Table 2.3.1-2 Component Groups Requiring Aging Management Review - Reactor Internals

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Jet Pump Assemblies (Does not include Sensing Lines) /Structural Support	Stainless Steel, Ni Alloy X 750	288°C (550°F) high-purity water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.B1.4-b	3.1.1.1	NA
Jet Pump Assemblies (Does not include Sensing Lines) /Structural Support	Stainless Steel	288°C (550°F) high-purity water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking irradiation-assisted stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.4-a	3.1.1.17	NA
Orificed Fuel Support Pieces /Structural Support	Stainless Steel	288°C (550°F) high-purity water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking irradiation-assisted stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.1-b	3.1.1.17	NA
Orificed Fuel Support Pieces /Structural Support	Cast Austenitic Stainless Steel	288°C (550°F) high-purity water	Loss of fracture toughness/ Thermal aging and neutron irradiation embrittlement	Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) (B.1.10)	IV.B1.5-a	3.1.1.19	NA
Orificed Fuel Supports /Structural Support	Stainless Steel, Cast Austenitic Stainless Steel	288°C (550°F) high-purity water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.B1.5-b	3.1.1.1	NA
Reactor Internals Modification/Repair Hardware /Structural Support	Stainless Steel	288°C (550°F) high-purity water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking irradiation-assisted stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.1-a	3.1.1.17	NA

Aging Management Review Aid

Table 2.3.1-2 Component Groups Requiring Aging Management Review - Reactor Internals

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Reactor Internals Modification/Repair Hardware /Structural Support	Stainless Steel	288°C (550°F) high-purity water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking irradiation-assisted stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.3-a	3.1.1.17	NA
Reactor Internals Modification/Repair Hardware /Structural Support	Stainless Steel	288°C (550°F) high-purity water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking irradiation-assisted stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.4-a	3.1.1.17	NA
Shroud Support Structures /Structural Support	Alloy 600 Alloy 182 Welds	288°C (550°F) high-purity water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking irradiation-assisted stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.1-f	3.1.1.17	NA
Top Guides /Structural Support	Stainless Steel	288°C (550°F) high-purity water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.B1.2-b	3.1.1.1	NA
Top Guides /Structural Support	Stainless Steel	288°C (550°F) high-purity water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking irradiation-assisted stress corrosion cracking	BWR Vessel Internals (B.1.9) and Water Chemistry (B.1.2)	IV.B1.2-a	3.1.1.17	NA

Aging Management Review Aid

Table 2.3.1-5 Component Groups Requiring Aging Management Review - Reactor Recirculation System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel SA193Gr B7	Air with metal temperature up to 288°C (550°F)	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.2-f	3.1.1.1	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel SA193Gr B7	Air with metal temperature up to 288°C (550°F)	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-g	3.1.1.1	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel SA193Gr B7	Air with metal temperature up to 288°C (550°F)	Loss of material/ Wear	Bolting Integrity (B.1.12)	IV.C1.2-d	3.1.1.12	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel SA193Gr B7	Air with metal temperature up to 288°C (550°F)	Loss of preload/ Stress relaxation	Bolting Integrity (B.1.12)	IV.C1.2-e	3.1.1.12	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Air with metal temperature up to 288°C (550°F)	Loss of material/ Wear	Bolting Integrity (B.1.12)	IV.C1.3-e	3.1.1.12	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Air with metal temperature up to 288°C (550°F)	Loss of preload/ Stress relaxation	Bolting Integrity (B.1.12)	IV.C1.3-f	3.1.1.12	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Crack initiation and growth/ Cyclic loading	Bolting Integrity (B.1.12)	Non-GALL	3.1.2.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Loss of material/ Wear	Bolting Integrity (B.1.12)	Non-GALL	3.1.2.2	NA
Dampeners /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.1.2.7
Dampeners (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.9	3.1.2.7
Filters/Strainers (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.12	3.1.2.3

Aging Management Review Aid

Table 2.3.1-5 Component Groups Requiring Aging Management Review - Reactor Recirculation System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Flow Elements /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.1.2.8
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.18	3.1.2.18
Piping and Fittings /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water or steam	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.1-h	3.1.1.1	NA
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.1.2.8
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.21	3.1.2.3
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Wet Gas	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.22	3.1.2.4
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Wet Gas	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.22	3.1.2.3
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.23	3.1.2.7

Aging Management Review Aid

Table 2.3.1-5 Component Groups Requiring Aging Management Review - Reactor Recirculation System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.23	3.1.2.8
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.25	3.1.2.7
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.26	3.1.2.7
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Wet Gas	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.22	3.1.2.3
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Wet Gas	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.22	3.1.2.4
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.23	3.1.2.8
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.24	3.1.2.8
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.24	3.1.2.7

Aging Management Review Aid

Table 2.3.1-5 Component Groups Requiring Aging Management Review - Reactor Recirculation System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.25	3.1.2.8
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.26	3.1.2.8
Piping and Fittings (small bore) /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.1.2.8
Pumps /Pressure Boundary	Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.2-a	3.1.1.1	NA
Pumps /Pressure Boundary	Cast Austenitic Stainless Steel	288°C (550°F) reactor coolant water	Loss of fracture toughness/ Thermal aging embrittlement	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1.2-c	3.1.1.9	3.1.2.8
Pumps /Pressure Boundary	Cast Austenitic Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.2-b	3.1.1.15	3.1.2.8
Restricting Orifices (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.27	3.1.2.3
Restricting Orifices (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.28	3.1.2.8

Aging Management Review Aid

Table 2.3.1-5 Component Groups Requiring Aging Management Review - Reactor Recirculation System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Restricting Orifices (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.29	3.1.2.8
Sight Glasses (spatial interaction)/Leakage Boundary (spatial)	Glass	Lubricating oil (with contaminants and/or moisture)	None	None	Non-GALL	3.1.2.31	3.1.2.5
Sight Glasses (spatial interaction)/Leakage Boundary (spatial)	Glass	Wet Gas	None	None	Non-GALL	3.1.2.32	3.1.2.5
Sight Glasses (attached support)/Structural Integrity (Attached)	Glass	25-288°C (77-550°F) demineralized water	None	None	Non-GALL	3.1.2.30	3.1.2.6
Sight Glasses (attached support)/Structural Integrity (Attached)	Glass	Wet Gas	None	None	Non-GALL	3.1.2.32	3.1.2.6
Sight Glasses (attached support)/Structural Integrity (Attached)	Glass	Wet Gas	None	None	Non-GALL	3.1.2.32	3.1.2.5
Thermowells /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.1.2.8
Tubing /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.1.2.41	3.1.2.8
Tubing /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.1.2.41	3.1.2.7

Aging Management Review Aid

Table 2.3.1-5 Component Groups Requiring Aging Management Review - Reactor Recirculation System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Tubing (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.39	3.1.2.8
Tubing (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.39	3.1.2.7
Tubing (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.40	3.1.2.8
Tubing (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.40	3.1.2.7
Valves /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-d	3.1.1.1	NA
Valves /Pressure Boundary	Cast Austenitic Stainless Steel	288°C (550°F) reactor coolant water	Loss of fracture toughness/ Thermal aging embrittlement	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1.3-b	3.1.1.9	3.1.2.8
Valves /Pressure Boundary	Cast Austenitic Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.1.2.8
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.1.2.8
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.1.2.7

Aging Management Review Aid

Table 2.3.1-5 Component Groups Requiring Aging Management Review - Reactor Recirculation System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.45	3.1.2.3
Valves /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.1.2.50	3.1.2.8
Valves /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.1.2.50	3.1.2.7
Valves (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.45	3.1.2.3
Valves (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.46	3.1.2.3
Valves (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.47	3.1.2.3
Valves (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.52	3.1.2.7
Valves (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.53	3.1.2.7
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Wet Gas	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.48	3.1.2.48
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.49	3.1.2.51

Aging Management Review Aid

Table 2.3.1-5 Component Groups Requiring Aging Management Review - Reactor Recirculation System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	Wet Gas	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.51	3.1.2.51
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.52	3.1.2.51
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.52	3.1.2.8
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.53	3.1.2.51
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.53	3.1.2.8

Aging Management Review Aid

Table 2.3.1-6 Component Groups Requiring Aging Management Review - Reactor Vessel Head Vents

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Air with metal temperature up to 288°C (550°F)	Loss of material/ Wear	Bolting Integrity (B.1.12)	IV.C1.3-e	3.1.1.12	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Air with metal temperature up to 288°C (550°F)	Loss of preload/ Stress relaxation	Bolting Integrity (B.1.12)	IV.C1.3-f	3.1.1.12	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Crack initiation and growth/ Cyclic loading	Bolting Integrity (B.1.12)	Non-GALL	3.1.2.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Loss of material/ Wear	Bolting Integrity (B.1.12)	Non-GALL	3.1.2.2	NA
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.18	3.1.2.18
Piping and Fittings /Pressure Boundary	Carbon Steel SA106Gr B	Up to 225°C (437°F) reactor coolant water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.1-c	3.1.1.11	3.1.2.4
Piping and Fittings (small bore) /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.1.2.4
Sight Glasses (attached support)/Structural Integrity (Attached)	Glass	Wet Gas	None	None	Non-GALL	3.1.2.32	3.1.2.32
Tubing /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.1.2.8
Tubing /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.1.2.41	3.1.2.8

Aging Management Review Aid

Table 2.3.1-6 Component Groups Requiring Aging Management Review - Reactor Vessel Head Vents

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-d	3.1.1.1	NA
Valves /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.3-a	3.1.1.11	3.1.2.4
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.1.2.8
Valves /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.1.2.50	3.1.2.8

Aging Management Review Aid

Table 2.3.1-7 Component Groups Requiring Aging Management Review - Nuclear Boiler Instrumentation

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Air with metal temperature up to 288°C (550°F)	Loss of material/ Wear	Bolting Integrity (B.1.12)	IV.C1.3-e	3.1.1.12	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Air with metal temperature up to 288°C (550°F)	Loss of preload/ Stress relaxation	Bolting Integrity (B.1.12)	IV.C1.3-f	3.1.1.12	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Crack initiation and growth/ Cyclic loading	Bolting Integrity (B.1.12)	Non-GALL	3.1.2.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Loss of material/ Wear	Bolting Integrity (B.1.12)	Non-GALL	3.1.2.2	NA
Dampeners /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.1.2.7
Filters/Strainers (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.13	3.1.2.7
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.18	3.1.2.18
Pipes /Pressure Boundary	Stainless Steel	Leaking reactor coolant water and/or steam up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Plant-specific	IV.A1.1-d	3.1.1.6	3.1.2.7
Pipes /Pressure Boundary	Stainless Steel	Leaking reactor coolant water and/or steam up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Plant-specific	IV.A1.1-d	3.1.1.6	3.1.2.8
Pipes /Pressure Boundary	Carbon Steel	Leaking reactor coolant water and/or steam up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.1.2.19	3.1.2.3

Aging Management Review Aid

Table 2.3.1-7 Component Groups Requiring Aging Management Review - Nuclear Boiler Instrumentation

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Pipes /Pressure Boundary	Carbon Steel	Leaking reactor coolant water and/or steam up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.1.2.19	3.1.2.4
Piping and Fittings /Pressure Boundary	Carbon Steel SA106Gr B	288°C (550°F) steam	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.1-a	3.1.1.11	3.1.2.3
Piping and Fittings /Pressure Boundary	Carbon Steel SA106Gr B	288°C (550°F) steam	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.1-a	3.1.1.11	3.1.2.4
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.1.2.7
Piping and Fittings /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.25	3.1.2.8
Piping and Fittings /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.26	3.1.2.8
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.24	3.1.2.7
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.24	3.1.2.8
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.23	3.1.2.7
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.24	3.1.2.8

Aging Management Review Aid

Table 2.3.1-7 Component Groups Requiring Aging Management Review - Nuclear Boiler Instrumentation

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings (small bore) /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	NA
Piping and Fittings (small bore) /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.1.2.4
Piping and Fittings (small bore) /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.1.2.4
Piping and Fittings (small bore) /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.1.2.8
Piping and Fittings (small bore) /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.1.2.7
Piping and Fittings (small bore) (attached support)/Structural Integrity (Attached)	Carbon Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	NA
Tanks /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.1.2.8

Aging Management Review Aid

Table 2.3.1-7 Component Groups Requiring Aging Management Review - Nuclear Boiler Instrumentation

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Thermowells /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.1.2.8
Tubing /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.1.2.7
Tubing /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.1.2.8
Tubing (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.38	3.1.2.8
Tubing (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.38	3.1.2.7
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.38	3.1.2.8
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.38	3.1.2.7
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.42	3.1.2.7

Aging Management Review Aid

Table 2.3.1-7 Component Groups Requiring Aging Management Review - Nuclear Boiler Instrumentation

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Stainless Steel	Leaking reactor coolant water and/or steam up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Plant-specific	IV.A1.1-d	3.1.1.6	3.1.2.8
Valves /Pressure Boundary	Stainless Steel	Leaking reactor coolant water and/or steam up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Plant-specific	IV.A1.1-d	3.1.1.6	3.1.2.7
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.1.2.7
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.1.2.8
Valves /Pressure Boundary	Carbon Steel	Leaking reactor coolant water and/or steam up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.1.2.44	3.1.2.4
Valves /Pressure Boundary	Carbon Steel	Leaking reactor coolant water and/or steam up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.1.2.44	3.1.2.3
Valves /Pressure Boundary	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.52	3.1.2.7
Valves /Pressure Boundary	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.53	3.1.2.7
Valves (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.49	3.1.2.7

Aging Management Review Aid

Table 2.3.1-7 Component Groups Requiring Aging Management Review - Nuclear Boiler Instrumentation

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.52	3.1.2.7
Valves (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.53	3.1.2.7
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.49	3.1.2.7

Aging Management Review Aid

Table 2.3.1-8 Component Groups Requiring Aging Management Review - Head Spray System (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Air with metal temperature up to 288°C (550°F)	Loss of material/ Wear	Bolting Integrity (B.1.12)	IV.C1.3-e	3.1.1.12	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Air with metal temperature up to 288°C (550°F)	Loss of preload/ Stress relaxation	Bolting Integrity (B.1.12)	IV.C1.3-f	3.1.1.12	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Crack initiation and growth/ Cyclic loading	Bolting Integrity (B.1.12)	Non-GALL	3.1.2.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Loss of material/ Wear	Bolting Integrity (B.1.12)	Non-GALL	3.1.2.2	NA
Flow Elements (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.14	3.1.2.3
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.18	3.1.2.18
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.1.2.8
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.1.2.7
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.20	3.1.2.3

Aging Management Review Aid

Table 2.3.1-8 Component Groups Requiring Aging Management Review - Head Spray System (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings (small bore) /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.1.2.7
Piping and Fittings (small bore) /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.1.2.8
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.1.2.8
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.1.2.7
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.43	3.1.2.3

Aging Management Review Aid

Table 2.3.2-1 Component Groups Requiring Aging Management Review - High Pressure Coolant Injection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel SA193Gr B7	Air with metal temperature up to 288°C (550°F)	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-g	3.1.1.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	V.E.2-a	3.2.1.14	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	V.E.2-b	3.2.1.14	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Crack initiation and growth/ Cyclic loading	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Loss of material/ Wear	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.4	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Outdoor ambient conditions	Loss of Material/General corrosion and wear	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.6	NA
Dampeners /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22
Dampeners /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.125	3.2.2.22
Diffusers /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	NA
Filters/Strainers /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.3-a	3.1.1.11	3.2.2.13
Filters/Strainers /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137

Aging Management Review Aid

Table 2.3.2-1 Component Groups Requiring Aging Management Review - High Pressure Coolant Injection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Filters/Strainers /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137
Filters/Strainers /Pressure Boundary	Stainless Steel Casting	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.3-c	3.2.1.13	3.2.2.22
Filters/Strainers /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.32	3.2.2.137
Filters/Strainers /Filter	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	NA
Filters/Strainers /Filter	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	NA
Filters/Strainers /Filter	Stainless Steel Casting	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.3-c	3.2.1.13	NA
Filters/Strainers /Filter	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.32	NA
Flexible Hoses /Pressure Boundary	Elastomers Neoprene and Similar Materials	Lubricating oil (with contaminants and/or moisture)	Hardening and loss of strength/ Elastomer degradation	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.33	3.2.2.34
Flexible Hoses /Pressure Boundary	Elastomers Neoprene and Similar Materials	Moist air	Hardening and loss of strength/ Elastomer degradation	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.34	3.2.2.34
Flow Orifices /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137

Aging Management Review Aid

Table 2.3.2-1 Component Groups Requiring Aging Management Review - High Pressure Coolant Injection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Flow Orifices /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137
Heat Exchangers /Pressure Boundary	Tubes: Admiralty Brass; Tubesheet: Brass; Channel Head: Carbon Steel; Shell: Carbon Steel	Tube Side: Condensate (demineralized water); Shell side: Lubricating oil	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Selective Leaching	Water Chemistry (B.1.2), Selective Leaching of Materials (B.1.24), Lube Oil Monitoring Activities, Heat Exchanger Test and Inspection Activities (B.2.6)	Non-GALL	3.2.2.40	3.2.2.137
Heat Exchangers /Pressure Boundary	Tubes: Admiralty Brass; Tubesheet: Brass; Channel Head: Carbon Steel; Shell: Carbon Steel	Tube Side: Condensate (demineralized water); Shell side: Lubricating oil	Cracking/Mech Fatigue, SCC	Water Chemistry (B.1.2), Lube Oil Monitoring Activities, Heat Exchanger Test and Inspection Activities (B.2.6)	Non-GALL	3.2.2.41	3.2.2.137
Heat Exchangers /Pressure Boundary	Tubes: Admiralty Brass; Tubesheet: Carbon Steel; Channel Head: Carbon Steel; Shell: Carbon Steel	Tube Side: Condensate (demineralized water); Shell side: Reactor coolant water and Warm moist air	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Selective Leaching, Pitting Corrosion, Crevice Corrosion	Water Chemistry (B.1.2), Selective Leaching of Materials (B.1.24), Heat Exchanger Test and Inspection Activities	Non-GALL	3.2.2.42	3.2.2.137
Heat Exchangers /Pressure Boundary	Tubes: Admiralty Brass; Tubesheet: Carbon Steel; Channel Head: Carbon Steel; Shell: Carbon Steel	Tube Side: Condensate (demineralized water); Shell side: Reactor coolant water and Warm moist air	Cracking/Mech Fatigue, SCC	Water Chemistry (B.1.2), Heat Exchanger Test and Inspection Activities (B.2.6)	Non-GALL	3.2.2.43	3.2.2.137
Heat Exchangers /Heat Transfer	Tubes: Admiralty Brass	Tube Side: Condensate (demineralized water); Shell side: Lubricating oil	Buildup of Deposit/Fouling	Heat Exchanger Test and Inspection Activities (B.2.6)	Non-GALL	3.2.2.38	NA
Heat Exchangers /Heat Transfer	Tubes: Admiralty Brass	Tube Side: Condensate (demineralized water); Shell side: Reactor coolant water and Warm moist air	Buildup of Deposit/Fouling	Heat Exchanger Test and Inspection Activities (B.2.6)	Non-GALL	3.2.2.39	NA

Aging Management Review Aid

Table 2.3.2-1 Component Groups Requiring Aging Management Review - High Pressure Coolant Injection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.55	3.2.2.55
Piping and Fittings /Pressure Boundary	Carbon Steel SA106Gr B, SA333Gr 6, SA155Gr KCF70	288°C (550°F) reactor coolant water or steam	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.1-e	3.1.1.1	NA
Piping and Fittings /Pressure Boundary	Carbon Steel SA106Gr B	288°C (550°F) steam	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.1-a	3.1.1.11	3.2.2.137
Piping and Fittings /Pressure Boundary	Carbon steel, stainless steel	25-288°C (77-550°F) demineralized water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	V.D2.1-b	3.2.1.1	NA
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.14
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.14
Piping and Fittings /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.26

Aging Management Review Aid

Table 2.3.2-1 Component Groups Requiring Aging Management Review - High Pressure Coolant Injection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.23
Piping and Fittings /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.25
Piping and Fittings /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.24
Piping and Fittings /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.2	3.2.2.24
Piping and Fittings /Pressure Boundary	Aluminum	25-288°C (77-550°F) demineralized water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.2.2.56	3.2.2.10
Piping and Fittings /Pressure Boundary	Aluminum	25-288°C (77-550°F) demineralized water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.2.2.56	3.2.2.9
Piping and Fittings /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.2.2.58	3.2.2.13
Piping and Fittings /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.59	3.2.2.137
Piping and Fittings /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.64	3.2.2.23
Piping and Fittings /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.64	3.2.2.22

Aging Management Review Aid

Table 2.3.2-1 Component Groups Requiring Aging Management Review - High Pressure Coolant Injection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.64	3.2.2.24
Piping and Fittings /Pressure Boundary	Stainless Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.65	3.2.2.22
Piping and Fittings /Pressure Boundary	Steel Chrome Moly	25-288°C (77-550°F) demineralized water	Loss of material/ Pitting	Water Chemistry (B.1.2)	Non-GALL	3.2.2.68	3.2.2.28
Piping and Fittings /Pressure Boundary	Steel Chrome Moly	25-288°C (77-550°F) demineralized water	Loss of material/ Pitting	Water Chemistry (B.1.2)	Non-GALL	3.2.2.68	3.2.2.27
Piping and Fittings /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.126	3.2.2.137
Piping and Fittings /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.126	3.2.2.14
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.57	3.2.2.14
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.57	3.2.2.137
Piping and Fittings (small bore) /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.2.2.24
Pumps /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General pitting crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.2-a	3.2.1.2	3.2.2.137

Aging Management Review Aid

Table 2.3.2-1 Component Groups Requiring Aging Management Review - High Pressure Coolant Injection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Pumps /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General pitting crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.2-a	3.2.1.4	3.2.2.137
Pumps /Pressure Boundary	Cast Iron	25-288°C (77-550°F) demineralized water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.2.2.69	3.2.2.17
Pumps /Pressure Boundary	Cast Iron	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General pitting crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.70	3.2.2.17
Pumps /Pressure Boundary	Cast Iron	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.71	3.2.2.17
Restricting Orifices /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137
Restricting Orifices /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.13
Restricting Orifices /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137
Restricting Orifices /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.13
Restricting Orifices /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.128	3.2.2.13
Restricting Orifices /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.128	3.2.2.137
Restricting Orifices /Throttle	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	NA

Aging Management Review Aid

Table 2.3.2-1 Component Groups Requiring Aging Management Review - High Pressure Coolant Injection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Restricting Orifices /Throttle	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	NA
Restricting Orifices /Throttle	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.128	NA
Restricting Orifices (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.72	3.2.2.137
Restricting Orifices (attached support)/Structural Integrity (Attached)	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.128	3.2.2.137
Rupture Discs /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.129	3.2.2.22
Sight Glasses /Pressure Boundary	Glass	Air and steam up to 320°C (608°F)	None	None	Non-GALL	3.2.2.5	3.2.2.20
Sight Glasses /Pressure Boundary	Glass	25-288°C (77-550°F) demineralized water	None	None	Non-GALL	3.2.2.76	3.2.2.20
Sight Glasses (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.75	3.2.2.137
Sight Glasses (attached support)/Structural Integrity (Attached)	Glass	25-288°C (77-550°F) demineralized water	None	None	Non-GALL	3.2.2.76	3.2.2.20
Tanks /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137

Aging Management Review Aid

Table 2.3.2-1 Component Groups Requiring Aging Management Review - High Pressure Coolant Injection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Tanks /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.13
Tanks /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.13
Tanks /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137
Tanks /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.2.2.83	3.2.2.13
Tanks /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.84	3.2.2.137
Tanks /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.130	3.2.2.137
Thermowells /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137
Thermowells /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137
Thermowells /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.86	3.2.2.137
Traps /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.13
Traps /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.13

Aging Management Review Aid

Table 2.3.2-1 Component Groups Requiring Aging Management Review - High Pressure Coolant Injection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Tubing /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.2.2.23
Tubing /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22
Tubing /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.94	3.2.2.24
Tubing /Pressure Boundary	Stainless Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.96	3.2.2.22
Tubing /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.97	3.2.2.22
Tubing /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.132	3.2.2.24
Tubing (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.89	3.2.2.137
Tubing (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.89	3.2.2.13
Tubing (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.89	3.2.2.14
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.92	3.2.2.22

Aging Management Review Aid

Table 2.3.2-1 Component Groups Requiring Aging Management Review - High Pressure Coolant Injection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.92	3.2.2.23
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.92	3.2.2.24
Turbine Casings /Pressure Boundary	Alloy Steel Casting (A217)	Air and steam up to 320°C (608°F)	Loss of material/ General, pitting, and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.99	3.2.2.8
Valves /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-d	3.1.1.1	NA
Valves /Pressure Boundary	Carbon Steel SA106Gr B	288°C (550°F) steam	Wall thinning/ Flow-accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.1-a	3.1.1.11	3.2.2.137
Valves /Pressure Boundary	Carbon Steel SA106Gr B	288°C (550°F) steam	Wall thinning/ Flow-accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.1-a	3.1.1.11	3.2.2.13
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.2.2.24
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.2.2.22
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.2.2.23

Aging Management Review Aid

Table 2.3.2-1 Component Groups Requiring Aging Management Review - High Pressure Coolant Injection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.2	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.2	3.2.2.13
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.2	3.2.2.13
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.2	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.4	3.2.2.13
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.4	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.4	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.4	3.2.2.13
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.3-a	3.2.1.12	3.2.2.13
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.3-a	3.2.1.12	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.3-a	3.2.1.12	3.2.2.13

Aging Management Review Aid

Table 2.3.2-1 Component Groups Requiring Aging Management Review - High Pressure Coolant Injection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.3-a	3.2.1.12	3.2.2.137
Valves /Pressure Boundary	Stainless Steel Forging	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.3-c	3.2.1.13	3.2.2.22
Valves /Pressure Boundary	Brass or Bronze	Air and steam up to 320°C (608°F)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.7	3.2.2.11
Valves /Pressure Boundary	Aluminum	25-288°C (77-550°F) demineralized water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.2.2.100	3.2.2.10
Valves /Pressure Boundary	Brass or Bronze	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.102	3.2.2.11
Valves /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.104	3.2.2.137
Valves /Pressure Boundary	Carbon Steel	Air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.105	3.2.2.137
Valves /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.2.2.106	3.2.2.13
Valves /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.2.2.106	3.2.2.14
Valves /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.2.2.106	3.2.2.137
Valves /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F)	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.107	3.2.2.137
Valves /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.109	3.2.2.137

Aging Management Review Aid

Table 2.3.2-1 Component Groups Requiring Aging Management Review - High Pressure Coolant Injection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.119	3.2.2.24
Valves /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.119	3.2.2.23
Valves /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.119	3.2.2.22
Valves /Pressure Boundary	Stainless Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.121	3.2.2.22
Valves /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.122	3.2.2.22
Valves /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.133	3.2.2.14
Valves /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.133	3.2.2.137
Valves /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.135	3.2.2.22
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.104	3.2.2.137
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Air and steam up to 320°C (608°F)	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.107	3.2.2.137

Aging Management Review Aid

Table 2.3.2-2 Component Groups Requiring Aging Management Review - Core Spray System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel SA193Gr B7	Air with metal temperature up to 288°C (550°F)	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-g	3.1.1.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	V.E.2-a	3.2.1.14	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	V.E.2-b	3.2.1.14	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Crack initiation and growth/ Cyclic loading	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Loss of material/ Wear	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.4	NA
Flow Elements /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22
Flow Elements /Throttle	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	NA
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.55	3.2.2.55
Piping and Fittings /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water or steam	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.1-h	3.1.1.1	NA
Piping and Fittings /Pressure Boundary	Carbon Steel SA106Gr B	Up to 225°C (437°F) reactor coolant water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.1-c	3.1.1.11	3.2.2.14

Aging Management Review Aid

Table 2.3.2-2 Component Groups Requiring Aging Management Review - Core Spray System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.2.2.22
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.2.2.24
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.57	3.2.2.137
Pumps /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General pitting crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.2-a	3.2.1.2	3.2.2.137
Pumps /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General pitting crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.2-a	3.2.1.4	3.2.2.137
Restricting Orifices /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137
Restricting Orifices /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137
Restricting Orifices /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22

Aging Management Review Aid

Table 2.3.2-2 Component Groups Requiring Aging Management Review - Core Spray System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Restricting Orifices /Throttle	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	NA
Restricting Orifices /Throttle	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	NA
Restricting Orifices /Throttle	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	NA
Sight Glasses (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.75	3.2.2.137
Sight Glasses (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.75	3.2.2.14
Thermowells /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22
Tubing /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.92	3.2.2.22
Valves /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-d	3.1.1.1	NA

Aging Management Review Aid

Table 2.3.2-2 Component Groups Requiring Aging Management Review - Core Spray System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.3-a	3.1.1.11	3.2.2.137
Valves /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.3-a	3.1.1.11	3.2.2.14
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.2.2.22
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.2.2.24
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.2	3.2.2.14
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.2	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.4	3.2.2.14
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.4	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.3-a	3.2.1.12	3.2.2.14
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.3-a	3.2.1.12	3.2.2.137
Valves /Pressure Boundary	Stainless Steel Forging	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.3-c	3.2.1.13	3.2.2.22

Aging Management Review Aid

Table 2.3.2-2 Component Groups Requiring Aging Management Review - Core Spray System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.122	3.2.2.22
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.104	3.2.2.137
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Wet Gas	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.113	3.2.2.137
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.115	3.2.2.22
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.116	3.2.2.22
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	Wet Gas	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.124	3.2.2.22

Aging Management Review Aid

Table 2.3.2-3 Component Groups Requiring Aging Management Review - Containment Isolation Components and Primary Containment Piping System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	V.E.2-a	3.2.1.14	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	V.E.2-b	3.2.1.14	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Crack initiation and growth/ Cyclic loading	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Loss of material/ Wear	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.4	NA
Flexible Hoses /Pressure Boundary	Elastomers Neoprene and Similar Materials	Saturated air	Hardening and loss of strength/ Elastomer degradation	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.36	3.2.2.35
Flow Elements /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.37	3.2.2.22
Isolation Barriers /Pressure Boundary	Carbon Steel	Inside surface: treated or raw water, liquid waste; outside surface: ambient air	Loss of material/ General pitting crevice microbiologically influenced corrosion and biofouling	Plant-specific	V.C.1-a	3.2.1.3	3.2.2.14
Isolation Barriers /Pressure Boundary	Carbon Steel	Inside surface: treated or raw water, liquid waste; outside surface: ambient air	Loss of material/ General pitting crevice microbiologically influenced corrosion and biofouling	Plant-specific	V.C.1-a	3.2.1.3	3.2.2.137
Isolation Barriers /Pressure Boundary	Carbon Steel	Moist containment atmosphere (air/nitrogen), steam, or demineralized water	Loss of material/ General (carbon steel only) pitting and crevice corrosion	Plant-specific	V.D2.1-e	3.2.1.3	3.2.2.137
Isolation Barriers /Pressure Boundary	Carbon Steel	Inside surface: treated or raw water, liquid waste; outside surface: ambient air	Loss of material/ General pitting crevice microbiologically influenced corrosion and biofouling	Plant-specific	V.C.1-a	3.2.1.5	3.2.2.14

Aging Management Review Aid

Table 2.3.2-3 Component Groups Requiring Aging Management Review - Containment Isolation Components and Primary Containment Piping System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Isolation Barriers /Pressure Boundary	Carbon Steel	Inside surface: treated or raw water, liquid waste; outside surface: ambient air	Loss of material/ General pitting crevice microbiologically influenced corrosion and biofouling	Plant-specific	V.C.1-a	3.2.1.5	3.2.2.137
Isolation Barriers /Pressure Boundary	Stainless Steel	Inside surface: treated or raw water, liquid waste; outside surface: ambient air	Loss of material/ Pitting crevice microbiologically influenced corrosion and biofouling	Plant-specific	V.C.1-b	3.2.1.5	3.2.2.22
Isolation Barriers /Pressure Boundary	Carbon Steel	Moist containment atmosphere (air/nitrogen), steam, or demineralized water	Loss of material/ General (carbon steel only) pitting and crevice corrosion	Plant-specific	V.D2.1-e	3.2.1.5	3.2.2.137
Isolation Barriers /Pressure Boundary	Carbon Steel	Inside surface: treated or raw water, liquid waste; outside surface: ambient air	Loss of material/ General pitting crevice microbiologically influenced corrosion and biofouling	Plant-specific	V.C.1-a	3.2.1.6	3.2.2.137
Isolation Barriers /Pressure Boundary	Carbon Steel	Inside surface: treated or raw water, liquid waste; outside surface: ambient air	Loss of material/ General pitting crevice microbiologically influenced corrosion and biofouling	Plant-specific	V.C.1-a	3.2.1.6	3.2.2.14
Isolation Barriers /Pressure Boundary	Stainless Steel	Inside surface: treated or raw water, liquid waste; outside surface: ambient air	Loss of material/ Pitting crevice microbiologically influenced corrosion and biofouling	Plant-specific	V.C.1-b	3.2.1.6	3.2.2.22
Isolation Barriers /Pressure Boundary	Brass or Bronze	Saturated air	Loss of material/ Pitting and crevice corrosion	10 CFR Part 50, Appendix J (B.1.28)	Non-GALL	3.2.2.49	3.2.2.12
Isolation Barriers /Pressure Boundary	Brass or Bronze	Saturated air	Loss of material/ Pitting and crevice corrosion	10 CFR Part 50, Appendix J (B.1.28)	Non-GALL	3.2.2.49	3.2.2.11
Isolation Barriers /Pressure Boundary	Carbon Steel	Saturated air	Loss of material/ General pitting crevice corrosion	10 CFR Part 50, Appendix J (B.1.28)	Non-GALL	3.2.2.50	3.2.2.137

