

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-13 Auxiliary Systems – Summary of Aging Management Evaluation – Fuel Building HVAC System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Blower	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.F2-2	3.3.1.56	B
Blower	PB	Carbon Steel	Ventilation Atmosphere (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F2-3	3.3.1.72	B
Closure Bolting	NSRS, PB	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G, 1
Closure Bolting	NSRS, PB	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-1	3.3.1.43	B
Closure Bolting	NSRS, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.F2-4	3.3.1.55	B
Closure Bolting	NSRS, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-4	3.3.1.43	B
Closure Bolting	NSRS, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VII.I-5	3.3.1.45	B
Damper	NSRS	Carbon Steel (Galvanized)	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-9	3.3.1.58	B
Damper	FB, NSRS	Carbon Steel (Galvanized)	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Damper	PB	Carbon Steel (Galvanized)	Plant Indoor Air (Ext)	None	None	VII.J-6	3.3.1.92	C

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Table 3.3.2-13 Auxiliary Systems – Summary of Aging Management Evaluation – Fuel Building HVAC System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Damper	PB	Carbon Steel (Galvanized)	Ventilation Atmosphere (Ext)	None	None	VII.J-6	3.3.1.92	C
Damper	FB, NSRS, PB	Carbon Steel (Galvanized)	Ventilation Atmosphere (Int)	None	None	VII.J-6	3.3.1.92	C
Ductwork	NSRS, PB	Carbon Steel (Galvanized)	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-9	3.3.1.58	B
Ductwork	NSRS, PB	Carbon Steel (Galvanized)	Plant Indoor Air (Ext)	None	None	VII.J-6	3.3.1.92	C
Ductwork	NSRS, PB	Carbon Steel (Galvanized)	Ventilation Atmosphere (Int)	None	None	VII.J-6	3.3.1.92	C
Flex Connectors	NSRS, PB	Elastomer	Plant Indoor Air (Ext)	Hardening and loss of strength	External Surfaces Monitoring Program (B2.1.20)	VII.F2-7	3.3.1.11	E
Flex Connectors	PB	Elastomer	Ventilation Atmosphere (Ext)	Hardening and loss of strength	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F2-7	3.3.1.11	E
Flex Connectors	NSRS, PB	Elastomer	Ventilation Atmosphere (Int)	Hardening and loss of strength	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F2-7	3.3.1.11	E
Flow Element	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Flow Element	PB	Stainless Steel	Ventilation Atmosphere (Int)	None	None	VII.J-15	3.3.1.94	A, 2

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Table 3.3.2-13 Auxiliary Systems – Summary of Aging Management Evaluation – Fuel Building HVAC System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	NSRS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Piping	NSRS	Carbon Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F2-3	3.3.1.72	B
Piping	PB	Stainless Steel	Atmosphere/ Weather (Ext)	None	None	None	None	G
Piping	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Piping	PB	Stainless Steel	Ventilation Atmosphere (Int)	None	None	VII.J-15	3.3.1.94	A, 2
Tubing	PB	Stainless Steel	Atmosphere/ Weather (Ext)	None	None	None	None	G
Tubing	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Tubing	PB	Stainless Steel	Ventilation Atmosphere (Int)	None	None	VII.J-15	3.3.1.94	A, 2
Valve	NSRS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Valve	NSRS	Carbon Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F2-3	3.3.1.72	B

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Table 3.3.2-13 Auxiliary Systems – Summary of Aging Management Evaluation – Fuel Building HVAC System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	PB	Stainless Steel	Atmosphere/Weather (Ext)	None	None	None	None	G
Valve	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Valve	PB	Stainless Steel	Ventilation Atmosphere (Int)	None	None	VII.J-15	3.3.1.94	A, 2

Notes for Table 3.3.2-13:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
- G Environment not in NUREG-1801 for this component and material.

Plant Specific Notes:

- 1 Line VII.I-5 has loss of preload/thermal effects, gasket creep, and self-loosening for steel closure bolting in indoor uncontrolled (external) air. This aging effect would also exist in the environment or outdoor (external) air, therefore this non-NUREG-1801 line has been added to also address loss of preload for the component/material/environment of line VII.I-1.
- 2 Stainless steel valves and tubing in HVAC systems with an internal environment of ventilation atmosphere are used for air sampling, flow measurement and as differential pressure instrument lines. Condensation is not expected in these applications. The NUREG-1801 line referenced for the aging evaluation is VII.J-15 which is for Air-Uncontrolled (external). In ventilation systems, the internal and external air environments are evaluated as equivalent.



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Table 3.3.2-14 Auxiliary Systems – Summary of Aging Management Evaluation – Containment Building HVAC System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Blower	NSRS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.F3-2	3.3.1.56	B
Blower	NSRS	Carbon Steel	Ventilation Atmosphere (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F3-3	3.3.1.72	B
Closure Bolting	NSRS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.F3-4	3.3.1.55	B
Closure Bolting	LBS, NSRS, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-4	3.3.1.43	B
Closure Bolting	LBS, NSRS, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VII.I-5	3.3.1.45	B
Damper	NSRS	Carbon Steel (Galvanized)	Plant Indoor Air (Ext)	None	None	VII.J-6	3.3.1.92	C
Damper	NSRS	Carbon Steel (Galvanized)	Ventilation Atmosphere (Int)	None	None	VII.J-6	3.3.1.92	C
Ductwork	NSRS	Carbon Steel (Galvanized)	Plant Indoor Air (Ext)	None	None	VII.J-6	3.3.1.92	C
Ductwork	NSRS	Carbon Steel (Galvanized)	Ventilation Atmosphere (Int)	None	None	VII.J-6	3.3.1.92	C

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Table 3.3.2-14 Auxiliary Systems – Summary of Aging Management Evaluation – Containment Building HVAC System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2/Item	Table 1 Item	Notes
Ductwork	NSRS	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	C
Ductwork	NSRS	Stainless Steel	Ventilation Atmosphere (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F3-1	3.3.1.27	E
Flex Connectors	NSRS	Elastomer	Plant Indoor Air (Ext)	Hardening and loss of strength	External Surfaces Monitoring Program (B2.1.20)	VII.F3-7	3.3.1.11	E
Flex Connectors	NSRS	Elastomer	Ventilation Atmosphere (Int)	Hardening and loss of strength	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F3-7	3.3.1.11	E
Flexible Hoses	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Flexible Hoses	PB	Stainless Steel	Plant Indoor Air (Int)	None	None	VII.J-15	3.3.1.94	A, 1
Heat Exchanger (Containment Bldg)	LBS, NSRS	Copper Alloy	Closed-Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.F3-8	3.3.1.51	B
Heat Exchanger (Containment Bldg)	LBS, NSRS	Copper Alloy	Ventilation Atmosphere (Ext)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F3-16	3.3.1.25	E

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Table 3.3.2-14 Auxiliary Systems – Summary of Aging Management Evaluation – Containment Building HVAC System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchanger (Containment CEDM)	LBS, NSRS	Copper Alloy	Closed-Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.F3-8	3.3.1.51	B
Heat Exchanger (Containment CEDM)	LBS, NSRS	Copper Alloy	Ventilation Atmosphere (Ext)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F3-16	3.3.1.25	E
Heater	NSRS	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	C
Heater	NSRS	Stainless Steel	Ventilation Atmosphere (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F3-1	3.3.1.27	E
Piping	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Piping	PB	Carbon Steel	Plant Indoor Air (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	V.A-19	3.2.1.32	B
Piping	PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Piping	PB, SIA	Stainless Steel	Plant Indoor Air (Int)	None	None	VII.J-15	3.3.1.94	A, 1

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Table 3.3.2-14 Auxiliary Systems – Summary of Aging Management Evaluation – Containment Building HVAC System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tubing	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Tubing	PB	Stainless Steel	Plant Indoor Air (Int)	None	None	VII.J-15	3.3.1.94	A, 1
Valve	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Valve	PB	Carbon Steel	Plant Indoor Air (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	V.A-19	3.2.1.32	B
Valve	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Valve	PB	Stainless Steel	Plant Indoor Air (Int)	None	None	VII.J-15	3.3.1.94	A, 1

Notes for Table 3.3.2-14:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

Plant Specific Note:

- 1      Stainless steel piping and piping components associated with containment building HVAC are used in containment pressure monitoring instrument lines. Condensation is not expected in these applications. The NUREG-1801 line referenced for the aging evaluation is VII.J-15 which is for Air-Uncontrolled (external). In this application, the internal and external air environments are evaluated as equivalent.

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Table 3.3.2-15 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator Building HVAC System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Blower	NSRS, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.F4-1	3.3.1.56	B
Blower	NSRS, PB	Carbon Steel	Ventilation Atmosphere (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F4-2	3.3.1.72	B
Closure Bolting	NSRS, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.F4-3	3.3.1.55	B
Closure Bolting	NSRS, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-4	3.3.1.43	B
Closure Bolting	NSRS, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VII.I-5	3.3.1.45	B
Damper	FB, NSRS	Carbon Steel (Galvanized)	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Damper	NSRS, PB	Carbon Steel (Galvanized)	Plant Indoor Air (Ext)	None	None	VII.J-6	3.3.1.92	C
Damper	FB, NSRS, PB	Carbon Steel (Galvanized)	Ventilation Atmosphere (Int)	None	None	VII.J-6	3.3.1.92	C
Ductwork	NSRS, PB	Carbon Steel (Galvanized)	Plant Indoor Air (Ext)	None	None	VII.J-6	3.3.1.92	C
Ductwork	NSRS, PB	Carbon Steel (Galvanized)	Ventilation Atmosphere (Int)	None	None	VII.J-6	3.3.1.92	C

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**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

*Table 3.3.2-15 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator Building HVAC System  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flex Connectors	NSRS, PB	Elastomer	Plant Indoor Air (Ext)	Hardening and loss of strength	External Surfaces Monitoring Program (B2.1.20)	VII.F4-6	3.3.1.11	E
Flex Connectors	NSRS, PB	Elastomer	Ventilation Atmosphere (Int)	Hardening and loss of strength	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F4-6	3.3.1.11	E
Heater	NSRS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.F4-1	3.3.1.56	B
Heater	NSRS	Carbon Steel	Ventilation Atmosphere (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F4-2	3.3.1.72	B
Piping	LBS, NSRS	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Piping	LBS, NSRS	Copper Alloy	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.G-9	3.3.1.28	E
Strainer	LBS	Copper Alloy	Plant Indoor Air (Ext)	None	None	VII.I-2	3.4.1.41	A

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Table 3.3.2-15 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator Building HVAC System  
(Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Strainer	LBS	Copper Alloy	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.G-9	3.3.1.28	E
Tubing	PB	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Tubing	PB	Copper Alloy	Ventilation Atmosphere (Int)	None	None	VIII.I-2	3.4.1.41	A, 1
Valve	LBS, NSRS	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Valve	LBS, NSRS	Copper Alloy	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.G-9	3.3.1.28	E

Notes for Table 3.3.2-15:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.