Aging Management Review Aid

Table 2.3.2-3 Component Groups Requiring Aging Management Review - Containment Isolation Components and Primary Containment Piping System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Isolation Barriers /Pressure Boundary	Carbon Steel	Saturated air	Loss of material/ General pitting crevice corrosion	10 CFR Part 50, Appendix J (B.1.28)	Non-GALL	3.2.2.50	3.2.2.14
Isolation Barriers /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General pitting crevice corrosion	10 CFR Part 50, Appendix J (B.1.28)	Non-GALL	3.2.2.51	3.2.2.14
Isolation Barriers /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General pitting crevice corrosion	10 CFR Part 50, Appendix J (B.1.28)	Non-GALL	3.2.2.51	3.2.2.137
Isolation Barriers /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	10 CFR Part 50, Appendix J (B.1.28)	Non-GALL	3.2.2.52	3.2.2.22
Isolation Barriers /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	10 CFR Part 50, Appendix J (B.1.28)	Non-GALL	3.2.2.52	3.2.2.24
Isolation Barriers /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	10 CFR Part 50, Appendix J (B.1.28)	Non-GALL	3.2.2.53	3.2.2.22
Isolation Barriers /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	10 CFR Part 50, Appendix J (B.1.28)	Non-GALL	3.2.2.53	3.2.2.24
Isolation Barriers (attached support)/Structural Integrity (Attached)	Brass or Bronze	Saturated air	Loss of material/ Pitting and crevice corrosion	10 CFR Part 50, Appendix J (B.1.28)	Non-GALL	3.2.2.49	3.2.2.11
Isolation Barriers (attached support)/Structural Integrity (Attached)	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	10 CFR Part 50, Appendix J (B.1.28)	Non-GALL	3.2.2.52	3.2.2.22
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.55	3.2.2.55
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137

Aging Management Review Aid

Table 2.3.2-3 Component Groups Requiring Aging Management Review - Containment Isolation Components and Primary Containment Piping System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.14
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.14
Piping and Fittings /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.62	3.2.2.14
Piping and Fittings /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.62	3.2.2.137
Piping and Fittings /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.67	3.2.2.24
Piping and Fittings /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.67	3.2.2.22
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.57	3.2.2.137
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Saturated air	Loss of material/ General and pitting corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.60	3.2.2.137
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.62	3.2.2.14

Aging Management Review Aid

Table 2.3.2-3 Component Groups Requiring Aging Management Review - Containment Isolation Components and Primary Containment Piping System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.62	3.2.2.137
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.66	3.2.2.22
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.66	3.2.2.24
Restricting Orifices /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.74	3.2.2.74
Tanks /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22
Tanks /Pressure Boundary	Brass or Bronze	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.3	3.2.2.11
Thermowells /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.87	3.2.2.137
Tubing /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.24
Tubing /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22

Aging Management Review Aid

Table 2.3.2-3 Component Groups Requiring Aging Management Review - Containment Isolation Components and Primary Containment Piping System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Tubing /Pressure Boundary	Copper	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.90	3.2.2.18
Tubing /Pressure Boundary	Copper	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.90	3.2.2.19
Tubing /Pressure Boundary	Copper	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.91	3.2.2.18
Tubing /Pressure Boundary	Copper	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.91	3.2.2.19
Tubing /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.98	3.2.2.22
Tubing /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.98	3.2.2.24
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.2	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.4	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Wall thinning/ Flow-accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.3-a	3.2.1.12	3.2.2.137
Valves /Pressure Boundary	Stainless Steel Forging	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.3-c	3.2.1.13	3.2.2.22
Valves /Pressure Boundary	Stainless Steel Forging	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.3-c	3.2.1.13	3.2.2.137
Valves /Pressure Boundary	Brass or Bronze	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.103	3.2.2.12

Aging Management Review Aid

Table 2.3.2-3 Component Groups Requiring Aging Management Review - Containment Isolation Components and Primary Containment Piping System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Brass or Bronze	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.103	3.2.2.11
Valves /Pressure Boundary	Carbon Steel	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.108	3.2.2.137
Valves /Pressure Boundary	Carbon Steel	Saturated air	Loss of material/ General and pitting corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.110	3.2.2.137
Valves /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.112	3.2.2.137
Valves /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.112	3.2.2.14
Valves /Pressure Boundary	Carbon Steel	Wet Gas	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.113	3.2.2.137
Valves /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.122	3.2.2.22
Valves /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.122	3.2.2.24
Valves /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.123	3.2.2.22
Valves (attached support)/Structural Integrity (Attached)	Brass or Bronze	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.103	3.2.2.11
Valves (attached support)/Structural Integrity (Attached)	Brass or Bronze	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.103	3.2.2.12

Aging Management Review Aid

Table 2.3.2-3 Component Groups Requiring Aging Management Review - Containment Isolation Components and Primary Containment Piping System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.104	3.2.2.137
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Saturated air	Loss of material/ General and pitting corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.110	3.2.2.137
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Saturated air	Loss of material/ General and pitting corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.110	3.2.2.14
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.112	3.2.2.14
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.112	3.2.2.137
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Wet Gas	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.113	3.2.2.137
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.122	3.2.2.22
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.122	3.2.2.24
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.123	3.2.2.22

Aging Management Review Aid

Table 2.3.2-4 Component Groups Requiring Aging Management Review - Reactor Core Isolation Cooling System (Quad Cities only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel SA193Gr B7	Air with metal temperature up to 288°C (550°F)	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-g	3.1.1.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	V.E.2-a	3.2.1.14	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	V.E.2-b	3.2.1.14	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Crack initiation and growth/ Cyclic loading	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Loss of material/ Wear	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.4	NA
Dampeners /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.23
Dampeners /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22
Dampeners /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.125	3.2.2.22
Filters/Strainers /Pressure Boundary	Stainless Steel Forging	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.3-c	3.2.1.13	3.2.2.22
Filters/Strainers /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.32	3.2.2.137
Filters/Strainers /Filter	Stainless Steel Casting	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.3-c	3.2.1.13	NA

Aging Management Review Aid

Table 2.3.2-4 Component Groups Requiring Aging Management Review - Reactor Core Isolation Cooling System (Quad Cities only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Flexible Hoses /Pressure Boundary	Elastomers Neoprene and Similar Materials	Moist containment atmosphere (air/nitrogen), steam, or demineralized water	Hardening and loss of strength/ Elastomer degradation	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.35	3.2.2.35
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.55	3.2.2.55
Piping and Fittings /Pressure Boundary	Carbon Steel SA106Gr B, SA333Gr 6, SA155Gr KCF70	288°C (550°F) reactor coolant water or steam	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.1-e	3.1.1.1	NA
Piping and Fittings /Pressure Boundary	Carbon Steel SA106Gr B	288°C (550°F) steam	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.1-a	3.1.1.11	3.2.2.13
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.13
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.13
Piping and Fittings /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22
Piping and Fittings /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.2	3.2.2.24

Aging Management Review Aid

Table 2.3.2-4 Component Groups Requiring Aging Management Review - Reactor Core Isolation Cooling System (Quad Cities only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.2	3.2.2.23
Piping and Fittings /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.2.2.58	3.2.2.13
Piping and Fittings /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.59	3.2.2.137
Piping and Fittings /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.64	3.2.2.24
Piping and Fittings /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.64	3.2.2.23
Piping and Fittings /Pressure Boundary	Steel Chrome Moly	25-288°C (77-550°F) demineralized water	Loss of material/ Pitting	Water Chemistry (B.1.2)	Non-GALL	3.2.2.68	3.2.2.27
Piping and Fittings /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.126	3.2.2.13
Piping and Fittings /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.126	3.2.2.14
Piping and Fittings (small bore) /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.2.2.24
Piping and Fittings (small bore) /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.2.2.23

Aging Management Review Aid

Table 2.3.2-4 Component Groups Requiring Aging Management Review - Reactor Core Isolation Cooling System (Quad Cities only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Pumps /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General pitting crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.2-a	3.2.1.2	3.2.2.137
Pumps /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General pitting crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.2-a	3.2.1.4	3.2.2.137
Pumps /Pressure Boundary	Cast Iron	25-288°C (77-550°F) demineralized water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.2.2.69	3.2.2.17
Pumps /Pressure Boundary	Cast Iron	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General pitting crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.70	3.2.2.17
Pumps /Pressure Boundary	Cast Iron	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.71	3.2.2.17
Restricting Orifices /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137
Restricting Orifices /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137
Restricting Orifices /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22
Restricting Orifices /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.73	3.2.2.137
Restricting Orifices /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.128	3.2.2.137
Restricting Orifices /Throttle	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	NA

Aging Management Review Aid

Table 2.3.2-4 Component Groups Requiring Aging Management Review - Reactor Core Isolation Cooling System (Quad Cities only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Restricting Orifices /Throttle	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	NA
Restricting Orifices /Throttle	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.73	NA
Restricting Orifices /Throttle	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.128	NA
Sight Glasses /Pressure Boundary	Glass	Lubricating oil (with contaminants and/or moisture)	None	None	Non-GALL	3.2.2.77	3.2.2.20
Tanks /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.13
Tanks /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.13
Tanks /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.2.2.83	3.2.2.13
Tanks /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.84	3.2.2.137
Tanks /Pressure Boundary	Cast Iron	25-288°C (77-550°F) demineralized water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.2.2.85	3.2.2.17
Tanks /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.130	3.2.2.137
Traps /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.2.2.88	3.2.2.13
Traps /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.131	3.2.2.137

Aging Management Review Aid

Table 2.3.2-4 Component Groups Requiring Aging Management Review - Reactor Core Isolation Cooling System (Quad Cities only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Tubing /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22
Tubing /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.23
Tubing /Pressure Boundary	Stainless Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.96	3.2.2.24
Tubing /Pressure Boundary	Stainless Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.96	3.2.2.22
Turbine Casings /Pressure Boundary	Alloy Steel Casting (A217)	Air and steam up to 320°C (608°F)	Loss of material/ General, pitting, and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.99	3.2.2.8
Valves /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-d	3.1.1.1	NA
Valves /Pressure Boundary	Carbon Steel SA106Gr B	288°C (550°F) steam	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.1-a	3.1.1.11	3.2.2.14
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.2.2.24
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.2.2.23

Aging Management Review Aid

Table 2.3.2-4 Component Groups Requiring Aging Management Review - Reactor Core Isolation Cooling System (Quad Cities only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.2	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.2	3.2.2.13
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.2	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.2	3.2.2.13
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.4	3.2.2.13
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.4	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.4	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.4	3.2.2.13
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.3-a	3.2.1.12	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.3-a	3.2.1.12	3.2.2.13
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.3-a	3.2.1.12	3.2.2.137

Aging Management Review Aid

Table 2.3.2-4 Component Groups Requiring Aging Management Review - Reactor Core Isolation Cooling System (Quad Cities only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.3-a	3.2.1.12	3.2.2.13
Valves /Pressure Boundary	Stainless Steel Forging	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.3-c	3.2.1.13	3.2.2.22
Valves /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.2.2.106	3.2.2.13
Valves /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F)	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.107	3.2.2.14
Valves /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F)	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.107	3.2.2.137
Valves /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.109	3.2.2.137
Valves /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Steam)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.119	3.2.2.23
Valves /Pressure Boundary	Stainless Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.121	3.2.2.22
Valves /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.133	3.2.2.13
Valves /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.133	3.2.2.137
Valves /Pressure Boundary	Stainless Steel	Air and steam up to 320°C (608°F) (Primarily Air)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.135	3.2.2.22

Aging Management Review Aid

Table 2.3.2-4 Component Groups Requiring Aging Management Review - Reactor Core Isolation Cooling System (Quad Cities only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves (small bore) /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.2.2.24
Valves (small bore) /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.2.2.23
Valves (small bore) /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.2.2.22

Aging Management Review Aid

Table 2.3.2-5 Component Groups Requiring Aging Management Review - Isolation Condenser (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel SA193Gr B7	Air with metal temperature up to 288°C (550°F)	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-g	3.1.1.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	V.E.2-a	3.2.1.14	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	V.E.2-b	3.2.1.14	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Crack initiation and growth/ Cyclic loading	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Loss of material/ Wear	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.4	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Outdoor ambient conditions	Loss of Material/General corrosion and wear	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.6	NA
Flow Elements /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.2.2.22
Flow Elements /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.24
Isolation Condensers /Pressure Boundary	Tubes: stainless steel; tubesheet: carbon steel, stainless steel; channel head: carbon steel, stainless steel; shell: carbon steel	Tube side: Steam; shell side: Demineralized water	Loss of material/ General, pitting, and crevice corrosion	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1), for Class 1 components; and Water Chemistry (B.1.2); and ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) AMP augmentation activities	IV.C1.4-b	3.1.1.2	3.2.2.137

Aging Management Review Aid

Table 2.3.2-5 Component Groups Requiring Aging Management Review - Isolation Condenser (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Isolation Condensers /Pressure Boundary	Tubes: stainless steel; tubesheet: carbon steel, stainless steel; channel head: carbon steel, stainless steel; shell: carbon steel	Tube side: Steam; shell side: Demineralized water	Crack initiation and growth/ Stress corrosion cracking, cyclic loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1), for Class 1 components; and Water Chemistry (B.1.2); and ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) AMP augmentation activities	IV.C1.4-a	3.1.1.7	3.2.2.137
Isolation Condensers /Heat Transfer	Tubes: stainless steel	Tube side: Steam; shell side: Demineralized water	Buildup of Deposit/Fouling	Heat Exchanger Test and Inspection Activities (B.2.6)	Non-GALL	3.1.2.15	NA
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.55	3.2.2.55
Piping and Fittings /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water or steam	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.1-h	3.1.1.1	NA
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.2.2.22
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.13
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.15

Aging Management Review Aid

Table 2.3.2-5 Component Groups Requiring Aging Management Review - Isolation Condenser (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.14
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.15
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.14
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.13
Piping and Fittings /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.26
Piping and Fittings /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.25
Piping and Fittings /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.24
Piping and Fittings /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.23

Aging Management Review Aid

Table 2.3.2-5 Component Groups Requiring Aging Management Review - Isolation Condenser (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Aluminum	25-288°C (77-550°F) demineralized water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.2.2.56	3.2.2.10
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.61	3.2.2.137
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.61	3.2.2.15
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.61	3.2.2.14
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.61	3.2.2.13
Piping and Fittings (small bore) /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.2.2.23
Piping and Fittings (small bore) /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.2.2.24
Pumps /Pressure Boundary	Stainless Steel Casting	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.3-c	3.2.1.13	3.2.2.22
Sight Glasses /Pressure Boundary	Glass	25-288°C (77-550°F) demineralized water	None	None	Non-GALL	3.2.2.76	3.2.2.20

Aging Management Review Aid

Table 2.3.2-5 Component Groups Requiring Aging Management Review - Isolation Condenser (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Tanks /Pressure Boundary	Aluminum	25-288°C (77-550°F) demineralized water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.2.2.82	3.2.2.10
Thermowells /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.2.2.22
Tubing /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.97	3.2.2.22
Tubing /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.97	3.2.2.23
Tubing /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.97	3.2.2.24
Valves /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-d	3.1.1.1	NA
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.2.2.25
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.2.2.22
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.2.2.24
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.2.2.23

Aging Management Review Aid

Table 2.3.2-5 Component Groups Requiring Aging Management Review - Isolation Condenser (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.2	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.2	3.2.2.15
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.2	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.4	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.4	3.2.2.15
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.4	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.3-a	3.2.1.12	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.3-a	3.2.1.12	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.3-a	3.2.1.12	3.2.2.15
Valves /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.122	3.2.2.22
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.111	3.2.2.137

Aging Management Review Aid

Table 2.3.2-5 Component Groups Requiring Aging Management Review - Isolation Condenser (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.116	3.2.2.22

Aging Management Review Aid

Table 2.3.2-6 Component Groups Requiring Aging Management Review - Residual Heat Removal System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel SA193Gr B7	Air with metal temperature up to 288°C (550°F)	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-g	3.1.1.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	V.E.2-a	3.2.1.14	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	V.E.2-b	3.2.1.14	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Crack initiation and growth/ Cyclic loading	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Loss of material/ Wear	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.4	NA
Dampeners /Pressure Boundary	Stainless Steel	Air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.30	3.2.2.22
Dampeners (attached support)/Structural Integrity (Attached)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.29	3.2.2.22
ECCS Suction Headers /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137
ECCS Suction Headers /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137
Filters/Strainers /Pressure Boundary	Stainless Steel Forging	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.3-c	3.2.1.13	3.2.2.22
Filters/Strainers /Filter	Stainless Steel Forging	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.3-c	3.2.1.13	NA

Aging Management Review Aid

Table 2.3.2-6 Component Groups Requiring Aging Management Review - Residual Heat Removal System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Flow Elements /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22
Flow Elements /Throttle	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	NA
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.55	3.2.2.55
Piping and Fittings /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water or steam	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.1-h	3.1.1.1	NA
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.2.2.24
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.2.2.23
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137
Piping and Fittings /Pressure Boundary	Carbon Steel	Air	Loss of material/ General corrosion	Plant-specific	V.D2.5-a	3.2.1.3	3.2.2.137
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137

Aging Management Review Aid

Table 2.3.2-6 Component Groups Requiring Aging Management Review - Residual Heat Removal System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F)	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.1-f	3.2.1.12	3.2.2.14
Piping and Fittings /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.57	3.2.2.137
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.57	3.2.2.14
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.63	3.2.2.22
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.63	3.2.2.24
Pumps /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General pitting crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.2-a	3.2.1.2	3.2.2.137
Pumps /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General pitting crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.2-a	3.2.1.4	3.2.2.137
Restricting Orifices /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137
Restricting Orifices /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137

Aging Management Review Aid

Table 2.3.2-6 Component Groups Requiring Aging Management Review - Residual Heat Removal System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Restricting Orifices /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22
Restricting Orifices /Throttle	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	NA
Restricting Orifices /Throttle	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	NA
Restricting Orifices /Throttle	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	NA
Sight Glasses (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.75	3.2.2.137
Sight Glasses (attached support)/Structural Integrity (Attached)	Glass	25-288°C (77-550°F) demineralized water	None	None	Non-GALL	3.2.2.76	3.2.2.20
Spray Nozzles /Pressure Boundary	Brass or Bronze	Air	Plugging of flow orifice and spray nozzles/ General corrosion	Periodic Testing of Drywell and Torus Spray Nozzles (B.2.4)	Non-GALL	3.2.2.78	3.2.2.12
Spray Nozzles /Spray	Brass or Bronze	Air	Plugging of flow orifice and spray nozzles/ General corrosion	Periodic Testing of Drywell and Torus Spray Nozzles (B.2.4)	Non-GALL	3.2.2.78	NA
Thermowells /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22

Aging Management Review Aid

Table 2.3.2-6 Component Groups Requiring Aging Management Review - Residual Heat Removal System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Tubing /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.24
Tubing /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22
Tubing /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.97	3.2.2.22
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.93	3.2.2.22
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.93	3.2.2.24
Valves /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-d	3.1.1.1	NA
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.2.2.23
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.2.2.24
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.2	3.2.2.137

Aging Management Review Aid

Table 2.3.2-6 Component Groups Requiring Aging Management Review - Residual Heat Removal System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.4	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.3-a	3.2.1.12	3.2.2.137
Valves /Pressure Boundary	Stainless Steel Forging	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.3-c	3.2.1.13	3.2.2.22
Valves /Pressure Boundary	Carbon Steel	Air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.105	3.2.2.14
Valves /Pressure Boundary	Carbon Steel	Air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.105	3.2.2.137
Valves /Pressure Boundary	Carbon Steel	Saturated air	Loss of material/ General and pitting corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.110	3.2.2.137
Valves /Pressure Boundary	Stainless Steel	Air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.117	3.2.2.22
Valves /Pressure Boundary	Stainless Steel	Air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.117	3.2.2.24
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.104	3.2.2.14
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.104	3.2.2.137
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.115	3.2.2.22

Aging Management Review Aid

Table 2.3.2-6 Component Groups Requiring Aging Management Review - Residual Heat Removal System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.116	3.2.2.22
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.116	3.2.2.24

Aging Management Review Aid

Table 2.3.2-7 Component Groups Requiring Aging Management Review - Low Pressure Coolant Injection System (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel SA193Gr B7	Air with metal temperature up to 288°C (550°F)	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-g	3.1.1.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	V.E.2-a	3.2.1.14	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	V.E.2-b	3.2.1.14	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Crack initiation and growth/ Cyclic loading	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Loss of material/ Wear	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.4	NA
ECCS Suction Headers /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137
ECCS Suction Headers /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137
Filters/Strainers /Filter	Stainless Steel Forging	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.3-c	3.2.1.13	NA
Flow Elements /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137
Flow Elements /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137
Flow Elements /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22

Aging Management Review Aid

Table 2.3.2-7 Component Groups Requiring Aging Management Review - Low Pressure Coolant Injection System (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Flow Elements /Throttle	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	NA
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.55	3.2.2.55
Piping and Fittings /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water or steam	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.1-h	3.1.1.1	NA
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.2.2.22
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.2.2.24
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137
Piping and Fittings /Pressure Boundary	Carbon Steel	Air	Loss of material/ General corrosion	Plant-specific	V.D2.5-a	3.2.1.3	3.2.2.137
Piping and Fittings /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137
Piping and Fittings /Pressure Boundary	Carbon Steel	Air and steam up to 320°C (608°F)	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.1-f	3.2.1.12	3.2.2.137

Aging Management Review Aid

Table 2.3.2-7 Component Groups Requiring Aging Management Review - Low Pressure Coolant Injection System (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.57	3.2.2.137
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.62	3.2.2.137
Pumps /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General pitting crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.2-a	3.2.1.2	3.2.2.137
Pumps /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General pitting crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.2-a	3.2.1.4	3.2.2.137
Restricting Orifices /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	3.2.2.137
Restricting Orifices /Pressure Boundary	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	3.2.2.137
Restricting Orifices /Throttle	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.2	NA
Restricting Orifices /Throttle	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.1-a	3.2.1.4	NA
Sight Glasses (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.75	3.2.2.137
Spray Nozzles /Pressure Boundary	Brass or Bronze	Air	Plugging of flow orifice and spray nozzles/ General corrosion	Periodic Testing of Drywell and Torus Spray Nozzles (B.2.4)	Non-GALL	3.2.2.78	3.2.2.12

Aging Management Review Aid

Table 2.3.2-7 Component Groups Requiring Aging Management Review - Low Pressure Coolant Injection System (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Spray Nozzles /Spray	Brass or Bronze	Air	Plugging of flow orifice and spray nozzles/ General corrosion	Periodic Testing of Drywell and Torus Spray Nozzles (B.2.4)	Non-GALL	3.2.2.78	NA
Thermowells /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22
Tubing /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22
Tubing /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.97	3.2.2.22
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.92	3.2.2.22
Valves /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-d	3.1.1.1	NA
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.2.2.24
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.2.2.22
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.2	3.2.2.137

Aging Management Review Aid

Table 2.3.2-7 Component Groups Requiring Aging Management Review - Low Pressure Coolant Injection System (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.4	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Casting	25-288°C (77-550°F) demineralized water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.3-a	3.2.1.12	3.2.2.137
Valves /Pressure Boundary	Stainless Steel Forging	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.3-c	3.2.1.13	3.2.2.22
Valves /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.122	3.2.2.22
Valves /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.123	3.2.2.22
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.104	3.2.2.137
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Wet Gas	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.113	3.2.2.137
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.115	3.2.2.22
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.122	3.2.2.24

Aging Management Review Aid

Table 2.3.2-8 Component Groups Requiring Aging Management Review - Standby Liquid Control System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Accumulators /Pressure Boundary	Carbon Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Loss of material/ General galvanic pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.3	3.3.1.5
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel SA193Gr B7	Air with metal temperature up to 288°C (550°F)	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-g	3.1.1.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Crack initiation and growth/ Cyclic loading	Bolting Integrity (B.1.12)	Non-GALL	3.1.2.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Containment Nitrogen	Loss of material/ Wear	Bolting Integrity (B.1.12)	Non-GALL	3.1.2.2	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Dampeners /Pressure Boundary	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	VII.E2.1-a	3.3.1.23	3.3.2.40
Dampeners /Pressure Boundary	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.47	3.3.2.40
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.130	3.3.2.130
Piping and Fittings /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water or steam	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.1-h	3.1.1.1	NA

Aging Management Review Aid

Table 2.3.2-8 Component Groups Requiring Aging Management Review - Standby Liquid Control System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.3.2.42
Piping and Fittings /Pressure Boundary	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	VII.E2.1-a	3.3.1.23	3.3.2.40
Piping and Fittings /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.139	3.3.1.5
Piping and Fittings /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.164	3.3.2.40
Piping and Fittings /Pressure Boundary	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.165	3.3.2.40
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.1.5
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.42
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	VII.E2.1-a	3.3.1.23	3.3.2.40
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	3.3.2.42

Aging Management Review Aid

Table 2.3.2-8 Component Groups Requiring Aging Management Review - Standby Liquid Control System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.165	3.3.2.40
Pumps /Pressure Boundary	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	VII.E2.4-a	3.3.1.23	3.3.2.40
Pumps /Pressure Boundary	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.185	3.3.2.40
Sight Glasses /Pressure Boundary	Glass	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	None	None	Non-GALL	3.3.2.203	3.3.2.36
Tanks /Pressure Boundary	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	VII.E2.2-a	3.3.1.23	3.3.2.40
Tanks /Pressure Boundary	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.219	3.3.2.40
Thermowells /Pressure Boundary	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	VII.E2.1-a	3.3.1.23	3.3.2.40
Thermowells /Pressure Boundary	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.227	3.3.2.40
Tubing /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.3.2.40
Tubing /Pressure Boundary	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	VII.E2.1-a	3.3.1.23	3.3.2.40

Aging Management Review Aid

Table 2.3.2-8 Component Groups Requiring Aging Management Review - Standby Liquid Control System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Tubing /Pressure Boundary	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.253	3.3.2.40
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	VII.E2.1-a	3.3.1.23	3.3.2.40
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.253	3.3.2.40
Valves /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-d	3.1.1.1	NA
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.3.2.40
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.3.2.42
Valves /Pressure Boundary	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	VII.E2.3-a	3.3.1.23	3.3.2.40
Valves /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.293	3.3.2.40
Valves /Pressure Boundary	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.294	3.3.2.40
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	VII.E2.3-a	3.3.1.23	3.3.2.40

Aging Management Review Aid

Table 2.3.2-8 Component Groups Requiring Aging Management Review - Standby Liquid Control System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.3-a	3.3.1.25	3.3.2.40
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.272	3.3.1.5
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	Sodium pentaborate solution at 21 - 32 °C (70 - 90°F) (~24,500 ppm B)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.294	3.3.2.40

Aging Management Review Aid

Table 2.3.2-9 Component Groups Requiring Aging Management Review - Standby Gas Treatment System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Outdoor ambient conditions	Loss of Material/General corrosion and wear	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.6	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, and humidity < 100°C (212°F)	Loss of Material/General corrosion and wear	Bolting Integrity (B.1.12)	Non-GALL	3.2.2.118	NA
Doors, Closure Bolts, Equip Frames /Pressure Boundary	Carbon Steel	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ General corrosion	Plant-specific	V.B.1-a	3.2.1.3	3.2.1.3
Doors, Closure Bolts, Equip Frames /Throttle	Carbon Steel	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ General corrosion	Plant-specific	V.B.1-a	3.2.1.3	3.2.1.3
Doors, Closure Bolts, Equip Frames /Throttle	Cast Iron	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ General, pitting, and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.127	3.2.1.3
Duct /Pressure Boundary	Carbon Steel	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ General corrosion	Plant-specific	V.B.1-a	3.2.1.3	3.2.2.16
Duct /Pressure Boundary	Carbon Steel	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ General corrosion	Plant-specific	V.B.1-a	3.2.1.3	3.2.2.15
Duct /Pressure Boundary	Carbon Steel	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ General corrosion	Plant-specific	V.B.1-a	3.2.1.3	3.2.1.3
Fan Housings /Pressure Boundary	Carbon Steel	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ General corrosion	Plant-specific	V.B.1-a	3.2.1.3	3.2.1.3

Aging Management Review Aid

Table 2.3.2-9 Component Groups Requiring Aging Management Review - Standby Gas Treatment System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Filters/Strainers /Pressure Boundary	Stainless Steel	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.31	3.2.2.31
Flex Collars, Doors and Damper Seals /Pressure Boundary	Elastomer Neoprene	Internal: occasional exposure to moist air; external: ambient plant air environment	Hardening and loss of strength/ Elastomer degradation	Plant-specific	V.B.1-b	3.2.1.7	3.2.1.7
Housings and Supports /Pressure Boundary	Carbon Steel	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ General corrosion	Plant-specific	V.B.2-a	3.2.1.3	3.2.1.3
Manifolds /Pressure Boundary	Stainless Steel	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.54	3.2.2.54
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.55	3.2.2.55
Seals /Pressure Boundary	Elastomers Neoprene and Similar Materials	Occasional exposure to moist air	Hardening and loss of strength/ Elastomer degradation	Plant-specific	V.B.2-b	3.2.1.7	3.2.1.7
Tubing /Pressure Boundary	Stainless Steel	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.95	3.2.2.95
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.95	3.2.2.95

Aging Management Review Aid

Table 2.3.2-9 Component Groups Requiring Aging Management Review - Standby Gas Treatment System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Brass or Bronze	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.101	3.2.2.101
Valves /Pressure Boundary	Brass or Bronze	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.2.2.103	3.2.2.103
Valves /Pressure Boundary	Carbon Steel	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.108	3.2.2.108
Valves /Pressure Boundary	Cast Iron	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ General, pitting, and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.114	3.2.2.114
Valves /Pressure Boundary	Stainless Steel	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.120	3.2.2.120
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.108	3.2.2.108
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	Internal: occasional exposure to moist air; external: ambient plant air environment	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.2.2.120	3.2.2.120

Aging Management Review Aid

Table 2.3.2-11 Component Groups Requiring Aging Management Review - Anticipated Transients Without Scram System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	V.E.2-a	3.2.1.14	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	V.E.2-b	3.2.1.14	NA
Piping and Fittings /Pressure Boundary	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.1-c	3.2.1.13	3.2.2.22
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.2	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	V.D2.3-b	3.2.1.4	3.2.2.137
Valves /Pressure Boundary	Carbon Steel Forging	25-288°C (77-550°F) demineralized water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	V.D2.3-a	3.2.1.12	3.2.2.137
Valves /Pressure Boundary	Stainless Steel Casting	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	V.D2.3-c	3.2.1.13	3.2.2.22

Aging Management Review Aid

Table 2.3.3-1 Component Groups Requiring Aging Management Review - Refueling Equipment System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Cranes /Structural Support	Steel A36	Air at 100% relative humidity and 49°C (120°F)	Loss of material/ General corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.15)	VII.B.1-b	3.3.1.14	NA
Fuel Grapples /Structural Support	Stainless Steel	Chemically treated oxygenated water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.3.2.74	NA
Fuel Pool Gates /Pressure Boundary	Aluminum	Chemically treated oxygenated water	Loss of material/ General and pitting corrosion	Water Chemistry (B.1.2)	Non-GALL	3.3.2.75	NA
Fuel Preparation Machines /Structural Support	Aluminum	Chemically treated oxygenated water	Loss of material/ General and pitting corrosion	Water Chemistry (B.1.2)	Non-GALL	3.3.2.76	NA

Aging Management Review Aid

Table 2.3.3-2 Component Groups Requiring Aging Management Review - Shutdown Cooling System (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Dampeners /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.40
Dampeners /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	3.3.2.40
Filters/Strainers /Pressure Boundary	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.1.5
Filters/Strainers /Filter	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	NA
Heat Exchangers /Pressure Boundary	Channel head and access cover: carbon steel; tubesheet: carbon steel (stainless steel cladding on channel side; Tubes: stainless steel; Shell: carbon steel	Tube side: Reactor coolant water; Shell side: Closed-cycle cooling water	Loss of material/ Pitting crevice and microbiologically influenced corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.E4.4-a	3.3.1.26	3.3.1.5
Heat Exchangers /Pressure Boundary	Tubes: 90-10 Cu-Ni; Tubesheet: Carbon Steel; Channel Head: Carbon Steel; Shell: Carbon Steel	Tube side: Reactor coolant water; Shell side: Closed-cycle cooling water	Cracking/Mech Fatigue, SCC	Water Chemistry (B.1.2), Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.86	3.3.1.5
Heat Exchangers /Pressure Boundary	Tubes: 90-10 Cu-Ni; Tubesheet: Carbon Steel; Channel Head: Carbon Steel; Shell: Carbon Steel	Tube side: Reactor coolant water; Shell side: Closed-cycle cooling water	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Pitting Corrosion, Crevice Corrosion	Water Chemistry (B.1.2), Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.87	3.3.1.5

Aging Management Review Aid

Table 2.3.3-2 Component Groups Requiring Aging Management Review - Shutdown Cooling System (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Heat Exchangers /Pressure Boundary	Tubes: Stainless Steel; Channel Head: Cast Steel; Shell: Cast Steel	Tube side: Reactor coolant water; Shell side: Closed-cycle cooling water	Cracking/Mech Fatigue, SCC	Water Chemistry (B.1.2), Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.303	3.3.1.5
Heat Exchangers /Heat Transfer	Tubes: 90-10 Cu-Ni	Tube side: Reactor coolant water; Shell side: Closed-cycle cooling water	Buildup of Deposit/Fouling	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.83	NA
Heat Exchangers /Heat Transfer	Tubes: stainless steel	Tube side: Reactor coolant water; Shell side: Closed-cycle cooling water	Buildup of Deposit/Fouling	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.114	NA
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.130	3.3.2.130
Piping and Fittings /Pressure Boundary	Carbon Steel SA106Gr B	Up to 225°C (437°F) reactor coolant water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.1-c	3.1.1.11	3.3.1.5
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.3.2.42
Piping and Fittings /Pressure Boundary	Carbon steel, stainless steel	Oxygenated water, up to 288°C (550°F)	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	VII.E4.1-b	3.3.1.3	NA
Piping and Fittings /Pressure Boundary	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.27
Piping and Fittings /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.40
Piping and Fittings /Pressure Boundary	Carbon Steel	35°C (95°F) treated water	Loss of material/ General, pitting, and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.1-a	3.3.1.13	3.3.2.27

Aging Management Review Aid

Table 2.3.3-2 Component Groups Requiring Aging Management Review - Shutdown Cooling System (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	3.3.2.40
Pumps /Pressure Boundary	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.2-a	3.3.1.8	3.3.1.5
Restricting Orifices /Pressure Boundary	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.1.5
Restricting Orifices /Throttle	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	NA
Sight Glasses /Pressure Boundary	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.1.5
Sight Glasses (attached support)/Structural Integrity (Attached)	Glass	Wet Gas	None	None	Non-GALL	3.3.2.204	3.3.2.204
Thermowells /Pressure Boundary	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.1.5
Valves /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.3-a	3.1.1.11	3.3.1.5
Valves /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.3-a	3.1.1.11	3.3.2.27
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.3.2.40
Valves /Pressure Boundary	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.27
Valves /Pressure Boundary	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.1.5

Aging Management Review Aid

Table 2.3.3-2 Component Groups Requiring Aging Management Review - Shutdown Cooling System (Dresden only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel	35°C (95°F) treated water	Loss of material/ General (only for carbon steel) pitting and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.2-a	3.3.1.13	3.3.1.5
Valves /Pressure Boundary	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.3-a	3.3.1.25	3.3.2.40
Valves /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.293	3.3.2.40