**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

Plant Specific Note:

- 1 Copper alloy valves and tubing in HVAC systems with an internal environment of ventilation atmosphere are used for air sampling, flow measurement and as differential pressure instrument lines. Condensation is not expected in these applications. The NUREG-1801 line referenced for the aging evaluation is VIII.I-2 which is for Air-Indoor-Uncontrolled (External). In ventilation systems, the internal and external air environments are evaluated as equivalent.

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Table 3.3.2-16 Auxiliary Systems – Summary of Aging Management Evaluation – Radwaste Building HVAC System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure Bolting	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.F2-4	3.3.1.55	B
Closure Bolting	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-4	3.3.1.43	B
Closure Bolting	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VII.I-5	3.3.1.45	B
Damper	FB	Carbon Steel (Galvanized)	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Damper	FB	Carbon Steel (Galvanized)	Ventilation Atmosphere (Int)	None	None	VII.J-6	3.3.1.92	C
Piping	LBS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Piping	LBS	Carbon Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F2-3	3.3.1.72	B

Notes for Table 3.3.2-16:

Standard Notes:

- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.

Plant Specific Notes:

None

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-17 Auxiliary Systems – Summary of Aging Management Evaluation – Turbine Building HVAC System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Blower	PB	Aluminum	Plant Indoor Air (Ext)	None	None	VII.J-1	3.3.1.95	C
Blower	PB	Aluminum	Ventilation Atmosphere (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F2-12	3.3.1.27	E
Closure Bolting	PB	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G
Closure Bolting	PB	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-1	3.3.1.43	B
Closure Bolting	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.F2-4	3.3.1.55	B
Closure Bolting	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-4	3.3.1.43	B
Closure Bolting	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VII.I-5	3.3.1.45	B
Damper	PB	Aluminum	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	None	None	G
Damper	PB	Aluminum	Ventilation Atmosphere (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F2-12	3.3.1.27	E
Damper	FB, PB	Carbon Steel (Galvanized)	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Damper	FB, PB	Carbon Steel (Galvanized)	Ventilation Atmosphere (Int)	None	None	VII.J-6	3.3.1.92	C

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

Notes for Table 3.3.2-17:

Standard Notes:

- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
- G Environment not in NUREG-1801 for this component and material.

Plant Specific Notes:

None

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

*Table 3.3.2-18 Auxiliary Systems – Summary of Aging Management Evaluation – Miscellaneous Site Structures/Spray Pond Pump House HVAC System*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Blower	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.F2-2	3.3.1.56	B
Blower	PB	Carbon Steel	Ventilation Atmosphere (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F2-3	3.3.1.72	B
Closure Bolting	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.F2-4	3.3.1.55	B
Closure Bolting	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-4	3.3.1.43	B
Closure Bolting	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VII.I-5	3.3.1.45	B
Ductwork	PB	Carbon Steel (Galvanized)	Plant Indoor Air (Ext)	None	None	VII.J-6	3.3.1.92	C
Ductwork	PB	Carbon Steel (Galvanized)	Ventilation Atmosphere (Int)	None	None	VII.J-6	3.3.1.92	C
Flex Connectors	PB	Elastomer	Plant Indoor Air (Ext)	Hardening and loss of strength	External Surfaces Monitoring Program (B2.1.20)	VII.F2-7	3.3.1.11	E
Flex Connectors	PB	Elastomer	Ventilation Atmosphere (Int)	Hardening and loss of strength	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F2-7	3.3.1.11	E

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

Notes for Table 3.3.2-18

Standard Notes:

- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.

Plant Specific Notes:

None

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-19 Auxiliary Systems – Summary of Aging Management Evaluation – Fire Protection System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure Bolting	PB	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G, 1
Closure Bolting	PB	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-1	3.3.1.43	B
Closure Bolting	PB	Carbon Steel	Buried (Ext)	Loss of material	Buried Piping and Tanks Inspection (B2.1.18)	VII.G-25	3.3.1.19	D
Closure Bolting	LBS, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-4	3.3.1.43	B
Closure Bolting	LBS, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VII.I-5	3.3.1.45	B
Expansion Joint	PB	Stainless Steel	Diesel Exhaust (Int)	Cracking	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-1	3.3.1.06	E
Expansion Joint	PB	Stainless Steel	Diesel Exhaust (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-2	3.3.1.18	E
Expansion Joint	PB	Stainless Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.G-17	3.3.1.32	B
Expansion Joint	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Filter	FIL, PB	Aluminum	Dry Gas (Int)	None	None	VII.J-2	3.3.1.97	A

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-19 Auxiliary Systems – Summary of Aging Management Evaluation – Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Filter	FIL, PB	Aluminum	Plant Indoor Air (Ext)	None	None	V.F-2	3.2.1.50	A
Flame Arrestor	PB	Aluminum	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	None	None	G
Flame Arrestor	PB	Aluminum	Atmosphere/ Weather (Int)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	None	None	G, 4
Flexible Hoses	PB	Stainless Steel	Dry Gas (Int)	None	None	VII.J-19	3.3.1.97	A
Flexible Hoses	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Flow Element	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Flow Element	PB	Stainless Steel	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-19	3.3.1.69	B
Hydrant	PB	Cast Iron (Gray Cast Iron)	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-9	3.3.1.58	B
Hydrant	PB	Cast Iron (Gray Cast Iron)	Buried (Ext)	Loss of material	Selective Leaching of Materials (B2.1.17)	VII.G-15	3.3.1.85	B
Hydrant	PB	Cast Iron (Gray Cast Iron)	Buried (Ext)	Loss of material	Buried Piping and Tanks Inspection (B2.1.18)	VII.G-25	3.3.1.19	B
Hydrant	PB	Cast Iron (Gray Cast Iron)	Raw Water (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	VII.G-14	3.3.1.85	B



**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-19**    *Auxiliary Systems – Summary of Aging Management Evaluation – Fire Protection System (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Hydrant	PB	Cast Iron (Gray Cast Iron)	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B
Piping	PB	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-9	3.3.1.58	B
Piping	PB	Carbon Steel	Atmosphere/ Weather (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.I-9	3.3.1.58	E, 4
Piping	PB	Carbon Steel	Buried (Ext)	Loss of material	Buried Piping and Tanks Inspection (B2.1.18)	VII.G-25	3.3.1.19	B
Piping	PB	Carbon Steel	Diesel Exhaust (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-2	3.3.1.18	E
Piping	PB	Carbon Steel	Dry Gas (Int)	None	None	VII.J-22	3.3.1.98	A
Piping	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Piping	LBS, NSRS, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-19 Auxiliary Systems – Summary of Aging Management Evaluation – Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	PB	Carbon Steel	Plant Indoor Air (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.I-8	3.3.1.58	E, 2
Piping	LBS, PB	Carbon Steel	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B
Piping	NSRS, PB	Carbon Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.G-23	3.3.1.71	B
Piping	PB	Carbon Steel (Galvanized)	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-9	3.3.1.58	B
Piping	PB	Carbon Steel (Galvanized)	Dry Gas (Int)	None	None	VII.J-22	3.3.1.98	A
Piping	PB	Carbon Steel (Galvanized)	Plant Indoor Air (Ext)	None	None	VII.J-6	3.3.1.92	A
Piping	PB	Carbon Steel (Galvanized)	Plant Indoor Air (Int)	None	None	VII.J-6	3.3.1.92	A
Piping	PB	Carbon Steel (Galvanized)	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B
Piping	PB	Cast Iron	Dry Gas (Int)	None	None	VII.J-22	3.3.1.98	A
Piping	PB	Cast Iron	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-19**    *Auxiliary Systems – Summary of Aging Management Evaluation – Fire Protection System (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Piping	PB	Cast Iron (Gray Cast Iron)	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Piping	PB	Cast Iron (Gray Cast Iron)	Raw Water (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	VII.G-14	3.3.1.85	B
Piping	PB	Cast Iron (Gray Cast Iron)	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B
Piping	PB	Copper Alloy (Zinc >15%)	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	None	None	G
Piping	PB	Copper Alloy (Zinc >15%)	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Piping	PB	Copper Alloy (Zinc >15%)	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-12	3.3.1.70	B
Piping	PB	Copper Alloy (Zinc >15%)	Raw Water (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	VII.G-13	3.3.1.84	B
Piping	PB	Copper Alloy (Zinc >15%)	Wetted Gas (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	None	None	G
Piping	PB	Ductile Iron	Buried (Ext)	Loss of material	Buried Piping and Tanks Inspection (B2.1.18)	VII.G-25	3.3.1.19	B
Piping	PB	Ductile Iron	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B
Piping	PB	Fiberglass Reinforced Plastic	Buried (Ext)	None	None	None	None	F, 3

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-19 Auxiliary Systems – Summary of Aging Management Evaluation – Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	PB	Fiberglass Reinforced Plastic	Raw Water (Int)	None	None	None	None	F, 3
Piping	PB	Stainless Steel	Atmosphere/ Weather (Ext)	None	None	None	None	G
Piping	PB	Stainless Steel	Buried (Ext)	Loss of material	Buried Piping and Tanks Inspection (B2.1.18)	VII.G-20	3.3.1.29	E
Piping	PB	Stainless Steel	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-19	3.3.1.69	B
Pump	PB	Cast Iron (Gray Cast Iron)	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Pump	PB	Cast Iron (Gray Cast Iron)	Raw Water (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	VII.G-14	3.3.1.85	B
Pump	PB	Cast Iron (Gray Cast Iron)	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B
Silencer	PB	Stainless Steel	Diesel Exhaust (Int)	Cracking	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-1	3.3.1.06	E
Silencer	PB	Stainless Steel	Diesel Exhaust (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-2	3.3.1.18	E

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AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-19 Auxiliary Systems – Summary of Aging Management Evaluation – Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Silencer	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	V.F-12	3.2.1.53	A
Spray Nozzle	PB	Copper Alloy (Zinc >15%)	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A, 2
Spray Nozzle	SP	Copper Alloy (Zinc >15%)	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A, 2
Spray Nozzle	SP	Copper Alloy (Zinc >15%)	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Spray Nozzle	SP	Copper Alloy (Zinc >15%)	Plant Indoor Air (Int)	None	None	VIII.I-2	3.4.1.41	A, 2
Spray Nozzle	SP	Copper Alloy (Zinc >15%)	Plant Indoor Air (Int)	None	None	VIII.I-2	3.4.1.41	A
Spray Nozzle	PB	Copper Alloy (Zinc >15%)	Plant Indoor Air (Int)	None	None	VIII.I-2	3.4.1.41	A
Spray Nozzle	SP	Stainless Steel	Atmosphere/ Weather (Ext)	None	None	None	None	G
Spray Nozzle	SP	Stainless Steel	Atmosphere/ Weather (Int)	None	None	None	None	G, 4
Spray Nozzle	SP	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Spray Nozzle	SP	Stainless Steel	Plant Indoor Air (Int)	None	None	VII.J-15	3.3.1.94	A, 2
Sprinkler Head	PB, SP	Copper Alloy (Zinc >15%)	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Sprinkler Head	PB, SP	Copper Alloy (Zinc >15%)	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-12	3.3.1.70	B
Sprinkler Head	PB, SP	Copper Alloy (Zinc >15%)	Raw Water (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	VII.G-13	3.3.1.84	B