Aging Management Review Aid

Table 2.3.3-3 Component Groups Requiring Aging Management Review - Control Rod Drive Hydraulic System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Accumulators /Pressure Boundary	Carbon Steel	Dry Gas	None	None	Non-GALL	3.3.2.1	3.3.1.5
Accumulators /Pressure Boundary	Stainless Steel	Dry Gas	None	None	Non-GALL	3.3.2.5	3.3.2.40
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Dampeners /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.40
Dampeners /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	3.3.2.40
Dampeners (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.40
Dampeners (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	3.3.2.40
Filters/Strainers /Pressure Boundary	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.10	3.3.2.40
Filters/Strainers /Pressure Boundary	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.11	3.3.2.40
Filters/Strainers /Pressure Boundary	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.3-a	3.3.1.25	3.3.2.40
Filters/Strainers /Filter	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.10	NA

Aging Management Review Aid

Table 2.3.3-3 Component Groups Requiring Aging Management Review - Control Rod Drive Hydraulic System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Filters/Strainers /Filter	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.11	NA
Filters/Strainers /Filter	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.3-a	3.3.1.25	NA
Filters/Strainers /Filter	Stainless Steel Forging	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.3-a	3.3.1.25	NA
Flow Elements /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.40
Flow Elements /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	3.3.2.40
Flow Elements (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.40
Flow Elements (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	3.3.2.40
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.130	3.3.2.130
Piping and Fittings /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.25	3.3.2.40
Piping and Fittings /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.26	3.3.2.40

Aging Management Review Aid

Table 2.3.3-3 Component Groups Requiring Aging Management Review - Control Rod Drive Hydraulic System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.1.5
Piping and Fittings /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.40
Piping and Fittings /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.42
Piping and Fittings /Pressure Boundary	Carbon Steel	Saturated air	Loss of material/ General and pitting corrosion	Compressed Air Monitoring (B.1.16)	VII.D.1-a	3.3.1.17	3.3.1.5
Piping and Fittings /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	3.3.2.42
Piping and Fittings /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	3.3.2.40
Piping and Fittings /Pressure Boundary	Carbon Steel	Wet Gas	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.146	3.3.1.5
Piping and Fittings /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.164	3.3.2.40
Piping and Fittings /Pressure Boundary	Stainless Steel	Wet Gas	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.167	3.3.2.40
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.40
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	3.3.2.40

Aging Management Review Aid

Table 2.3.3-3 Component Groups Requiring Aging Management Review - Control Rod Drive Hydraulic System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.40
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	3.3.2.40
Pumps /Pressure Boundary	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.3-a	3.3.1.25	3.3.2.40
Restricting Orifices /Pressure Boundary	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.1.5
Restricting Orifices /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.40
Restricting Orifices /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	3.3.2.40
Rupture Discs /Pressure Boundary	Stainless Steel	Dry Gas	None	None	Non-GALL	3.3.2.194	3.3.2.40
Tanks /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.34	3.3.2.40
Tanks /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.35	3.3.2.40
Tanks /Pressure Boundary	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.1.5
Tanks /Pressure Boundary	Carbon Steel	Wet Gas	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.216	3.3.1.5

Aging Management Review Aid

Table 2.3.3-3 Component Groups Requiring Aging Management Review - Control Rod Drive Hydraulic System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Tubing /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.40
Tubing /Pressure Boundary	Carbon Steel	Saturated air	Loss of material/ General and pitting corrosion	Compressed Air Monitoring (B.1.16)	VII.D.1-a	3.3.1.17	3.3.1.5
Tubing /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	3.3.2.40
Tubing /Pressure Boundary	Copper	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.242	3.3.2.34
Tubing /Pressure Boundary	Stainless Steel	Dry Gas	None	None	Non-GALL	3.3.2.248	3.3.2.40
Valves /Pressure Boundary	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.1.2.52	3.3.2.40
Valves /Pressure Boundary	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.1.2.53	3.3.2.40
Valves /Pressure Boundary	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.2-a	3.3.1.8	3.3.1.5
Valves /Pressure Boundary	Carbon Steel	Saturated air	Loss of material/ General and pitting corrosion	Compressed Air Monitoring (B.1.16)	VII.D.2-a	3.3.1.17	3.3.1.5
Valves /Pressure Boundary	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.3-a	3.3.1.25	3.3.2.42
Valves /Pressure Boundary	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.3-a	3.3.1.25	3.3.2.40
Valves /Pressure Boundary	Brass or Bronze	Dry Gas	None	None	Non-GALL	3.3.2.260	3.3.2.23
Valves /Pressure Boundary	Brass or Bronze	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.262	3.3.2.23

Aging Management Review Aid

Table 2.3.3-3 Component Groups Requiring Aging Management Review - Control Rod Drive Hydraulic System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel	Wet Gas	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.274	3.3.1.5
Valves /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.293	3.3.2.40
Valves /Pressure Boundary	Stainless Steel	Wet Gas	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.296	3.3.2.40
Valves (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.2-a	3.3.1.8	3.3.1.5
Valves (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.3-a	3.3.1.25	3.3.2.40
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.3-a	3.3.1.25	3.3.2.40
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	Wet Gas	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.296	3.3.2.40

Aging Management Review Aid

Table 2.3.3-4 Component Groups Requiring Aging Management Review - Reactor Water Cleanup System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel SA193Gr B7	Air with metal temperature up to 288°C (550°F)	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-g	3.1.1.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.130	3.3.2.130
Piping and Fittings /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water or steam	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.1-h	3.1.1.1	NA
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.3.2.42
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	Oxygenated water 93°C - 288°C (200°F-550°F)	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	VII.E3.1-b	3.3.1.3	NA
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	Oxygenated water 93°C - 288°C (200°F-550°F)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Reactor Water Cleanup System (B.1.17)	VII.E3.1-a	3.3.1.24	3.3.2.40
Piping and Fittings /Pressure Boundary	Carbon Steel	Oxygenated water 93°C - 288°C (200°F-550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.140	3.3.1.5

Aging Management Review Aid

Table 2.3.3-4 Component Groups Requiring Aging Management Review - Reactor Water Cleanup System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.40
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	3.3.2.40
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.40
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	3.3.2.40
Piping and Fittings (small bore) /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.3.2.42
Piping and Fittings (small bore) /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.3.2.40
Sight Glasses (attached support)/Structural Integrity (Attached)	Glass	Wet Gas	None	None	Non-GALL	3.3.2.204	3.3.2.204
Valves /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-d	3.1.1.1	NA

Aging Management Review Aid

Table 2.3.3-4 Component Groups Requiring Aging Management Review - Reactor Water Cleanup System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Cast Austenitic Stainless Steel	288°C (550°F) reactor coolant water	Loss of fracture toughness/ Thermal aging embrittlement	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1.3-b	3.1.1.9	3.3.2.40
Valves /Pressure Boundary	Cast Austenitic Stainless Steel	288°C (550°F) reactor coolant water	Loss of fracture toughness/ Thermal aging embrittlement	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1)	IV.C1.3-b	3.1.1.9	3.3.2.42
Valves /Pressure Boundary	Cast Austenitic Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.3.2.40
Valves /Pressure Boundary	Cast Austenitic Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.3.2.42
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.3.2.40
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.3.2.42
Valves /Pressure Boundary	Carbon Steel	Oxygenated water 93°C - 288°C (200°F-550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.270	3.3.1.5
Valves (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Oxygenated water 93°C - 288°C (200°F-550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.292	3.3.2.40
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	Oxygenated water 93°C - 288°C (200°F-550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.292	3.3.2.40

Aging Management Review Aid

Table 2.3.3-5 Component Groups Requiring Aging Management Review - Fire Protection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Cast Iron	Soil and groundwater	Loss of Material/Pitting, Crevice Corrosion, Selective Leaching and MIC	Selective Leaching of Materials (B.1.24) and Buried Piping & Tanks Inspection (B.1.25)	Non-GALL	3.3.2.17	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Outdoor ambient conditions	Loss of Material/General corrosion and wear	Bolting Integrity (B.1.12)	Non-GALL	3.3.2.18	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Raw water (submerged)	Loss of material/ General, pitting, crevice, microbiologically influenced corrosion and macro organisms	Bolting Integrity (B.1.12)	Non-GALL	3.3.2.19	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Soil and groundwater	Loss of material/ Pitting crevice and microbiologically influenced corrosion	Buried Piping and Tanks Inspection (B.1.25)	Non-GALL	3.3.2.20	NA
Filters/Strainers /Pressure Boundary	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.3-a	3.3.1.5	3.3.1.5
Filters/Strainers /Pressure Boundary	Carbon Steel	Saturated air	Loss of material/ General and pitting corrosion	Compressed Air Monitoring (B.1.16)	VII.D.1-a	3.3.1.17	3.3.1.5
Filters/Strainers /Pressure Boundary	Brass or Bronze	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.23
Filters/Strainers /Pressure Boundary	Carbon Steel	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.1.5

Aging Management Review Aid

Table 2.3.3-5 Component Groups Requiring Aging Management Review - Fire Protection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Filters/Strainers /Pressure Boundary	Cast Iron	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.300
Filters/Strainers /Pressure Boundary	Cast Iron	Raw water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.56	3.3.2.300
Filters/Strainers /Filter	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.3-a	3.3.1.5	NA
Filters/Strainers /Filter	Carbon Steel	Saturated air	Loss of material/ General and pitting corrosion	Compressed Air Monitoring (B.1.16)	VII.D.1-a	3.3.1.17	NA
Filters/Strainers /Filter	Brass or Bronze	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	NA
Filters/Strainers /Filter	Cast Iron	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	NA
Filters/Strainers /Filter	Stainless Steel	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	NA
Filters/Strainers /Filter	Cast Iron	Raw water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.56	NA
Fire Dampers /Pressure Boundary	Steel	Indoor and outdoor environments	Loss of material/ Wear	Fire Protection (B.1.18)	VII.G.2-d	3.3.1.18	NA
Fire Dampers /Pressure Boundary	Steel	Indoor and outdoor environments	Loss of material/ Wear	Fire Protection (B.1.18)	VII.G.3-d	3.3.1.18	NA
Fire Dampers /Pressure Boundary	Steel	Indoor and outdoor environments	Loss of material/ Wear	Fire Protection (B.1.18)	VII.G.4-d	3.3.1.18	NA

Aging Management Review Aid

Table 2.3.3-5 Component Groups Requiring Aging Management Review - Fire Protection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Fire Dampers /Pressure Boundary	Steel	Indoor	Loss of material/ Wear	Fire Protection (B.1.18)	VII.G.5-c	3.3.1.18	NA
Fire Dampers /Fire Barrier	Steel	Indoor and outdoor environments	Loss of material/ Wear	Fire Protection (B.1.18)	VII.G.2-d	3.3.1.18	NA
Fire Dampers /Fire Barrier	Steel	Indoor and outdoor environments	Loss of material/ Wear	Fire Protection (B.1.18)	VII.G.3-d	3.3.1.18	NA
Fire Dampers /Fire Barrier	Steel	Indoor and outdoor environments	Loss of material/ Wear	Fire Protection (B.1.18)	VII.G.4-d	3.3.1.18	NA
Fire Dampers /Fire Barrier	Steel	Indoor	Loss of material/ Wear	Fire Protection (B.1.18)	VII.G.5-c	3.3.1.18	NA
Fire Hydrants /Pressure Boundary	Cast Iron	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.32
Fire Hydrants /Pressure Boundary	Cast Iron	Raw water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.61	3.3.2.32
Fire Wrap /Fire Barrier	Ceramic Fiber	Indoor	None	None	Non-GALL	3.3.2.63	NA
Mufflers /Pressure Boundary	Carbon Steel	Hot diesel engine exhaust gases containing moisture and particulates	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.4-a	3.3.1.5	3.3.1.5
Penetration Seals /Fire Barrier	Sealant	Indoors: air; outdoors: sun, weather, humidity, and moisture	Increased hardness and shrinkage/ Weathering	Fire Protection (B.1.18)	VII.G.2-a	3.3.1.18	NA
Penetration Seals /Fire Barrier	Sealant	Indoors: air; outdoors: sun, weather, humidity, and moisture	Increased hardness and shrinkage/ Weathering	Fire Protection (B.1.18)	VII.G.3-a	3.3.1.18	NA
Penetration Seals /Flood Barrier	Sealant	Indoors: air; outdoors: sun, weather, humidity, and moisture	Increased hardness and shrinkage/ Weathering	Fire Protection (B.1.18)	VII.G.3-a	3.3.1.18	NA

Aging Management Review Aid

Table 2.3.3-5 Component Groups Requiring Aging Management Review - Fire Protection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Penetration Seals /Flood Barrier	Sealant	Indoors: air; outdoors: sun, weather, humidity, and moisture	Increased hardness and shrinkage/ Weathering	Fire Protection (B.1.18)	VII.G.4-a	3.3.1.18	NA
Piping and Fittings /Pressure Boundary	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.3-a	3.3.1.5	3.3.2.30
Piping and Fittings /Pressure Boundary	Carbon Steel	Hot diesel engine exhaust gases containing moisture and particulates	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.4-a	3.3.1.5	3.3.2.26
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-a	3.3.1.19	3.3.1.16
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-a	3.3.1.19	3.3.2.131
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-a	3.3.1.19	3.3.2.26
Piping and Fittings /Pressure Boundary	Stainless Steel	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-a	3.3.1.19	3.3.2.40
Piping and Fittings /Pressure Boundary	Brass or Bronze	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.23
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.30

Aging Management Review Aid

Table 2.3.3-5 Component Groups Requiring Aging Management Review - Fire Protection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.26
Piping and Fittings /Pressure Boundary	Cast Iron	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.300
Piping and Fittings /Pressure Boundary	Copper	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.34
Piping and Fittings /Pressure Boundary	Stainless Steel	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.40
Piping and Fittings /Pressure Boundary	Carbon Steel	Fuel oil	Loss of material/ General galvanic pitting and crevice corrosion	Fire Protection (B.1.18) and Fuel Oil Chemistry (B.1.21)	VII.G.8-a	3.3.1.20	3.3.2.26
Piping and Fittings /Pressure Boundary	Carbon Steel	Dry Gas	None	None	Non-GALL	3.3.2.138	3.3.2.26
Piping and Fittings /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	Fire Water System (B.1.19)	Non-GALL	3.3.2.144	3.3.2.26
Piping and Fittings /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	Fire Water System (B.1.19)	Non-GALL	3.3.2.144	3.3.2.30
Piping and Fittings /Pressure Boundary	Cast Iron	Raw water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.150	3.3.2.300
Piping and Fittings /Pressure Boundary	Cast Iron	Raw water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.150	3.3.2.33

Aging Management Review Aid

Table 2.3.3-5 Component Groups Requiring Aging Management Review - Fire Protection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Iron Ductile	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	Non-GALL	3.3.2.153	3.3.2.154
Piping and Fittings /Pressure Boundary	Iron Malleable	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	Non-GALL	3.3.2.157	3.3.2.38
Piping and Fittings /Pressure Boundary	Polyvinyl Chloride (PVC)	Raw water	None	None	Non-GALL	3.3.2.158	3.3.2.39
Piping and Fittings /Throttle	Carbon Steel	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-a	3.3.1.19	NA
Pumps /Pressure Boundary	Cast Iron	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.171
Pumps /Pressure Boundary	Cast Iron	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.170
Pumps /Pressure Boundary	Cast Iron	Raw water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.178	3.3.2.171
Pumps /Pressure Boundary	Cast Iron	Raw water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.178	3.3.2.170
Sprinklers /Pressure Boundary	Brass or Bronze	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.23
Sprinklers /Pressure Boundary	Brass or Bronze	Warm, moist air	Loss of material/ Pitting and crevice corrosion	Fire Water System (B.1.19)	Non-GALL	3.3.2.205	3.3.2.23

Aging Management Review Aid

Table 2.3.3-5 Component Groups Requiring Aging Management Review - Fire Protection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Sprinklers /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	Fire Water System (B.1.19)	Non-GALL	3.3.2.206	3.3.1.5
Sprinklers /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	Fire Water System (B.1.19)	Non-GALL	3.3.2.206	3.3.2.26
Tanks /Pressure Boundary	Carbon Steel	Fuel oil	Loss of material/ General galvanic pitting and crevice corrosion	Fire Protection (B.1.18) and Fuel Oil Chemistry (B.1.21)	VII.G.8-a	3.3.1.20	3.3.1.5
Valves /Pressure Boundary	Brass or Bronze	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.23
Valves /Pressure Boundary	Carbon Steel	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.1.5
Valves /Pressure Boundary	Stainless Steel	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.40
Valves /Pressure Boundary	Carbon Steel	Fuel oil	Loss of material/ General galvanic pitting and crevice corrosion	Fire Protection (B.1.18) and Fuel Oil Chemistry (B.1.21)	VII.G.8-a	3.3.1.20	3.3.1.5
Valves /Pressure Boundary	Brass or Bronze	Dry Gas	None	None	Non-GALL	3.3.2.260	3.3.2.23
Valves /Pressure Boundary	Brass or Bronze	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.262	3.3.2.23
Valves /Pressure Boundary	Brass or Bronze	Warm, moist air	Loss of material/ Pitting and crevice corrosion	Fire Water System (B.1.19)	Non-GALL	3.3.2.265	3.3.2.23

Aging Management Review Aid

Table 2.3.3-5 Component Groups Requiring Aging Management Review - Fire Protection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Cast Iron	Warm, moist air	Loss of material/ General, pitting, and crevice corrosion	Fire Water System (B.1.19)	Non-GALL	3.3.2.283	3.3.2.32
Valves /Pressure Boundary	Cast Iron	Warm, moist air	Loss of material/ General, pitting, and crevice corrosion	Fire Water System (B.1.19)	Non-GALL	3.3.2.283	3.3.2.31
Valves /Pressure Boundary	Cast Iron	Warm, moist air	Loss of material/ General, pitting, and crevice corrosion	Fire Water System (B.1.19)	Non-GALL	3.3.2.283	3.3.2.300
Valves (Fire Protection) /Pressure Boundary	Cast Iron	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.32
Valves (Fire Protection) /Pressure Boundary	Cast Iron	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.33
Valves (Fire Protection) /Pressure Boundary	Cast Iron	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.300
Valves (Fire Protection) /Pressure Boundary	Cast Iron	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.31
Valves (Fire Protection) /Pressure Boundary	Cast Iron	Raw water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.301	3.3.2.33
Valves (Fire Protection) /Pressure Boundary	Cast Iron	Raw water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.301	3.3.2.32

Aging Management Review Aid

Table 2.3.3-5 Component Groups Requiring Aging Management Review - Fire Protection System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves (Fire Protection) /Pressure Boundary	Cast Iron	Raw water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.301	3.3.2.31
Valves (Fire Protection) /Pressure Boundary	Cast Iron	Raw water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.301	3.3.2.300

Aging Management Review Aid

Table 2.3.3-6 Component Groups Requiring Aging Management Review - Emergency Diesel Generator and Auxiliaries

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Air Accumulator Vessels /Pressure Boundary	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.2-a	3.3.1.5	3.3.1.5
Air Accumulator Vessels /Pressure Boundary	Stainless Steel	Moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.6	3.3.2.40
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Outdoor ambient conditions	Loss of Material/General corrosion and wear	Bolting Integrity (B.1.12)	Non-GALL	3.3.2.18	NA
Debris Screens /Filter	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.59	NA
Doors, Closure Bolts, Equip Frames /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General pitting crevice corrosion and microbiologically influenced corrosion (for duct [drip-pan] and piping for moisture drainage)	Plant-specific	VII.F4.1-a	3.3.1.5	NA
Duct Fittings, Hinges, Latches /Pressure Boundary	Aluminum-Zinc Alloy	Warm, moist air	None	None	Non-GALL	3.3.2.49	NA
Filters/Strainers /Pressure Boundary	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.2-a	3.3.1.5	3.3.2.29
Filters/Strainers /Pressure Boundary	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.3-a	3.3.1.5	3.3.2.29
Filters/Strainers /Pressure Boundary	Cast Iron	Moist air	Loss of material/ General, pitting, and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.55	3.3.2.300

Aging Management Review Aid

Table 2.3.3-6 Component Groups Requiring Aging Management Review - Emergency Diesel Generator and Auxiliaries

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Filters/Strainers /Pressure Boundary	Stainless Steel	Moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.58	3.3.2.43
Filters/Strainers /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.60	3.3.2.29
Filters/Strainers /Filter	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.2-a	3.3.1.5	NA
Filters/Strainers /Filter	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.3-a	3.3.1.5	NA
Filters/Strainers /Filter	Cast Iron	Moist air	Loss of material/ General, pitting, and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.55	NA
Filters/Strainers /Filter	Stainless Steel	Moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.58	NA
Filters/Strainers /Filter	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.60	NA
Flex Collars, Doors and Damper Seals /Pressure Boundary	Elastomer Neoprene	Warm, moist air	Hardening and loss of strength/ Elastomer degradation	Plant-specific	VII.F4.1-b	3.3.1.2	NA
Flex Collars, Doors and Damper Seals /Pressure Boundary	Elastomer Neoprene	Warm, moist air	Loss of material/ Wear	Plant-specific	VII.F4.1-c	3.3.1.2	NA
Flexible Hoses /Pressure Boundary	Elastomers Neoprene and Similar Materials	Moist air	Hardening and loss of strength/ Elastomer degradation	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.65	3.3.2.65
Flexible Hoses /Pressure Boundary	Elastomers Neoprene and Similar Materials	Saturated air	Hardening and loss of strength/ Elastomer degradation	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.66	3.3.2.65

Aging Management Review Aid

Table 2.3.3-6 Component Groups Requiring Aging Management Review - Emergency Diesel Generator and Auxiliaries

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Heat Exchangers /Pressure Boundary	Tubes: Austenitic Stainless Steel; Tubesheet: Carbon Steel; Shell: Carbon Steel	Tube side: Open cycle cooling water (raw water); Shell side: Closed cooling water (treated water)	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Pitting Corrosion, Crevice Corrosion	Open Cycle Cooling Water System (B.1.13), Closed- Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.94	3.3.1.5
Heat Exchangers /Pressure Boundary	Tubes: Austenitic Stainless Steel; Tubesheet: Carbon Steel; Shell: Carbon Steel	Tube side: Open cycle cooling water (raw water); Shell side: Closed cooling water (treated water)	Cracking/Mech Fatigue, SCC	Open Cycle Cooling Water System (B.1.13), Closed- Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.95	3.3.1.5
Heat Exchangers /Pressure Boundary	Tubes: Copper; Channel Head: Cast Steel; Shell: Cast Steel	Tube side: Closed cooling water; Shell side: Warm moist air	Cracking/Mech Fatigue, SCC	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.100	3.3.1.5
Heat Exchangers /Pressure Boundary	Tubes: Copper; Channel Head: Cast Steel; Shell: Cast Steel	Tube side: Closed cooling water; Shell side: Warm moist air	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Pitting Corrosion, Crevice Corrosion	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.101	3.3.1.5
Heat Exchangers /Pressure Boundary	Tubes: Copper; Tubesheet: Carbon Steel; Channel Head: Cast Iron; Shell: Carbon Steel	Tube side: Lubricating Oil; Shell side: Closed cooling water	Cracking/Mech Fatigue, SCC	Closed-Cycle Cooling Water System (B.1.14), Lube Oil Monitoring Activities (B.2.5)	Non-GALL	3.3.2.108	3.3.1.5
Heat Exchangers /Pressure Boundary	Tubes: Copper; Tubesheet: Carbon Steel; Channel Head: Cast Iron; Shell: Carbon Steel	Tube side: Lubricating Oil; Shell side: Closed cooling water	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Pitting Corrosion, Crevice Corrosion	Closed-Cycle Cooling Water System (B.1.14), Lube Oil Monitoring Activities (B.2.5)	Non-GALL	3.3.2.109	3.3.1.5

Aging Management Review Aid

Table 2.3.3-6 Component Groups Requiring Aging Management Review - Emergency Diesel Generator and Auxiliaries

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Heat Exchangers /Pressure Boundary	Tubes: Cu-Ni; Tubesheet: Carbon Steel; Channel Head: Carbon Steel; Shell: Cu- Ni	Tube side: Open cycle cooling water (raw water); Shell side: Closed cooling water (treated water)	Cracking/Mech Fatigue, SCC	Open Cycle Cooling Water System (B.1.13), Closed- Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.110	3.3.2.34
Heat Exchangers /Pressure Boundary	Tubes: Cu-Ni; Tubesheet: Carbon Steel; Channel Head: Carbon Steel; Shell: Cu- Ni	Tube side: Open cycle cooling water (raw water); Shell side: Closed cooling water (treated water)	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Selective Leaching, Pitting Corrosion, Crevice Corrosion	Open Cycle Cooling Water System (B.1.13), Closed- Cycle Cooling Water System (B.1.14), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.111	3.3.2.34
Heat Exchangers /Heat Transfer	Tubes: Austenitic Stainless Steel	Tube side: Open cycle cooling water (raw water); Shell side: Closed cooling water (treated water)	Buildup of Deposit/Fouling	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.93	NA
Heat Exchangers /Heat Transfer	Tubes: Copper	Tube side: Closed cooling water; Shell side: Warm moist air	Buildup of Deposit/Fouling	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.96	NA
Heat Exchangers /Heat Transfer	Tubes: Copper	Tube side: Lubricating Oil; Shell side: Closed cooling water	Buildup of Deposit/Fouling	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.99	NA
Lubricators /Pressure Boundary	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.2-a	3.3.1.5	3.3.1.5
Mufflers /Pressure Boundary	Carbon Steel	Hot diesel engine exhaust gases containing moisture and particulates	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.4-a	3.3.1.5	3.3.2.29
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.130	3.3.2.130

Aging Management Review Aid

Table 2.3.3-6 Component Groups Requiring Aging Management Review - Emergency Diesel Generator and Auxiliaries

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.2-a	3.3.1.5	3.3.2.29
Piping and Fittings /Pressure Boundary	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.3-a	3.3.1.5	3.3.2.29
Piping and Fittings /Pressure Boundary	Carbon Steel	Hot diesel engine exhaust gases containing moisture and particulates	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.4-a	3.3.1.5	3.3.2.29
Piping and Fittings /Pressure Boundary	Carbon Steel	Chemically treated demineralized water <90°C (194°F)	Loss of material/ General pitting crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.H2.1-a	3.3.1.13	3.3.2.29
Piping and Fittings /Pressure Boundary	Aluminum	Moist air	Loss of material/ General and pitting corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.132	3.3.2.21
Piping and Fittings /Pressure Boundary	Brass or Bronze	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Cracking/ Stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.133	3.3.2.23
Piping and Fittings /Pressure Boundary	Brass or Bronze	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Loss of Material/General, Galvanic, Pitting, Crevice Corrosion, Selective Leaching and MIC	Closed-Cycle Cooling Water System (B.1.14), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.134	3.3.2.23
Piping and Fittings /Pressure Boundary	Carbon Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.137	3.3.2.29
Piping and Fittings /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.139	3.3.2.29

Aging Management Review Aid

Table 2.3.3-6 Component Groups Requiring Aging Management Review - Emergency Diesel Generator and Auxiliaries

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Cast Iron	Chemically treated demineralized water <90°C (194°F)	Loss of material/ General, pitting and crevice corrosion, selective leaching and microbiologically influenced corrosion	Closed-Cycle Cooling Water System (B.1.14), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.147	3.3.2.300
Piping and Fittings /Pressure Boundary	Stainless Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.159	3.3.2.40
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.2-a	3.3.1.5	3.3.1.5
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.3-a	3.3.1.5	3.3.1.5
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	3.3.1.5
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Chemically treated demineralized water <90°C (194°F)	Loss of material/ General pitting crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.H2.1-a	3.3.1.13	3.3.1.5
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.139	3.3.1.5
Pumps /Pressure Boundary	Carbon Steel	Chemically treated demineralized water <90°C (194°F)	Loss of material/ General pitting crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.H2.1-a	3.3.1.13	3.3.1.5

Aging Management Review Aid

Table 2.3.3-6 Component Groups Requiring Aging Management Review - Emergency Diesel Generator and Auxiliaries

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Pumps /Pressure Boundary	Carbon Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.174	3.3.1.5
Pumps /Pressure Boundary	Cast Iron	Chemically treated demineralized water <90°C (194°F)	Loss of Material/General, Galvanic, Pitting, Crevice Corrosion, Selective Leaching and MIC	Closed-Cycle Cooling Water System (B.1.14), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.175	3.3.2.300
Pumps /Pressure Boundary	Cast Iron	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General pitting crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.177	3.3.2.300
Restricting Orifices /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.187	3.3.1.5
Restricting Orifices /Throttle	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.187	NA
Sight Glasses /Pressure Boundary	Glass	Chemically treated demineralized water <90°C (194°F)	None	None	Non-GALL	3.3.2.200	3.3.2.36
Sight Glasses /Pressure Boundary	Glass	Lubricating oil (with contaminants and/or moisture)	None	None	Non-GALL	3.3.2.202	3.3.2.36
Tanks /Pressure Boundary	Carbon Steel	Chemically treated demineralized water <90°C (194°F)	Loss of material/ General pitting crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.H2.1-a	3.3.1.13	3.3.1.5
Tanks /Pressure Boundary	Carbon Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.211	3.3.1.5

Aging Management Review Aid

Table 2.3.3-6 Component Groups Requiring Aging Management Review - Emergency Diesel Generator and Auxiliaries

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Thermowells /Pressure Boundary	Brass or Bronze	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Cracking/ Stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.220	3.3.2.23
Thermowells /Pressure Boundary	Brass or Bronze	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Loss of Material/General, Galvanic, Pitting, Crevice Corrosion, Selective Leaching and MIC	Closed-Cycle Cooling Water System (B.1.14), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.221	3.3.2.23
Thermowells /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.224	3.3.1.5
Thermowells /Pressure Boundary	Stainless Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.225	3.3.2.40
Tubes /Heat Transfer	Copper-nickel, aluminum brass	Tube side: Open cycle cooling water (raw water); Shell side: Closed cooling water (treated water)	Buildup of deposit/ Biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.3-b	3.3.1.15	NA
Tubing /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.40
Tubing /Pressure Boundary	Brass or Bronze	Moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.232	3.3.2.23

Aging Management Review Aid

Table 2.3.3-6 Component Groups Requiring Aging Management Review - Emergency Diesel Generator and Auxiliaries

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Tubing /Pressure Boundary	Carbon Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.233	3.3.1.5
Tubing /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.235	3.3.1.5
Tubing /Pressure Boundary	Copper	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Cracking/ Stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.236	3.3.2.34
Tubing /Pressure Boundary	Copper	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Loss of material/Crevice, galvanic, pitting corrosion and MIC	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.237	3.3.2.34
Tubing /Pressure Boundary	Copper	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.240	3.3.2.34
Tubing /Pressure Boundary	Copper	Moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.241	3.3.2.34
Tubing /Pressure Boundary	Stainless Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.245	3.3.2.40
Tubing /Pressure Boundary	Stainless Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.249	3.3.2.40
Tubing /Pressure Boundary	Stainless Steel	Moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.250	3.3.2.40

Aging Management Review Aid

Table 2.3.3-6 Component Groups Requiring Aging Management Review - Emergency Diesel Generator and Auxiliaries

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.245	3.3.2.40
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	Moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.250	3.3.2.40
Turbochargers /Pressure Boundary	Cast Iron	Hot diesel engine exhaust gases containing moisture and particulates	Loss of material/ General, pitting, and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.256	3.3.2.300
Valves /Pressure Boundary	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.2-a	3.3.1.5	3.3.1.5
Valves /Pressure Boundary	Carbon Steel	Chemically treated demineralized water <90°C (194°F)	Loss of material/ General pitting crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.H2.1-a	3.3.1.13	3.3.1.5
Valves /Pressure Boundary	Brass or Bronze	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Cracking/ Stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.258	3.3.2.23
Valves /Pressure Boundary	Brass or Bronze	Dry Gas	None	None	Non-GALL	3.3.2.260	3.3.2.23
Valves /Pressure Boundary	Brass or Bronze	Moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.261	3.3.2.23
Valves /Pressure Boundary	Brass or Bronze	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.262	3.3.2.23
Valves /Pressure Boundary	Carbon Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.267	3.3.1.5

Aging Management Review Aid

Table 2.3.3-6 Component Groups Requiring Aging Management Review - Emergency Diesel Generator and Auxiliaries

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.269	3.3.1.5
Valves /Pressure Boundary	Cast Iron	Chemically treated demineralized water <90°C (194°F)	Loss of Material/General, Galvanic, Pitting, Crevice Corrosion, Selective Leaching and MIC	Closed-Cycle Cooling Water System (B.1.14), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.275	3.3.2.300
Valves /Pressure Boundary	Stainless Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.286	3.3.2.40
Valves /Pressure Boundary	Stainless Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.290	3.3.2.40
Valves /Pressure Boundary	Stainless Steel	Moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.291	3.3.2.40
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	3.3.1.5
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.269	3.3.1.5

Aging Management Review Aid

Table 2.3.3-7 Component Groups Requiring Aging Management Review - HVAC - Main Control Room

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Air Handlers Heating/Cooling (CR HVAC) /Pressure Boundary	Copper/ Nickel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	Plant-specific	VII.F1.2-a	3.3.1.5	3.3.1.5
Air Handlers Heating/Cooling (CR HVAC) /Pressure Boundary	Tubes: Copper; Tubesheet: Copper; End Bells: Copper; Fins: Aluminum	Tube side: Refrigerant; Shell side: Warm moist air	Cracking/Mech Fatigue	Heat Exchanger Test and Inspection Activities (B.2.6)	Non-GALL	3.3.2.11	3.3.2.21
Air Handlers Heating/Cooling (CR HVAC) /Heat Transfer	Tubes: Copper	Tube side: Refrigerant; Shell side: Warm moist air	Buildup of Deposit/Fouling	Heat Exchanger Test and Inspection Activities (B.2.6)	Non-GALL	3.3.2.10	NA
Dampeners /Pressure Boundary	Brass or Bronze	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.46	3.3.2.23
Debris Screens /Filter	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.59	NA
Diffusers /Pressure Boundary	Carbon Steel	Dry Gas	None	None	Non-GALL	3.3.2.48	3.3.1.5
Doors, Closure Bolts, Equip Frames /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General pitting crevice corrosion and microbiologically influenced corrosion (for duct [drip-pan] and piping for moisture drainage)	Plant-specific	VII.F1.1-a	3.3.1.5	NA
Duct Fittings, Hinges, Latches /Pressure Boundary	Aluminum-Zinc Alloy	Warm, moist air	None	None	Non-GALL	3.3.2.49	NA
Filters/Strainers /Pressure Boundary	Carbon Steel	Dry Gas	None	None	Non-GALL	3.3.2.53	3.3.1.5
Filters/Strainers /Filter	Carbon Steel	Dry Gas	None	None	Non-GALL	3.3.2.53	NA

Aging Management Review Aid

Table 2.3.3-7 Component Groups Requiring Aging Management Review - HVAC - Main Control Room

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Flex Collars, Doors and Damper Seals /Pressure Boundary	Elastomer Neoprene	Warm, moist air	Hardening and loss of strength/ Elastomer degradation	Plant-specific	VII.F1.1-b	3.3.1.2	NA
Flex Collars, Doors and Damper Seals /Pressure Boundary	Elastomer Neoprene	Warm, moist air	Loss of material/ Wear	Plant-specific	VII.F1.1-c	3.3.1.2	NA
Flow Elements /Throttle	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.73	NA
Heat Exchangers /Pressure Boundary	Tubes: 90-10 Cu-Ni; Shell: Carbon Steel	Tube side: Open cycle cooling water (raw water); Shell side: Refrigerant	Cracking/Mech Fatigue, SCC	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.84	3.3.1.5
Heat Exchangers /Pressure Boundary	Tubes: 90-10 Cu-Ni; Shell: Carbon Steel	Tube side: Open cycle cooling water (raw water); Shell side: Refrigerant	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Pitting Corrosion, Crevice Corrosion	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.85	3.3.1.5
Heat Exchangers /Heat Transfer	Tubes: 90-10 Cu-Ni	Tube side: Open cycle cooling water (raw water); Shell side: Refrigerant	Buildup of Deposit/Fouling	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.82	NA
Housings and Supports /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (only for carbon steel) pitting and crevice corrosion	Plant-specific	VII.F1.4-a	3.3.1.5	3.3.1.5
Housings and Supports /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ General (only for carbon steel) pitting and crevice corrosion	Plant-specific	VII.F1.4-a	3.3.1.5	3.3.2.40
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.130	3.3.2.130

Aging Management Review Aid

Table 2.3.3-7 Component Groups Requiring Aging Management Review - HVAC - Main Control Room

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.145	3.3.1.5
Piping and Fittings /Pressure Boundary	Copper	Dry Gas	None	None	Non-GALL	3.3.2.152	3.3.2.34
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.5
Piping and Fittings (attached support)/Structural Integrity (Attached)	Copper	Dry Gas	None	None	Non-GALL	3.3.2.152	3.3.2.34
Seals /Pressure Boundary	Elastomers Neoprene and Similar Materials	Warm, moist air	Hardening and loss of strength/ Elastomer degradation	Plant-specific	VII.F1.4-b	3.3.1.2	NA
Sight Glasses /Pressure Boundary	Carbon Steel	Dry Gas	None	None	Non-GALL	3.3.2.196	3.3.2.198
Tubing /Pressure Boundary	Copper	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.244	3.3.2.244

Aging Management Review Aid

Table 2.3.3-7 Component Groups Requiring Aging Management Review - HVAC - Main Control Room

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.1.5
Valves /Pressure Boundary	Brass or Bronze	Dry Gas	None	None	Non-GALL	3.3.2.260	3.3.2.23
Valves /Pressure Boundary	Brass or Bronze	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.264	3.3.2.23
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.279	3.3.2.300
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.280	3.3.2.300
Valves /Pressure Boundary	Iron Ductile	Dry Gas	None	None	Non-GALL	3.3.2.284	3.3.2.37
Valves /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.293	3.3.2.40

Aging Management Review Aid

Table 2.3.3-8 Component Groups Requiring Aging Management Review - HVAC - Reactor Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Debris Screens /Filter	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.59	NA
Doors, Closure Bolts, Equip Frames /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General pitting crevice corrosion and microbiologically influenced corrosion (for duct [drip-pan] and piping for moisture drainage)	Plant-specific	VII.F3.1-a	3.3.1.5	NA
Duct Fittings, Hinges, Latches /Pressure Boundary	Aluminum-Zinc Alloy	Warm, moist air	None	None	Non-GALL	3.3.2.49	NA
Filters/Strainers /Pressure Boundary	Brass or Bronze	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.52	3.3.2.23
Flex Collars, Doors, Duct and Damper Seals /Pressure Boundary	Elastomer Neoprene	Warm, moist air	Hardening and loss of strength/ Elastomer degradation	Plant-specific	VII.F3.1-b	3.3.1.2	NA
Flex Collars, Doors, Duct and Damper Seals /Pressure Boundary	Elastomer Neoprene	Warm, moist air	Loss of material/ Wear	Plant-specific	VII.F3.1-c	3.3.1.2	NA
Housings and Supports /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (only for carbon steel) pitting and crevice corrosion	Plant-specific	VII.F3.4-a	3.3.1.5	3.3.1.5
Piping and Fittings /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.166	3.3.2.166
Seals /Pressure Boundary	Elastomers Neoprene and Similar Materials	Warm, moist air	Hardening and loss of strength/ Elastomer degradation	Plant-specific	VII.F3.4-b	3.3.1.2	NA
Tubing /Pressure Boundary	Copper	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.242	3.3.2.34

Aging Management Review Aid

Table 2.3.3-8 Component Groups Requiring Aging Management Review - HVAC - Reactor Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Tubing /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.251	3.3.2.40
Valves /Pressure Boundary	Brass or Bronze	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.262	3.3.2.23
Valves /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.273	3.3.1.5
Valves /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.295	3.3.2.40

Aging Management Review Aid

Table 2.3.3-9 Component Groups Requiring Aging Management Review - ECCS Corner Room HVAC

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Air Handlers Heating/Cooling (Aux&RW HVAC) /Pressure Boundary	Tubes: Copper; Tubesheet: Stainless Steel; End Bells: Carbon Steel; Fins: Aluminum	Tube side: Open cycle cooling water (raw water); Shell side: Warm moist air	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Pitting Corrosion, Crevice Corrosion	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.8	3.3.2.21
Air Handlers Heating/Cooling (Aux&RW HVAC) /Pressure Boundary	Tubes: Copper; Tubesheet: Stainless Steel; End Bells: Carbon Steel; Fins: Aluminum	Tube side: Open cycle cooling water (raw water); Shell side: Warm moist air	Cracking/Mech Fatigue, SCC	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.9	3.3.2.21
Air Handlers Heating/Cooling (Aux&RW HVAC) /Heat Transfer	Tubes: Copper	Tube side: Open cycle cooling water (raw water); Shell side: Warm moist air	Buildup of Deposit/Fouling	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.7	NA
Ducts & Fittings, Access Doors, Closure Bolts, Equip Frames /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General pitting crevice corrosion and microbiologically influenced corrosion (for duct [drip-pan] and piping for moisture drainage)	Plant-specific	VII.F2.1-a	3.3.1.5	NA

Aging Management Review Aid

Table 2.3.3-10 Component Groups Requiring Aging Management Review - SBO Building HVAC

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Air Handlers Heating/Cooling (DGB HVAC) /Pressure Boundary	Tubes: Copper; End Bells: Galvanized Steel; Fins: Aluminum	Tube side: Refrigerant; Shell side: Warm moist air	Loss of Material/Galvanic Corrosion, Wear, Pitting Corrosion, Crevice Corrosion	Heat Exchanger Test and Inspection Activities (B.2.6)	Non-GALL	3.3.2.14	3.3.2.21
Air Handlers Heating/Cooling (DGB HVAC) /Heat Transfer	Tubes: Copper	Tube side: Refrigerant; Shell side: Warm moist air	Buildup of Deposit/Fouling	Heat Exchanger Test and Inspection Activities (B.2.6)	Non-GALL	3.3.2.13	NA
Debris Screens /Filter	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.59	NA
Doors, Closure Bolts, Equip Frames /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General pitting crevice corrosion and microbiologically influenced corrosion (for duct [drip-pan] and piping for moisture drainage)	Plant-specific	VII.F4.1-a	3.3.1.5	NA
Duct Fittings, Hinges, Latches /Pressure Boundary	Aluminum-Zinc Alloy	Warm, moist air	None	None	Non-GALL	3.3.2.49	NA
Flex Collars, Doors and Damper Seals /Pressure Boundary	Elastomer Neoprene	Warm, moist air	Hardening and loss of strength/ Elastomer degradation	Plant-specific	VII.F4.1-b	3.3.1.2	NA
Flex Collars, Doors and Damper Seals /Pressure Boundary	Elastomer Neoprene	Warm, moist air	Loss of material/ Wear	Plant-specific	VII.F4.1-c	3.3.1.2	NA
Flow Elements /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.73	3.3.2.40
Tubing /Pressure Boundary	Copper	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.244	3.3.2.34
Tubing /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.254	3.3.2.40

Aging Management Review Aid

Table 2.3.3-11 Component Groups Requiring Aging Management Review - Station Blackout (diesels and auxiliaries)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Air Accumulator Vessels /Pressure Boundary	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.2-a	3.3.1.5	3.3.1.5
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Outdoor ambient conditions	Loss of Material/General corrosion and wear	Bolting Integrity (B.1.12)	Non-GALL	3.3.2.18	NA
Filters/Strainers /Pressure Boundary	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.3-a	3.3.1.5	3.3.1.5
Filters/Strainers /Pressure Boundary	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	3.3.1.5
Filters/Strainers /Pressure Boundary	Aluminum	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21)	Non-GALL	3.3.2.50	3.3.2.21
Filters/Strainers /Pressure Boundary	Cast Iron	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21)	Non-GALL	3.3.2.54	3.3.2.300
Filters/Strainers /Pressure Boundary	Cast Iron	Moist air	Loss of material/ General, pitting, and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.55	3.3.2.300
Filters/Strainers /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.60	3.3.1.5

Aging Management Review Aid

Table 2.3.3-11 Component Groups Requiring Aging Management Review - Station Blackout (diesels and auxiliaries)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Filters/Strainers /Filter	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.3-a	3.3.1.5	NA
Filters/Strainers /Filter	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	NA
Filters/Strainers /Filter	Cast Iron	Moist air	Loss of material/ General, pitting, and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.55	NA
Filters/Strainers /Filter	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.60	NA
Flexible Hoses /Pressure Boundary	Elastomers Neoprene and Similar Materials	Dry Gas	Hardening and loss of strength/ Elastomer degradation	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.64	3.3.2.66
Flexible Hoses /Pressure Boundary	Elastomers Neoprene and Similar Materials	Saturated air	Hardening and loss of strength/ Elastomer degradation	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.66	3.3.2.66
Flow Elements /Pressure Boundary	Stainless Steel	Chemically treated demineralized water <90°C (194°F) (Glycol based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.70	3.3.2.40
Heat Exchangers /Pressure Boundary	Tubes: Copper; Channel Head: Cast Steel; Shell: Cast Steel	Tube Side: Glycol-based cooling water (closed- cycle cooling water); Shell side: Warm moist air	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Pitting Corrosion, Crevice Corrosion	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.102	3.3.1.5
Heat Exchangers /Pressure Boundary	Tubes: Copper; Channel Head: Cast Steel; Shell: Cast Steel	Tube Side: Glycol-based cooling water (closed- cycle cooling water); Shell side: Warm moist air	Cracking/Mech Fatigue	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.103	3.3.1.5

Aging Management Review Aid

Table 2.3.3-11 Component Groups Requiring Aging Management Review - Station Blackout (diesels and auxiliaries)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Heat Exchangers /Pressure Boundary	Tubes: Copper; Tubesheet: Carbon Steel; Channel Head: Carbon Steel; Fins: Aluminum	Tube Side: Glycol-based cooling water (closed- cycle cooling water); Shell side: Warm moist air	Cracking/Mech Fatigue	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.104	3.3.2.29
Heat Exchangers /Pressure Boundary	Tubes: Copper; Tubesheet: Carbon Steel; Channel Head: Carbon Steel; Fins: Aluminum	Tube Side: Glycol-based cooling water (closed- cycle cooling water); Shell side: Warm moist air	Cracking/Mech Fatigue	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.104	3.3.2.21
Heat Exchangers /Pressure Boundary	Tubes: Copper; Tubesheet: Carbon Steel; Channel Head: Carbon Steel; Fins: Aluminum	Tube Side: Glycol-based cooling water (closed- cycle cooling water); Shell side: Warm moist air	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Pitting Corrosion, Crevice Corrosion	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.105	3.3.2.29
Heat Exchangers /Pressure Boundary	Tubes: Copper; Tubesheet: Carbon Steel; Channel Head: Carbon Steel; Fins: Aluminum	Tube Side: Glycol-based cooling water (closed- cycle cooling water); Shell side: Warm moist air	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Pitting Corrosion, Crevice Corrosion	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.105	3.3.2.21
Heat Exchangers /Pressure Boundary	Tubes: Copper; Tubesheet: Carbon Steel; Channel Head: Cast Iron; Shell: Carbon Steel	Tube side: Glycol-based cooling water (closed- cycle cooling water); Shell side: Lubricating oil	Cracking/Mech Fatigue	Closed-Cycle Cooling Water System (B.1.14), Lube Oil Monitoring Activities (B.2.5)	Non-GALL	3.3.2.106	3.3.1.5
Heat Exchangers /Pressure Boundary	Tubes: Copper; Tubesheet: Carbon Steel; Channel Head: Cast Iron; Shell: Carbon Steel	Tube side: Glycol-based cooling water (closed- cycle cooling water); Shell side: Lubricating oil	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Selective Leaching	Closed-Cycle Cooling Water System (B.1.14), Selective Leaching of Materials (B.1.24), Lubricating Oil Monitoring Activities (B.2.5)	Non-GALL	3.3.2.107	3.3.1.5

Aging Management Review Aid

Table 2.3.3-11 Component Groups Requiring Aging Management Review - Station Blackout (diesels and auxiliaries)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Heat Exchangers /Heat Transfer	Tubes: Copper	Tube side: Glycol-based cooling water (closed- cycle cooling water); Shell side: Lubricating oil	Buildup of Deposit/Fouling	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.97	NA
Heat Exchangers /Heat Transfer	Tubes: Copper	Tube Side: Glycol-based cooling water (closed- cycle cooling water); Shell side: Warm moist air	Buildup of Deposit/Fouling	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.98	NA
Lubricators /Pressure Boundary	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.2-a	3.3.1.5	3.3.1.5
Lubricators /Pressure Boundary	Aluminum	Moist air	Loss of material/ General and pitting corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.126	3.3.2.21
Lubricators /Pressure Boundary	Glass	Moist air	None	None	Non-GALL	3.3.2.127	3.3.2.127
Mufflers /Pressure Boundary	Carbon Steel	Hot diesel engine exhaust gases containing moisture and particulates	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.4-a	3.3.1.5	3.3.2.29
Piping and Fittings /Pressure Boundary	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.2-a	3.3.1.5	3.3.2.29
Piping and Fittings /Pressure Boundary	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.3-a	3.3.1.5	3.3.2.29
Piping and Fittings /Pressure Boundary	Carbon Steel	Hot diesel engine exhaust gases containing moisture and particulates	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.4-a	3.3.1.5	3.3.2.29
Piping and Fittings /Pressure Boundary	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	3.3.1.5
Piping and Fittings /Pressure Boundary	Carbon Steel	35°C (95°F) treated water	Loss of material/ General, pitting, and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.1-a	3.3.1.13	3.3.2.29

Aging Management Review Aid

Table 2.3.3-11 Component Groups Requiring Aging Management Review - Station Blackout (diesels and auxiliaries)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Carbon Steel	Chemically treated demineralized water <90°C (194°F)	Loss of material/ General pitting crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.H2.1-a	3.3.1.13	3.3.2.29
Piping and Fittings /Pressure Boundary	Brass or Bronze	Diesel fuel oil	Loss of material/ General pitting crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.135	3.3.2.23
Piping and Fittings /Pressure Boundary	Brass or Bronze	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.136	3.3.2.23
Piping and Fittings /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.139	3.3.2.29
Piping and Fittings /Pressure Boundary	Cast Iron	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General pitting crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.148	3.3.2.300
Piping and Fittings /Pressure Boundary	Cast Iron	Moist air	Loss of material/ General, pitting, and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.149	3.3.2.300
Piping and Fittings /Pressure Boundary	Copper	Chemically treated demineralized water <90°C (194°F) (Glycol based chemical treatment)	Loss of material/Crevice, galvanic, pitting corrosion and MIC	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.151	3.3.2.34
Piping and Fittings /Pressure Boundary	Iron Malleable	Chemically treated demineralized water <90°C (194°F) (Glycol based chemical treatment)	Loss of Material/General, Galvanic, Pitting, Crevice Corrosion, Selective Leaching and MIC	Closed-Cycle Cooling Water System (B.1.14), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.155	3.3.2.38
Piping and Fittings /Pressure Boundary	Iron Malleable	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General pitting crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.156	3.3.2.38
Piping and Fittings /Pressure Boundary	Stainless Steel	Chemically treated demineralized water <90°C (194°F) (Glycol based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.160	3.3.2.40

Aging Management Review Aid

Table 2.3.3-11 Component Groups Requiring Aging Management Review - Station Blackout (diesels and auxiliaries)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Stainless Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.162	3.3.2.40
Piping and Fittings /Pressure Boundary	Stainless Steel	Moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.163	3.3.2.40
Piping and Fittings /Throttle	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.2-a	3.3.1.5	NA
Piping and Fittings /Throttle	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.3-a	3.3.1.5	NA
Piping and Fittings /Throttle	Carbon Steel	Hot diesel engine exhaust gases containing moisture and particulates	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.4-a	3.3.1.5	NA
Pumps /Pressure Boundary	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.2-a	3.3.1.5	3.3.1.5
Pumps /Pressure Boundary	Carbon Steel	Chemically treated demineralized water <90°C (194°F)	Loss of material/ General pitting crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.H2.1-a	3.3.1.13	3.3.1.5
Pumps /Pressure Boundary	Cast Iron	Chemically treated demineralized water <90°C (194°F)	Loss of Material/General, Galvanic, Pitting, Crevice Corrosion, Selective Leaching and MIC	Closed-Cycle Cooling Water System (B.1.14), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.175	3.3.2.300
Pumps /Pressure Boundary	Cast Iron	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21)	Non-GALL	3.3.2.176	3.3.2.300
Pumps /Pressure Boundary	Cast Iron	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General pitting crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.177	3.3.2.300
Pumps /Throttle	Carbon Steel	Chemically treated demineralized water <90°C (194°F)	Loss of material/ General pitting crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.H2.1-a	3.3.1.13	NA

Aging Management Review Aid

Table 2.3.3-11 Component Groups Requiring Aging Management Review - Station Blackout (diesels and auxiliaries)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Restricting Orifices /Pressure Boundary	Stainless Steel	Chemically treated demineralized water <90°C (194°F) (Glycol based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.190	3.3.2.40
Restricting Orifices /Pressure Boundary	Stainless Steel	Diesel fuel oil	Loss of material/ Pitting and crevice corrosion	Fuel Oil Chemistry (B.1.21)	Non-GALL	3.3.2.191	3.3.2.40
Restricting Orifices /Pressure Boundary	Stainless Steel	Moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.192	3.3.2.40
Restricting Orifices /Throttle	Stainless Steel	Chemically treated demineralized water <90°C (194°F) (Glycol based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.190	NA
Restricting Orifices /Throttle	Stainless Steel	Moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.192	NA
Sight Glasses /Pressure Boundary	Glass	Chemically treated demineralized water <90°C (194°F)	None	None	Non-GALL	3.3.2.200	3.3.2.36
Tanks /Pressure Boundary	Carbon Steel	Fuel oil, water (as contaminant)	Loss of material/ General pitting crevice microbiologically influenced corrosion and biofouling	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H1.4-a	3.3.1.7	3.3.1.5
Tanks /Pressure Boundary	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	3.3.1.5
Tanks /Pressure Boundary	Carbon Steel	Chemically treated demineralized water <90°C (194°F)	Loss of material/ General pitting crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.H2.1-a	3.3.1.13	3.3.1.5
Thermowells /Pressure Boundary	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	3.3.1.5

Aging Management Review Aid

Table 2.3.3-11 Component Groups Requiring Aging Management Review - Station Blackout (diesels and auxiliaries)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Thermowells /Pressure Boundary	Brass or Bronze	Chemically treated demineralized water <90°C (194°F) (Glycol based chemical treatment)	Loss of Material/ Galvanic, Pitting, Crevice Corrosion, Selective Leaching and MIC	Closed-Cycle Cooling Water System (B.1.14), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.222	3.3.2.23
Thermowells /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.224	3.3.1.5
Thermowells /Pressure Boundary	Stainless Steel	Chemically treated demineralized water <90°C (194°F) (Glycol based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.226	3.3.2.40
Tubing /Pressure Boundary	Copper	Chemically treated demineralized water <90°C (194°F) (Glycol based chemical treatment)	Loss of material/Crevice, galvanic, pitting corrosion and MIC	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.238	3.3.2.34
Tubing /Pressure Boundary	Stainless Steel	Chemically treated demineralized water <90°C (194°F) (Glycol based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.246	3.3.2.40
Tubing /Pressure Boundary	Stainless Steel	Diesel fuel oil	Loss of material/ Pitting and crevice corrosion	Fuel Oil Chemistry (B.1.21)	Non-GALL	3.3.2.247	3.3.2.40
Tubing /Pressure Boundary	Stainless Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.249	3.3.2.40
Turbochargers /Pressure Boundary	Cast Iron	Hot diesel engine exhaust gases containing moisture and particulates	Loss of material/ General, pitting, and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.256	3.3.2.300
Valves /Pressure Boundary	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.2-a	3.3.1.5	3.3.1.5
Valves /Pressure Boundary	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.3-a	3.3.1.5	3.3.1.5

Aging Management Review Aid

Table 2.3.3-11 Component Groups Requiring Aging Management Review - Station Blackout (diesels and auxiliaries)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel	Hot diesel engine exhaust gases containing moisture and particulates	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.4-a	3.3.1.5	3.3.1.5
Valves /Pressure Boundary	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	3.3.1.5
Valves /Pressure Boundary	Carbon Steel	Chemically treated demineralized water <90°C (194°F)	Loss of material/ General pitting crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.H2.1-a	3.3.1.13	3.3.1.5
Valves /Pressure Boundary	Brass or Bronze	Moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.261	3.3.2.23
Valves /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.269	3.3.1.5
Valves /Pressure Boundary	Stainless Steel	Chemically treated demineralized water <90°C (194°F) (Glycol based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.287	3.3.2.40
Valves /Pressure Boundary	Stainless Steel	Diesel fuel oil	Loss of material/ Pitting and crevice corrosion	Fuel Oil Chemistry (B.1.21)	Non-GALL	3.3.2.288	3.3.2.40
Valves /Pressure Boundary	Stainless Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.290	3.3.2.40
Valves /Pressure Boundary	Stainless Steel	Moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.291	3.3.2.40

Aging Management Review Aid

Table 2.3.3-12 Component Groups Requiring Aging Management Review - Diesel Generator Cooling Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Air Handlers Heating/Cooling (DGB HVAC) /Pressure Boundary	Tubes: Copper; Tubesheet: Carbon Steel; End Bells: Carbon Steel; Fins: Aluminum	Tube side: Open cycle cooling water (raw water); Shell side: Warm moist air	Cracking/Mech Fatigue, SCC	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.15	3.3.2.16
Air Handlers Heating/Cooling (DGB HVAC) /Pressure Boundary	Tubes: Copper; Tubesheet: Carbon Steel; End Bells: Carbon Steel; Fins: Aluminum	Tube side: Open cycle cooling water (raw water); Shell side: Warm moist air	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Pitting Corrosion, Crevice Corrosion	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.16	3.3.2.16
Air Handlers Heating/Cooling (DGB HVAC) /Heat Transfer	Tubes: Copper	Tube side: Open cycle cooling water (raw water); Shell side: Warm moist air	Buildup of Deposit/Fouling	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.12	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Outdoor ambient conditions	Loss of Material/General corrosion and wear	Bolting Integrity (B.1.12)	Non-GALL	3.3.2.18	NA
Doors, Closure Bolts, Equip Frames /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General pitting crevice corrosion and microbiologically influenced corrosion (for duct [drip-pan] and piping for moisture drainage)	Plant-specific	VII.F4.1-a	3.3.1.5	NA
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.130	3.3.2.130

Aging Management Review Aid

Table 2.3.3-12 Component Groups Requiring Aging Management Review - Diesel Generator Cooling Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Orifice Bodies /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ Pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.4-a	3.3.1.15	3.3.2.40
Orifice Bodies /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ Pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.4-a	3.3.1.15	3.3.2.41
Orifice Bodies /Throttle	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ Pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.4-a	3.3.1.15	NA
Orifice Bodies (attached support)/Structural Integrity (Attached)	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ Pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.4-a	3.3.1.15	3.3.2.40
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.26
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.141

Aging Management Review Aid

Table 2.3.3-12 Component Groups Requiring Aging Management Review - Diesel Generator Cooling Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.5
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.H2.1-b	3.3.1.15	3.3.2.26
Piping and Fittings /Pressure Boundary	Titanium	Raw, untreated salt water or fresh water	Flow Blockage/Biofouling	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.169	3.3.2.45
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.5
Pulsation Dampeners (attached support)/Structural Integrity (Attached)	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ Pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.4-a	3.3.1.15	3.3.2.41
Pumps /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General selective leaching (for cast steel) pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.5-a	3.3.1.15	3.3.2.26

Aging Management Review Aid

Table 2.3.3-12 Component Groups Requiring Aging Management Review - Diesel Generator Cooling Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Pumps /Pressure Boundary	Iron Cast (Lined)	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.183	3.3.2.173
Pumps /Pressure Boundary	Iron Cast (Lined)	Raw, untreated salt water or fresh water	Loss of material/ General, pitting, crevice, microbiologically influenced corrosion and macro organisms	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.184	3.3.2.173
Strainer Bodies /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open Cycle Cooling Water System (B.1.13), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.208	3.3.2.31
Strainer Screens /Filter	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (carbon steel only) pitting crevice and microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.6-a	3.3.1.15	NA
Thermowells /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.26
Tubing /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.40

Aging Management Review Aid

Table 2.3.3-12 Component Groups Requiring Aging Management Review - Diesel Generator Cooling Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Tubing /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.41
Valves /Pressure Boundary	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.24
Valves /Pressure Boundary	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.23

Aging Management Review Aid

Table 2.3.3-12 Component Groups Requiring Aging Management Review - Diesel Generator Cooling Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.26
Valves /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.1.5
Valves /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.41

Aging Management Review Aid

Table 2.3.3-12 Component Groups Requiring Aging Management Review - Diesel Generator Cooling Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.40
Valves /Pressure Boundary	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Selective Leaching of Materials (B.1.24)	VII.C1.2-a	3.3.1.27	3.3.2.23
Valves /Pressure Boundary	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Selective Leaching of Materials (B.1.24)	VII.C1.2-a	3.3.1.27	3.3.2.24
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.279	3.3.2.31
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.279	3.3.2.300

Aging Management Review Aid

Table 2.3.3-12 Component Groups Requiring Aging Management Review - Diesel Generator Cooling Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.280	3.3.2.31
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.280	3.3.2.300
Valves /Pressure Boundary	Titanium	Raw, untreated salt water or fresh water	None	None	Non-GALL	3.3.2.298	3.3.2.45
Valves (attached support)/Structural Integrity (Attached)	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.24
Valves (attached support)/Structural Integrity (Attached)	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.23

Aging Management Review Aid

Table 2.3.3-12 Component Groups Requiring Aging Management Review - Diesel Generator Cooling Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.40
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.41
Valves (attached support)/Structural Integrity (Attached)	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Selective Leaching of Materials (B.1.24)	VII.C1.2-a	3.3.1.27	3.3.2.23

Aging Management Review Aid

Table 2.3.3-12 Component Groups Requiring Aging Management Review - Diesel Generator Cooling Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves (attached support)/Structural Integrity (Attached)	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Selective Leaching of Materials (B.1.24)	VII.C1.2-a	3.3.1.27	3.3.2.24
Valves (attached support)/Structural Integrity (Attached)	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.279	3.3.2.300
Valves (attached support)/Structural Integrity (Attached)	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.280	3.3.2.300

Aging Management Review Aid

Table 2.3.3-13 Component Groups Requiring Aging Management Review - Diesel Fuel Oil System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Outdoor ambient conditions	Loss of Material/General corrosion and wear	Bolting Integrity (B.1.12)	Non-GALL	3.3.2.18	NA
Filters/Strainers /Pressure Boundary	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	3.3.1.5
Filters/Strainers /Pressure Boundary	Carbon Steel	Fuel oil	Loss of material/ General galvanic pitting and crevice corrosion	Fire Protection (B.1.18) and Fuel Oil Chemistry (B.1.21)	VII.G.8-a	3.3.1.20	3.3.1.5
Filters/Strainers /Pressure Boundary	Cast Iron	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21)	Non-GALL	3.3.2.54	3.3.2.300
Filters/Strainers /Filter	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	NA
Filters/Strainers /Filter	Carbon Steel	Fuel oil	Loss of material/ General galvanic pitting and crevice corrosion	Fire Protection (B.1.18) and Fuel Oil Chemistry (B.1.21)	VII.G.8-a	3.3.1.20	NA
Flame Arrestors /Fire Barrier	Carbon Steel	Moist air	Loss of material/ General pitting crevice corrosion	Plant-specific	VII.H2.3-a	3.3.1.5	NA
Piping and Fittings /Pressure Boundary	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	3.3.2.29

Aging Management Review Aid

Table 2.3.3-13 Component Groups Requiring Aging Management Review - Diesel Fuel Oil System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	3.3.1.5
Piping and Fittings /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.139	3.3.2.29
Piping and Fittings /Pressure Boundary	Carbon Steel	Lubricating oil (with contaminants and/or moisture)	Loss of material/ General galvanic pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.139	3.3.1.5
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	3.3.1.5
Pumps /Pressure Boundary	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	3.3.1.5
Pumps /Pressure Boundary	Cast Iron	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21)	Non-GALL	3.3.2.176	3.3.2.300
Restricting Orifices /Pressure Boundary	Stainless Steel	Diesel fuel oil	Loss of material/ Pitting and crevice corrosion	Fuel Oil Chemistry (B.1.21)	Non-GALL	3.3.2.191	3.3.2.40
Sight Glasses /Pressure Boundary	Glass	Fuel oil	None	None	Non-GALL	3.3.2.201	3.3.2.36
Tanks /Pressure Boundary	Carbon Steel	Fuel oil, water (as contaminant)	Loss of material/ General pitting crevice microbiologically influenced corrosion and biofouling	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H1.4-a	3.3.1.7	3.3.1.5

Aging Management Review Aid

Table 2.3.3-13 Component Groups Requiring Aging Management Review - Diesel Fuel Oil System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Tanks /Pressure Boundary	Carbon Steel	Fuel oil, water (as contaminant)	Loss of material/ General pitting crevice microbiologically influenced corrosion and biofouling	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H1.4-a	3.3.1.7	3.3.2.215
Tanks /Pressure Boundary	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	3.3.1.5
Tanks /Pressure Boundary	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	3.3.2.215
Tanks /Pressure Boundary	Carbon Steel	Fuel oil	Loss of material/ General galvanic pitting and crevice corrosion	Fire Protection (B.1.18) and Fuel Oil Chemistry (B.1.21)	VII.G.8-a	3.3.1.20	3.3.2.215
Tanks /Pressure Boundary	Fiberglass	Fuel oil, water (as contaminant)	Buildup of deposit/ Biofouling	Fuel Oil Chemistry (B.1.21)	Non-GALL	3.3.2.217	3.3.2.218
Tubing /Pressure Boundary	Stainless Steel	Diesel fuel oil	Loss of material/ Pitting and crevice corrosion	Fuel Oil Chemistry (B.1.21)	Non-GALL	3.3.2.247	3.3.2.40
Valves /Pressure Boundary	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	3.3.1.5
Valves /Pressure Boundary	Carbon Steel	Fuel oil	Loss of material/ General galvanic pitting and crevice corrosion	Fire Protection (B.1.18) and Fuel Oil Chemistry (B.1.21)	VII.G.8-a	3.3.1.20	3.3.1.5
Valves /Pressure Boundary	Brass or Bronze	Diesel fuel oil	Loss of material/ General pitting crevice corrosion	Fuel Oil Chemistry (B.1.21)	Non-GALL	3.3.2.259	3.3.2.23
Valves /Pressure Boundary	Stainless Steel	Diesel fuel oil	Loss of material/ Pitting and crevice corrosion	Fuel Oil Chemistry (B.1.21)	Non-GALL	3.3.2.288	3.3.2.40

Aging Management Review Aid

Table 2.3.3-13 Component Groups Requiring Aging Management Review - Diesel Fuel Oil System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Diesel fuel oil	Loss of Material/ General pitting crevice and microbiologically influenced corrosion	Fuel Oil Chemistry (B.1.21) and One-Time Inspection (B.1.23)	VII.H2.5-a	3.3.1.7	3.3.1.5
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Fuel oil	Loss of material/ General galvanic pitting and crevice corrosion	Fire Protection (B.1.18) and Fuel Oil Chemistry (B.1.21)	VII.G.8-a	3.3.1.20	3.3.1.5

Aging Management Review Aid

Table 2.3.3-14 Component Groups Requiring Aging Management Review - Process Sampling System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.130	3.3.2.130
Piping and Fittings /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.145	3.3.1.5
Piping and Fittings /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.166	3.3.2.40
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.145	3.3.2.145
Tubing /Pressure Boundary	Copper	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.244	3.3.2.34
Tubing /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.254	3.3.2.42
Tubing /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.254	3.3.2.40
Valves /Pressure Boundary	Brass or Bronze	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.264	3.3.2.23
Valves /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.273	3.3.1.5

Aging Management Review Aid

Table 2.3.3-14 Component Groups Requiring Aging Management Review - Process Sampling System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.293	3.3.2.40
Valves /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.295	3.3.2.40
Valves (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.266	3.3.1.5
Valves (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	25-288°C (77-550°F) demineralized water	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.3.2.285	3.3.2.40
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.273	3.3.2.273

Aging Management Review Aid

Table 2.3.3-15 Component Groups Requiring Aging Management Review - Carbon Dioxide System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Piping and Fittings /Pressure Boundary	Carbon Steel	Dry Gas	None	None	Non-GALL	3.3.2.138	3.3.1.5
Tanks /Pressure Boundary	Carbon Steel	Dry Gas	None	None	Non-GALL	3.3.2.212	3.3.1.5
Tubing /Pressure Boundary	Carbon Steel	Dry Gas	None	None	Non-GALL	3.3.2.234	3.3.1.5
Valves /Pressure Boundary	Brass or Bronze	Dry Gas	None	None	Non-GALL	3.3.2.260	3.3.2.23
Valves /Pressure Boundary	Carbon Steel	Dry Gas	None	None	Non-GALL	3.3.2.268	3.3.1.5