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-19 Auxiliary Systems – Summary of Aging Management Evaluation – Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Strainer	PB	Cast Iron (Gray Cast Iron)	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Strainer	PB	Cast Iron (Gray Cast Iron)	Raw Water (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	VII.G-14	3.3.1.85	B
Strainer	PB	Cast Iron (Gray Cast Iron)	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B
Strainer	FIL, PB	Copper Alloy	Dry Gas (Int)	None	None	VII.J-3	3.3.1.98	A
Strainer	FIL, PB	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Strainer	FIL, PB	Copper Alloy	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-12	3.3.1.70	B
Strainer	FIL	Stainless Steel	Raw Water (Ext)	Loss of material	Fire Water System (B2.1.13)	VII.G-19	3.3.1.69	B
Tank	PB	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-9	3.3.1.58	B
Tank	PB	Carbon Steel	Dry Gas (Int)	None	None	VII.J-22	3.3.1.98	C
Tank	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Tank	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Tank	PB	Carbon Steel	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	D
Tubing	PB	Copper Alloy	Dry Gas (Int)	None	None	VII.J-3	3.3.1.98	A

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-19 Auxiliary Systems – Summary of Aging Management Evaluation – Fire Protection System (Continued)**

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tubing	LBS, PB	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Tubing	LBS, PB	Copper Alloy	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-12	3.3.1.70	B
Tubing	LBS, PB	Copper Alloy (Zinc >15%)	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Tubing	LBS, PB	Copper Alloy (Zinc >15%)	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-12	3.3.1.70	B
Tubing	LBS, PB	Copper Alloy (Zinc >15%)	Raw Water (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	VII.G-13	3.3.1.84	B
Tubing	LBS, PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Tubing	LBS, PB	Stainless Steel	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-19	3.3.1.69	B
Valve	PB	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-9	3.3.1.58	B
Valve	PB	Carbon Steel	Dry Gas (Int)	None	None	VII.J-22	3.3.1.98	A
Valve	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Valve	NSRS, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Valve	PB	Carbon Steel	Plant Indoor Air (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.I-8	3.3.1.58	E, 2

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AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-19 Auxiliary Systems – Summary of Aging Management Evaluation – Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	PB	Carbon Steel	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B
Valve	NSRS, PB	Carbon Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.G-23	3.3.1.71	B
Valve	PB	Cast Iron	Dry Gas (Int)	None	None	VII.J-22	3.3.1.98	A
Valve	PB	Cast Iron	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Valve	PB	Cast Iron (Gray Cast Iron)	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-9	3.3.1.58	B
Valve	PB	Cast Iron (Gray Cast Iron)	Buried (Ext)	Loss of material	Selective Leaching of Materials (B2.1.17)	VII.G-15	3.3.1.85	B
Valve	PB	Cast Iron (Gray Cast Iron)	Buried (Ext)	Loss of material	Buried Piping and Tanks Inspection (B2.1.18)	VII.G-25	3.3.1.19	B
Valve	LBS, PB	Cast Iron (Gray Cast Iron)	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Valve	PB	Cast Iron (Gray Cast Iron)	Plant Indoor Air (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.I-8	3.3.1.58	E, 2



**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

*Table 3.3.2-19 Auxiliary Systems – Summary of Aging Management Evaluation – Fire Protection System (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	LBS, PB	Cast Iron (Gray Cast Iron)	Raw Water (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	VII.G-14	3.3.1.85	B
Valve	LBS, PB	Cast Iron (Gray Cast Iron)	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B
Valve	PB	Copper Alloy	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	None	None	B
Valve	PB	Copper Alloy	Dry Gas (Int)	None	None	VII.J-3	3.3.1.98	A
Valve	PB	Copper Alloy	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.G-10	3.3.1.32	B
Valve	LBS, PB	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Valve	LBS, PB	Copper Alloy	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-12	3.3.1.70	B
Valve	PB	Copper Alloy (Zinc >15%)	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	None	None	B
Valve	PB	Copper Alloy (Zinc >15%)	Dry Gas (Int)	None	None	VII.J-3	3.3.1.98	A
Valve	LBS, PB	Copper Alloy (Zinc >15%)	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Valve	LBS, PB	Copper Alloy (Zinc >15%)	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-12	3.3.1.70	B
Valve	LBS, PB	Copper Alloy (Zinc >15%)	Raw Water (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	VII.G-13	3.3.1.84	B

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-19 Auxiliary Systems – Summary of Aging Management Evaluation – Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	PB	Copper Alloy (Zinc >15%)	Wetted Gas (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	None	None	G
Valve	PB	Stainless Steel	Atmosphere/ Weather (Ext)	None	None	None	None	G
Valve	PB	Stainless Steel	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-19	3.3.1.69	B

Notes for Table 3.3.2-19:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- D Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
- F Material not in NUREG-1801 for this component.
- G Environment not in NUREG-1801 for this component and material.

Plant Specific Notes:

- 1 Loss of Preload is considered to be applicable for all closure bolting.
- 2 These items are assigned the environment of "Plant Indoor Air (internal)". The items are vented or open to the plant atmosphere so the distinction between internal and external is not relevant for aging purposes.

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

- 3 Millstone Unit 2 SER Section 3.3A.2.3.2 notes "The NRC's review of the applicant's technical report, current industry research, and operating experience, finds that fiberglass components in air and seawater environments are not exposed to high levels of ultraviolet radiation, high temperatures, or ozone, and therefore has no aging effects that require aging management. Fiberglass reinforced plastic in Atmosphere/ Weather and Soil environments are not exposed to high levels of ultraviolet radiation, high temperatures, or ozone, and therefore do not have aging effects that require aging management".
- 4 These items are assigned the environment of "Atmosphere/ Weather (internal)". The items are vented or open to the outside atmosphere so the distinction between internal and external is not relevant for aging purposes.

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

*Table 3.3.2-20 Auxiliary Systems – Summary of Aging Management Evaluation –Diesel Generator Fuel Oil Storage and Transfer System*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure Bolting	PB	Carbon Steel	Atmosphere/Weather (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G
Closure Bolting	PB	Carbon Steel	Atmosphere/Weather (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-1	3.3.1.43	B
Closure Bolting	PB	Carbon Steel	Fuel Oil (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G, 1
Closure Bolting	PB	Carbon Steel	Fuel Oil (Ext)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-10	3.3.1.20	D
Closure Bolting	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-4	3.3.1.43	B
Closure Bolting	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VII.I-5	3.3.1.45	B
Flame Arrestor	PB	Aluminum	Atmosphere/Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	None	None	G
Flame Arrestor	PB	Aluminum	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-1	3.3.1.32	D
Flow Element	PB	Stainless Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-6	3.3.1.32	B
Flow Element	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Piping	LBS, PB, SIA	Carbon Steel	Atmosphere/Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.H1-8	3.3.1.60	B

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

*Table 3.3.2-20 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator Fuel Oil Storage and Transfer System (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	PB	Carbon Steel	Buried (Ext)	Loss of material	Buried Piping and Tanks Inspection (B2.1.18)	VII.H1-9	3.3.1.19	B
Piping	PB	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	A
Piping	PB	Carbon Steel	Fuel Oil (Ext)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-10	3.3.1.20	B
Piping	LBS, PB, SIA	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-10	3.3.1.20	B
Piping	LBS, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Piping	PB	Carbon Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-21	3.3.1.71	B
Pump	PB	Stainless Steel	Fuel Oil (Ext)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-6	3.3.1.32	B
Pump	PB	Stainless Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-6	3.3.1.32	B
Strainer	FIL, PB, SIA	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-10	3.3.1.20	B

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-20**    *Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator Fuel Oil Storage and Transfer System (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Strainer	FIL, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Strainer	FIL	Stainless Steel	Fuel Oil (Ext)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-6	3.3.1.32	B
Strainer	FIL	Stainless Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-6	3.3.1.32	B
Tank	PB	Carbon Steel	Buried (Ext)	Loss of material	Buried Piping and Tanks Inspection (B2.1.18)	VII.H1-9	3.3.1.19	D
Tank	PB	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Tank	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-10	3.3.1.20	B
Tank	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	D
Tubing	LBS	Copper Alloy	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-3	3.3.1.32	B
Tubing	LBS	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Tubing	PB	Stainless Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-6	3.3.1.32	B

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AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-20 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator Fuel Oil Storage and Transfer System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tubing	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Valve	PB, SIA	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-10	3.3.1.20	B
Valve	PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Valve	PB	Stainless Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-6	3.3.1.32	B
Valve	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A

Notes for Table 3.3.2-20:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- D Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- G Environment not in NUREG-1801 for this component and material.

Plant Specific Note:

- 1 Loss of Preload is considered to be applicable for all closure bolting.

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-21 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Accumulator	PB, SIA	Carbon Steel	Dry Gas (Int)	None	None	VII.J-22	3.3.1.98	C
Accumulator	PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Blower	HT, PB	Cast Iron	Closed Cycle Cooling Water (Int)	Reduction of heat transfer	Closed-Cycle Cooling Water System (B2.1.10)	VII.F4-9	3.3.1.52	D
Blower	HT, PB	Cast Iron	Closed Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.H2-23	3.3.1.47	D
Blower	PB	Cast Iron	Diesel Exhaust (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-2	3.3.1.18	E
Blower	PB	Cast Iron	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.H2-3	3.3.1.59	B
Blower	HT, PB	Cast Iron	Ventilation Atmosphere (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	D
Blower	PB	Cast Iron	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-21	3.3.1.71	D
Closure Bolting	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-4	3.3.1.43	B



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AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-21 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure Bolting	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VII.I-5	3.3.1.45	B
Closure Bolting	PB	Stainless Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G
Dryer	SIA	Carbon Steel	Dry Gas (Int)	None	None	VII.J-22	3.3.1.98	A
Dryer	SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Expansion Joint	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B
Expansion Joint	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Expansion Joint	PB	Stainless Steel	Closed Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.C2-10	3.3.1.50	B
Expansion Joint	PB	Stainless Steel	Diesel Exhaust (Int)	Cracking	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-1	3.3.1.06	E
Expansion Joint	PB	Stainless Steel	Diesel Exhaust (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-2	3.3.1.18	E

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Table 3.3.2-21 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Expansion Joint	PB	Stainless Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-17	3.3.1.33	B
Expansion Joint	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Expansion Joint	PB	Stainless Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	V.D1-29	3.2.1.08	E
Filter	FIL, PB, SIA	Aluminum	Dry Gas (Int)	None	None	VII.J-2	3.3.1.97	A
Filter	FIL, PB	Aluminum	Plant Indoor Air (Ext)	None	None	V.F-2	3.2.1.50	A
Filter	SIA	Aluminum	Plant Indoor Air (Ext)	None	None	VII.J-1	3.3.1.95	A
Filter	FIL, PB	Carbon Steel	Diesel Exhaust (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-2	3.3.1.18	E
Filter	FIL, PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Filter	FIL, PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B