Aging Management Review Aid

Table 2.3.3-16 Component Groups Requiring Aging Management Review - Service Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Raw water (submerged)	Loss of material/ General, pitting, crevice, microbiologically influenced corrosion and macro organisms	Bolting Integrity (B.1.12)	Non-GALL	3.3.2.19	NA
Flow Orifices (attached support)/Structural Integrity (Attached)	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.5
Orifice Bodies /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ Pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.4-a	3.3.1.15	3.3.2.40
Orifice Bodies /Throttle	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ Pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.4-a	3.3.1.15	NA

Aging Management Review Aid

Table 2.3.3-16 Component Groups Requiring Aging Management Review - Service Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.26
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.16
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.5

Aging Management Review Aid

Table 2.3.3-16 Component Groups Requiring Aging Management Review - Service Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.29
Piping and Fittings /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.40
Piping and Fittings /Pressure Boundary	Titanium	Raw, untreated salt water or fresh water	Flow Blockage/Biofouling	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.169	3.3.2.45
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.5

Aging Management Review Aid

Table 2.3.3-16 Component Groups Requiring Aging Management Review - Service Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.5
Pumps /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of material/ General, pitting, crevice, microbiologically influenced corrosion and macro organisms	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.179	3.3.2.170
Pumps /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of material/ General, pitting, crevice, microbiologically influenced corrosion and macro organisms	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.179	3.3.2.171
Pumps /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of material/ General, pitting, crevice, microbiologically influenced corrosion and macro organisms	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.179	3.3.2.300
Pumps /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.180	3.3.2.300
Pumps /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.180	3.3.2.171
Pumps /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.180	3.3.2.170

Aging Management Review Aid

Table 2.3.3-16 Component Groups Requiring Aging Management Review - Service Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Strainer Bodies /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (carbon steel only) pitting crevice and microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.6-a	3.3.1.15	3.3.1.5
Strainer Bodies /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open Cycle Cooling Water System (B.1.13), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.208	3.3.2.300
Strainer Screens /Filter	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (carbon steel only) pitting crevice and microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.6-a	3.3.1.15	NA
Thermowells /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.5
Tubing /Pressure Boundary	Copper	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.242	3.3.2.34
Valves /Pressure Boundary	Carbon Steel	35°C (95°F) treated water	Loss of material/ General (only for carbon steel) pitting and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.2-a	3.3.1.13	3.3.1.5

Aging Management Review Aid

Table 2.3.3-16 Component Groups Requiring Aging Management Review - Service Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.23
Valves /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.1.5
Valves /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.40

Aging Management Review Aid

Table 2.3.3-16 Component Groups Requiring Aging Management Review - Service Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Selective Leaching of Materials (B.1.24)	VII.C1.2-a	3.3.1.27	3.3.2.23
Valves /Pressure Boundary	Brass or Bronze	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.262	3.3.2.23
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.279	3.3.2.300
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.279	3.3.2.31
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.280	3.3.2.300
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.280	3.3.2.31
Valves /Pressure Boundary	Titanium	Raw, untreated salt water or fresh water	None	None	Non-GALL	3.3.2.298	3.3.2.45

Aging Management Review Aid

Table 2.3.3-16 Component Groups Requiring Aging Management Review - Service Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves (spatial interaction)/Leakage Boundary (spatial)	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.23
Valves (spatial interaction)/Leakage Boundary (spatial)	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Selective Leaching of Materials (B.1.24)	VII.C1.2-a	3.3.1.27	3.3.2.23
Valves (spatial interaction)/Leakage Boundary (spatial)	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.279	3.3.2.300
Valves (spatial interaction)/Leakage Boundary (spatial)	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.280	3.3.2.300
Valves (spatial interaction)/Leakage Boundary (spatial)	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.281	3.3.2.300

Aging Management Review Aid

Table 2.3.3-16 Component Groups Requiring Aging Management Review - Service Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves (attached support)/Structural Integrity (Attached)	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.23
Valves (attached support)/Structural Integrity (Attached)	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Selective Leaching of Materials (B.1.24)	VII.C1.2-a	3.3.1.27	3.3.2.23
Valves (attached support)/Structural Integrity (Attached)	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.279	3.3.2.300
Valves (attached support)/Structural Integrity (Attached)	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.280	3.3.2.300

Aging Management Review Aid

Table 2.3.3-17 Component Groups Requiring Aging Management Review - Reactor Building Closed Cooling Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Flow Elements /Pressure Boundary	Carbon Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.68	3.3.1.5
Heat Exchangers /Pressure Boundary	Tubes: stainless steel; tubesheet: carbon steel; channel head: carbon steel; shell: carbon steel	Tube side: Open cycle cooling water (raw water); Shell side: Closed cooling water (treated water)	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Pitting Corrosion, Crevice Corrosion	Open Cycle Cooling Water System (B.1.13), Closed- Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.116	3.3.1.5
Heat Exchangers /Pressure Boundary	Tubes: stainless steel; tubesheet: carbon steel; channel head: carbon steel; shell: carbon steel	Tube side: Open cycle cooling water (raw water); Shell side: Closed cooling water (treated water)	Cracking/Mech Fatigue, SCC	Open Cycle Cooling Water System (B.1.13), Closed- Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.117	3.3.1.5
Heat Exchangers /Heat Transfer	Tubes: stainless steel	Tube side: Open cycle cooling water (raw water); Shell side: Closed cooling water (treated water)	Buildup of Deposit/Fouling	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.112	NA
Heat Exchangers (spatial interaction)/Leakage Boundary (spatial)	Channel Head: Carbon Steel; Shell: Carbon Steel	Tube side: Open cycle cooling water (raw water); Shell side: Closed cooling water (treated water)	Crack initiation and growth/ Stress corrosion cracking	Open Cycle Cooling Water System (B.1.13), Closed- Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.77	3.3.1.5
Heat Exchangers (spatial interaction)/Leakage Boundary (spatial)	Channel Head: Carbon Steel; Shell: Carbon Steel	Tube side: Open cycle cooling water (raw water); Shell side: Closed cooling water (treated water)	Loss of Material/General, MIC, Erosion/FAC, Wear, Pitting, Crevice Corrosion	Open Cycle Cooling Water System (B.1.13), Closed- Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.78	3.3.1.5

Aging Management Review Aid

Table 2.3.3-17 Component Groups Requiring Aging Management Review - Reactor Building Closed Cooling Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Manifolds /Pressure Boundary	Stainless Steel	35°C (95°F) treated water	Loss of material/ General (only for carbon steel) pitting and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.2-a	3.3.1.13	3.3.2.40
Manifolds /Pressure Boundary	Stainless Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.128	3.3.2.40
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.130	3.3.2.130
Orifice Bodies /Pressure Boundary	Carbon Steel	35°C (95°F) treated water	Loss of material/ General, pitting, and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.5-a	3.3.1.13	3.3.1.5
Piping and Fittings /Pressure Boundary	Carbon Steel	35°C (95°F) treated water	Loss of material/ General, pitting, and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.1-a	3.3.1.13	3.3.1.5
Piping and Fittings /Pressure Boundary	Stainless Steel	35°C (95°F) treated water	Loss of material/ General (only for carbon steel) pitting and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.2-a	3.3.1.13	3.3.2.40
Piping and Fittings /Pressure Boundary	Carbon Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.137	3.3.1.5
Piping and Fittings /Pressure Boundary	Stainless Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.159	3.3.2.40

Aging Management Review Aid

Table 2.3.3-17 Component Groups Requiring Aging Management Review - Reactor Building Closed Cooling Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	35°C (95°F) treated water	Loss of material/ General, pitting, and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.1-a	3.3.1.13	3.3.1.5
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	35°C (95°F) treated water	Loss of material/ General (only for carbon steel) pitting and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.2-a	3.3.1.13	3.3.2.40
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	35°C (95°F) treated water	Loss of material/ General, pitting, and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.1-a	3.3.1.13	3.3.1.5
Pumps /Pressure Boundary	Carbon Steel	35°C (95°F) treated water	Loss of material/ General (only for carbon steel) selective leaching (for cast iron only) pitting and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.3-a	3.3.1.13	3.3.1.5
Pumps /Pressure Boundary	Carbon Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.174	3.3.1.5
Tanks /Pressure Boundary	Carbon Steel	35°C (95°F) treated water	Loss of material/ General, pitting, and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.4-a	3.3.1.13	3.3.1.5
Tanks /Pressure Boundary	Carbon Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.211	3.3.1.5
Thermowells /Pressure Boundary	Stainless Steel	35°C (95°F) treated water	Loss of material/ General (only for carbon steel) pitting and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.2-a	3.3.1.13	3.3.2.40

Aging Management Review Aid

Table 2.3.3-17 Component Groups Requiring Aging Management Review - Reactor Building Closed Cooling Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Thermowells /Pressure Boundary	Brass or Bronze	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Cracking/ Stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.220	3.3.2.23
Thermowells /Pressure Boundary	Brass or Bronze	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Loss of Material/General, Galvanic, Pitting, Crevice Corrosion, Selective Leaching and MIC	Closed-Cycle Cooling Water System (B.1.14), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.221	3.3.2.23
Thermowells /Pressure Boundary	Stainless Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.225	3.3.2.40
Tubing /Pressure Boundary	Carbon Steel	35°C (95°F) treated water	Loss of material/ General, pitting, and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.1-a	3.3.1.13	3.3.1.5
Tubing /Pressure Boundary	Carbon Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.233	3.3.1.5
Valves /Pressure Boundary	Carbon Steel	35°C (95°F) treated water	Loss of material/ General (only for carbon steel) pitting and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.2-a	3.3.1.13	3.3.1.5
Valves /Pressure Boundary	Stainless Steel	35°C (95°F) treated water	Loss of material/ General (only for carbon steel) pitting and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.2-a	3.3.1.13	3.3.2.40
Valves /Pressure Boundary	Carbon Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.267	3.3.1.5

Aging Management Review Aid

Table 2.3.3-17 Component Groups Requiring Aging Management Review - Reactor Building Closed Cooling Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Stainless Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.286	3.3.2.40
Valves /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.293	3.3.2.40
Valves (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	35°C (95°F) treated water	Loss of material/ General (only for carbon steel) pitting and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.2-a	3.3.1.13	3.3.1.5
Valves (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.266	3.3.1.5
Valves (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.267	3.3.1.5
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	35°C (95°F) treated water	Loss of material/ General (only for carbon steel) pitting and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.2-a	3.3.1.13	3.3.1.5
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.267	3.3.1.5

Aging Management Review Aid

Table 2.3.3-18 Component Groups Requiring Aging Management Review - Turbine Building Closed Cooling Water System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Heat Exchangers /Pressure Boundary	Tubes: Admiralty Brass; Tubesheet: Carbon Steel; Channel Head: Carbon Steel	Raw, untreated fresh water	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Selective Leaching, Pitting Corrosion, Crevice Corrosion	Open Cycle Cooling Water System (B.1.13), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.91	NA
Heat Exchangers /Pressure Boundary	Tubes: Admiralty Brass; Tubesheet: Carbon Steel; Channel Head: Carbon Steel	Raw, untreated fresh water	Cracking/Mech Fatigue, SCC	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.92	NA
Piping and Fittings /Pressure Boundary	Carbon Steel	35°C (95°F) treated water	Loss of material/ General, pitting, and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.1-a	3.3.1.13	3.3.1.5
Piping and Fittings /Pressure Boundary	Carbon Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.137	3.3.1.5
Valves /Pressure Boundary	Carbon Steel	35°C (95°F) treated water	Loss of material/ General (only for carbon steel) pitting and crevice corrosion	Closed-Cycle Cooling Water System (B.1.14)	VII.C2.2-a	3.3.1.13	3.3.1.5
Valves /Pressure Boundary	Carbon Steel	Chemically treated demineralized water < 90°C (194°F) (TTA-Nitrite based chemical treatment)	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Closed-Cycle Cooling Water System (B.1.14)	Non-GALL	3.3.2.267	3.3.1.5

Aging Management Review Aid

Table 2.3.3-19 Component Groups Requiring Aging Management Review - Makeup Demineralizer System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Outdoor ambient conditions	Loss of Material/General corrosion and wear	Bolting Integrity (B.1.12)	Non-GALL	3.3.2.18	NA
Flow Elements (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Treated water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.72	3.3.2.40
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.130	3.3.2.130
Piping and Fittings /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.43
Piping and Fittings /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	3.3.2.43
Piping and Fittings /Pressure Boundary	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.143	3.3.2.29
Piping and Fittings /Pressure Boundary	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.143	3.3.1.5
Piping and Fittings /Pressure Boundary	Aluminum	<90°C (<194°F) treated water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.3.2.302	3.3.2.22

Aging Management Review Aid

Table 2.3.3-19 Component Groups Requiring Aging Management Review - Makeup Demineralizer System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.143	3.3.1.5
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.143	3.3.1.5
Pumps /Pressure Boundary	Cast Iron	Treated water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.182	3.3.2.300
Pumps (spatial interaction)/Leakage Boundary (spatial)	Cast Iron	Treated water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.182	3.3.2.300
Restricting Orifices /Pressure Boundary	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.188	3.3.1.5
Restricting Orifices (spatial interaction)/Leakage Boundary (spatial)	Brass or Bronze	25-288°C (77-550°F) demineralized water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.3.2.186	3.3.2.23
Strainers (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.209	3.3.1.5
Valves /Pressure Boundary	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.272	3.3.2.29
Valves /Pressure Boundary	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.272	3.3.1.5
Valves (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel Casting	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.3-a	3.3.1.25	3.3.2.40

Aging Management Review Aid

Table 2.3.3-19 Component Groups Requiring Aging Management Review - Makeup Demineralizer System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves (spatial interaction)/Leakage Boundary (spatial)	Brass or Bronze	25-288°C (77-550°F) demineralized water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.3.2.257	3.3.2.23
Valves (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.272	3.3.1.5
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.3.2.272	3.3.1.5

Aging Management Review Aid

Table 2.3.3-20 Component Groups Requiring Aging Management Review - Residual Heat Removal Service Water System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Air Handlers Heating/Cooling (Aux&RW HVAC) /Pressure Boundary	Tubes: Copper; Tubesheet: Stainless Steel; End Bells: Carbon Steel; Fins: Aluminum	Tube side: Open cycle cooling water (raw water); Shell side: Warm moist air	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Pitting Corrosion, Crevice Corrosion	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.8	3.3.2.8
Air Handlers Heating/Cooling (Aux&RW HVAC) /Pressure Boundary	Tubes: Copper; Tubesheet: Stainless Steel; End Bells: Carbon Steel; Fins: Aluminum	Tube side: Open cycle cooling water (raw water); Shell side: Warm moist air	Cracking/Mech Fatigue, SCC	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.9	3.3.2.8
Air Handlers Heating/Cooling (Aux&RW HVAC) /Heat Transfer	Tubes: Copper	Tube side: Open cycle cooling water (raw water); Shell side: Warm moist air	Buildup of Deposit/Fouling	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.7	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Dampeners /Pressure Boundary	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.24

Aging Management Review Aid

Table 2.3.3-20 Component Groups Requiring Aging Management Review - Residual Heat Removal Service Water System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Dampeners /Pressure Boundary	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Selective Leaching of Materials (B.1.24)	VII.C1.1-a	3.3.1.27	3.3.2.24
Ducts & Fittings, Access Doors, Closure Bolts, Equip Frames /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General pitting crevice corrosion and microbiologically influenced corrosion (for duct [drip-pan] and piping for moisture drainage)	Plant-specific	VII.F2.1-a	3.3.1.5	NA
Heat Exchangers /Pressure Boundary	Tubes: Admiralty Brass; Channel Head: Cast Iron; Shell: Carbon Steel	Tube side: Open cycle cooling water (raw water); Shell side: Torus Water (demineralized water)	Cracking/Mech Fatigue, SCC	Water Chemistry (B.1.2), Open Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.89	3.3.2.26
Heat Exchangers /Pressure Boundary	Tubes: Admiralty Brass; Channel Head: Cast Iron; Shell: Carbon Steel	Tube side: Open cycle cooling water (raw water); Shell side: Torus Water (demineralized water)	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Selective Leaching, Pitting Corrosion, Crevice Corrosion	Water Chemistry (B.1.2), Open Cycle Cooling Water System (B.1.13), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.90	3.3.2.26
Heat Exchangers /Pressure Boundary	Tubes: Stainless Steel; Tubesheet: Cast Iron; Channel Head: Cast Iron; Shell: Carbon Steel	Tube side: Open cycle cooling water (raw water); Shell side: Torus Water (demineralized water)	Cracking/Mech Fatigue, SCC	Water Chemistry (B.1.2), Open Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.118	3.3.2.26

Aging Management Review Aid

Table 2.3.3-20 Component Groups Requiring Aging Management Review - Residual Heat Removal Service Water System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Heat Exchangers /Pressure Boundary	Tubes: Stainless Steel; Tubesheet: Cast Iron; Channel Head: Cast Iron; Shell: Carbon Steel	Tube side: Open cycle cooling water (raw water); Shell side: Torus Water (demineralized water)	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Selective Leaching, Pitting Corrosion, Crevice Corrosion	Water Chemistry (B.1.2), Open Cycle Cooling Water System (B.1.13), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.119	3.3.2.26
Heat Exchangers /Pressure Boundary	Tubes: Stainless Steel; Tubesheet: Cast Iron; Shell: Cast Iron	Tube side: Torus Water (demineralized water); Shell side: Open cycle cooling water (raw water)	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Selective Leaching, Pitting Corrosion, Crevice Corrosion	Water Chemistry (B.1.2), Open Cycle Cooling Water System (B.1.13), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.120	3.3.2.31
Heat Exchangers /Pressure Boundary	Tubes: Stainless Steel; Tubesheet: Cast Iron; Shell: Cast Iron	Tube side: Torus Water (demineralized water); Shell side: Open cycle cooling water (raw water)	Cracking/Mech Fatigue, SCC	Water Chemistry (B.1.2), Open Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.121	3.3.2.31
Heat Exchangers /Heat Transfer	Tubes: Admiralty Brass	Tube side: Open cycle cooling water (raw water); Shell side: Torus Water (demineralized water)	Buildup of Deposit/Fouling	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.88	NA
Heat Exchangers /Heat Transfer	Tubes: stainless steel	Tube side: Open cycle cooling water (raw water); Shell side: Torus Water (demineralized water)	Buildup of Deposit/Fouling	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.113	NA
Heat Exchangers /Heat Transfer	Tubes: stainless steel	Tube side: Torus Water (demineralized water); Shell side: Open cycle cooling water (raw water)	Buildup of Deposit/Fouling	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.115	NA
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.130	3.3.2.130

Aging Management Review Aid

Table 2.3.3-20 Component Groups Requiring Aging Management Review - Residual Heat Removal Service Water System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Orifice Bodies /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ Pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.4-a	3.3.1.15	3.3.2.40
Orifice Bodies /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ Pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.4-a	3.3.1.15	3.3.2.41
Orifice Bodies /Throttle	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ Pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.4-a	3.3.1.15	NA
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.16
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.141

Aging Management Review Aid

Table 2.3.3-20 Component Groups Requiring Aging Management Review - Residual Heat Removal Service Water System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.5
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.26
Piping and Fittings /Pressure Boundary	Steel Saran Lined	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.168	3.3.2.44
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.5

Aging Management Review Aid

Table 2.3.3-20 Component Groups Requiring Aging Management Review - Residual Heat Removal Service Water System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.26
Pulsation Dampeners /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ Pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.4-a	3.3.1.15	3.3.2.41
Pumps /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General selective leaching (for cast steel) pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.5-a	3.3.1.15	3.3.2.26
Pumps /Pressure Boundary	Iron Cast (Lined)	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.183	3.3.2.173
Pumps /Pressure Boundary	Iron Cast (Lined)	Raw, untreated salt water or fresh water	Loss of material/ General, pitting, crevice, microbiologically influenced corrosion and macro organisms	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.184	3.3.2.173
Sight Glasses (attached support)/Structural Integrity (Attached)	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.5

Aging Management Review Aid

Table 2.3.3-20 Component Groups Requiring Aging Management Review - Residual Heat Removal Service Water System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Strainer Bodies /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (carbon steel only) pitting crevice and microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.6-a	3.3.1.15	3.3.1.5
Strainer Screens /Filter	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (carbon steel only) pitting crevice and microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.6-a	3.3.1.15	NA
Thermowells /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.5
Tubing /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.41

Aging Management Review Aid

Table 2.3.3-20 Component Groups Requiring Aging Management Review - Residual Heat Removal Service Water System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Tubing /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.40
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.40
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.41

Aging Management Review Aid

Table 2.3.3-20 Component Groups Requiring Aging Management Review - Residual Heat Removal Service Water System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.24
Valves /Pressure Boundary	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.23
Valves /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.26

Aging Management Review Aid

Table 2.3.3-20 Component Groups Requiring Aging Management Review - Residual Heat Removal Service Water System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.1.5
Valves /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.40
Valves /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.41

Aging Management Review Aid

Table 2.3.3-20 Component Groups Requiring Aging Management Review - Residual Heat Removal Service Water System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Selective Leaching of Materials (B.1.24)	VII.C1.2-a	3.3.1.27	3.3.2.24
Valves /Pressure Boundary	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Selective Leaching of Materials (B.1.24)	VII.C1.2-a	3.3.1.27	3.3.2.23
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.279	3.3.2.300
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.279	3.3.2.31
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.280	3.3.2.300
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.280	3.3.2.31

Aging Management Review Aid

Table 2.3.3-20 Component Groups Requiring Aging Management Review - Residual Heat Removal Service Water System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Steel Saran Lined	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.297	3.3.2.26
Valves (attached support)/Structural Integrity (Attached)	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.24
Valves (attached support)/Structural Integrity (Attached)	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.23
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.1.5

Aging Management Review Aid

Table 2.3.3-20 Component Groups Requiring Aging Management Review - Residual Heat Removal Service Water System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.26
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.40
Valves (attached support)/Structural Integrity (Attached)	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Selective Leaching of Materials (B.1.24)	VII.C1.2-a	3.3.1.27	3.3.2.23

Aging Management Review Aid

Table 2.3.3-20 Component Groups Requiring Aging Management Review - Residual Heat Removal Service Water System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves (attached support)/Structural Integrity (Attached)	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Selective Leaching of Materials (B.1.24)	VII.C1.2-a	3.3.1.27	3.3.2.24
Valves (attached support)/Structural Integrity (Attached)	Cast Iron	Raw water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.276	3.3.2.300
Valves (attached support)/Structural Integrity (Attached)	Cast Iron	Raw water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.277	3.3.2.300

Aging Management Review Aid

Table 2.3.3-21 Component Groups Requiring Aging Management Review - Containment Cooling Service Water System (Dresden Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Air Handlers Heating/Cooling (Aux&RW HVAC) /Pressure Boundary	Tubes: Copper; Tubesheet: Stainless Steel; End Bells: Carbon Steel; Fins: Aluminum	Tube side: Open cycle cooling water (raw water); Shell side: Warm moist air	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Pitting Corrosion, Crevice Corrosion	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.8	3.3.2.8
Air Handlers Heating/Cooling (Aux&RW HVAC) /Pressure Boundary	Tubes: Copper; Tubesheet: Stainless Steel; End Bells: Carbon Steel; Fins: Aluminum	Tube side: Open cycle cooling water (raw water); Shell side: Warm moist air	Cracking/Mech Fatigue, SCC	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.9	3.3.2.8
Air Handlers Heating/Cooling (Aux&RW HVAC) /Heat Transfer	Tubes: Copper	Tube side: Open cycle cooling water (raw water); Shell side: Warm moist air	Buildup of Deposit/Fouling	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.7	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Ducts & Fittings, Access Doors, Closure Bolts, Equip Frames /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General pitting crevice corrosion and microbiologically influenced corrosion (for duct [drip-pan] and piping for moisture drainage)	Plant-specific	VII.F2.1-a	3.3.1.5	NA
Flow Elements /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ Pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.4-a	3.3.1.15	3.3.2.40
Flow Elements /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ Pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.4-a	3.3.1.15	3.3.2.41

Aging Management Review Aid

Table 2.3.3-21 Component Groups Requiring Aging Management Review - Containment Cooling Service Water System (Dresden Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Heat Exchangers /Pressure Boundary	Tubes: 70-30 Cu-Ni; Tubesheet: Carbon Steel; Channel Head: Carbon Steel; Shell: Carbon Steel	Tube side: Open cycle cooling water (raw water); Shell side: Torus Water (demineralized water)	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Selective Leaching, Pitting Corrosion, Crevice Corrosion	Water Chemistry (B.1.2), Open Cycle Cooling Water System (B.1.13), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.80	3.3.1.5
Heat Exchangers /Pressure Boundary	Tubes: 70-30 Cu-Ni; Tubesheet: Carbon Steel; Channel Head: Carbon Steel; Shell: Carbon Steel	Tube side: Open cycle cooling water (raw water); Shell side: Torus Water (demineralized water)	Cracking/Mech Fatigue, SCC	Water Chemistry (B.1.2), Open Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.81	3.3.1.5
Heat Exchangers /Heat Transfer	Tubes: 70-30 Cu-Ni	Tube side: Open cycle cooling water (raw water); Shell side: Torus Water (demineralized water)	Buildup of Deposit/Fouling	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.79	NA
Orifice Bodies /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ Pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.4-a	3.3.1.15	3.3.2.40
Orifice Bodies /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ Pitting crevice microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.4-a	3.3.1.15	3.3.2.41
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.16

Aging Management Review Aid

Table 2.3.3-21 Component Groups Requiring Aging Management Review - Containment Cooling Service Water System (Dresden Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.5
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.26
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.141

Aging Management Review Aid

Table 2.3.3-21 Component Groups Requiring Aging Management Review - Containment Cooling Service Water System (Dresden Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.40
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.2.26
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.5
Pumps /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of material/ General, pitting, crevice, microbiologically influenced corrosion and macro organisms	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.179	3.3.2.31
Pumps /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.180	3.3.2.31

Aging Management Review Aid

Table 2.3.3-21 Component Groups Requiring Aging Management Review - Containment Cooling Service Water System (Dresden Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Strainer Bodies /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open Cycle Cooling Water System (B.1.13), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.208	3.3.2.300
Strainer Screens /Filter	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (carbon steel only) pitting crevice and microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.6-a	3.3.1.15	NA
Thermowells /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.1-a	3.3.1.15	3.3.1.5
Tubing /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.40

Aging Management Review Aid

Table 2.3.3-21 Component Groups Requiring Aging Management Review - Containment Cooling Service Water System (Dresden Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Tubing /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.41
Valves /Pressure Boundary	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.24
Valves /Pressure Boundary	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.23

Aging Management Review Aid

Table 2.3.3-21 Component Groups Requiring Aging Management Review - Containment Cooling Service Water System (Dresden Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.1.5
Valves /Pressure Boundary	Carbon Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.26
Valves /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.41

Aging Management Review Aid

Table 2.3.3-21 Component Groups Requiring Aging Management Review - Containment Cooling Service Water System (Dresden Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Stainless Steel	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Open-Cycle Cooling Water System (B.1.13)	VII.C1.2-a	3.3.1.15	3.3.2.40
Valves /Pressure Boundary	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Selective Leaching of Materials (B.1.24)	VII.C1.2-a	3.3.1.27	3.3.2.24
Valves /Pressure Boundary	Brass or Bronze	Raw, untreated salt water or fresh water	Loss of material/ General (for carbon steel without lining/coating or with degraded lining/coating) selective leaching (for aluminum-bronze, brass, bronze and copper-nickel) pitting crevice galvanic microbiologically influenced corrosion and biofouling	Selective Leaching of Materials (B.1.24)	VII.C1.2-a	3.3.1.27	3.3.2.23
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.279	3.3.2.300
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.279	3.3.2.31

Aging Management Review Aid

Table 2.3.3-21 Component Groups Requiring Aging Management Review - Containment Cooling Service Water System (Dresden Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.280	3.3.2.300
Valves /Pressure Boundary	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.280	3.3.2.31
Valves (attached support)/Structural Integrity (Attached)	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/Selective Leaching	Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.279	3.3.2.300
Valves (attached support)/Structural Integrity (Attached)	Cast Iron	Raw, untreated salt water or fresh water	Loss of Material/General, pitting, crevice, galvanic, erosion, and MIC Flow Blockage/Biofouling, silting & corrosion product buildup	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.280	3.3.2.300

Aging Management Review Aid

Table 2.3.3-22 Component Groups Requiring Aging Management Review - Ultimate Heat Sink

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated fresh water	Loss of material/ General (only for carbon steel without internal lining or coating) selective leaching (only for brass copper- nickel) pitting crevice and microbiologically influenced corrosion	Open-Cycle Cooling Water System (B.1.13)	VII.C3.1-a	3.3.1.15	3.3.2.141
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated fresh water	Loss of material/ General (only for carbon steel without internal lining or coating) selective leaching (only for brass copper- nickel) pitting crevice and microbiologically influenced corrosion	Open-Cycle Cooling Water System (B.1.13)	VII.C3.1-a	3.3.1.15	3.3.1.5
Piping and Fittings /Pressure Boundary	Carbon Steel	Raw, untreated fresh water	Loss of material/ General (only for carbon steel without internal lining or coating) selective leaching (only for brass copper- nickel) pitting crevice and microbiologically influenced corrosion	Open-Cycle Cooling Water System (B.1.13)	VII.C3.1-a	3.3.1.15	3.3.2.28
Pump Casings /Pressure Boundary	Cast Iron	Raw, untreated fresh water	Loss of material/ General, pitting and crevice corrosion, selective leaching and microbiologically influenced corrosion	Open Cycle Cooling Water System (B.1.13), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.172	3.3.2.300

Aging Management Review Aid

Table 2.3.3-22 Component Groups Requiring Aging Management Review - Ultimate Heat Sink

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Cast Iron	Raw, untreated fresh water	Loss of material/ General, pitting and crevice corrosion, selective leaching and microbiologically influenced corrosion	Open Cycle Cooling Water System (B.1.13), Selective Leaching of Materials (B.1.24)	Non-GALL	3.3.2.278	3.3.2.300

Aging Management Review Aid

Table 2.3.3-23 Component Groups Requiring Aging Management Review - Fuel Pool Cooling and Filter Demineralizer System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Piping and Fittings /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.145	3.3.1.5
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Chemically treated oxygenated water up to 50°C (125°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.A4.1-a	3.3.1.1	3.3.2.40
Sight Glasses (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.198	3.3.1.5
Sight Glasses (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Wet Gas	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.199	3.3.1.5
Valves /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.273	3.3.1.5
Valves (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.273	3.3.1.5

Aging Management Review Aid

Table 2.3.3-24 Component Groups Requiring Aging Management Review - Plant Heating System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Filters/Strainers (spatial interaction)/Leakage Boundary (spatial)	Cast Iron	Saturated Steam/Condensate	Loss of material/ General corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.57	3.3.2.300
NSR Vents or Drains, Piping and Valves (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.130	3.3.2.130
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Saturated Steam/Condensate	Loss of material/ General corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.142	3.3.1.5
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Saturated Steam/Condensate	Loss of material/ General corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.142	3.3.2.26
Pumps (spatial interaction)/Leakage Boundary (spatial)	Cast Iron	Saturated Steam/Condensate	Loss of material/ General corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.181	3.3.2.300
Sight Glasses (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Saturated Steam/Condensate	Loss of material/ General corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.197	3.3.1.5
Tanks (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Saturated Steam/Condensate	Loss of material/ General corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.214	3.3.1.5

Aging Management Review Aid

Table 2.3.3-24 Component Groups Requiring Aging Management Review - Plant Heating System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Thermowells (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Saturated Steam/Condensate	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.2	3.3.2.40
Traps (spatial interaction)/Leakage Boundary (spatial)	Cast Iron	Saturated Steam/Condensate	Loss of material/ General corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.229	3.3.2.300
Traps (spatial interaction)/Leakage Boundary (spatial)	Cast Iron	Saturated Steam/Condensate	Loss of material/ General corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.229	3.3.2.31
Tubing (spatial interaction)/Leakage Boundary (spatial)	Copper	Saturated Steam/Condensate	Loss of material/ General corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.243	3.3.2.34
Tubing (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Saturated Steam/Condensate	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.252	3.3.2.40
Tubing (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Saturated Steam/Condensate	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.252	3.3.2.41
Valves (spatial interaction)/Leakage Boundary (spatial)	Brass or Bronze	Saturated Steam/Condensate	Loss of material/ General corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.263	3.3.2.23
Valves (spatial interaction)/Leakage Boundary (spatial)	Brass or Bronze	Saturated Steam/Condensate	Loss of material/ General corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.263	3.3.2.24
Valves (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Saturated Steam/Condensate	Loss of material/ General corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.271	3.3.1.5
Valves (spatial interaction)/Leakage Boundary (spatial)	Cast Iron	Saturated Steam/Condensate	Loss of material/ General corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.282	3.3.2.300

Aging Management Review Aid

Table 2.3.3-24 Component Groups Requiring Aging Management Review - Plant Heating System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves (spatial interaction)/Leakage Boundary (spatial)	Cast Iron	Saturated Steam/Condensate	Loss of material/ General corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.282	3.3.2.31

Aging Management Review Aid

Table 2.3.3-25 Component Groups Requiring Aging Management Review - Containment Atmosphere Monitoring System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Filters/Strainers /Filter	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.230	NA
Flexible Hoses /Pressure Boundary	Elastomers Neoprene and Similar Materials	Dry Gas	Hardening and loss of strength/ Elastomer degradation	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.64	3.3.2.67
Flexible Hoses /Pressure Boundary	Elastomers Neoprene and Similar Materials	Warm, moist air	Hardening and loss of strength/ Elastomer degradation	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.67	3.3.2.67
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.130	3.3.2.130
Piping and Fittings /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.166	3.3.2.40
Piping and Fittings (attached support)/Structural Integrity (Attached)	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.166	3.3.2.40
Pumps /Pressure Boundary	Stainless Steel	Wet Gas	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.299	3.3.2.40
Restricting Orifices /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.193	3.3.2.40