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AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-21 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Filter	FIL, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Filter	FIL, PB	Carbon Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-21	3.3.1.71	B
Flame Arrestor	PB	Aluminum	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-7	3.3.1.32	D
Flame Arrestor	PB	Aluminum	Plant Indoor Air (Ext)	None	None	V.F-2	3.2.1.50	C
Heat Exchanger (DG Fuel Oil)	PB	Aluminum	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-7	3.3.1.32	D
Heat Exchanger (DG Fuel Oil)	PB	Aluminum	Plant Indoor Air (Ext)	None	None	V.F-2	3.2.1.50	A
Heat Exchanger (DG Fuel Oil)	PB	Copper Alloy	Fuel Oil (Ext)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-9	3.3.1.32	B
Heat Exchanger (DG Fuel Oil)	PB	Copper Alloy	Raw Water (Int)	Loss of material	Open-Cycle Cooling Water System (B2.1.9)	VII.H2-11	3.3.1.80	A
Heat Exchanger (DG Jacket Water)	PB	Carbon Steel	Closed Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.C2-1	3.3.1.48	B

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-21 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchanger (DG Jacket Water)	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.H2-3	3.3.1.59	B
Heat Exchanger (DG Jacket Water)	HT, PB	Copper Alloy (Zinc >15%)	Closed Cycle Cooling Water (Ext)	Reduction of heat transfer	Closed-Cycle Cooling Water System (B2.1.10)	VII.C2-2	3.3.1.52	B, 1
Heat Exchanger (DG Jacket Water)	HT, PB	Copper Alloy (Zinc >15%)	Closed Cycle Cooling Water (Ext)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.H2-8	3.3.1.51	D, 1
Heat Exchanger (DG Jacket Water)	HT, PB	Copper Alloy (Zinc >15%)	Raw Water (Int)	Reduction of heat transfer	Open-Cycle Cooling Water System (B2.1.9)	VII.C1-6	3.3.1.83	A, 1
Heat Exchanger (DG Jacket Water)	HT, PB	Copper Alloy (Zinc >15%)	Raw Water (Int)	Loss of material	Open-Cycle Cooling Water System (B2.1.9)	VII.H2-11	3.3.1.80	C, 1
Heat Exchanger (DG Lube Oil)	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-5	3.3.1.21	B
Heat Exchanger (DG Lube Oil)	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.H2-3	3.3.1.59	B
Heat Exchanger (DG Lube Oil)	HT, PB	Copper Alloy (Zinc >15%)	Lubricating Oil (Ext)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-10	3.3.1.26	B, 1
Heat Exchanger (DG Lube Oil)	HT, PB	Copper Alloy (Zinc >15%)	Lubricating Oil (Ext)	Reduction of heat transfer	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VIII.G-8	3.4.1.10	B, 1

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AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-21 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchanger (DG Lube Oil)	HT, PB	Copper Alloy (Zinc >15%)	Raw Water (Int)	Reduction of heat transfer	Open-Cycle Cooling Water System (B2.1.9)	VII.C1-6	3.3.1.83	A
Heat Exchanger (DG Lube Oil)	HT, PB	Copper Alloy (Zinc >15%)	Raw Water (Int)	Loss of material	Open-Cycle Cooling Water System (B2.1.9)	VII.H2-11	3.3.1.80	C, 1
Heat Exchanger (DG Turbo Air Intercooler)	HT	Aluminum	Ventilation Atmosphere (Ext)	None	None	V.F-2	3.2.1.50	C
Heat Exchanger (DG Turbo Air Intercooler)	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.H2-3	3.3.1.59	B
Heat Exchanger (DG Turbo Air Intercooler)	PB	Carbon Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-21	3.3.1.71	D
Heat Exchanger (DG Turbo Air Intercooler)	HT, PB	Copper Alloy	Closed Cycle Cooling Water (Int)	Reduction of heat transfer	Closed-Cycle Cooling Water System (B2.1.10)	VII.C2-2	3.3.1.52	B
Heat Exchanger (DG Turbo Air Intercooler)	HT, PB	Copper Alloy	Closed Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.H2-8	3.3.1.51	D

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**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

*Table 3.3.2-21 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator System (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Heat Exchanger (DG Turbo Air Intercooler)	HT, PB	Copper Alloy	Raw Water (Int)	Reduction of heat transfer	Open-Cycle Cooling Water System (B2.1.9)	VII.C1-6	3.3.1.83	A
Heat Exchanger (DG Turbo Air Intercooler)	HT, PB	Copper Alloy	Ventilation Atmosphere (Ext)	None	None	VIII.I-2	3.4.1.41	C
Heat Exchanger (Governor Oil Cooler)	PB	Aluminum	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	None	None	G
Heat Exchanger (Governor Oil Cooler)	PB	Aluminum	Plant Indoor Air (Ext)	None	None	V.F-2	3.2.1.50	C
Heat Exchanger (Governor Oil Cooler)	HT, PB	Copper Alloy	Closed Cycle Cooling Water (Int)	Reduction of heat transfer	Closed-Cycle Cooling Water System (B2.1.10)	VII.C2-2	3.3.1.52	B
Heat Exchanger (Governor Oil Cooler)	HT, PB	Copper Alloy	Closed Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.C2-4	3.3.1.51	D
Heat Exchanger (Governor Oil Cooler)	PB	Copper Alloy	Closed Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.H2-8	3.3.1.51	B

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-21**     *Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator System (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Heat Exchanger (Governor Oil Cooler)	HT, PB	Copper Alloy	Lubricating Oil (Ext)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-10	3.3.1.26	D
Heat Exchanger (Governor Oil Cooler)	HT, PB	Copper Alloy	Lubricating Oil (Ext)	Reduction of heat transfer	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VIII.G-8	3.4.1.10	B
Heat Exchanger (Governor Oil Cooler)	PB	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Heater	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	D
Heater	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.H2-3	3.3.1.59	D
Heater	PB	Carbon Steel (Galvanized)	Closed Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.H2-23	3.3.1.47	B
Heater	PB	Carbon Steel (Galvanized)	Plant Indoor Air (Ext)	None	None	VII.J-6	3.3.1.92	C
Heater	PB	Stainless Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-17	3.3.1.33	D
Heater	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	C
Insulation	INS	Insulation Mineral Wool	Plant Indoor Air (Ext)	None	None	None	None	J

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-21 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	LBS, SIA	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-9	3.3.1.58	B
Piping	LBS, PB, SIA	Carbon Steel	Closed Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.H2-23	3.3.1.47	B
Piping	PB, SIA	Carbon Steel	Diesel Exhaust (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-2	3.3.1.18	E
Piping	PB, SIA	Carbon Steel	Dry Gas (Int)	None	None	VII.J-22	3.3.1.98	A
Piping	LBS, PB, SIA	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Piping	LBS, PB, SIA	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B
Piping	LBS, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Piping	LBS, PB, SIA	Carbon Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-21	3.3.1.71	B
Piping	PB	Stainless Steel	Closed Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.C2-10	3.3.1.50	B



**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-21 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator System (Continued)**

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Piping	LBS, PB, SIA	Stainless Steel	Demineralized Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A
Piping	PB	Stainless Steel	Diesel Exhaust (Int)	Cracking	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-1	3.3.1.06	E
Piping	PB	Stainless Steel	Diesel Exhaust (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-2	3.3.1.18	E
Piping	PB	Stainless Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-17	3.3.1.33	B
Piping	LBS, PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Piping	SIA	Stainless Steel	Plant Indoor Air (Int)	None	None	VII.J-15	3.3.1.94	A
Piping	PB	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A
Piping	LBS, PB	Stainless Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	V.D1-29	3.2.1.08	E

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-21 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Pump	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B
Pump	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Pump	PB	Cast Iron	Closed Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.H2-23	3.3.1.47	B
Pump	PB	Cast Iron	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Pump	PB	Stainless Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-17	3.3.1.33	B
Pump	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Sight Gauge	LBS, NSRS	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Sight Gauge	LBS, NSRS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Sight Gauge	PB	Glass	Closed Cycle Cooling Water (Int)	None	None	VII.J-13	3.3.1.93	A
Sight Gauge	LBS, NSRS	Glass	Fuel Oil (Int)	None	None	VII.J-9	3.3.1.93	C

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-21 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Sight Gauge	LBS, NSRS, PB	Glass	Plant Indoor Air (Ext)	None	None	VII.J-8	3.3.1.93	A
Sight Gauge	PB	Stainless Steel	Closed Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.C2-10	3.3.1.50	B
Sight Gauge	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Strainer	LBS	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-9	3.3.1.58	B
Strainer	FIL, LBS, PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Strainer	FIL, PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B
Strainer	FIL, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Strainer	FIL, PB	Stainless Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-17	3.3.1.33	B
Strainer	FIL, PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Tank	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Tank	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-21 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tank	PB	Cast Iron	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	D
Tank	PB	Cast Iron	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Tubing	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Tubing	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Tubing	PB	Copper Alloy	Dry Gas (Int)	None	None	VII.J-3	3.3.1.98	A
Tubing	PB	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Tubing	LBS, PB, SIA	Stainless Steel	Closed Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.C2-10	3.3.1.50	B
Tubing	PB, SIA	Stainless Steel	Dry Gas (Int)	None	None	VII.J-18	3.3.1.98	A
Tubing	LBS, PB, SIA	Stainless Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-16	3.3.1.32	B
Tubing	LBS, PB, SIA	Stainless Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-17	3.3.1.33	B
Tubing	LBS, PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-21 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator System (Continued)**

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	LBS, NSRS, PB, SIA	Aluminum	Dry Gas (Int)	None	None	VII.J-2	3.3.1.97	A
Valve	LBS, NSRS, PB, SIA	Aluminum	Plant Indoor Air (Ext)	None	None	V.F-2	3.2.1.50	A
Valve	LBS, SIA	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-9	3.3.1.58	B
Valve	PB	Carbon Steel	Closed Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.H2-23	3.3.1.47	B
Valve	PB	Carbon Steel	Diesel Exhaust (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-2	3.3.1.18	E
Valve	PB, SIA	Carbon Steel	Dry Gas (Int)	None	None	VII.J-22	3.3.1.98	A
Valve	LBS, PB, SIA	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Valve	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B
Valve	LBS, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-21 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator System (Continued)**

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	LBS, PB	Carbon Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-21	3.3.1.71	B
Valve	PB	Cast Iron	Dry Gas (Int)	None	None	VII.J-22	3.3.1.98	A
Valve	PB	Cast Iron	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Valve	PB	Cast Iron	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B
Valve	PB	Cast Iron	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Valve	PB, SIA	Copper Alloy	Dry Gas (Int)	None	None	VII.J-3	3.3.1.98	A
Valve	PB, SIA	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Valve	PB	Copper Alloy	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.G-9	3.3.1.28	E
Valve	LBS	Copper Alloy (Zinc >15%)	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Valve	LBS	Copper Alloy (Zinc >15%)	Wetted Gas (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	None	None	G
Valve	PB	Nickel Alloys	Dry Gas (Int)	None	None	None	None	G

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-21**    *Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator System (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Valve	PB	Nickel Alloys	Plant Indoor Air (Ext)	None	None	VII.J-14	3.3.1.94	A
Valve	PB	Stainless Steel	Closed Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.C2-10	3.3.1.50	B
Valve	PB	Stainless Steel	Demineralized Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A
Valve	PB, SIA	Stainless Steel	Dry Gas (Int)	None	None	VII.J-18	3.3.1.98	A
Valve	PB	Stainless Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-16	3.3.1.32	B
Valve	PB	Stainless Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-17	3.3.1.33	B
Valve	PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Valve	PB	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A
Valve	PB	Stainless Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	V.D1-29	3.2.1.08	E

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

Notes for Table 3.3.2-21:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- D Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
- G Environment not in NUREG-1801 for this component and material.
- J Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Note:

- 1 The DG Jacket Water Cooler and DG Lube Oil Cooler heat exchanger tubes are fabricated of Admiralty Brass (nominal Cu-71%, Zn-28%, Sn-1%). EPRI Rpt 1010639 "Non-Class 1 Mechanical Implementation Guideline and Mechanical Tools" Rev. 4, Appendices A, B and C state that the addition of tin to brass effectively inhibits dezincification and significantly reduces the susceptibility of the material to selective leaching. This is consistent with NUREG 1801, IX.C which states that selective leaching is not a consideration for inhibited brass. Therefore, loss of material due to selective leaching has not been selected as an aging effect for Admiralty Brass heat exchanger tubes in Closed-Cycle Cooling Water, Raw Water and Lubricating Oil environments.