Aging Management Review Aid

Table 2.3.3-25 Component Groups Requiring Aging Management Review - Containment Atmosphere Monitoring System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Sample Pumps /Pressure Boundary	Stainless Steel	Moist containment atmosphere (air/nitrogen), steam, or demineralized water	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.195	3.3.2.40
Tubing /Pressure Boundary	Stainless Steel	Dry Gas	None	None	Non-GALL	3.3.2.248	3.3.2.40
Tubing /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.254	3.3.2.42
Tubing /Pressure Boundary	Stainless Steel	Wet Gas	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.255	3.3.2.40
Valves /Pressure Boundary	Brass or Bronze	Dry Gas	None	None	Non-GALL	3.3.2.260	3.3.2.23
Valves /Pressure Boundary	Stainless Steel	Dry Gas	None	None	Non-GALL	3.3.2.289	3.3.2.40
Valves /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.295	3.3.2.40
Valves /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.295	3.3.2.42
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.295	3.3.2.40

Aging Management Review Aid

Table 2.3.3-26 Component Groups Requiring Aging Management Review - Nitrogen Containment Atmosphere Dilution System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Outdoor ambient conditions	Loss of Material/General corrosion and wear	Bolting Integrity (B.1.12)	Non-GALL	3.3.2.18	NA
Restricting Orifices /Pressure Boundary	Copper	Dry Gas	None	None	Non-GALL	3.3.2.189	3.3.2.35
Restricting Orifices /Throttle	Copper	Dry Gas	None	None	Non-GALL	3.3.2.189	NA
Tubing /Pressure Boundary	Copper	Dry Gas	None	None	Non-GALL	3.3.2.239	3.3.2.34
Tubing /Pressure Boundary	Copper	Dry Gas	None	None	Non-GALL	3.3.2.239	3.3.2.35
Valves /Pressure Boundary	Brass or Bronze	Dry Gas	None	None	Non-GALL	3.3.2.260	3.3.2.23
Valves /Pressure Boundary	Brass or Bronze	Dry Gas	None	None	Non-GALL	3.3.2.260	3.3.2.25

Aging Management Review Aid

Table 2.3.3-27 Component Groups Requiring Aging Management Review - Drywell Nitrogen Inerting System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Filters/Strainers /Pressure Boundary	Brass or Bronze	Dry Gas	None	None	Non-GALL	3.3.2.51	3.3.2.25
Filters/Strainers /Filter	Brass or Bronze	Dry Gas	None	None	Non-GALL	3.3.2.51	NA
Flow Elements /Pressure Boundary	Carbon Steel	Dry Gas	None	None	Non-GALL	3.3.2.69	3.3.1.5
Flow Elements /Pressure Boundary	Stainless Steel	Dry Gas	None	None	Non-GALL	3.3.2.71	3.3.2.40
Isolation Barriers /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	10 CFR Part 50, Appendix J (B.1.28)	Non-GALL	3.3.2.124	3.3.2.124
Isolation Barriers /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	10 CFR Part 50, Appendix J (B.1.28)	Non-GALL	3.3.2.125	3.3.2.125
Piping and Fittings /Pressure Boundary	Carbon Steel	Dry Gas	None	None	Non-GALL	3.3.2.138	3.3.1.5
Piping and Fittings /Pressure Boundary	Stainless Steel	Dry Gas	None	None	Non-GALL	3.3.2.161	3.3.2.40
Tanks /Pressure Boundary	Aluminum	Dry Gas	None	None	Non-GALL	3.3.2.210	3.3.2.21
Tanks /Pressure Boundary	Carbon Steel	Dry Gas	None	None	Non-GALL	3.3.2.212	3.3.1.5
Thermowells /Pressure Boundary	Carbon Steel	Dry Gas	None	None	Non-GALL	3.3.2.223	3.3.1.5

Aging Management Review Aid

Table 2.3.3-27 Component Groups Requiring Aging Management Review - Drywell Nitrogen Inerting System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Traps /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.228	3.3.1.5
Tubing /Pressure Boundary	Aluminum	Dry Gas	None	None	Non-GALL	3.3.2.231	3.3.2.22
Tubing /Pressure Boundary	Copper	Dry Gas	None	None	Non-GALL	3.3.2.239	3.3.2.34
Tubing /Pressure Boundary	Copper	Dry Gas	None	None	Non-GALL	3.3.2.239	3.3.2.35
Tubing /Pressure Boundary	Stainless Steel	Dry Gas	None	None	Non-GALL	3.3.2.248	3.3.2.40
Tubing /Pressure Boundary	Stainless Steel	Dry Gas	None	None	Non-GALL	3.3.2.248	3.3.2.43
Valves /Pressure Boundary	Brass or Bronze	Dry Gas	None	None	Non-GALL	3.3.2.260	3.3.2.25
Valves /Pressure Boundary	Brass or Bronze	Dry Gas	None	None	Non-GALL	3.3.2.260	3.3.2.23
Valves /Pressure Boundary	Brass or Bronze	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.3.2.262	3.3.2.23
Valves /Pressure Boundary	Carbon Steel	Dry Gas	None	None	Non-GALL	3.3.2.268	3.3.1.5
Valves /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General (carbon steel only) pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.273	3.3.1.5
Valves /Pressure Boundary	Stainless Steel	Dry Gas	None	None	Non-GALL	3.3.2.289	3.3.2.40
Valves /Pressure Boundary	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.3.2.295	3.3.2.40

Aging Management Review Aid

Table 2.3.3-28 Component Groups Requiring Aging Management Review - Safe Shutdown Makeup Pump System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Air Handlers Heating/Cooling (Aux&RW HVAC) /Pressure Boundary	Tubes: Copper; Tubesheet: Stainless Steel; End Bells: Carbon Steel; Fins: Aluminum	Tube side: Open cycle cooling water (raw water); Shell side: Warm moist air	Loss of Material/General Corrosion, Galvanic Corrosion, MIC, Erosion or FAC, Wear, Pitting Corrosion, Crevice Corrosion	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.8	3.3.2.21
Air Handlers Heating/Cooling (Aux&RW HVAC) /Pressure Boundary	Tubes: Copper; Tubesheet: Stainless Steel; End Bells: Carbon Steel; Fins: Aluminum	Tube side: Open cycle cooling water (raw water); Shell side: Warm moist air	Cracking/Mech Fatigue, SCC	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.9	3.3.2.21
Air Handlers Heating/Cooling (Aux&RW HVAC) /Heat Transfer	Tubes: Copper	Tube side: Open cycle cooling water (raw water); Shell side: Warm moist air	Buildup of Deposit/Fouling	Open-Cycle Cooling Water System (B.1.13)	Non-GALL	3.3.2.7	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VII.I.2-a	3.3.1.22	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VII.I.2-b	3.3.1.22	NA
Ducts & Fittings, Access Doors, Closure Bolts, Equip Frames /Pressure Boundary	Carbon Steel	Warm, moist air	Loss of material/ General pitting crevice corrosion and microbiologically influenced corrosion (for duct [drip-pan] and piping for moisture drainage)	Plant-specific	VII.F2.1-a	3.3.1.5	NA
Filters/Strainers /Pressure Boundary	Carbon Steel	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.1.5
Filters/Strainers /Filter	Carbon Steel	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	NA

Aging Management Review Aid

Table 2.3.3-28 Component Groups Requiring Aging Management Review - Safe Shutdown Makeup Pump System (Quad Cities Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.1.5
Piping and Fittings /Pressure Boundary	Stainless Steel	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.2.40
Pumps /Pressure Boundary	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.2-a	3.3.1.8	3.3.1.5
Restricting Orifices /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	3.3.2.40
Restricting Orifices /Pressure Boundary	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	3.3.2.40
Restricting Orifices /Throttle	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.1-a	3.3.1.8	NA
Restricting Orifices /Throttle	Stainless Steel	Oxygenated water, up to 288°C (550°F)	Crack initiation and growth/ Stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	VII.E4.1-c	3.3.1.25	NA
Valves /Pressure Boundary	Carbon Steel	Oxygenated water, up to 288°C (550°F)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VII.E4.2-a	3.3.1.8	3.3.1.5
Valves /Pressure Boundary	Carbon Steel	Raw water	Loss of material/ General galvanic pitting crevice microbiologically influenced corrosion and biofouling	Fire Water System (B.1.19)	VII.G.6-b	3.3.1.19	3.3.1.5

Aging Management Review Aid

Table 2.3.4-1 Component Groups Requiring Aging Management Review - Main Steam

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Accumulators /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.4.2.1	3.4.2.11
Accumulators /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.4.2.1	3.4.2.13
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel SA193Gr B7	Air with metal temperature up to 288°C (550°F)	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-g	3.1.1.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VIII.H.2-a	3.4.1.6	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VIII.H.2-b	3.4.1.6	NA
Dampeners /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.4.2.11
Dampeners /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.4.2.13
Filters/Strainers /Filter	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.4.2.17	3.4.2.13
Flexible Hoses /Pressure Boundary	Elastomers Neoprene and Similar Materials	Saturated air	Hardening and loss of strength/ Elastomer degradation	One-Time Inspection (B.1.23)	Non-GALL	3.4.2.19	3.4.2.18
Flow Elements /Pressure Boundary	Carbon Steel SA106Gr B	288°C (550°F) steam	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.1-a	3.1.1.11	3.4.2.6
Flow Elements /Throttle	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	NA

Aging Management Review Aid

Table 2.3.4-1 Component Groups Requiring Aging Management Review - Main Steam

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
NSR Vents or Drains, Piping and Valves (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.4.2.30	3.4.2.30
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.4.2.30	3.4.2.30
Piping and Fittings /Pressure Boundary	Carbon Steel SA106Gr B, SA333Gr 6, SA155Gr KCF70	288°C (550°F) steam	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.1-b	3.1.1.1	NA
Piping and Fittings /Pressure Boundary	Carbon Steel SA106Gr B	288°C (550°F) steam	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.1-a	3.1.1.11	3.4.2.5
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.4.2.13
Piping and Fittings /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.4.2.12
Piping and Fittings /Pressure Boundary	Carbon Steel	Moist containment atmosphere (air/nitrogen), steam, or demineralized water	Loss of material/ General (carbon steel only) pitting and crevice corrosion	Plant-specific	V.D2.1-e	3.2.1.3	3.4.2.6
Piping and Fittings /Pressure Boundary	Carbon Steel	Moist containment atmosphere (air/nitrogen), steam, or demineralized water	Loss of material/ General (carbon steel only) pitting and crevice corrosion	Plant-specific	V.D2.1-e	3.2.1.5	3.4.2.6

Aging Management Review Aid

Table 2.3.4-1 Component Groups Requiring Aging Management Review - Main Steam

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Carbon Steel	288°C (550°F) steam	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	VIII.B2.1-c	3.4.1.1	NA
Piping and Fittings /Pressure Boundary	Carbon Steel	288°C (550°F) steam	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.B2.1-b	3.4.1.4	3.4.1.3
Piping and Fittings /Pressure Boundary	Carbon Steel	288°C (550°F) steam	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.B2.1-b	3.4.1.4	3.4.2.5
Piping and Fittings /Pressure Boundary	Carbon Steel	288°C (550°F) steam	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.B2.1-b	3.4.1.4	3.4.2.6
Piping and Fittings /Pressure Boundary	Carbon Steel	288°C (550°F) steam	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	VIII.B2.1-a	3.4.1.5	3.4.2.6
Piping and Fittings /Pressure Boundary	Carbon Steel	288°C (550°F) steam	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	VIII.B2.1-a	3.4.1.5	3.4.2.5
Piping and Fittings /Pressure Boundary	Carbon Steel	288°C (550°F) steam	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	VIII.B2.1-a	3.4.1.5	3.4.1.3
Piping and Fittings /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.4.2.34	3.4.2.11
Piping and Fittings (small bore) /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.4.2.6
Piping and Fittings (small bore) /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.4.2.5

Aging Management Review Aid

Table 2.3.4-1 Component Groups Requiring Aging Management Review - Main Steam

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings (small bore) /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.4.1.3
Piping and Fittings (small bore) /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.4.2.13
Restricting Orifices /Pressure Boundary	Carbon Steel	288°C (550°F) steam	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.B2.1-b	3.4.1.4	3.4.1.3
Restricting Orifices /Pressure Boundary	Carbon Steel	288°C (550°F) steam	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.B2.1-b	3.4.1.4	3.4.2.5
Restricting Orifices /Pressure Boundary	Carbon Steel	288°C (550°F) steam	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	VIII.B2.1-a	3.4.1.5	3.4.1.3
Restricting Orifices /Pressure Boundary	Carbon Steel	288°C (550°F) steam	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	VIII.B2.1-a	3.4.1.5	3.4.2.5
Rupture Discs /Pressure Boundary	Stainless Steel	Moist containment atmosphere (air/nitrogen), steam, or demineralized water	Loss of material/ General (carbon steel only) pitting and crevice corrosion	Plant-specific	V.D2.1-e	3.2.1.3	3.4.2.13
Rupture Discs /Pressure Boundary	Stainless Steel	Moist containment atmosphere (air/nitrogen), steam, or demineralized water	Loss of material/ General (carbon steel only) pitting and crevice corrosion	Plant-specific	V.D2.1-e	3.2.1.5	3.4.2.13
Tanks /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.4.2.13

Aging Management Review Aid

Table 2.3.4-1 Component Groups Requiring Aging Management Review - Main Steam

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Thermowells /Pressure Boundary	Stainless Steel Type 304, 316, 316NG	288°C (550°F) reactor coolant water or steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.1-f	3.1.1.15	3.4.2.12
Thermowells /Pressure Boundary	Carbon Steel	Moist containment atmosphere (air/nitrogen), steam, or demineralized water	Loss of material/ General (carbon steel only) pitting and crevice corrosion	Plant-specific	V.D2.1-e	3.2.1.3	3.4.2.6
Thermowells /Pressure Boundary	Carbon Steel	Moist containment atmosphere (air/nitrogen), steam, or demineralized water	Loss of material/ General (carbon steel only) pitting and crevice corrosion	Plant-specific	V.D2.1-e	3.2.1.5	3.4.2.6
Tubing (attached support)/Structural Integrity (Attached)	Stainless Steel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.1.2.42	3.4.2.13
Vacuum Breakers /Pressure Boundary	Carbon Steel	Moist containment atmosphere (air/nitrogen), steam, or demineralized water	Loss of material/ General (carbon steel only) pitting and crevice corrosion	Plant-specific	V.D2.1-e	3.2.1.3	3.2.1.3
Vacuum Breakers /Pressure Boundary	Carbon Steel	Moist containment atmosphere (air/nitrogen), steam, or demineralized water	Loss of material/ General (carbon steel only) pitting and crevice corrosion	Plant-specific	V.D2.1-e	3.2.1.5	3.2.1.3
Valves /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-d	3.1.1.1	NA
Valves /Pressure Boundary	Carbon Steel SA106Gr B	288°C (550°F) steam	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.1-a	3.1.1.11	3.4.1.3
Valves /Pressure Boundary	Carbon Steel SA106Gr B	288°C (550°F) steam	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.1-a	3.1.1.11	3.4.2.6
Valves /Pressure Boundary	Carbon Steel SA106Gr B	288°C (550°F) steam	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.1-a	3.1.1.11	3.4.2.5

Aging Management Review Aid

Table 2.3.4-1 Component Groups Requiring Aging Management Review - Main Steam

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.3-a	3.1.1.11	3.4.2.5
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.4.2.11
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.4.2.12
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.4.2.13
Valves /Pressure Boundary	Carbon Steel	Steam	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.A.2-b	3.4.1.2	3.4.2.5
Valves /Pressure Boundary	Carbon Steel	Steam	Wall thinning (body only)/ Flow-accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.A.2-a	3.4.1.4	3.4.2.5
Valves /Pressure Boundary	Carbon Steel	288°C (550°F) steam	Wall thinning (body only)/ Flow-accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.B2.2-a	3.4.1.4	3.4.2.6
Valves /Pressure Boundary	Carbon Steel	288°C (550°F) steam	Wall thinning (body only)/ Flow-accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.B2.2-a	3.4.1.4	3.4.2.5
Valves /Pressure Boundary	Carbon Steel	288°C (550°F) steam	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	VIII.B2.2-b	3.4.1.5	3.4.2.6
Valves /Pressure Boundary	Carbon Steel	288°C (550°F) steam	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	VIII.B2.2-b	3.4.1.5	3.4.2.5
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.4.2.51	3.4.2.12

Aging Management Review Aid

Table 2.3.4-1 Component Groups Requiring Aging Management Review - Main Steam

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) steam	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.4.2.51	3.4.2.11
Valves /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.4.2.53	3.4.2.13
Valves /Pressure Boundary	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.4.2.53	3.4.2.11
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	Saturated air	Loss of material/ Pitting and crevice corrosion	Compressed Air Monitoring (B.1.16)	Non-GALL	3.4.2.53	3.4.2.13

Aging Management Review Aid

Table 2.3.4-2 Component Groups Requiring Aging Management Review - Feedwater System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel SA193Gr B7	Air with metal temperature up to 288°C (550°F)	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-g	3.1.1.1	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VIII.H.2-a	3.4.1.6	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VIII.H.2-b	3.4.1.6	NA
NSR Vents or Drains, Piping and Valves (attached support)/Structural Integrity (Attached)	Carbon Steel, Stainless Steel, Brass or Bronze	Air, moisture, humidity, and leaking fluid	Loss of material/ Corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.4.2.30	3.4.2.30
Piping and Fittings /Pressure Boundary	Carbon Steel SA106Gr B, SA333Gr 6, SA155Gr KCF70	Up to 225°C (437°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.1-d	3.1.1.1	NA
Piping and Fittings /Pressure Boundary	Carbon Steel SA106Gr B	Up to 225°C (437°F) reactor coolant water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.1-c	3.1.1.11	3.4.2.5
Piping and Fittings /Pressure Boundary	Carbon Steel	Treated water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	VIII.D2.1-c	3.4.1.1	NA
Piping and Fittings /Pressure Boundary	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.D2.1-b	3.4.1.2	3.4.2.6
Piping and Fittings /Pressure Boundary	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.D2.1-b	3.4.1.2	3.4.1.3
Piping and Fittings /Pressure Boundary	Carbon Steel	Treated water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.D2.1-a	3.4.1.4	3.4.1.3
Piping and Fittings /Pressure Boundary	Carbon Steel	Treated water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.D2.1-a	3.4.1.4	3.4.2.6

Aging Management Review Aid

Table 2.3.4-2 Component Groups Requiring Aging Management Review - Feedwater System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.D2.1-b	3.4.1.2	3.4.1.3
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.D2.1-b	3.4.1.2	3.4.2.5
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.D2.1-b	3.4.1.2	3.4.2.6
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Treated water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.D2.1-a	3.4.1.4	3.4.2.5
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Treated water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.D2.1-a	3.4.1.4	3.4.2.6
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Treated water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.D2.1-a	3.4.1.4	3.4.1.3
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.D2.1-b	3.4.1.2	3.4.1.3
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.D2.1-b	3.4.1.2	3.4.2.6

Aging Management Review Aid

Table 2.3.4-2 Component Groups Requiring Aging Management Review - Feedwater System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.D2.1-b	3.4.1.2	3.4.2.5
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.D2.1-a	3.4.1.4	3.4.2.5
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.D2.1-a	3.4.1.4	3.4.2.6
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.D2.1-a	3.4.1.4	3.4.1.3
Piping and Fittings (small bore) /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.4.2.5
Piping and Fittings (small bore) /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking thermal and mechanical loading	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1) and Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	IV.C1.1-i	3.1.1.5	3.4.2.6
Valves /Pressure Boundary	Carbon Steel, Cast Austenitic Stainless Steel, Stainless Steel	288°C (550°F) reactor coolant water	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	IV.C1.3-d	3.1.1.1	NA
Valves /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.3-a	3.1.1.11	3.4.1.3
Valves /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.3-a	3.1.1.11	3.4.2.5

Aging Management Review Aid

Table 2.3.4-2 Component Groups Requiring Aging Management Review - Feedwater System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Carbon Steel	288°C (550°F) reactor coolant water	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	IV.C1.3-a	3.1.1.11	3.4.2.6
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.4.2.11
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.4.2.12
Valves /Pressure Boundary	Stainless Steel	288°C (550°F) reactor coolant water	Crack initiation and growth/ Stress corrosion cracking intergranular stress corrosion cracking	BWR Stress Corrosion Cracking (B.1.7) and Water Chemistry (B.1.2)	IV.C1.3-c	3.1.1.15	3.4.2.13
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.D2.2-b	3.4.1.2	3.4.1.3
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.D2.2-b	3.4.1.2	3.4.2.5
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Wall thinning (body only)/ Flow-accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.D2.2-a	3.4.1.4	3.4.2.5
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Wall thinning (body only)/ Flow-accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.D2.2-a	3.4.1.4	3.4.1.3
Valves (attached support)/Structural Integrity (Attached)	Stainless Steel	Treated water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.4.2.54	3.4.2.13

Aging Management Review Aid

Table 2.3.4-3 Component Groups Requiring Aging Management Review - Condensate and Condensate Storage System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VIII.H.2-a	3.4.1.6	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VIII.H.2-b	3.4.1.6	NA
Closure Bolting /Pressure Boundary	High Strength Low Alloy Steel	Outdoor ambient conditions	Loss of Material/General corrosion and wear	Bolting Integrity (B.1.12)	Non-GALL	3.4.2.2	NA
Piping and Fittings /Pressure Boundary	Carbon Steel	Treated water (BWRs: reactor coolant; PWRs: secondary side water)	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.E.1-b	3.4.1.2	3.4.1.3
Piping and Fittings /Pressure Boundary	Carbon Steel	Treated water (BWRs: reactor coolant; PWRs: secondary side water)	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.E.1-b	3.4.1.2	3.4.2.8
Piping and Fittings /Pressure Boundary	Carbon Steel	Treated water (BWRs: reactor coolant; PWRs: secondary side water)	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.E.1-b	3.4.1.2	3.4.2.7
Piping and Fittings /Pressure Boundary	Carbon Steel	Treated water (BWRs: reactor coolant; PWRs: secondary side water)	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.E.1-a	3.4.1.4	3.4.2.7
Piping and Fittings /Pressure Boundary	Carbon Steel	Treated water (BWRs: reactor coolant; PWRs: secondary side water)	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.E.1-a	3.4.1.4	3.4.2.8
Piping and Fittings /Pressure Boundary	Carbon Steel	Treated water (BWRs: reactor coolant; PWRs: secondary side water)	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.E.1-a	3.4.1.4	3.4.1.3
Piping and Fittings /Pressure Boundary	Aluminum	<90°C (<194°F) treated water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.4.2.31	3.4.2.3
Piping and Fittings /Pressure Boundary	Aluminum	<90°C (<194°F) treated water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.4.2.31	3.4.2.4

Aging Management Review Aid

Table 2.3.4-3 Component Groups Requiring Aging Management Review - Condensate and Condensate Storage System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Piping and Fittings /Pressure Boundary	Stainless Steel	Treated water (BWRs: reactor coolant; PWRs: secondary side water)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.4.2.35	3.4.2.15
Piping and Fittings /Pressure Boundary	Stainless Steel	Treated water (BWRs: reactor coolant; PWRs: secondary side water)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.4.2.35	3.4.2.14
Piping and Fittings /Pressure Boundary	Stainless Steel	Treated water (BWRs: reactor coolant; PWRs: secondary side water)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.4.2.35	3.4.2.11
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Treated water (BWRs: reactor coolant; PWRs: secondary side water)	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.E.1-b	3.4.1.2	3.4.1.3
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Treated water (BWRs: reactor coolant; PWRs: secondary side water)	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.E.1-a	3.4.1.4	3.4.1.3
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water (BWRs: reactor coolant; PWRs: secondary side water)	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.E.1-b	3.4.1.2	3.4.1.3
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water (BWRs: reactor coolant; PWRs: secondary side water)	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.E.1-a	3.4.1.4	3.4.1.3
Tanks /Pressure Boundary	Aluminum	<90°C (<194°F) treated water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.4.2.39	3.4.2.40
Tanks /Pressure Boundary	Aluminum	<90°C (<194°F) treated water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.4.2.39	3.4.2.41
Tanks /Pressure Boundary	Aluminum	<90°C (<194°F) treated water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.4.2.39	3.4.2.42

Aging Management Review Aid

Table 2.3.4-3 Component Groups Requiring Aging Management Review - Condensate and Condensate Storage System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Thermowells /Pressure Boundary	Carbon Steel	Treated water (BWRs: reactor coolant; PWRs: secondary side water)	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.E.1-b	3.4.1.2	3.4.1.3
Thermowells /Pressure Boundary	Carbon Steel	Treated water (BWRs: reactor coolant; PWRs: secondary side water)	Wall thinning/ Flow- accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.E.1-a	3.4.1.4	3.4.1.3
Thermowells /Pressure Boundary	Aluminum	<90°C (<194°F) treated water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.4.2.45	3.4.2.4
Tubing /Pressure Boundary	Aluminum	<90°C (<194°F) treated water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.4.2.46	3.4.2.3
Tubing /Pressure Boundary	Aluminum	<90°C (<194°F) treated water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.4.2.46	3.4.2.4
Tubing /Pressure Boundary	Stainless Steel	Treated water (BWRs: reactor coolant; PWRs: secondary side water)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.4.2.47	3.4.2.14
Tubing /Pressure Boundary	Stainless Steel	Treated water (BWRs: reactor coolant; PWRs: secondary side water)	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.4.2.47	3.4.2.11
Valves /Pressure Boundary	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.E.2-b	3.4.1.2	3.4.2.7
Valves /Pressure Boundary	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.E.2-b	3.4.1.2	3.4.1.3
Valves /Pressure Boundary	Carbon Steel	Treated water	Wall thinning (body only)/ Flow-accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.E.2-a	3.4.1.4	3.4.1.3
Valves /Pressure Boundary	Carbon Steel	Treated water	Wall thinning (body only)/ Flow-accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.E.2-a	3.4.1.4	3.4.2.7
Valves /Pressure Boundary	Aluminum	<90°C (<194°F) treated water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.4.2.49	3.4.2.3

Aging Management Review Aid

Table 2.3.4-3 Component Groups Requiring Aging Management Review - Condensate and Condensate Storage System

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Valves /Pressure Boundary	Aluminum	<90°C (<194°F) treated water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2)	Non-GALL	3.4.2.49	3.4.2.4
Valves /Pressure Boundary	Stainless Steel	Treated water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.4.2.54	3.4.2.11
Valves /Pressure Boundary	Stainless Steel	Treated water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.4.2.54	3.4.2.14
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Loss of material/ General, pitting, and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	VIII.E.2-b	3.4.1.2	3.4.1.3
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Treated water	Wall thinning (body only)/ Flow-accelerated corrosion	Flow-Accelerated Corrosion (B.1.11)	VIII.E.2-a	3.4.1.4	3.4.1.3

Aging Management Review Aid

Table 2.3.4-4 Component Groups Requiring Aging Management Review - Main Condenser

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Main Condenser Hotwells, False Floors /Containment Holdup and Plateout	Carbon Steel	Steam	None	None	Non-GALL	3.4.2.24	3.4.2.27
Main Condenser Tubes, Tubesheets /Containment Holdup and Plateout	Stainless Steel	Open-cycle cooling water (raw water) side	None	None	Non-GALL	3.4.2.25	NA
Main Condenser Tubes, Tubesheets /Containment Holdup and Plateout	Stainless Steel	Steam	None	None	Non-GALL	3.4.2.26	NA
Main Condenser Waterboxes, Hatches /Containment Holdup and Plateout	Carbon Steel	Open-cycle cooling water (raw water) side	None	None	Non-GALL	3.4.2.28	3.4.2.27

Aging Management Review Aid

Table 2.3.4-5 Component Groups Requiring Aging Management Review - Main Turbine and Auxiliary Systems

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Accumulators (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Turbine EHC Fluid	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.4.2.29	3.4.2.11
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VIII.H.2-a	3.4.1.6	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VIII.H.2-b	3.4.1.6	NA
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Turbine EHC Fluid	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.4.2.36	3.4.2.11
Tubing (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Turbine EHC Fluid	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.4.2.48	3.4.2.11
Valves (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Turbine EHC Fluid	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.4.2.55	3.4.2.11

Aging Management Review Aid

Table 2.3.4-6 Component Groups Requiring Aging Management Review - Turbine Oil System (In-scope for Quad Cities only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VIII.H.2-a	3.4.1.6	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VIII.H.2-b	3.4.1.6	NA
Filters/Strainers (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Generator Hydrogen Seal Oil	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.4.2.16	3.4.1.3
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Generator Hydrogen Seal Oil	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.4.2.32	3.4.1.3
Piping and Fittings (attached support)/Structural Integrity (Attached)	Carbon Steel	Generator Hydrogen Seal Oil	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.4.2.32	3.4.1.3
Pump Casings (spatial interaction)/Leakage Boundary (spatial)	Cast Iron	Generator Hydrogen Seal Oil	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.4.2.37	3.4.2.9
Tanks (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Generator Hydrogen Seal Oil	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.4.2.43	3.4.1.3
Valves (spatial interaction)/Leakage Boundary (spatial)	Carbon Steel	Generator Hydrogen Seal Oil	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.4.2.50	3.4.1.3
Valves (attached support)/Structural Integrity (Attached)	Carbon Steel	Generator Hydrogen Seal Oil	Loss of material/ Pitting and crevice corrosion	One-Time Inspection (B.1.23)	Non-GALL	3.4.2.50	3.4.1.3

Aging Management Review Aid

Table 2.3.4-7 Component Groups Requiring Aging Management Review - Main Generator and Auxiliaries (In-scope for Quad Cities only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Loss of material/ General corrosion	Bolting Integrity (B.1.12)	VIII.H.2-a	3.4.1.6	NA
Closure Bolting /Pressure Boundary	Low-Alloy Steel	Air, moisture, humidity, and leaking fluid	Crack initiation and growth/ Cyclic loading stress corrosion cracking	Bolting Integrity (B.1.12)	VIII.H.2-b	3.4.1.6	NA
Heat Exchangers (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Demineralized Water - Stator Liquid Cooling	Loss of material/ Pitting and crevice corrosion	Main Generator Stator Cooling Water Chemistry (B.2.7)	Non-GALL	3.4.2.20	3.4.2.11
Housings (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Demineralized Water - Stator Liquid Cooling	Loss of material/ Pitting and crevice corrosion	Main Generator Stator Cooling Water Chemistry (B.2.7)	Non-GALL	3.4.2.21	3.4.2.11
Piping and Fittings (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Demineralized Water - Stator Liquid Cooling	Loss of material/ Pitting and crevice corrosion	Main Generator Stator Cooling Water Chemistry (B.2.7)	Non-GALL	3.4.2.33	3.4.2.11
Pumps (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Demineralized Water - Stator Liquid Cooling	Loss of material/ Pitting and crevice corrosion	Main Generator Stator Cooling Water Chemistry (B.2.7)	Non-GALL	3.4.2.38	3.4.2.11
Tanks (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Demineralized Water - Stator Liquid Cooling	Loss of material/ Pitting and crevice corrosion	Main Generator Stator Cooling Water Chemistry (B.2.7)	Non-GALL	3.4.2.44	3.4.2.11
Valves (spatial interaction)/Leakage Boundary (spatial)	Stainless Steel	Demineralized Water - Stator Liquid Cooling	Loss of material/ Pitting and crevice corrosion	Main Generator Stator Cooling Water Chemistry (B.2.7)	Non-GALL	3.4.2.52	3.4.2.11

Aging Management Review Aid

Table 2.4-1 Component Groups Requiring Aging Management Review - Primary Containment

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Beam Seats /Structural Support	Lubrite	Inside containment	Lock-up/ Wear	Structures Monitoring Program (B.1.30)	III.A4.2-b	3.5.1.20	NA
Concrete & Grout /Structural Support	Reinforced Concrete Grout	Inside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B1.1.4- a	3.5.1.29	NA
Concrete & Grout /Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B1.3.3- a	3.5.1.29	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Inside containment, exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A4.1-a	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Inside containment	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A4.1-b	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Inside containment, exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A4.1-d	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Inside containment	Reduction of strength and modulus/ Elevated temperature (>150°F general; >200°F local)	Plant-specific	III.A4.1-c	3.5.1.27	NA
Concrete Walls /Structural Support	Reinforced Concrete	Inside containment, exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A4.1-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-1 Component Groups Requiring Aging Management Review - Primary Containment

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Walls /Structural Support	Reinforced Concrete	Inside containment	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A4.1-b	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Inside containment, exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A4.1-d	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Inside containment	Reduction of strength and modulus/ Elevated temperature (>150°F general; >200°F local)	Plant-specific	III.A4.1-c	3.5.1.27	NA
Concrete Walls /Shelter, Protection, Shielding	Reinforced Concrete	Inside containment	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A4.1-b	3.5.1.20	NA
Concrete Walls /Shelter, Protection, Shielding	Reinforced Concrete	Inside containment	Reduction of strength and modulus/ Elevated temperature (>150°F general; >200°F local)	Plant-specific	III.A4.1-c	3.5.1.27	NA
Containment Penetrations (Electrical) /Structural Support	Carbon Steel; Dissimilar Metal Welds	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B4.1-a	3.5.1.3	NA
Containment Penetrations (Electrical) /Fission Product Barrier	Carbon Steel; Dissimilar Metal Welds	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B4.1-a	3.5.1.3	NA
Containment Penetrations (Electrical) /Structural Pressure Barrier	Carbon Steel; Dissimilar Metal Welds	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B4.1-a	3.5.1.3	NA

Aging Management Review Aid

Table 2.4-1 Component Groups Requiring Aging Management Review - Primary Containment

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Containment Penetrations (Mechanical) /Structural Support	Carbon Steel; Dissimilar Metal Welds	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B4.1-a	3.5.1.3	NA
Containment Penetrations (Mechanical) /Fission Product Barrier	Carbon Steel; Dissimilar Metal Welds	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B4.1-a	3.5.1.3	NA
Containment Penetrations (Mechanical) /Structural Pressure Barrier	Carbon Steel; Dissimilar Metal Welds	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B4.1-a	3.5.1.3	NA
Containment Penetrations Bellows /Fission Product Barrier	Stainless Steel; Dissimilar Metal Welds	Inside or outside containment	Crack initiation and growth/ Stress corrosion cracking	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B4.1-d	3.5.1.2	NA
Containment Penetrations Bellows /Structural Pressure Barrier	Stainless Steel; Dissimilar Metal Welds	Inside or outside containment	Crack initiation and growth/ Stress corrosion cracking	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B4.1-d	3.5.1.2	NA
Downcomers /Structural Pressure Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B1.1.1-a	3.5.1.12	NA
Downcomers /Structural Pressure Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	Protective Coating Monitoring and Maintenance Program (B.1.32)	II.B1.1.1-a	3.5.1.14	NA
Drywell Expansion Foam /Expansion/Separati on	Polyurethane	Outside containment	Hardening/Radiation exposure	Time Limited Aging Analysis evaluated for the period of extended operation	Non-GALL	3.5.2.8	NA