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Table 3.3.2-22 Auxiliary Systems – Summary of Aging Management Evaluation – Domestic Water System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure Bolting	LBS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-4	3.3.1.43	B
Closure Bolting	LBS	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VII.I-5	3.3.1.45	B
Closure Bolting	LBS	Copper Alloy	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G
Closure Bolting	PB	Stainless Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G
Flow Indicator	LBS, PB	Cast Iron	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Flow Indicator	LBS	Cast Iron	Potable Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	None	None	G
Flow Indicator	PB	Cast Iron	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-22 Auxiliary Systems – Summary of Aging Management Evaluation – Domestic Water System (Continued)**

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	LBS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Piping	LBS	Carbon Steel	Potable Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	None	None	G
Piping	PB	Carbon Steel with Elastomer Lining	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Piping	PB	Carbon Steel with Elastomer Lining	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B
Piping	LBS	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Piping	LBS	Copper Alloy	Potable Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	None	None	G
Piping	PB	Polyethylene	Buried (Ext)	None	None	None	None	F
Piping	PB	Polyethylene	Plant Indoor Air (Ext)	None	None	None	None	F
Piping	PB	Polyethylene	Raw Water (Int)	None	None	None	None	F

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-22**    *Auxiliary Systems – Summary of Aging Management Evaluation – Domestic Water System (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Piping	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Piping	PB	Stainless Steel	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-19	3.3.1.69	B
Pump	PB	Cast Iron	Raw Water (Ext)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B
Pump	PB	Cast Iron	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B
Pump	LBS	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Pump	LBS	Copper Alloy	Potable Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	None	None	G
Strainer	LBS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Strainer	LBS	Carbon Steel	Potable Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	None	None	G
Strainer	LBS	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A

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Table 3.3.2-22 Auxiliary Systems – Summary of Aging Management Evaluation – Domestic Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Strainer	LBS	Copper Alloy	Potable Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	None	None	G
Tank	LBS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Tank	LBS	Carbon Steel	Potable Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	None	None	G
Valve	PB	Cast Iron	Buried (Ext)	Loss of material	Buried Piping and Tanks Inspection (B2.1.18)	VII.G-25	3.3.1.19	B
Valve	PB	Cast Iron	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Valve	PB	Cast Iron	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B
Valve	LBS	Copper Alloy	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	None	None	G
Valve	LBS	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A

Section 3.3  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-22**    *Auxiliary Systems – Summary of Aging Management Evaluation – Domestic Water System (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	LBS	Copper Alloy	Potable Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	None	None	G
Valve	LBS, PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Valve	LBS	Stainless Steel	Potable Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	None	None	G
Valve	PB	Stainless Steel	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-19	3.3.1.69	B

Notes for Table 3.3.2-22:

Standard Notes:

- A    Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B    Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- F    Material not in NUREG-1801 for this component.
- G    Environment not in NUREG-1801 for this component and material.

Plant Specific Notes:

None

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-23 Auxiliary Systems – Summary of Aging Management Evaluation – Demineralized Water System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure Bolting	LBS, SIA	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G, 1
Closure Bolting	LBS, SIA	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-1	3.3.1.43	B
Closure Bolting	LBS, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-4	3.3.1.43	B
Closure Bolting	LBS, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VII.I-5	3.3.1.45	B
Closure Bolting	LBS, SIA	Stainless Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G, 1
Piping	LBS, SIA	Stainless Steel	Atmosphere/ Weather (Ext)	None	None	None	None	G, 2
Piping	LBS, PB, SIA	Stainless Steel	Demineralized Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A
Piping	LBS, PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Valve	LBS	Stainless Steel	Atmosphere/ Weather (Ext)	None	None	None	None	G, 2
Valve	LBS, PB, SIA	Stainless Steel	Demineralized Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A
Valve	LBS, PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

Notes for Table 3.3.2-23:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- G Environment not in NUREG-1801 for this component and material.

Plant Specific Notes:

- 1 Loss of Preload is considered to be applicable for all closure bolting.
- 2 The PVNGS plant outdoor environment is not subject to aggressive contaminants or saline environment. Stainless steel does not experience any appreciable aging effects in this environment.

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AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-24 Auxiliary Systems – Summary of Aging Management Evaluation – WRF Fuel System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure Bolting	PB	Carbon Steel	Atmosphere/Weather (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G, 1
Closure Bolting	PB	Carbon Steel	Atmosphere/Weather (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-1	3.3.1.43	B
Filter	FIL, PB	Carbon Steel	Atmosphere/Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.H1-8	3.3.1.60	B
Filter	FIL, PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-10	3.3.1.20	B
Flame Arrestor	PB	Aluminum	Atmosphere/Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	None	None	G
Flame Arrestor	PB	Aluminum	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-1	3.3.1.32	D
Flexible Hoses	PB	Stainless Steel	Atmosphere/Weather (Ext)	None	None	None	None	G
Flexible Hoses	PB	Stainless Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-6	3.3.1.32	B
Flow Indicator	PB	Cast Iron (Gray Cast Iron)	Atmosphere/Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.H1-8	3.3.1.60	B, 2



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Table 3.3.2-24 Auxiliary Systems – Summary of Aging Management Evaluation – WRF Fuel System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow Indicator	PB	Cast Iron (Gray Cast Iron)	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-10	3.3.1.20	B
Piping	PB	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.H1-8	3.3.1.60	B
Piping	PB	Carbon Steel	Buried (Ext)	Loss of material	Buried Piping and Tanks Inspection (B2.1.18)	VII.H1-9	3.3.1.19	B
Piping	PB	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	A
Piping	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-10	3.3.1.20	B
Pump	PB	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.H1-8	3.3.1.60	B
Pump	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-10	3.3.1.20	B
Sight Gauge	PB	Copper Alloy	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	None	None	G
Sight Gauge	PB	Copper Alloy	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-3	3.3.1.32	B
Sight Gauge	PB	Glass	Atmosphere/ Weather (Ext)	None	None	None	None	G
Sight Gauge	PB	Glass	Fuel Oil (Int)	None	None	VII.J-9	3.3.1.93	A

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-24 Auxiliary Systems – Summary of Aging Management Evaluation – WRF Fuel System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Strainer	PB	Copper Alloy	Atmosphere/Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	None	None	G
Strainer	PB	Copper Alloy	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-3	3.3.1.32	B
Tank	PB	Carbon Steel	Atmosphere/Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.H1-8	3.3.1.60	D
Tank	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-10	3.3.1.20	B
Valve	PB, PR	Aluminum	Atmosphere/Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	None	None	G
Valve	PB, PR	Aluminum	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-1	3.3.1.32	B
Valve	PB	Carbon Steel	Atmosphere/Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.H1-8	3.3.1.60	B
Valve	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-10	3.3.1.20	B
Valve	PB	Copper Alloy	Atmosphere/Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	None	None	G

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-24 Auxiliary Systems – Summary of Aging Management Evaluation – WRF Fuel System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	PB	Copper Alloy	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-3	3.3.1.32	B
Vent (Emergency)	PB, PR	Aluminum	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	None	None	G
Vent (Emergency)	PB, PR	Aluminum	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-1	3.3.1.32	B
Vent (Emergency)	PB, PR	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-9	3.3.1.58	B
Vent (Emergency)	PB, PR	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-10	3.3.1.20	B

Notes for Table 3.3.2-24

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- D Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- G Environment not in NUREG-1801 for this component and material.

Plant Specific Notes:

- 1 Loss of Preload is considered to be applicable for all closure bolting.
- 2 The Mechanical Tools (EPRI Report 1010639), Revision 4, Appendix E, "External Surfaces", Section 4.4 states: "Cast iron is included with "steel" in NUREG-1801 for environments addressed by this tool, except where gray cast iron is identified in "soil" environments".

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-25 Auxiliary Systems – Summary of Aging Management Evaluation – Service Gases (N2 and H2) System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure Bolting	SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-4	3.3.1.43	B
Closure Bolting	SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VII.I-5	3.3.1.45	B
Filter	PB	Carbon Steel	Dry Gas (Int)	None	None	VII.J-22	3.3.1.98	A
Filter	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Flexible Hoses	PB	Stainless Steel	Dry Gas (Int)	None	None	VII.J-18	3.3.1.98	A
Flexible Hoses	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Orifice	SIA	Stainless Steel	Dry Gas (Int)	None	None	VII.J-18	3.3.1.98	A
Orifice	SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Piping	PB, SIA	Carbon Steel	Dry Gas (Int)	None	None	VII.J-22	3.3.1.98	A
Piping	PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Piping	PB	Stainless Steel	Dry Gas (Int)	None	None	VII.J-18	3.3.1.98	A
Piping	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Valve	PB, SIA	Carbon Steel	Dry Gas (Int)	None	None	VII.J-22	3.3.1.98	A
Valve	PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

*Table 3.3.2-25 Auxiliary Systems – Summary of Aging Management Evaluation – Service Gases (N2 and H2) System (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	PB	Stainless Steel	Dry Gas (Int)	None	None	VII.J-18	3.3.1.98	A
Valve	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A

Notes for Table 3.3.2-25:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.

Plant Specific Notes:

None

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-26 Auxiliary Systems – Summary of Aging Management Evaluation – Gaseous Radwaste System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure Bolting	LBS, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-4	3.3.1.43	B
Closure Bolting	LBS, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VII.I-5	3.3.1.45	B
Piping	LBS, PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Piping	LBS	Stainless Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-15	3.3.1.79	E, 1
Piping	PB, SIA	Stainless Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F2-1	3.3.1.27	E
Sight Gauge	LBS	Glass	Plant Indoor Air (Ext)	None	None	VII.J-8	3.3.1.93	A
Sight Gauge	LBS	Glass	Raw Water (Int)	None	None	VII.J-11	3.3.1.93	A
Sight Gauge	LBS	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Sight Gauge	LBS	Stainless Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-15	3.3.1.79	E, 1
Tubing	LBS	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Tubing	LBS	Stainless Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-15	3.3.1.79	E, 1

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AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-26 Auxiliary Systems – Summary of Aging Management Evaluation – Gaseous Radwaste System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	LBS, PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Valve	LBS	Stainless Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-15	3.3.1.79	E, 1
Valve	PB	Stainless Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.F2-1	3.3.1.27	E

Notes for Table 3.3.2-26:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.

Plant Specific Note:

- 1 The internal component environment of the gaseous radwaste system where gas that has condensed to water may be found is evaluated as a raw water environment. Loss of material on internal component surfaces exposed to the solid radwaste internal environment will be managed by Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program (B2.1.22) instead of Open-Cycle Cooling Water System program (B2.1.9).

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-27 Auxiliary Systems – Summary of Aging Management Evaluation – Radioactive Waste Drains System**

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure Bolting	LBS	Carbon Steel	Borated Water Leakage (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	IV.C2-8	3.1.1.52	B
Closure Bolting	LBS	Carbon Steel	Borated Water Leakage (Ext)	Loss of material	Boric Acid Corrosion (B2.1.4)	VII.I-10	3.3.1.89	A
Closure Bolting	LBS	Stainless Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G, 1
Orifice	LBS	Stainless Steel	Atmosphere/ Weather (Ext)	None	None	None	None	G
Orifice	LBS	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Orifice	LBS	Stainless Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-15	3.3.1.79	E, 2
Piping	LBS	Carbon Steel	Borated Water Leakage (Ext)	Loss of material	Boric Acid Corrosion (B2.1.4)	VII.I-10	3.3.1.89	A
Piping	LBS	Carbon Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-19	3.3.1.76	E, 2
Piping	LBS	Stainless Steel	Atmosphere/ Weather (Ext)	None	None	None	None	G
Piping	LBS, SIA	Stainless Steel	Borated Water Leakage (Ext)	None	None	VII.J-16	3.3.1.99	A



**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-27 Auxiliary Systems – Summary of Aging Management Evaluation – Radioactive Waste Drains System (Continued)**

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	LBS	Stainless Steel	Demineralized Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A
Piping	PB	Stainless Steel	Encased in Concrete (Ext)	None	None	VII.J-17	3.3.1.96	A
Piping	LBS, PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Piping	LBS, PB, SIA	Stainless Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-15	3.3.1.79	E, 2
Piping	LBS, SIA	Stainless Steel	Treated Borated Water (Int)	Loss of material	Water Chemistry (B2.1.2)	VII.E1-17	3.3.1.91	A
Sight Gauge	LBS	Cast Iron	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Sight Gauge	LBS	Cast Iron	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-19	3.3.1.76	E, 2
Sight Gauge	LBS	Glass	Plant Indoor Air (Ext)	None	None	VII.J-8	3.3.1.93	A
Sight Gauge	LBS	Glass	Raw Water (Int)	None	None	VII.J-11	3.3.1.93	A
Strainer	LBS	Stainless Steel	Atmosphere/ Weather (Ext)	None	None	None	None	G

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AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-27 Auxiliary Systems – Summary of Aging Management Evaluation – Radioactive Waste Drains System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Strainer	LBS	Stainless Steel	Demineralized Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A
Strainer	LBS	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Tubing	LBS	Stainless Steel	Demineralized Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A
Tubing	LBS, PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Tubing	LBS, PB	Stainless Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-15	3.3.1.79	E, 2
Valve	LBS	Carbon Steel	Borated Water Leakage (Ext)	Loss of material	Boric Acid Corrosion (B2.1.4)	VII.I-10	3.3.1.89	A
Valve	LBS	Carbon Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-19	3.3.1.76	E, 2
Valve	LBS	Stainless Steel	Atmosphere/ Weather (Ext)	None	None	None	None	G
Valve	LBS	Stainless Steel	Borated Water Leakage (Ext)	None	None	VII.J-16	3.3.1.99	A
Valve	LBS	Stainless Steel	Demineralized Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A

Section 3.3  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

*Table 3.3.2-27 Auxiliary Systems – Summary of Aging Management Evaluation – Radioactive Waste Drains System (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	LBS, PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Valve	LBS, PB	Stainless Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-15	3.3.1.79	E, 2
Valve	LBS	Stainless Steel	Treated Borated Water (Int)	Loss of material	Water Chemistry (B2.1.2)	VII.E1-17	3.3.1.91	A

Notes for Table 3.3.2-27:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
- G Environment not in NUREG-1801 for this component and material.

Plant Specific Notes:

- 1 Loss of Preload is considered to be applicable for all closure bolting.
- 2 The component environment for radioactive waste drains that has been evaluated as a raw water environment. Loss of material on internal component surface exposed to floor and equipment drains environment will be managed by Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program (B2.1.22) instead of the Open-Cycle Cooling Water System program (B2.1.9).

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-28 Auxiliary Systems – Summary of Aging Management Evaluation – Station Blackout Generator System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Accumulator	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Accumulator	PB	Carbon Steel	Ventilation Atmosphere (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.G-23	3.3.1.71	B
Closure Bolting	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-4	3.3.1.43	B
Closure Bolting	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VII.I-5	3.3.1.45	B
Closure Bolting	PB	Stainless Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G
Filter	FIL, PB	Aluminum	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-7	3.3.1.32	B
Filter	FIL, PB	Aluminum	Plant Indoor Air (Ext)	None	None	V.F-2	3.2.1.50	A
Filter	FIL, PB	Aluminum	Ventilation Atmosphere (Int)	None	None	V.F-2	3.2.1.50	A
Filter	FIL, PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

*Table 3.3.2-28 Auxiliary Systems – Summary of Aging Management Evaluation – Station Blackout Generator System (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Filter	FIL, PB	Carbon Steel	Hydraulic Fluid (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B
Filter	FIL, PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B
Filter	FIL, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Filter	FIL, PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Filter	FIL, PB	Stainless Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	V.D1-29	3.2.1.08	E
Heat Exchanger (Generator Bearing Oil)	HT, PB	Copper Alloy	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-10	3.3.1.26	B
Heat Exchanger (Generator Bearing Oil)	HT, PB	Copper Alloy	Lubricating Oil (Int)	Reduction of heat transfer	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VIII.G-8	3.4.1.10	B
Heat Exchanger (Generator Bearing Oil)	HT, PB	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	C

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-28 Auxiliary Systems – Summary of Aging Management Evaluation – Station Blackout Generator System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchanger (Lube Oil)	HT	Aluminum	Atmosphere/Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	None	None	G
Heat Exchanger (Lube Oil)	HT, PB	Carbon Steel	Atmosphere/Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.H2-4	3.3.1.59	B
Heat Exchanger (Lube Oil)	HT, PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-5	3.3.1.21	B
Heat Exchanger (Lube Oil)	HT, PB	Carbon Steel	Lubricating Oil (Int)	Reduction of heat transfer	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VIII.G-15	3.4.1.10	B
Orifice	PB, TH	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Orifice	PB, TH	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Orifice	PB, TH	Stainless Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-16	3.3.1.32	B
Orifice	PB, TH	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Piping	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Piping	PB	Carbon Steel	Hydraulic Fluid (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

*Table 3.3.2-28 Auxiliary Systems – Summary of Aging Management Evaluation – Station Blackout Generator System (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Piping	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Piping	PB	Carbon Steel	Ventilation Atmosphere (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.G-23	3.3.1.71	B
Piping	PB	Stainless Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-17	3.3.1.33	B
Piping	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Pump	PB	Aluminum	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-7	3.3.1.32	B
Pump	PB	Aluminum	Plant Indoor Air (Ext)	None	None	V.F-2	3.2.1.50	A
Pump	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Pump	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B
Pump	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-28 Auxiliary Systems – Summary of Aging Management Evaluation – Station Blackout Generator System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump	PB	Cast Iron	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Pump	PB	Cast Iron	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B
Pump	PB	Cast Iron	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Sight Gauge	PB	Glass	Lubricating Oil (Int)	None	None	VII.J-10	3.3.1.93	A
Sight Gauge	PB	Glass	Plant Indoor Air (Ext)	None	None	VII.J-8	3.3.1.93	A
Tank	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Tank	PB	Carbon Steel	Hydraulic Fluid (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	D
Tank	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Tubing	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Tubing	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B



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**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

*Table 3.3.2-28 Auxiliary Systems – Summary of Aging Management Evaluation – Station Blackout Generator System (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Tubing	PB	Carbon Steel	Ventilation Atmosphere (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.G-23	3.3.1.71	B
Tubing	PB	Copper Alloy	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-9	3.3.1.32	B
Tubing	PB	Copper Alloy	Hydraulic Fluid (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B
Tubing	PB	Copper Alloy	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-10	3.3.1.26	B
Tubing	PB	Copper Alloy	Plant Indoor Air (Ext)	None	None	V.F-3	3.2.1.53	A
Tubing	PB	Stainless Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-17	3.3.1.33	B
Tubing	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Turbine	PB	Ductile Iron	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Turbine	PB	Ductile Iron	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.H2-21	3.3.1.71	D

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-28 Auxiliary Systems – Summary of Aging Management Evaluation – Station Blackout Generator System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	PB	Aluminum	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-7	3.3.1.32	B
Valve	PB	Aluminum	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	None	None	G
Valve	PB	Aluminum	Plant Indoor Air (Ext)	None	None	V.F-2	3.2.1.50	A
Valve	PB	Aluminum	Ventilation Atmosphere (Int)	None	None	V.F-2	3.2.1.50	A
Valve	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-24	3.3.1.20	B
Valve	PB	Carbon Steel	Hydraulic Fluid (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B
Valve	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B
Valve	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Valve	PB	Copper Alloy	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-9	3.3.1.32	B
Valve	PB	Copper Alloy	Hydraulic Fluid (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-10	3.3.1.26	B

Section 3.3  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

*Table 3.3.2-28 Auxiliary Systems – Summary of Aging Management Evaluation – Station Blackout Generator System (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	PB	Copper Alloy	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-10	3.3.1.26	B
Valve	PB	Copper Alloy	Plant Indoor Air (Ext)	None	None	V.F-3	3.2.1.53	A
Valve	PB	Copper Alloy	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.G-9	3.3.1.28	E
Valve	PB	Stainless Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-16	3.3.1.32	B
Valve	PB	Stainless Steel	Hydraulic Fluid (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-17	3.3.1.33	B
Valve	PB	Stainless Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-17	3.3.1.33	B
Valve	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Valve	PB	Stainless Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	V.D1-29	3.2.1.08	E

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

Notes for Table 3.3.2-28:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- D Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
- G Environment not in NUREG-1801 for this component and material.

Plant Specific Notes:

None.