Aging Management Review Aid

Table 2.4-1 Component Groups Requiring Aging Management Review - Primary Containment

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Drywell Heads /Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B1.1.1-a	3.5.1.12	NA
Drywell Heads /Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	Protective Coating Monitoring and Maintenance Program (B.1.32)	II.B1.1.1-a	3.5.1.14	NA
Drywell Heads /Fission Product Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B1.1.1-a	3.5.1.12	NA
Drywell Heads /Fission Product Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	Protective Coating Monitoring and Maintenance Program (B.1.32)	II.B1.1.1-a	3.5.1.14	NA
Drywell Heads /Structural Pressure Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B1.1.1-a	3.5.1.12	NA
Drywell Heads /Structural Pressure Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	Protective Coating Monitoring and Maintenance Program (B.1.32)	II.B1.1.1-a	3.5.1.14	NA
Drywells /Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B1.1.1-a	3.5.1.12	NA
Drywells /Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	Protective Coating Monitoring and Maintenance Program (B.1.32)	II.B1.1.1-a	3.5.1.14	NA
Drywells /Fission Product Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B1.1.1-a	3.5.1.12	NA
Drywells /Fission Product Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	Protective Coating Monitoring and Maintenance Program (B.1.32)	II.B1.1.1-a	3.5.1.14	NA

Aging Management Review Aid

Table 2.4-1 Component Groups Requiring Aging Management Review - Primary Containment

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Drywells /Structural Pressure Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B1.1.1-a	3.5.1.12	NA
Drywells /Structural Pressure Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	Protective Coating Monitoring and Maintenance Program (B.1.32)	II.B1.1.1-a	3.5.1.14	NA
Hatches /Structural Pressure Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26), 10 CFR Part 50, Appendix J (B.1.28) and Protective Coating Monitoring and Maintenance Program (B.1.32)	II.B4.2-a	3.5.1.4	NA
Hatches /Structural Pressure Barrier	Carbon Steel	Inside or outside containment	Loss of leak tightness in closed position/ Mechanical wear of locks hinges and closure mechanisms	10 CFR Part 50, Appendix J (B.1.28) and Plant Technical Specifications	II.B4.2-b	3.5.1.5	NA
Misc. Steel /Non- S/R Structural Support	Carbon Steel	Inside containment	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A4.2-a	3.5.1.20	NA
Penetration Sleeves, Penetration Bellows /Structural Support	Carbon Steel; Stainless Steel Dissimilar Metal Welds	Inside or outside containment	Cumulative fatigue damage/ Fatigue (Only if CLB fatigue analysis exists)	Time Limited Aging Analysis evaluated for the period of extended operation	II.B4.1-b	3.5.1.1	NA
Penetration Sleeves, Penetration Bellows /Fission Product Barrier	Carbon Steel; Stainless Steel Dissimilar Metal Welds	Inside or outside containment	Cumulative fatigue damage/ Fatigue (Only if CLB fatigue analysis exists)	Time Limited Aging Analysis evaluated for the period of extended operation	II.B4.1-b	3.5.1.1	NA
Penetration Sleeves, Penetration Bellows /Structural Pressure Barrier	Carbon Steel; Stainless Steel Dissimilar Metal Welds	Inside or outside containment	Cumulative fatigue damage/ Fatigue (Only if CLB fatigue analysis exists)	Time Limited Aging Analysis evaluated for the period of extended operation	II.B4.1-b	3.5.1.1	NA

Aging Management Review Aid

Table 2.4-1 Component Groups Requiring Aging Management Review - Primary Containment

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Seals /Structural Pressure Barrier	Various	Inside or outside containment	Loss of sealing; leakage through containment/ Deterioration of seals gaskets and moisture barriers (caulking flashing and other sealants)	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B4.3-a	3.5.1.6	NA
Steel Embedments /Structural Support	Carbon Steel	Inside containment	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A4.2-a	3.5.1.20	NA
Steel Panels and Cabinets /Structural Support	Carbon Steel	Inside containment	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A4.2-a	3.5.1.20	NA
Structural Steel /Structural Support	Carbon Steel	Inside containment	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A4.2-a	3.5.1.20	NA
Suppression Chambers /Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B1.1.1-a	3.5.1.12	NA
Suppression Chambers /Structural Support	Carbon steel, stainless steel	Inside or outside containment	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	II.B1.1.1-c	3.5.1.13	NA
Suppression Chambers /Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	Protective Coating Monitoring and Maintenance Program (B.1.32)	II.B1.1.1-a	3.5.1.14	NA
Suppression Chambers /Fission Product Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B1.1.1-a	3.5.1.12	NA
Suppression Chambers /Fission Product Barrier	Carbon steel, stainless steel	Inside or outside containment	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	II.B1.1.1-c	3.5.1.13	NA
Suppression Chambers /Fission Product Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	Protective Coating Monitoring and Maintenance Program (B.1.32)	II.B1.1.1-a	3.5.1.14	NA

Aging Management Review Aid

Table 2.4-1 Component Groups Requiring Aging Management Review - Primary Containment

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Suppression Chambers /Structural Pressure Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B1.1.1-a	3.5.1.12	NA
Suppression Chambers /Structural Pressure Barrier	Carbon steel, stainless steel	Inside or outside containment	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	II.B1.1.1-c	3.5.1.13	NA
Suppression Chambers /Structural Pressure Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	Protective Coating Monitoring and Maintenance Program (B.1.32)	II.B1.1.1-a	3.5.1.14	NA
Thermowells /Structural Support	Stainless Steel; Dissimilar Metal Welds	Inside or outside containment	Loss of material/ General galvanic pitting and crevice corrosion	ASME Section XI, Subsection IWE (B.1.26)	Non-GALL	3.5.2.15	NA
Thermowells /Structural Pressure Barrier	Stainless Steel; Dissimilar Metal Welds	Inside or outside containment	Loss of material/ General galvanic pitting and crevice corrosion	ASME Section XI, Subsection IWE (B.1.26)	Non-GALL	3.5.2.15	NA
Vent Headers /Structural Support	Carbon steel, stainless steel	Inside or outside containment	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	II.B1.1.1-c	3.5.1.13	NA
Vent Headers /Structural Pressure Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B1.1.1-a	3.5.1.12	NA
Vent Headers /Structural Pressure Barrier	Carbon steel, stainless steel	Inside or outside containment	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	II.B1.1.1-c	3.5.1.13	NA
Vent Headers /Structural Pressure Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	Protective Coating Monitoring and Maintenance Program (B.1.32)	II.B1.1.1-a	3.5.1.14	NA

Aging Management Review Aid

Table 2.4-1 Component Groups Requiring Aging Management Review - Primary Containment

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Vent Line Bellows /Structural Support	Carbon steel, stainless steel	Inside or outside containment	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	II.B1.1.1-c	3.5.1.13	NA
Vent Line Bellows /Structural Pressure Barrier	Carbon steel, stainless steel	Inside or outside containment	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	II.B1.1.1-c	3.5.1.13	NA
Vent Line Bellows /Structural Pressure Barrier	Stainless Steel	Inside or outside containment	Crack initiation and growth/ Stress corrosion cracking	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B1.1.1-d	3.5.1.17	NA
Vent Lines /Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B1.1.1-a	3.5.1.12	NA
Vent Lines /Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	Protective Coating Monitoring and Maintenance Program (B.1.32)	II.B1.1.1-a	3.5.1.14	NA
Vent Lines /Structural Pressure Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	ASME Section XI, Subsection IWE (B.1.26) and 10 CFR Part 50, Appendix J (B.1.28)	II.B1.1.1-a	3.5.1.12	NA
Vent Lines /Structural Pressure Barrier	Carbon Steel	Inside or outside containment	Loss of material/ Corrosion	Protective Coating Monitoring and Maintenance Program (B.1.32)	II.B1.1.1-a	3.5.1.14	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor	Concrete cracking and spalling/ Aggressive chemical attack and reaction with aggregates	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.5-a	3.3.1.28	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor	Loss of material/ Corrosion of embedded steel	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.5-b	3.3.1.28	NA

Aging Management Review Aid

Table 2.4-2 Component Groups Requiring Aging Management Review - Reactor Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Blowout Panels /Structural Pressure Barrier	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Caulking/Sealants /Structural Pressure Barrier	Silicone Rubber	Weather exposed	Change in Material Properties/Loss of resiliency, loss of strength, loss of elasticity	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.4	NA
Concrete & Grout /Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B1.2.3- a	3.5.1.29	NA
Concrete & Grout /Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B2.2-a	3.5.1.29	NA
Concrete & Grout /Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B5.2-a	3.5.1.29	NA
Concrete Beams /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A2.1-c	3.5.1.20	NA
Concrete Beams /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A2.1-d	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-2 Component Groups Requiring Aging Management Review - Reactor Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Beams /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A2.1-f	3.5.1.20	NA
Concrete Beams /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A2.1-e	3.5.1.21	NA
Concrete Beams /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A2.1-g	3.5.1.21	NA
Concrete Columns /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A2.1-c	3.5.1.20	NA
Concrete Columns /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A2.1-d	3.5.1.20	NA
Concrete Columns /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A2.1-f	3.5.1.20	NA
Concrete Columns /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A2.1-e	3.5.1.21	NA
Concrete Columns /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A2.1-g	3.5.1.21	NA

Aging Management Review Aid

Table 2.4-2 Component Groups Requiring Aging Management Review - Reactor Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Columns /Structural Support	Reinforced Concrete	Outside containment	Reduction of strength and modulus/ Elevated temperature (>150°F general; >200°F local)	Plant-specific	III.A2.1-j	3.5.1.27	NA
Concrete Curbs /Direct Flow	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A2.1-a	3.5.1.20	NA
Concrete Curbs /Direct Flow	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A2.1-b	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A2.1-a	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A2.1-b	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A2.1-c	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A2.1-e	3.5.1.21	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A2.1-g	3.5.1.21	NA
Concrete Slabs /Shelter, Protection, Shielding	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A2.1-b	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-2 Component Groups Requiring Aging Management Review - Reactor Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Slabs /Shelter, Protection, Shielding	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A2.1-d	3.5.1.20	NA
Concrete Slabs /Shelter, Protection, Shielding	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A2.1-f	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A2.1-a	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A2.1-b	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A2.1-d	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A2.1-f	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A2.1-e	3.5.1.21	NA
Concrete Walls /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A2.1-g	3.5.1.21	NA

Aging Management Review Aid

Table 2.4-2 Component Groups Requiring Aging Management Review - Reactor Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Walls /Shelter, Protection, Shielding	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A2.1-c	3.5.1.20	NA
Concrete Walls /Shelter, Protection, Shielding	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A2.1-d	3.5.1.20	NA
Concrete Walls /Shelter, Protection, Shielding	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A2.1-f	3.5.1.20	NA
Concrete Walls /Structural Pressure Barrier	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A2.1-b	3.5.1.20	NA
Concrete Walls /Structural Pressure Barrier	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A2.1-c	3.5.1.20	NA
Door Seals /Flood Barrier	Silicone Rubber	Various	Hardening cracking/ Elastomer degradation	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.7	NA
Fire Doors /Fire Barrier	Steel	Indoor and outdoor environments	Loss of material/ Wear	Fire Protection (B.1.18)	Non-GALL	3.3.2.4	NA
Fire Doors /Shelter, Protection, Shielding	Steel	Indoor and outdoor environments	Loss of material/ Wear	Fire Protection (B.1.18)	Non-GALL	3.3.2.4	NA
Fire Proofing /Fire Barrier	Cementitious Fire Proofing	Indoor	None	None	Non-GALL	3.3.2.62	NA
Fire Wrap /Fire Barrier	Ceramic Fiber	Indoor	None	None	Non-GALL	3.3.2.63	NA

Aging Management Review Aid

Table 2.4-2 Component Groups Requiring Aging Management Review - Reactor Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Foundations /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A2.1-a	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A2.1-b	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A2.1-e	3.5.1.21	NA
Foundations /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A2.1-g	3.5.1.21	NA
Foundations /Structural Support	Reinforced Concrete	Soft soil; changes in groundwater conditions	Cracks; distortion; increase in component stress level/ Settlement	Structures Monitoring Program (B.1.30)	III.A2.1-h	3.5.1.25	NA
Foundations /Structural Support	Reinforced Concrete	Flowing water under foundation	Reduction in foundation strength cracking differential settlement/ Erosion of porous concrete subfoundation	Structures Monitoring Program (B.1.30)	III.A2.1-i	3.5.1.26	NA
Liners /Structural Pressure Barrier	Stainless Steel	Exposed to water	Crack initiation and growth Loss of material/ Stress corrosion cracking and crevice corrosion	Water Chemistry (B.1.2) and Monitoring of the Spent Fuel Pool Water Level	III.A5.2-b	3.5.1.23	NA
Masonry Walls /Structural Support	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	III.A2.3-a	3.5.1.24	NA

Aging Management Review Aid

Table 2.4-2 Component Groups Requiring Aging Management Review - Reactor Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Masonry Walls /Fire Barrier	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	Non-GALL	3.3.2.129	NA
Masonry Walls /Missile Barrier	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	III.A2.3-a	3.5.1.24	NA
Masonry Walls /HELB Shielding	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	III.A2.3-a	3.5.1.24	NA
Metal Decking /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Metal Siding /Shelter, Protection, Shielding	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Metal Siding /Structural Pressure Barrier	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Misc. Steel /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Misc. Steel /Non- S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Neutron-Absorbing Sheets /Absorb Neutrons	Boral	Chemically treated oxygenated water	Reduction of neutron- absorbing capacity and loss of material/General corrosion	Plant-specific	VII.A2.1-b	3.3.1.9	NA
Neutron-Absorbing Sheets /Absorb Neutrons	Boraflex	Chemically treated oxygenated water	Reduction of neutron- absorbing capacity/Boraflex degradation	Boraflex Monitoring (B.1.36)	VII.A2.1-a	3.3.1.12	NA

Aging Management Review Aid

Table 2.4-2 Component Groups Requiring Aging Management Review - Reactor Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
New Fuel Racks /Structural Support	Aluminum	Various	None	None	Non-GALL	3.5.2.10	NA
Penetration Seals /Fire Barrier	Sealant	Indoors: air; outdoors: sun, weather, humidity, and moisture	Increased hardness and shrinkage/ Weathering	Fire Protection (B.1.18)	VII.G.3-a	3.3.1.18	NA
Penetration Sleeves /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Precast Concrete Panels /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A2.1-a	3.5.1.20	NA
Precast Concrete Panels /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A2.1-c	3.5.1.20	NA
Precast Concrete Panels /Shelter, Protection, Shielding	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A2.1-b	3.5.1.20	NA
Roofing /Shelter, Protection, Shielding	Vapor barrier coal tar pitch rigid insulation felt gravel or single ply hypalon pavers	Weather exposed	Separation and water in- leakage/weathering	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.11	NA
Secondary Containment Boot Seals /Structural Pressure Barrier	Silicone Rubber	Various	Hardening cracking/ Elastomer degradation	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.12	NA
Steel Doors /Shelter, Protection, Shielding	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Steel Doors /Flood Barrier	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-2 Component Groups Requiring Aging Management Review - Reactor Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Steel Doors /Structural Pressure Barrier	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Steel Embedments /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Steel Panels and Cabinets /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Steel Plates /Missile Barrier	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Steel Plates /HELB Shielding	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Steel Plates /Direct Flow	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Storage Racks /Structural Support	Stainless Steel	Chemically treated oxygenated water	Crack initiation and growth/ Stress corrosion cracking	Water Chemistry (B.1.2)	VII.A2.1-c	3.3.1.11	NA
Structural Steel /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Structural Steel /HELB Shielding	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Structural Steel /Pipe Whip Restraint	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Concrete cracking and spalling/ Freeze-thaw aggressive chemical attack and reaction with aggregates	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.3-b	3.3.1.28	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Loss of material/ Corrosion of embedded steel	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.3-c	3.3.1.28	NA

Aging Management Review Aid

Table 2.4-3 Component Groups Requiring Aging Management Review - Main Control Room and Auxiliary Electric Equipment Room

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete & Grout /Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B2.2-a	3.5.1.29	NA
Concrete & Grout /Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B5.2-a	3.5.1.29	NA
Concrete Beams /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A1.1-c	3.5.1.20	NA
Concrete Beams /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A1.1-d	3.5.1.20	NA
Concrete Beams /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A1.1-f	3.5.1.20	NA
Concrete Columns /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A1.1-c	3.5.1.20	NA
Concrete Columns /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A1.1-d	3.5.1.20	NA
Concrete Columns /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A1.1-f	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-3 Component Groups Requiring Aging Management Review - Main Control Room and Auxiliary Electric Equipment Room

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Curbs /Direct Flow	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A1.1-a	3.5.1.20	NA
Concrete Curbs /Direct Flow	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A1.1-d	3.5.1.20	NA
Concrete Curbs /Direct Flow	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A1.1-f	3.5.1.20	NA
Concrete Manholes /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A1.1-a	3.5.1.20	NA
Concrete Manholes /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A1.1-b	3.5.1.20	NA
Concrete Manholes /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Concrete cracking and spalling/ Freeze-thaw aggressive chemical attack and reaction with aggregates	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.3-b	3.3.1.28	NA
Concrete Manholes /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Loss of material/ Corrosion of embedded steel	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.3-c	3.3.1.28	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A1.1-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-3 Component Groups Requiring Aging Management Review - Main Control Room and Auxiliary Electric Equipment Room

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Slabs /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A1.1-b	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A1.1-c	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A1.1-d	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A1.1-f	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A1.1-e	3.5.1.21	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A1.1-g	3.5.1.21	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Outside containment	Reduction of strength and modulus/ Elevated temperature (>150°F general; >200°F local)	Plant-specific	III.A1.1-j	3.5.1.27	NA
Concrete Slabs /Shelter, Protection, Shielding	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A1.1-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-3 Component Groups Requiring Aging Management Review - Main Control Room and Auxiliary Electric Equipment Room

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Slabs /Shelter, Protection, Shielding	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A1.1-b	3.5.1.20	NA
Concrete Slabs /Shelter, Protection, Shielding	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A1.1-e	3.5.1.21	NA
Concrete Slabs /Shelter, Protection, Shielding	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A1.1-g	3.5.1.21	NA
Concrete Slabs /Shelter, Protection, Shielding	Reinforced Concrete	Outside containment	Reduction of strength and modulus/ Elevated temperature (>150°F general; >200°F local)	Plant-specific	III.A1.1-j	3.5.1.27	NA
Concrete Walls /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A1.1-a	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A1.1-b	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A1.1-c	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A1.1-d	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-3 Component Groups Requiring Aging Management Review - Main Control Room and Auxiliary Electric Equipment Room

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Walls /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A1.1-f	3.5.1.20	NA
Concrete Walls /Shelter, Protection, Shielding	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A1.1-b	3.5.1.20	NA
Concrete Walls /Shelter, Protection, Shielding	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A1.1-d	3.5.1.20	NA
Concrete Walls /Shelter, Protection, Shielding	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A1.1-f	3.5.1.20	NA
Concrete Walls /Shelter, Protection, Shielding	Reinforced Concrete	Outside containment	Reduction of strength and modulus/ Elevated temperature (>150°F general; >200°F local)	Plant-specific	III.A1.1-j	3.5.1.27	NA
Fire Doors /Fire Barrier	Steel	Indoor and outdoor environments	Loss of material/ Wear	Fire Protection (B.1.18)	Non-GALL	3.3.2.4	NA
Fire Proofing /Fire Barrier	Cementitious Fire Proofing	Indoor	None	None	Non-GALL	3.3.2.62	NA
Fire Wrap /Fire Barrier	Ceramic Fiber	Indoor	None	None	Non-GALL	3.3.2.63	NA
Foundations /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A1.1-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-3 Component Groups Requiring Aging Management Review - Main Control Room and Auxiliary Electric Equipment Room

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Foundations /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A1.1-b	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A1.1-e	3.5.1.21	NA
Foundations /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A1.1-g	3.5.1.21	NA
Foundations /Structural Support	Reinforced Concrete	Soft soil; changes in groundwater conditions	Cracks; distortion; increase in component stress level/ Settlement	Structures Monitoring Program (B.1.30)	III.A1.1-h	3.5.1.25	NA
Foundations /Structural Support	Reinforced Concrete Porous Concrete	Flowing water under foundation	Reduction in foundation strength cracking differential settlement/ Erosion of porous concrete subfoundation	Structures Monitoring Program (B.1.30)	III.A1.1-i	3.5.1.26	NA
Masonry Walls /Structural Support	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	III.A1.3-a	3.5.1.24	NA
Masonry Walls /Fire Barrier	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	Non-GALL	3.3.2.129	NA
Masonry Walls /Shelter, Protection, Shielding	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	III.A1.3-a	3.5.1.24	NA
Masonry Walls /Missile Barrier	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	III.A1.3-a	3.5.1.24	NA

Aging Management Review Aid

Table 2.4-3 Component Groups Requiring Aging Management Review - Main Control Room and Auxiliary Electric Equipment Room

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Metal Decking /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Misc. Steel /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Penetration Seals /Fire Barrier	Sealant	Indoors: air; outdoors: sun, weather, humidity, and moisture	Increased hardness and shrinkage/ Weathering	Fire Protection (B.1.18)	VII.G.2-a	3.3.1.18	NA
Penetration Seals /Fire Barrier	Sealant	Indoors: air; outdoors: sun, weather, humidity, and moisture	Increased hardness and shrinkage/ Weathering	Fire Protection (B.1.18)	VII.G.3-a	3.3.1.18	NA
Penetration Seals /Non-S/R Structural Support	Sealant	Indoors: air; outdoors: sun, weather, humidity, and moisture	Increased hardness and shrinkage/ Weathering	Fire Protection (B.1.18)	VII.G.3-a	3.3.1.18	NA
Penetration Sleeves /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Roofing /Shelter, Protection, Shielding	Vapor barrier coal tar pitch rigid insulation felt gravel or single ply hypalon pavers	Weather exposed	Separation and water in- leakage/weathering	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.11	NA
Steel Embedments /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Steel Panels and Cabinets /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Steel Panels and Cabinets /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Structural Steel /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-3 Component Groups Requiring Aging Management Review - Main Control Room and Auxiliary Electric Equipment Room

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Structural Steel /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Concrete cracking and spalling/ Freeze-thaw aggressive chemical attack and reaction with aggregates	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.3-b	3.3.1.28	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Loss of material/ Corrosion of embedded steel	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.3-c	3.3.1.28	NA

Aging Management Review Aid

Table 2.4-4 Component Groups Requiring Aging Management Review - Turbine Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Caulking/Sealants /Structural Pressure Barrier	Silicone Rubber	Various	Hardening cracking/ Elastomer degradation	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.3	NA
Caulking/Sealants /Structural Pressure Barrier	Silicone Rubber	Weather exposed	Change in Material Properties/Loss of resiliency, loss of strength, loss of elasticity	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.4	NA
Concrete & Grout /Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B5.2-a	3.5.1.29	NA
Concrete & Grout /Non-S/R Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B5.2-a	3.5.1.29	NA
Concrete Beams /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A3.1-c	3.5.1.20	NA
Concrete Beams /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A3.1-d	3.5.1.20	NA
Concrete Beams /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A3.1-f	3.5.1.20	NA
Concrete Beams /Structural Support	Reinforced Concrete	Outside containment	Reduction of strength and modulus/ Elevated temperature (>150°F general; >200°F local)	Plant-specific	III.A3.1-j	3.5.1.27	NA

Aging Management Review Aid

Table 2.4-4 Component Groups Requiring Aging Management Review - Turbine Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Columns /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A3.1-c	3.5.1.20	NA
Concrete Columns /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A3.1-d	3.5.1.20	NA
Concrete Columns /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A3.1-f	3.5.1.20	NA
Concrete Curbs /Direct Flow	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Concrete Curbs /Direct Flow	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Concrete Manholes /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Concrete Manholes /Shelter, Protection, Shielding	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-4 Component Groups Requiring Aging Management Review - Turbine Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Walls /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Fire Doors /Fire Barrier	Steel	Indoor and outdoor environments	Loss of material/ Wear	Fire Protection (B.1.18)	VII.G.2-d	3.3.1.18	NA
Fire Proofing /Fire Barrier	Cementitious Fire Proofing	Indoor	None	None	Non-GALL	3.3.2.62	NA
Fire Wrap /Fire Barrier	Ceramic Fiber	Indoor	None	None	Non-GALL	3.3.2.63	NA
Foundations /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A3.1-c	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Soft soil; changes in groundwater conditions	Cracks; distortion; increase in component stress level/ Settlement	Structures Monitoring Program (B.1.30)	III.A3.1-h	3.5.1.25	NA
Foundations /Structural Support	Reinforced Concrete Porous Concrete	Flowing water under foundation	Reduction in foundation strength cracking differential settlement/ Erosion of porous concrete subfoundation	Structures Monitoring Program (B.1.30)	III.A3.1-i	3.5.1.26	NA

Aging Management Review Aid

Table 2.4-4 Component Groups Requiring Aging Management Review - Turbine Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Masonry Walls /Structural Support	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	III.A3.3-a	3.5.1.24	NA
Masonry Walls /Fire Barrier	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	Non-GALL	3.3.2.129	NA
Masonry Walls /Shelter, Protection, Shielding	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	III.A3.3-a	3.5.1.24	NA
Masonry Walls /Non- S/R Structural Support	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	III.A3.3-a	3.5.1.24	NA
Metal Siding /Shelter, Protection, Shielding	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Misc. Steel /Non- S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Penetration Seals /Flood Barrier	Sealant	Indoors: air; outdoors: sun, weather, humidity, and moisture	Increased hardness and shrinkage/ Weathering	Fire Protection (B.1.18)	VII.G.2-a	3.3.1.18	NA
Penetration Sleeves /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Precast Concrete Panels /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Precast Concrete Panels /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-4 Component Groups Requiring Aging Management Review - Turbine Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Precast Concrete Panels /Non-S/R Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Precast Concrete Panels /Non-S/R Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Roofing /Shelter, Protection, Shielding	Vapor barrier coal tar pitch rigid insulation felt gravel or single ply hypalon pavers	Weather exposed	Separation and water in- leakage/weathering	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.11	NA
Steel Doors /Flood Barrier	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Doors /Non- S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Doors /Structural Pressure Barrier	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Embedments /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Panels and Cabinets /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Plates /Shelter, Protection, Shielding	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Plates /Flood Barrier	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Structural Steel /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-4 Component Groups Requiring Aging Management Review - Turbine Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Structural Steel /Pipe Whip Restraint	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Concrete cracking and spalling/ Freeze-thaw aggressive chemical attack and reaction with aggregates	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.2-b	3.3.1.28	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Loss of material/ Corrosion of embedded steel	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.2-c	3.3.1.28	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Concrete cracking and spalling/ Freeze-thaw aggressive chemical attack and reaction with aggregates	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.3-b	3.3.1.28	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Loss of material/ Corrosion of embedded steel	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.3-c	3.3.1.28	NA

Aging Management Review Aid

Table 2.4-5 Component Groups Requiring Aging Management Review - Diesel Generator Buildings

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete & Grout /Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B4.3-a	3.5.1.29	NA
Concrete & Grout /Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B5.2-a	3.5.1.29	NA
Concrete & Grout /Non-S/R Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B4.3-a	3.5.1.29	NA
Concrete Beams /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A3.1-c	3.5.1.20	NA
Concrete Beams /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A3.1-d	3.5.1.20	NA
Concrete Beams /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A3.1-f	3.5.1.20	NA
Concrete Curbs /Direct Flow	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-5 Component Groups Requiring Aging Management Review - Diesel Generator Buildings

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Curbs /Direct Flow	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Concrete Shield Plugs /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A3.1-d	3.5.1.20	NA
Concrete Shield Plugs /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A3.1-f	3.5.1.20	NA
Concrete Shield Plugs /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Concrete cracking and spalling/ Freeze-thaw aggressive chemical attack and reaction with aggregates	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.4-b	3.3.1.28	NA
Concrete Shield Plugs /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Loss of material/ Corrosion of embedded steel	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.4-c	3.3.1.28	NA
Concrete Shield Plugs /Shelter, Protection, Shielding	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A3.1-c	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A3.1-c	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A3.1-d	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-5 Component Groups Requiring Aging Management Review - Diesel Generator Buildings

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Slabs /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A3.1-f	3.5.1.20	NA
Concrete Slabs /Shelter, Protection, Shielding	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A3.1-e	3.5.1.21	NA
Concrete Walls /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A3.1-g	3.5.1.21	NA
Concrete Walls /Structural Support	Reinforced Concrete	Outside containment	Reduction of strength and modulus/ Elevated temperature (>150°F general; >200°F local)	Plant-specific	III.A3.1-j	3.5.1.27	NA
Concrete Walls /Shelter, Protection, Shielding	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A3.1-c	3.5.1.20	NA
Concrete Walls /Missile Barrier	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-5 Component Groups Requiring Aging Management Review - Diesel Generator Buildings

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Walls /Missile Barrier	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A3.1-d	3.5.1.20	NA
Concrete Walls /Missile Barrier	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A3.1-f	3.5.1.20	NA
Fire Doors /Fire Barrier	Steel	Indoor and outdoor environments	Loss of material/ Wear	Fire Protection (B.1.18)	VII.G.4-d	3.3.1.18	NA
Fire Proofing /Fire Barrier	Cementitious Fire Proofing	Indoor	None	None	Non-GALL	3.3.2.62	NA
Fire Wrap /Fire Barrier	Ceramic Fiber	Indoor	None	None	Non-GALL	3.3.2.63	NA
Foundations /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Masonry Walls /Structural Support	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	III.A3.3-a	3.5.1.24	NA
Masonry Walls /Fire Barrier	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	Non-GALL	3.3.2.129	NA
Metal Decking /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-5 Component Groups Requiring Aging Management Review - Diesel Generator Buildings

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Misc. Steel /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Penetration Seals /Fire Barrier	Sealant	Indoors: air; outdoors: sun, weather, humidity, and moisture	Increased hardness and shrinkage/ Weathering	Fire Protection (B.1.18)	VII.G.4-a	3.3.1.18	NA
Penetration Sleeves /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Penetration Sleeves /Structural Pressure Barrier	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Doors /Structural Pressure Barrier	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Embedments /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Panels and Cabinets /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Plates /Direct Flow	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Structural Steel /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Concrete cracking and spalling/ Freeze-thaw aggressive chemical attack and reaction with aggregates	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.4-b	3.3.1.28	NA

Aging Management Review Aid

Table 2.4-5 Component Groups Requiring Aging Management Review - Diesel Generator Buildings

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Loss of material/ Corrosion of embedded steel	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.4-c	3.3.1.28	NA

Aging Management Review Aid

Table 2.4-6 Component Groups Requiring Aging Management Review - Station Blackout Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Bus Duct Covers /Non-S/R Structural Support	Galvanized or Coated Carbon Steel	Weather exposed	Loss of material/ General corrosion	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.1	NA
Bus Duct Supports /Non-S/R Structural Support	Galvanized or Coated Carbon Steel	Weather exposed	Loss of material/ General corrosion	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.2	NA
Caulking/Sealants /Flood Barrier	Silicone Rubber	Weather exposed	Change in Material Properties/Loss of resiliency, loss of strength, loss of elasticity	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.4	NA
Caulking/Sealants /Expansion/Separati on	Silicone Rubber	Weather exposed	Change in Material Properties/Loss of resiliency, loss of strength, loss of elasticity	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.4	NA
Concrete & Grout /Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B4.3-a	3.5.1.29	NA
Concrete & Grout /Non-S/R Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B2.2-a	3.5.1.29	NA
Concrete & Grout /Non-S/R Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B4.3-a	3.5.1.29	NA

Aging Management Review Aid

Table 2.4-6 Component Groups Requiring Aging Management Review - Station Blackout Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Curbs /Direct Flow	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Concrete Curbs /Direct Flow	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Concrete Curbs /Direct Flow	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A3.1-d	3.5.1.20	NA
Concrete Curbs /Direct Flow	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A3.1-f	3.5.1.20	NA
Concrete Manholes /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Concrete Manholes /Non-S/R Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Concrete Manholes /Non-S/R Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A3.1-e	3.5.1.21	NA
Concrete Manholes /Non-S/R Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A3.1-g	3.5.1.21	NA

Aging Management Review Aid

Table 2.4-6 Component Groups Requiring Aging Management Review - Station Blackout Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Slabs /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A3.1-d	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A3.1-f	3.5.1.20	NA
Concrete Slabs /Non-S/R Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Concrete Slabs /Non-S/R Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A3.1-c	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A3.1-e	3.5.1.21	NA

Aging Management Review Aid

Table 2.4-6 Component Groups Requiring Aging Management Review - Station Blackout Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Walls /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A3.1-g	3.5.1.21	NA
Dead End Structures /Non-S/R Structural Support	Galvanized or Coated Carbon Steel	Weather exposed	Loss of material/ General corrosion	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.6	NA
Doors /Fire Barrier	Steel	Indoor and outdoor environments	Loss of material/ Wear	Fire Protection (B.1.18)	VII.G.3-d	3.3.1.18	NA
Fire Proofing /Fire Barrier	Cementitious Fire Proofing	Indoor	None	None	Non-GALL	3.3.2.62	NA
Fire Wrap /Fire Barrier	Ceramic Fiber	Indoor	None	None	Non-GALL	3.3.2.63	NA
Foundations /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Soft soil; changes in groundwater conditions	Cracks; distortion; increase in component stress level/ Settlement	Structures Monitoring Program (B.1.30)	III.A3.1-h	3.5.1.25	NA
Foundations /Structural Support	Reinforced Concrete Porous Concrete	Flowing water under foundation	Reduction in foundation strength cracking differential settlement/ Erosion of porous concrete subfoundation	Structures Monitoring Program (B.1.30)	III.A3.1-i	3.5.1.26	NA