Section 3.3  
AGING MANAGEMENT OF AUXILIARY SYSTEMS

Table 3.3.2-29 Auxiliary Systems – Summary of Aging Management Evaluation – Cranes, Hoists, and Elevator System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Crane	NSRS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B2.1.11)	VII.B-3	3.3.1.73	A
Cranes - Rails	NSRS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B2.1.11)	VII.B-1	3.3.1.74	A
Cranes - Rails	NSRS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B2.1.11)	VII.B-3	3.3.1.73	C
Hoist	NSRS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B2.1.11)	VII.B-3	3.3.1.73	C
Trolley	NSRS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B2.1.11)	VII.B-3	3.3.1.73	C

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

Notes for Table 3.3.2-29:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.

Plant Specific Notes:

None.

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-30**      *Auxiliary Systems – Summary of Aging Management Evaluation - Miscellaneous Auxiliary Systems In-Scope  
ONLY based on Criterion 10 CFR 54.4(a)(2)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure Bolting	LBS	Carbon Steel	Borated Water Leakage (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	IV.C2-8	3.1.1.52	B
Closure Bolting	LBS	Carbon Steel	Borated Water Leakage (Ext)	Loss of material	Boric Acid Corrosion (B2.1.4)	V.E-2	3.2.1.45	A
Closure Bolting	LBS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-4	3.3.1.43	B
Closure Bolting	LBS	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VII.I-5	3.3.1.45	B
Closure Bolting	LBS, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VIII.H-4	3.4.1.22	B
Closure Bolting	LBS, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VIII.H-5	3.4.1.22	B
Closure Bolting	LBS	Copper Alloy	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	F, 1
Closure Bolting	LBS	Stainless Steel	Borated Water Leakage (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	IV.C2-8	3.1.1.52	B
Closure Bolting	LBS, SIA	Stainless Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G, 1
Filter	LBS	Stainless Steel	Borated Water Leakage (Ext)	None	None	V.F-13	3.2.1.57	A
Filter	LBS	Stainless Steel	Treated Borated Water (Int)	Loss of material	Water Chemistry (B2.1.2)	V.A-27	3.2.1.49	A

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-30**      *Auxiliary Systems – Summary of Aging Management Evaluation - Miscellaneous Auxiliary Systems In-Scope  
ONLY based on Criterion 10 CFR 54.4(a)(2) (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchanger (AS Condensate Vent Condenser)	LBS	Carbon Steel	Closed-Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VIII.A-1	3.4.1.24	B
Heat Exchanger (AS Condensate Vent Condenser)	LBS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Heat Exchanger (AS Condensate Vent Condenser)	LBS	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-37	3.4.1.03	A
Heat Exchanger (Sample Cooler)	LBS	Carbon Steel	Closed-Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VIII.A-1	3.4.1.24	B
Heat Exchanger (Sample Cooler)	LBS	Carbon Steel	Closed-Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VIII.F-4	3.4.1.24	B
Heat Exchanger (Sample Cooler)	LBS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B



**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-30**      *Auxiliary Systems – Summary of Aging Management Evaluation - Miscellaneous Auxiliary Systems In-Scope*  
*ONLY based on Criterion 10 CFR 54.4(a)(2) (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Heat Exchanger (Sample Cooler)	LBS	Stainless Steel	Closed-Cycle Cooling Water (Ext)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VIII.F-1	3.4.1.25	B
Heat Exchanger (Sample Cooler)	LBS	Stainless Steel	Secondary Water (Int)	Cracking	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.F-3	3.4.1.14	A
Heat Exchanger (Sample Cooler)	LBS	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.F-27	3.4.1.16	A
Orifice	LBS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Orifice	LBS	Carbon Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-19	3.3.1.76	E, 2
Orifice	LBS	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A
Orifice	LBS	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-4	3.4.1.16	A
Orifice	LBS	Stainless Steel	Secondary Water (Int)	Cracking	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-5	3.4.1.14	A

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-30**      *Auxiliary Systems – Summary of Aging Management Evaluation - Miscellaneous Auxiliary Systems In-Scope  
ONLY based on Criterion 10 CFR 54.4(a)(2) (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Piping	LBS, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Piping	LBS, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Piping	LBS	Carbon Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-19	3.3.1.76	E, 2
Piping	LBS	Carbon Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-19	3.3.1.76	E, 2
Piping	SIA	Carbon Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-19	3.3.1.76	E, 2
Piping	LBS, SIA	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2)	VIII.B1-8	3.4.1.37	A
Piping	LBS, SIA	Carbon Steel	Secondary Water (Int)	Wall thinning	Flow-Accelerated Corrosion (B2.1.6)	VIII.B1-9	3.4.1.29	B
Piping	LBS	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-11	3.4.1.04	A

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

*Table 3.3.2-30 Auxiliary Systems – Summary of Aging Management Evaluation - Miscellaneous Auxiliary Systems In-Scope  
ONLY based on Criterion 10 CFR 54.4(a)(2) (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	LBS	Carbon Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VIII.B1-7	3.4.1.30	B
Piping	LBS	Carbon Steel with Elastomer Lining	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Piping	LBS	Carbon Steel with Elastomer Lining	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-19	3.3.1.76	E, 2
Piping	LBS	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Piping	LBS	Copper Alloy	Potable Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	None	None	G
Piping	LBS	Copper Alloy	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-9	3.3.1.81	E, 2
Piping	LBS	Stainless Steel	Borated Water Leakage (Ext)	None	None	V.F-13	3.2.1.57	A
Piping	LBS, SIA	Stainless Steel	Demineralized Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

*Table 3.3.2-30 Auxiliary Systems – Summary of Aging Management Evaluation - Miscellaneous Auxiliary Systems In-Scope  
ONLY based on Criterion 10 CFR 54.4(a)(2) (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	LBS, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Piping	LBS, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A
Piping	LBS	Stainless Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-15	3.3.1.79	E, 2
Piping	LBS	Stainless Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-15	3.3.1.79	E, 2
Piping	SIA	Stainless Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-15	3.3.1.79	E, 2
Piping	LBS	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-4	3.4.1.16	A
Piping	LBS	Stainless Steel	Secondary Water (Int)	Cracking	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-5	3.4.1.14	A
Piping	LBS, SIA	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.F-23	3.4.1.16	A
Piping	LBS, SIA	Stainless Steel	Secondary Water (Int)	Cracking	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.F-24	3.4.1.14	A

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-30**      *Auxiliary Systems – Summary of Aging Management Evaluation - Miscellaneous Auxiliary Systems In-Scope  
ONLY based on Criterion 10 CFR 54.4(a)(2) (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	LBS	Stainless Steel	Treated Borated Water (Int)	Loss of material	Water Chemistry (B2.1.2)	V.A-27	3.2.1.49	A
Pump	LBS	Cast Iron (Gray Cast Iron)	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Pump	LBS	Cast Iron (Gray Cast Iron)	Secondary Water (Int)	Wall thinning	Flow-Accelerated Corrosion (B2.1.6)	VIII.B1-9	3.4.1.29	B
Pump	LBS	Cast Iron (Gray Cast Iron)	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-11	3.4.1.04	A
Pump	LBS	Cast Iron (Gray Cast Iron)	Secondary Water (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	VIII.E-23	3.4.1.36	B
Sight Gauge	LBS	Cast Iron	Borated Water Leakage (Ext)	Loss of material	Boric Acid Corrosion (B2.1.4)	V.E-9	3.2.1.45	A
Sight Gauge	LBS	Glass	Borated Water Leakage (Ext)	None	None	None	None	G
Sight Gauge	LBS, SIA	Glass	Plant Indoor Air (Ext)	None	None	VII.J-8	3.3.1.93	A
Sight Gauge	LBS	Glass	Plant Indoor Air (Ext)	None	None	VIII.I-5	3.4.1.40	A
Sight Gauge	LBS, SIA	Glass	Raw Water (Int)	None	None	VII.J-11	3.3.1.93	A
Sight Gauge	LBS	Glass	Secondary Water (Int)	None	None	VIII.I-8	3.4.1.40	A
Sight Gauge	LBS	Glass	Treated Borated Water (Int)	None	None	V.F-9	3.2.1.52	A

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-30**      *Auxiliary Systems – Summary of Aging Management Evaluation - Miscellaneous Auxiliary Systems In-Scope*  
*ONLY based on Criterion 10 CFR 54.4(a)(2) (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Sight Gauge	LBS	Stainless Steel	Borated Water Leakage (Ext)	None	None	V.F-13	3.2.1.57	A
Sight Gauge	LBS, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Sight Gauge	LBS, SIA	Stainless Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-15	3.3.1.79	E, 2
Sight Gauge	LBS	Stainless Steel	Treated Borated Water (Int)	Loss of material	Water Chemistry (B2.1.2)	V.A-27	3.2.1.49	A
Strainer	LBS, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Strainer	LBS, SIA	Carbon Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-19	3.3.1.76	E, 2
Strainer	LBS	Cast Iron (Gray Cast Iron)	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Strainer	LBS	Cast Iron (Gray Cast Iron)	Secondary Water (Int)	Wall thinning	Flow-Accelerated Corrosion (B2.1.6)	VIII.B1-9	3.4.1.29	B
Strainer	LBS	Cast Iron (Gray Cast Iron)	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-11	3.4.1.04	A

Section 3.3  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

Table 3.3.2-30      *Auxiliary Systems – Summary of Aging Management Evaluation - Miscellaneous Auxiliary Systems In-Scope  
ONLY based on Criterion 10 CFR 54.4(a)(2) (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Strainer	LBS	Cast Iron (Gray Cast Iron)	Secondary Water (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	VIII.E-23	3.4.1.36	B
Tank	LBS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Tank	LBS	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-11	3.4.1.04	A
Tubing	LBS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Tubing	LBS	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-11	3.4.1.04	A
Tubing	LBS	Stainless Steel	Borated Water Leakage (Ext)	None	None	V.F-13	3.2.1.57	A
Tubing	LBS	Stainless Steel	Treated Borated Water (Int)	Loss of material	Water Chemistry (B2.1.2)	V.A-27	3.2.1.49	A
Valve	LBS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Valve	LBS	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-30**      *Auxiliary Systems – Summary of Aging Management Evaluation - Miscellaneous Auxiliary Systems In-Scope*  
*ONLY based on Criterion 10 CFR 54.4(a)(2) (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	LBS	Carbon Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-19	3.3.1.76	E, 2
Valve	LBS	Carbon Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-19	3.3.1.76	E, 2
Valve	LBS	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2)	VIII.B1-8	3.4.1.37	A
Valve	LBS	Carbon Steel	Secondary Water (Int)	Wall thinning	Flow-Accelerated Corrosion (B2.1.6)	VIII.B1-9	3.4.1.29	B
Valve	LBS	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-11	3.4.1.04	A
Valve	LBS	Carbon Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VIII.B1-7	3.4.1.30	B
Valve	LBS	Cast Iron (Gray Cast Iron)	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Valve	LBS	Cast Iron (Gray Cast Iron)	Secondary Water (Int)	Wall thinning	Flow-Accelerated Corrosion (B2.1.6)	VIII.B1-9	3.4.1.29	B
Valve	LBS	Cast Iron (Gray Cast Iron)	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-11	3.4.1.04	A