Aging Management Review Aid

Table 2.4-6 Component Groups Requiring Aging Management Review - Station Blackout Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Foundations /Structural Support	Reinforced Concrete	Outside containment	Reduction of strength and modulus/ Elevated temperature (>150°F general; >200°F local)	Plant-specific	III.A3.1-j	3.5.1.27	NA
Foundations /Non- S/R Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Foundations /Non- S/R Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Foundations /Non- S/R Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A3.1-c	3.5.1.20	NA
Masonry Walls /Structural Support	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	III.A3.3-a	3.5.1.24	NA
Masonry Walls /Fire Barrier	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	Non-GALL	3.3.2.129	NA
Masonry Walls /Shelter, Protection, Shielding	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	III.A3.3-a	3.5.1.24	NA
Metal Decking /Shelter, Protection, Shielding	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Metal Decking /Non- S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Metal Siding /Shelter, Protection, Shielding	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-6 Component Groups Requiring Aging Management Review - Station Blackout Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Misc. Steel /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Penetration Seals /Fire Barrier	Sealant	Indoors: air; outdoors: sun, weather, humidity, and moisture	Increased hardness and shrinkage/ Weathering	Fire Protection (B.1.18)	VII.G.3-a	3.3.1.18	NA
Penetration Seals /Fire Barrier	Sealant	Indoors: air; outdoors: sun, weather, humidity, and moisture	Increased hardness and shrinkage/ Weathering	Fire Protection (B.1.18)	VII.G.4-a	3.3.1.18	NA
Penetration Seals /Expansion/Separation	Sealant	Indoors: air; outdoors: sun, weather, humidity, and moisture	Increased hardness and shrinkage/ Weathering	Fire Protection (B.1.18)	VII.G.3-a	3.3.1.18	NA
Penetration Sleeves /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Embedments /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Panels and Cabinets /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Piles /Non-S/R Structural Support	Carbon Steel	Soil and groundwater	None	None	Non-GALL	3.3.2.207	NA
Steel Plates /Missile Barrier	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Structural Steel /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Transmission Towers /Non-S/R Structural Support	Galvanized or Coated Carbon Steel	Weather exposed	Loss of material/ General corrosion	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.16	NA

Aging Management Review Aid

Table 2.4-6 Component Groups Requiring Aging Management Review - Station Blackout Building

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Concrete cracking and spalling/ Freeze-thaw aggressive chemical attack and reaction with aggregates	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.4-b	3.3.1.28	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Loss of material/ Corrosion of embedded steel	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.4-c	3.3.1.28	NA

Aging Management Review Aid

Table 2.4-7 Component Groups Requiring Aging Management Review - Isolation Condenser Pump House (Dresden Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Caulking/Sealants /Expansion/Separation	Silicone Rubber	Weather exposed	Change in Material Properties/Loss of resiliency, loss of strength, loss of elasticity	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.4	NA
Concrete Duct Banks /Non-S/R Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A3.1-e	3.5.1.21	NA
Concrete Duct Banks /Non-S/R Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A3.1-g	3.5.1.21	NA
Concrete Walls /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A3.1-d	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A3.1-f	3.5.1.20	NA
Concrete Walls /Non-S/R Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Doors /Fire Barrier	Steel	Indoor and outdoor environments	Loss of material/ Wear	Fire Protection (B.1.18)	VII.G.3-d	3.3.1.18	NA

Aging Management Review Aid

Table 2.4-7 Component Groups Requiring Aging Management Review - Isolation Condenser Pump House (Dresden Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Foundations /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A3.1-c	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A3.1-e	3.5.1.21	NA
Foundations /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A3.1-g	3.5.1.21	NA
Foundations /Structural Support	Reinforced Concrete	Soft soil; changes in groundwater conditions	Cracks; distortion; increase in component stress level/ Settlement	Structures Monitoring Program (B.1.30)	III.A3.1-h	3.5.1.25	NA
Foundations /Structural Support	Reinforced Concrete Porous Concrete	Flowing water under foundation	Reduction in foundation strength cracking differential settlement/ Erosion of porous concrete subfoundation	Structures Monitoring Program (B.1.30)	III.A3.1-i	3.5.1.26	NA
Foundations /Non- S/R Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Masonry Walls /Structural Support	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	III.A3.3-a	3.5.1.24	NA
Masonry Walls /Fire Barrier	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	Non-GALL	3.3.2.129	NA

Aging Management Review Aid

Table 2.4-7 Component Groups Requiring Aging Management Review - Isolation Condenser Pump House (Dresden Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Masonry Walls /Non-S/R Structural Support	Concrete Block	Ambient environment inside building	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	III.A3.3-a	3.5.1.24	NA
Metal Decking /Shelter, Protection, Shielding	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Metal Decking /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Penetration Seals /Fire Barrier	Sealant	Indoors: air; outdoors: sun, weather, humidity, and moisture	Increased hardness and shrinkage/ Weathering	Fire Protection (B.1.18)	VII.G.3-a	3.3.1.18	NA
Penetration Sleeves /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Roofing /Shelter, Protection, Shielding	Vapor barrier coal tar pitch rigid insulation felt gravel or single ply hypalon pavers	Weather exposed	Separation and water in-leakage/weathering	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.11	NA
Seismic Gap Filler /Expansion/Separation	Polyethylene	Weather exposed	Change in Material Properties/Loss of resiliency, loss of strength, loss of elasticity	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.13	NA
Steel Doors /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A2.2-a	3.5.1.20	NA
Steel Embedments /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Panels and Cabinets /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-7 Component Groups Requiring Aging Management Review - Isolation Condenser Pump House (Dresden Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Structural Steel /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Concrete cracking and spalling/ Freeze-thaw aggressive chemical attack and reaction with aggregates	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.3-b	3.3.1.28	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Loss of material/ Corrosion of embedded steel	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.3-c	3.3.1.28	NA

Aging Management Review Aid

Table 2.4-8 Component Groups Requiring Aging Management Review - Makeup Demineralizer Building (Dresden Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete & Grout /Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B5.2-a	3.5.1.29	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Concrete Slabs /Non-S/R Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A3.1-a	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A3.1-c	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A3.1-e	3.5.1.21	NA
Foundations /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A3.1-g	3.5.1.21	NA
Foundations /Structural Support	Reinforced Concrete	Soft soil; changes in groundwater conditions	Cracks; distortion; increase in component stress level/ Settlement	Structures Monitoring Program (B.1.30)	III.A3.1-h	3.5.1.25	NA

Aging Management Review Aid

Table 2.4-8 Component Groups Requiring Aging Management Review - Makeup Demineralizer Building (Dresden Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Foundations /Structural Support	Reinforced Concrete Porous Concrete	Flowing water under foundation	Reduction in foundation strength cracking differential settlement/ Erosion of porous concrete subfoundation	Structures Monitoring Program (B.1.30)	III.A3.1-i	3.5.1.26	NA
Foundations /Structural Support	Reinforced Concrete	Outside containment	Reduction of strength and modulus/ Elevated temperature (>150°F general; >200°F local)	Plant-specific	III.A3.1-j	3.5.1.27	NA
Foundations /Non- S/R Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A3.1-b	3.5.1.20	NA
Metal Decking /Shelter, Protection, Shielding	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Metal Siding /Shelter, Protection, Shielding	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Doors /Shelter, Protection, Shielding	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Panels and Cabinets /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Structural Steel /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-9 Component Groups Requiring Aging Management Review - Radwaste Floor Drain Surge Tank

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Manholes /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A7.1-a	3.5.1.20	NA
Concrete Manholes /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A7.1-c	3.5.1.20	NA
Concrete Manholes /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A7.1-e	3.5.1.21	NA
Concrete Manholes /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A7.1-g	3.5.1.21	NA
Concrete Manholes /Shelter, Protection, Shielding	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A7.1-b	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A7.1-a	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A7.1-c	3.5.1.20	NA
Concrete Slabs /Shelter, Protection, Shielding	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A7.1-b	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A7.1-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-9 Component Groups Requiring Aging Management Review - Radwaste Floor Drain Surge Tank

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Walls /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A7.1-b	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A7.1-c	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A7.1-d	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A7.1-f	3.5.1.20	NA
Concrete Walls /Shelter, Protection, Shielding	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A7.1-b	3.5.1.20	NA
Concrete Walls /Shelter, Protection, Shielding	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A7.1-d	3.5.1.20	NA
Concrete Walls /Shelter, Protection, Shielding	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A7.1-f	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A7.1-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-9 Component Groups Requiring Aging Management Review - Radwaste Floor Drain Surge Tank

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Foundations /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A7.1-b	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A7.1-e	3.5.1.21	NA
Foundations /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A7.1-g	3.5.1.21	NA
Foundations /Structural Support	Reinforced Concrete	Soft soil; changes in groundwater conditions	Cracks; distortion; increase in component stress level/ Settlement	Structures Monitoring Program (B.1.30)	III.A7.1-h	3.5.1.25	NA
Foundations /Structural Support	Reinforced Concrete Porous Concrete	Flowing water under foundation	Reduction in foundation strength cracking differential settlement/ Erosion of porous concrete subfoundation	Structures Monitoring Program (B.1.30)	III.A7.1-i	3.5.1.26	NA
Liners /Structural Pressure Barrier	Stainless Steel	Exposed to fluid environment (water, fuel)	Crack initiation and growth Loss of material/ Stress corrosion cracking and crevice corrosion	Plant-specific	III.A7.2-b	3.5.1.28	NA
Steel Embedments /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A7.2-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-10 Component Groups Requiring Aging Management Review - Miscellaneous Foundations

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Caulking/Sealants /Shelter, Protection, Shielding	Silicone Rubber	Weather exposed	Change in Material Properties/Loss of resiliency, loss of strength, loss of elasticity	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.4	NA
Foundations /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A8.1-a	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A8.1-b	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A8.1-c	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A8.1-d	3.5.1.21	NA
Foundations /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A8.1-e	3.5.1.21	NA
Foundations /Structural Support	Reinforced Concrete	Soft soil; changes in groundwater conditions	Cracks; distortion; increase in component stress level/ Settlement	Structures Monitoring Program (B.1.30)	III.A8.1-f	3.5.1.25	NA
Foundations /Structural Support	Reinforced Concrete Porous Concrete	Flowing water under foundation	Reduction in foundation strength cracking differential settlement/ Erosion of porous concrete subfoundation	Structures Monitoring Program (B.1.30)	III.A8.1-g	3.5.1.26	NA

Aging Management Review Aid

Table 2.4-10 Component Groups Requiring Aging Management Review - Miscellaneous Foundations

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Foundations /Non- S/R Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A8.1-b	3.5.1.20	NA
Foundations /Non- S/R Structural Support	Reinforced Concrete Porous Concrete	Flowing water under foundation	Reduction in foundation strength cracking differential settlement/ Erosion of porous concrete subfoundation	Structures Monitoring Program (B.1.30)	III.A8.1-g	3.5.1.26	NA
Steel Embedments /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-11 Component Groups Requiring Aging Management Review - Crib House

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete & Grout /Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B1.2.3- a	3.5.1.29	NA
Concrete & Grout /Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B2.2-a	3.5.1.29	NA
Concrete & Grout /Non-S/R Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B1.2.3- a	3.5.1.29	NA
Concrete & Grout /Non-S/R Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B2.2-a	3.5.1.29	NA
Concrete Canal Weirs /Heat Sink	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-b	3.5.1.22	NA
Concrete Canal Weirs /Heat Sink	Reinforced Concrete	Flowing water	Loss of material/ Abrasion; cavitation	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-h	3.5.1.22	NA

Aging Management Review Aid

Table 2.4-11 Component Groups Requiring Aging Management Review - Crib House

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Curbs /Direct Flow	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-a	3.5.1.22	NA
Concrete Curbs /Direct Flow	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-b	3.5.1.22	NA
Concrete Curbs /Direct Flow	Reinforced Concrete	Flowing water	Loss of material/ Abrasion; cavitation	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-h	3.5.1.22	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-a	3.5.1.22	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-b	3.5.1.22	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Flowing water	Loss of material/ Abrasion; cavitation	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-h	3.5.1.22	NA
Concrete Slabs /Structural Support	Reinforced Concrete Porous Concrete	Flowing water under foundation	Reduction in foundation strength cracking differential settlement/ Erosion of porous concrete subfoundation	Structures Monitoring Program (B.1.30)	III.A6.1-g	3.5.1.26	NA

Aging Management Review Aid

Table 2.4-11 Component Groups Requiring Aging Management Review - Crib House

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Slabs /Shutdown Cooling Water	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-c	3.5.1.22	NA
Concrete Slabs /Shutdown Cooling Water	Reinforced Concrete	Soft soil; changes in groundwater conditions	Cracks; distortion; increase in component stress level/ Settlement	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-f	3.5.1.22	NA
Concrete Slabs /Heat Sink	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-a	3.5.1.22	NA
Concrete Slabs /Heat Sink	Reinforced Concrete Porous Concrete	Flowing water under foundation	Reduction in foundation strength cracking differential settlement/ Erosion of porous concrete subfoundation	Structures Monitoring Program (B.1.30)	III.A6.1-g	3.5.1.26	NA
Concrete Stairs /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-c	3.5.1.22	NA
Concrete Stairs /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-d	3.5.1.22	NA
Concrete Stairs /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-e	3.5.1.22	NA

Aging Management Review Aid

Table 2.4-11 Component Groups Requiring Aging Management Review - Crib House

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Stairs /Non-S/R Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-c	3.5.1.22	NA
Concrete Stairs /Non-S/R Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-d	3.5.1.22	NA
Concrete Stairs /Non-S/R Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-e	3.5.1.22	NA
Concrete Walls /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-a	3.5.1.22	NA
Concrete Walls /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-b	3.5.1.22	NA
Concrete Walls /Structural Support	Reinforced Concrete	Flowing water	Loss of material/ Abrasion; cavitation	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-h	3.5.1.22	NA
Concrete Walls /Non-S/R Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-a	3.5.1.22	NA

Aging Management Review Aid

Table 2.4-11 Component Groups Requiring Aging Management Review - Crib House

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Walls /Non-S/R Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-c	3.5.1.22	NA
Concrete Walls /Shutdown Cooling Water	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-c	3.5.1.22	NA
Concrete Walls /Shutdown Cooling Water	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-d	3.5.1.22	NA
Concrete Walls /Shutdown Cooling Water	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-e	3.5.1.22	NA
Concrete Walls /Heat Sink	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-b	3.5.1.22	NA
Concrete Walls /Heat Sink	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-d	3.5.1.22	NA
Concrete Walls /Heat Sink	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-e	3.5.1.22	NA

Aging Management Review Aid

Table 2.4-11 Component Groups Requiring Aging Management Review - Crib House

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete Walls /Heat Sink	Reinforced Concrete	Flowing water	Loss of material/ Abrasion; cavitation	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-h	3.5.1.22	NA
Fire Doors /Fire Barrier	Steel	Indoor and outdoor environments	Loss of material/ Wear	Fire Protection (B.1.18)	VII.G.1-d	3.3.1.18	NA
Foundations /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-a	3.5.1.22	NA
Foundations /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-b	3.5.1.22	NA
Foundations /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-c	3.5.1.22	NA
Foundations /Structural Support	Reinforced Concrete	Soft soil; changes in groundwater conditions	Cracks; distortion; increase in component stress level/ Settlement	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-f	3.5.1.22	NA
Foundations /Structural Support	Reinforced Concrete	Flowing water	Loss of material/ Abrasion; cavitation	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-h	3.5.1.22	NA

Aging Management Review Aid

Table 2.4-11 Component Groups Requiring Aging Management Review - Crib House

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Foundations /Structural Support	Reinforced Concrete Porous Concrete	Flowing water under foundation	Reduction in foundation strength cracking differential settlement/ Erosion of porous concrete subfoundation	Structures Monitoring Program (B.1.30)	III.A6.1-g	3.5.1.26	NA
Foundations /Non- S/R Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-a	3.5.1.22	NA
Foundations /Non- S/R Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-b	3.5.1.22	NA
Foundations /Non- S/R Structural Support	Reinforced Concrete	Flowing water	Loss of material/ Abrasion; cavitation	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-h	3.5.1.22	NA
Masonry Walls /Structural Support	Concrete Block	Various	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	III.A6.3-a	3.5.1.24	NA
Masonry Walls /Shelter, Protection, Shielding	Concrete Block	Various	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	III.A6.3-a	3.5.1.24	NA
Metal Siding /Shelter, Protection, Shielding	Carbon Steel	Various	Loss of material/ Corrosion	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.2-a	3.5.1.22	NA

Aging Management Review Aid

Table 2.4-11 Component Groups Requiring Aging Management Review - Crib House

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Misc. Steel /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.2-a	3.5.1.22	NA
Misc. Steel /Direct Flow	Carbon Steel	Various	Loss of material/ Corrosion	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.2-a	3.5.1.22	NA
Precast Concrete Panels /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-a	3.5.1.22	NA
Precast Concrete Panels /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-c	3.5.1.22	NA
Precast Concrete Panels /Shelter, Protection, Shielding	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-a	3.5.1.22	NA
Precast Concrete Panels /Shelter, Protection, Shielding	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-b	3.5.1.22	NA
Precast Concrete Panels /Shelter, Protection, Shielding	Reinforced Concrete	Flowing water	Loss of material/ Abrasion; cavitation	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-h	3.5.1.22	NA

Aging Management Review Aid

Table 2.4-11 Component Groups Requiring Aging Management Review - Crib House

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Roofing /Shelter, Protection, Shielding	Vapor barrier coal tar pitch rigid insulation felt gravel or single ply hypalon pavers	Weather exposed	Separation and water in- leakage/weathering	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.11	NA
Steel Embedments /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Embedments /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.2-a	3.5.1.22	NA
Steel Embedments /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.2-a	3.5.1.22	NA
Steel Panels and Cabinets /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Panels and Cabinets /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.2-a	3.5.1.22	NA
Steel Panels and Cabinets /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Plates /Direct Flow	Carbon Steel	Various	Loss of material/ Corrosion	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.2-a	3.5.1.22	NA

Aging Management Review Aid

Table 2.4-11 Component Groups Requiring Aging Management Review - Crib House

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Steel Sump Screens /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.2-a	3.5.1.22	NA
Structural Steel /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.2-a	3.5.1.22	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Concrete cracking and spalling/ Freeze-thaw aggressive chemical attack and reaction with aggregates	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.1-b	3.3.1.28	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Loss of material/ Corrosion of embedded steel	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.1-c	3.3.1.28	NA

Aging Management Review Aid

Table 2.4-12 Component Groups Requiring Aging Management Review - Unit 1 Crib House (Dresden Only)

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Concrete & Grout /Non-S/R Structural Support	Reinforced Concrete Grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation/ Service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B.1.30)	III.B3.2-a	3.5.1.29	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-a	3.5.1.22	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-c	3.5.1.22	NA
Concrete Slabs /Non-S/R Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-d	3.5.1.22	NA
Concrete Slabs /Non-S/R Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.31)	III.A6.1-e	3.5.1.22	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Concrete cracking and spalling/ Freeze-thaw aggressive chemical attack and reaction with aggregates	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.1-b	3.3.1.28	NA
Walls, Ceilings, Floors /Fire Barrier	Concrete and Reinforcement	Indoor and outdoor environments	Loss of material/ Corrosion of embedded steel	Fire Protection (B.1.18) and Structures Monitoring Program (B.1.30)	VII.G.1-c	3.3.1.28	NA

Aging Management Review Aid

Table 2.4-13 Component Groups Requiring Aging Management Review - Station Chimney

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Caulking/Sealants/ /Gaseous Release Path	Silicone Rubber	Weather exposed	Change in Material Properties/Loss of resiliency, loss of strength, loss of elasticity	Structures Monitoring Program (B.1.30)	Non-GALL	3.5.2.4	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A9.1-a	3.5.1.20	NA
Concrete Slabs /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A9.1-b	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A9.1-a	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A9.1-b	3.5.1.20	NA
Concrete Walls /Structural Support	Reinforced Concrete	Any	Expansion and cracking/ Reaction with aggregates	Structures Monitoring Program (B.1.30)	III.A9.1-c	3.5.1.20	NA
Concrete Walls /Gaseous Release Path	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Structures Monitoring Program (B.1.30)	III.A9.1-d	3.5.1.20	NA
Concrete Walls /Gaseous Release Path	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Structures Monitoring Program (B.1.30)	III.A9.1-f	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Weather exposed	Loss of material (spalling scaling) and cracking/ Freeze-thaw	Structures Monitoring Program (B.1.30)	III.A9.1-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-13 Component Groups Requiring Aging Management Review - Station Chimney

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Foundations /Structural Support	Reinforced Concrete	Flowing water	Increase in porosity and permeability loss of strength/ Leaching of calcium hydroxide	Structures Monitoring Program (B.1.30)	III.A9.1-b	3.5.1.20	NA
Foundations /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A7.1-e	3.5.1.21	NA
Foundations /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A7.1-g	3.5.1.21	NA
Foundations /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Cracking loss of bond and loss of material (spalling scaling)/ Corrosion of embedded steel	Plant-specific	III.A9.1-e	3.5.1.21	NA
Foundations /Structural Support	Reinforced Concrete	Exposure to aggressive environment	Increase in porosity and permeability cracking loss of material (spalling scaling)/ Aggressive chemical attack	Plant-specific	III.A9.1-g	3.5.1.21	NA
Foundations /Structural Support	Reinforced Concrete	Soft soil; changes in groundwater conditions	Cracks; distortion; increase in component stress level/ Settlement	Structures Monitoring Program (B.1.30)	III.A9.1-h	3.5.1.25	NA
Foundations /Structural Support	Reinforced Concrete Porous Concrete	Flowing water under foundation	Reduction in foundation strength cracking differential settlement/ Erosion of porous concrete subfoundation	Structures Monitoring Program (B.1.30)	III.A9.1-i	3.5.1.26	NA
Masonry Walls /Structural Pressure Barrier	Concrete Block	Various	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	Non-GALL	3.5.2.9	NA

Aging Management Review Aid

Table 2.4-13 Component Groups Requiring Aging Management Review - Station Chimney

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Masonry Walls /Gaseous Release Path	Concrete Block	Various	Cracking/ Restraint; shrinkage; creep; aggressive environment	Masonry Wall Program (B.1.29)	Non-GALL	3.5.2.9	NA
Misc. Steel /Non- S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Doors /Gaseous Release Path	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Embedments /Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Steel Plates /Gaseous Release Path	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA
Structural Steel /Non-S/R Structural Support	Carbon Steel	Various	Loss of material/ Corrosion	Structures Monitoring Program (B.1.30)	III.A3.2-a	3.5.1.20	NA

Aging Management Review Aid

Table 2.4-14 Component Groups Requiring Aging Management Review - Cranes and Hoists

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Cranes /Structural Support	Structural Steel A-36, A- 7 or A-285	Air at 100% relative humidity and 49°C (120°F)	Cumulative fatigue damage/ Fatigue	Time Limited Aging Analysis evaluated for the period of extended operation	VII.B.1-a	3.3.1.3	NA
Cranes /Non-S/R Structural Support	Steel A36	Air at 100% relative humidity and 49°C (120°F)	Loss of material/ General corrosion	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.15)	VII.B.1-b	3.3.1.14	NA
Rails /Non-S/R Structural Support	Steel A759	Air at 100% relative humidity and 49°C (120°F)	Loss of material/ Wear	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.15)	VII.B.2-a	3.3.1.14	NA

Aging Management Review Aid

Table 2.4-15 Component Groups Requiring Aging Management Review - Component Supports

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Anchorage to Buildings, Including Bolted/Welded Connections /Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Environmental corrosion (i.e. pitting corrosion general corrosion etc.)	Structures Monitoring Program (B.1.30)	III.B4.1-a	3.5.1.29	NA
Anchorage to Buildings, Including Bolted/Welded Connections /Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Environmental corrosion (i.e. pitting corrosion general corrosion etc.)	Structures Monitoring Program (B.1.30)	III.B5.1-a	3.5.1.29	NA
Anchorage to Buildings, Including Bolted/Welded Connections /Structural Support	Carbon Steel	Inside containment	Cumulative fatigue damage/ Fatigue (Only if CLB fatigue analysis exists)	Time Limited Aging Analysis evaluated for the period of extended operation	III.B1.1.1-c	3.5.1.30	NA
Anchorage to Buildings, Including Bolted/Welded Connections /Structural Support	Carbon Steel	Inside or outside containment	Cumulative fatigue damage/ Fatigue (Only if CLB fatigue analysis exists)	Time Limited Aging Analysis evaluated for the period of extended operation	III.B1.2.1-c	3.5.1.30	NA
Anchorage to Buildings, Including Bolted/Welded Connections /Structural Support	Carbon Steel	Inside or outside containment	Cumulative fatigue damage/ Fatigue (Only if CLB fatigue analysis exists)	Time Limited Aging Analysis evaluated for the period of extended operation	III.B1.3.1- b	3.5.1.30	NA
Anchorage to Buildings, Including Bolted/Welded Connections /Non- S/R Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Environmental corrosion (i.e. pitting corrosion general corrosion etc.)	Structures Monitoring Program (B.1.30)	III.B5.1-a	3.5.1.29	NA
Bolting /Structural Support	Low Alloy Steel Yield Strength 150 Ksi	Inside containment	Cracking/ Stress corrosion cracking	Bolting Integrity (B.1.12)	III.B1.1.2- a	3.5.1.32	NA

Aging Management Review Aid

Table 2.4-15 Component Groups Requiring Aging Management Review - Component Supports

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Clevis Pins: Suppression chamber Columns, Vent Systems, ESF Lines /Structural Support	Carbon Steel or Stainless Steel	Submerged (torus grade water) and inside or outside containment	Loss of Material/ Mechanical wear	ASME Section XI, Subsection IWF (B.1.27)	Non-GALL	3.5.2.5	NA
Instrument Racks, Frames, Panels, Etc, /Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Environmental corrosion (i.e. pitting corrosion general corrosion etc.)	Structures Monitoring Program (B.1.30)	III.B3.1-a	3.5.1.29	NA
Instrument Racks, Frames, Panels, Etc, /Non-S/R Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Environmental corrosion (i.e. pitting corrosion general corrosion etc.)	Structures Monitoring Program (B.1.30)	III.B3.1-a	3.5.1.29	NA
Raceway /Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Environmental corrosion (i.e. pitting corrosion general corrosion etc.)	Structures Monitoring Program (B.1.30)	III.B2.1-a	3.5.1.29	NA
Sliding Surfaces /Structural Support	Steel and Non Steel Materials eg Lubrite Plates	Inside or outside containment	Loss of mechanical function/ Corrosion distortion dirt overload fatigue due to vibratory and cyclic thermal loads; elastomer hardening	ASME Section XI, Subsection IWF (B.1.27)	III.B1.3.2- a	3.5.1.31	NA
Support Members /Structural Support	Carbon Steel	25-288°C (77-550°F) demineralized water	Loss of material/ General galvanic pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.79	NA
Support Members /Structural Support	Stainless Steel	25-288°C (77-550°F) demineralized water	Cracking/ Stress corrosion cracking	Water Chemistry (B.1.2)	Non-GALL	3.2.2.80	NA
Support Members /Structural Support	Stainless Steel	25-288°C (77-550°F) demineralized water	Loss of material/ Pitting and crevice corrosion	Water Chemistry (B.1.2) and One-Time Inspection (B.1.23)	Non-GALL	3.2.2.81	NA

Aging Management Review Aid

Table 2.4-15 Component Groups Requiring Aging Management Review - Component Supports

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Management Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Support Members /Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Environmental corrosion (i.e. pitting corrosion general corrosion etc.)	Structures Monitoring Program (B.1.30)	III.B2.1-a	3.5.1.29	NA
Support Members /Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Environmental corrosion (i.e. pitting corrosion general corrosion etc.)	Structures Monitoring Program (B.1.30)	III.B3.1-a	3.5.1.29	NA
Support Members /Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Environmental corrosion (i.e. pitting corrosion general corrosion etc.)	Structures Monitoring Program (B.1.30)	III.B4.1-a	3.5.1.29	NA
Support Members /Structural Support	Carbon Steel	Inside containment	Loss of material/ Environmental corrosion (i.e. pitting corrosion general corrosion etc.)	ASME Section XI, Subsection IWF (B.1.27)	III.B1.1.1- a	3.5.1.31	NA
Support Members /Structural Support	Steel and Non Steel Materials eg Lubrite Plates	Inside containment	Loss of mechanical function/ Corrosion distortion dirt overload fatigue due to vibratory and cyclic thermal loads; elastomer hardening	ASME Section XI, Subsection IWF (B.1.27)	III.B1.1.3- a	3.5.1.31	NA
Support Members /Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Environmental corrosion (i.e. pitting corrosion general corrosion etc.)	ASME Section XI, Subsection IWF (B.1.27)	III.B1.2.1- a	3.5.1.31	NA
Support Members /Structural Support	Steel and Non Steel Materials eg Lubrite Plates	Inside or outside containment	Loss of mechanical function/ Corrosion distortion dirt overload fatigue due to vibratory and cyclic thermal loads; elastomer hardening	ASME Section XI, Subsection IWF (B.1.27)	III.B1.2.2- a	3.5.1.31	NA

Aging Management Review Aid

Table 2.4-15 Component Groups Requiring Aging Management Review - Component Supports

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Support Members /Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Environmental corrosion (i.e. pitting corrosion general corrosion etc.)	ASME Section XI, Subsection IWF (B.1.27)	III.B1.3.1- a	3.5.1.31	NA
Support Members /Structural Support	Stainless Steel	Inside or outside containment	Loss of material/ Pitting and crevice corrosion	ASME Section XI, Subsection IWF (B.1.27)	Non-GALL	3.5.2.14	NA
Support Members /Non-S/R Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Environmental corrosion (i.e. pitting corrosion general corrosion etc.)	Structures Monitoring Program (B.1.30)	III.B2.1-a	3.5.1.29	NA
Support Members /Non-S/R Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Environmental corrosion (i.e. pitting corrosion general corrosion etc.)	Structures Monitoring Program (B.1.30)	III.B3.1-a	3.5.1.29	NA
Support Members /Non-S/R Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Environmental corrosion (i.e. pitting corrosion general corrosion etc.)	Structures Monitoring Program (B.1.30)	III.B4.1-a	3.5.1.29	NA
Support Members /Non-S/R Structural Support	Carbon Steel	Inside or outside containment	Loss of material/ Environmental corrosion (i.e. pitting corrosion general corrosion etc.)	Structures Monitoring Program (B.1.30)	III.B5.1-a	3.5.1.29	NA
Vibration Isolation Elements /Structural Support	Non Metallic Eg Rubber	Inside or outside containment	Reduction or loss of isolation function/ Radiation hardening temperature humidity sustained vibratory loading	Structures Monitoring Program (B.1.30)	III.B4.2-a	3.5.1.29	NA

Aging Management Review Aid

Table 2.4-16 Component Groups Requiring Aging Management Review - Insulation

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Insulation /Insulating Characteristics	Asbestos	Air, moisture, and humidity < 100°C (212°F)	Insulation degradation/Loss of insulating characteristics	Structures Monitoring Program (B.1.30)	Non-GALL	3.2.2.44	NA
Insulation /Insulating Characteristics	Fiberglass	Air, moisture, and humidity < 100°C (212°F)	Insulation degradation/Loss of insulating characteristics	Structures Monitoring Program (B.1.30)	Non-GALL	3.2.2.45	NA
Insulation /Insulating Characteristics	NUKON quilted fiberglass	Air, moisture, and humidity < 100°C (212°F)	None	None	Non-GALL	3.2.2.46	NA
Insulation /Insulating Characteristics	Stainless Steel Mirror Insulation	Air, moisture, and humidity < 100°C (212°F)	None	None	Non-GALL	3.2.2.47	NA
Insulation /Insulating Characteristics	Closed-Cell Foam	Air, moisture, and humidity < 100°C (212°F)	None	None	Non-GALL	3.3.2.122	NA
Insulation /Insulating Characteristics	Calcium Silicate	Outdoor ambient conditions	None	None	Non-GALL	3.4.2.22	NA
Insulation Jacketing /Insulation Jacket Integrity	Stainless Steel	Air, moisture, and humidity < 100°C (212°F)	None	None	Non-GALL	3.2.2.48	NA
Insulation Jacketing /Insulation Jacket Integrity	Aluminum	Air, moisture, and humidity < 100°C (212°F)	None	None	Non-GALL	3.3.2.123	NA
Insulation Jacketing /Insulation Jacket Integrity	Aluminum Jacketing	Outdoor ambient conditions	Insulation degradation/Loss of jacket leak-tight integrity	Structures Monitoring Program (B.1.30)	Non-GALL	3.4.2.23	NA

Aging Management Review Aid

Table 2.5-1 Component Groups Requiring Aging Management Review - Electrical Commodities

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Connectors /Electrical Continuity	Various Organic Polymers	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 electrical failure	Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B.1.33)	VI.A.1-a	3.6.1.2	NA
Electrical Cables /Electrical Continuity	Various Organic Polymers	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 electrical failure	Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B.1.33)	VI.A.1-a	3.6.1.2	NA
Electrical Cables /Electrical Continuity	Various Organic Polymers	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 electrical failure	Electrical Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits	VI.A.1-b	3.6.1.3	NA
Electrical Cables /Electrical Continuity	Various Organic Polymers	Adverse localized environment caused by exposure to moisture and voltage	Formation of water trees localized damage leading to electrical failure (breakdown of insulation)/ Moisture intrusion water trees	Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	VI.A.1-c	3.6.1.4	NA
Electrical Equipment Subject to 10 CFR 50.49 (EQ) Requirements /Electrical Continuity	Various Polymeric and Metallic Materials	Adverse localized environment caused by heat, radiation, oxygen, moisture or voltage	Various degradation/ Various mechanisms	Time Limited Aging Analysis evaluated for the period of extended operation	VI.B.1-a	3.6.1.1	NA
Electrical Equipment Subject to 10 CFR 50.49 (EQ) Requirements /Insulate	Various Polymeric and Metallic Materials	Adverse localized environment caused by heat, radiation, oxygen, moisture or voltage	Various degradation/ Various mechanisms	Time Limited Aging Analysis evaluated for the period of extended operation	VI.B.1-a	3.6.1.1	NA

Aging Management Review Aid

Table 2.5-1 Component Groups Requiring Aging Management Review - Electrical Commodities

Component Group/ Intended Function	Material	Primary Environment	Primary Aging Effect/Mechanism	Primary Aging Mangement Program	GALL Ref	Pri. LRA Ref	LRA Ref External
Fuse Blocks /Electrical Continuity	Various Organic Polymers	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 electrical failure	Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B.1.33)	VI.A.1-a	3.6.1.2	NA
High Voltage Transmission Conductors /Electrical Continuity	Aluminum Conductor Steel Reinforced	Outdoors: sun, weather, humidity, and moisture	Loss of material/ Corrosion	None	Non-GALL	3.6.2.1	NA
Insulators /Insulate	Polyester Glass	Indoor and outdoor environments	Embrittlement cracking melting discoloration swelling or loss of dielectric strength leading to reduced insulation resistance electrical failure	Periodic Visual Inspection of Electrical Bus Duct Insulation (B.2.2)	Non-GALL	3.6.2.2	NA
Insulators /Insulate	Porcelain	Indoor and outdoor environments	None	None	Non-GALL	3.6.2.3	NA
Splices /Electrical Continuity	Various Organic Polymers	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 electrical failure	Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B.1.33)	VI.A.1-a	3.6.1.2	NA
Terminal Blocks /Electrical Continuity	Various Organic Polymers	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 electrical failure	Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B.1.33)	VI.A.1-a	3.6.1.2	NA