**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-30**      *Auxiliary Systems – Summary of Aging Management Evaluation - Miscellaneous Auxiliary Systems In-Scope*  
*ONLY based on Criterion 10 CFR 54.4(a)(2) (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Valve	LBS	Cast Iron (Gray Cast Iron)	Secondary Water (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	VIII.E-23	3.4.1.36	B
Valve	LBS	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Valve	LBS	Copper Alloy	Potable Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	None	None	G
Valve	LBS	Copper Alloy	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.A-5	3.4.1.15	A
Valve	LBS	Copper Alloy (Zinc >15%)	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Valve	LBS	Copper Alloy (Zinc >15%)	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.A-5	3.4.1.15	A
Valve	LBS	Copper Alloy (Zinc >15%)	Secondary Water (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	VIII.E-21	3.4.1.35	B
Valve	LBS	Stainless Steel	Borated Water Leakage (Ext)	None	None	V.F-13	3.2.1.57	A
Valve	LBS, SIA	Stainless Steel	Demineralized Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A
Valve	LBS, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Valve	LBS	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

**Table 3.3.2-30**      *Auxiliary Systems – Summary of Aging Management Evaluation - Miscellaneous Auxiliary Systems In-Scope  
ONLY based on Criterion 10 CFR 54.4(a)(2) (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	LBS	Stainless Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-15	3.3.1.79	E, 2
Valve	LBS	Stainless Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-15	3.3.1.79	E, 2
Valve	SIA	Stainless Steel	Raw Water (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VII.C1-15	3.3.1.79	E, 2
Valve	LBS	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.F-23	3.4.1.16	A
Valve	LBS	Stainless Steel	Secondary Water (Int)	Cracking	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.F-24	3.4.1.14	A
Valve	LBS	Stainless Steel	Treated Borated Water (Int)	Loss of material	Water Chemistry (B2.1.2)	V.A-27	3.2.1.49	A

**Section 3.3**  
**AGING MANAGEMENT OF AUXILIARY SYSTEMS**

Notes for Table 3.3.2-30:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
- F Material not in NUREG-1801 for this component.
- G Environment not in NUREG-1801 for this component and material.

Plant Specific Notes:

- 1 Loss of Preload is considered to be applicable for all closure bolting.
- 2 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program (B2.1.22) is credited instead of Open-Cycle Cooling Water System program (B2.1.9) for aging management of the components of solid radwaste system, sanitary drains and treatment, chemical waste, oily waste systems.

## **3.4 AGING MANAGEMENT OF STEAM AND POWER CONVERSION SYSTEM**

### **3.4.1 Introduction**

Section 3.4 provides the results of the aging management reviews for those component types identified in Section 2.3.4, Steam and Power Conversion System, subject to aging management review. These systems are described in the following sections:

- Main steam (Section 2.3.4.1)
- Condensate storage and transfer (Section 2.3.4.2)
- Auxiliary feedwater (Section 2.3.4.3)

Table 3.4.1, Summary of Aging Management Evaluations in Chapter VIII of NUREG-1801 for Steam and Power Conversion System, provides the summary of the programs evaluated in NUREG-1801 that are applicable to the component types in this section. Table 3.4.1 uses the format of Table 3.x.1 (Table 1) described in Section 3.0.

### **3.4.2 Results**

The following tables summarize the results of the aging management review for the systems in the Steam and Power Conversion System area:

- Table 3.4.2-1, Steam and Power Conversion System – Summary of Aging Management Evaluation – Main Steam System
- Table 3.4.2-2, Steam and Power Conversion System – Summary of Aging Management Evaluation – Condensate Storage and Transfer System
- Table 3.4.2-3, Steam and Power Conversion System – Summary of Aging Management Evaluation – Auxiliary Feedwater System

These tables use the format of Table 2 discussed in Section 3.0.

#### **3.4.2.1 Materials, Environment, Aging Effects Requiring Management and Aging Management Programs**

The materials from which the component types are fabricated, the environments to which they are exposed, the potential aging effects requiring management, and the aging management programs used to manage these aging effects are provided for each of the above systems in the following subsections.

### **3.4.2.1.1 Main Steam System**

#### **Materials**

The materials of construction for the main steam system component types are:

- Aluminum
- Carbon Steel
- Copper Alloy
- Copper Alloy (Zinc >15%)
- Insulation Calcium Silicate
- Nickel Alloys
- Stainless Steel

#### **Environment**

The main steam system component types are exposed to the following environments:

- Dry Gas
- Plant Indoor Air
- Secondary Water
- Wetted Gas

#### **Aging Effects Requiring Management**

The following main steam system aging effects require management:

- Cracking
- Loss of material
- Loss of preload
- Wall thinning

#### **Aging Management Programs**

The following aging management programs manage the aging effects for the main steam system component types:

- Bolting Integrity (B2.1.7)
- External Surfaces Monitoring Program (B2.1.20)
- Flow-Accelerated Corrosion (B2.1.6)

**Section 3.4**  
**AGING MANAGEMENT OF STEAM AND**  
**POWER CONVERSION SYSTEM**

- Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)
- One-Time Inspection (B2.1.16)
- Water Chemistry (B2.1.2)

**3.4.2.1.2 Condensate Storage and Transfer System**

**Materials**

The materials of construction for the condensate storage and transfer system component types are:

- Carbon Steel
- Stainless Steel
- Stainless Steel Cast Austenitic

**Environment**

The condensate storage and transfer system components are exposed to the following environments:

- Atmosphere/ Weather
- Dry Gas
- Encased in Concrete
- Plant Indoor Air
- Secondary Water
- Wetted Gas

**Aging Effects Requiring Management**

The following condensate storage and transfer system aging effects require management:

- Loss of material
- Loss of preload

**Aging Management Programs**

The following aging management programs manage the aging effects for the condensate storage and transfer system component types:

- Bolting Integrity (B2.1.7)
- External Surfaces Monitoring Program (B2.1.20)

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- Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)
- One-Time Inspection (B2.1.16)
- Water Chemistry (B2.1.2)

**3.4.2.1.3                    Auxiliary Feedwater System**

**Materials**

The materials of construction for the auxiliary feedwater system component types are:

- Aluminum
- Carbon Steel
- Cast Iron
- Glass
- Insulation Calcium Silicate
- Nickel Alloys
- Stainless Steel
- Stainless Steel Cast Austenitic

**Environment**

The auxiliary feedwater system components are exposed to the following environments:

- Lubricating Oil
- Plant Indoor Air
- Secondary Water

**Aging Effects Requiring Management**

The following auxiliary feedwater system aging effects require management:

- Loss of material
- Loss of preload
- Reduction of heat transfer
- Wall thinning

**Aging Management Programs**

The following aging management programs manage the aging effects for the auxiliary feedwater system component types:

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- Bolting Integrity (B2.1.7)
- External Surfaces Monitoring Program (B2.1.20)
- Flow-Accelerated Corrosion (B2.1.6)
- Lubricating Oil Analysis (B2.1.23)
- One-Time Inspection (B2.1.16)
- Water Chemistry (B2.1.2)

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

NUREG-1801 provides the basis for identifying those programs that warrant further evaluation. For the Steam and Power Conversion System, those evaluations are addressed in the following subsections.

**3.4.2.2.1 Cumulative Fatigue Damage**

Evaluation of fatigue is a time-limited aging analysis (TLAA) as defined in 10 CFR 54.3. TLAA's are evaluated in accordance with 10 CFR 54.21(c)(1). PVNGS piping designed to ASME III Class 2, Class 3, and ANSI B31.1 assumes a reduction in the allowable secondary stress range if more than 7,000 full-range thermal cycles are expected in a design lifetime. Section 4.3.5 describes the evaluation of these cyclic design TLAA's. The main steam safety valves are ASME III Class 2 components designed with a Class 1 fatigue analysis. Section 4.3.2.12 describes the evaluation of this TLAA.

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

**3.4.2.2.2.1 Steel piping and components, tanks, and heat exchangers exposed to treated water and steel piping and components exposed to steam**

The Water Chemistry program (B2.1.2) and the One-Time Inspection program (B2.1.16) will manage loss of material due to general, pitting, and crevice corrosion for carbon steel and gray cast iron components exposed to secondary water and demineralized water. The one-time inspection will include selected components at susceptible locations where contaminants could accumulate (e.g. stagnant flow locations).

**3.4.2.2.2.2 Steel piping and components exposed to lubricating oil**

The Lubricating Oil Analysis program (B2.1.23) and the One-Time Inspection program (B2.1.16) will manage loss of material due to general, pitting, and crevice corrosion for carbon steel components exposed to lubricating oil. The one-time inspection will include selected components at susceptible locations where contaminants such as water could accumulate.



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

Not applicable. PVNGS has no in-scope components exposed to raw water in the auxiliary feedwater system, so the applicable NUREG-1801 line was not used.

**3.4.2.2.4      Reduction of Heat Transfer due to Fouling**

**3.4.2.2.4.1      Stainless steel and copper alloy heat exchanger tubes exposed to treated water**

Not applicable. PVNGS has no in-scope heat exchangers in the condensate or blowdown systems, and no in-scope heat exchangers with a heat transfer intended function in the auxiliary feedwater system, so the applicable NUREG-1801 lines were not used.

**3.4.2.2.4.2      Stainless steel and copper alloy heat exchanger tubes exposed to lubricating oil**

The Lubricating Oil Analysis program (B2.1.23) and the One-Time Inspection program (B2.1.16) will manage reduction of heat transfer due to fouling for carbon steel and copper alloy components exposed to lubricating oil. The one-time inspection will include selected components at susceptible locations where contaminants such as water could accumulate.

**3.4.2.2.5      Loss of Material due to General, Pitting, Crevice, and Microbiologically-Influenced Corrosion**

**3.4.2.2.5.1      Steel piping and components and tanks exposed to soil**

Not applicable. PVNGS has no in-scope buried steel components or tanks exposed to soil in the condensate or auxiliary feedwater systems, so the applicable NUREG-1801 lines were not used.

**3.4.2.2.5.2      Steel heat exchanger components exposed to lubricating oil**

The Lubricating Oil Analysis program (B2.1.23) and the One-Time Inspection program (B2.1.16) will manage loss of material due to general, pitting, crevice and microbiologically influenced corrosion for carbon steel components exposed to lubricating oil. The one-time inspection will include selected components at susceptible locations where contaminants such as water could accumulate.

**3.4.2.2.6      Cracking due to Stress Corrosion Cracking**

The Water Chemistry program (B2.1.2) and the One-Time Inspection program (B2.1.16) will manage cracking due to stress corrosion cracking for stainless steel components exposed to secondary water. The one-time inspection will include selected components at susceptible locations where contaminants could accumulate (e.g. stagnant flow locations).

**3.4.2.2.7 Loss of Material due to Pitting and Crevice Corrosion**

- 3.4.2.2.7.1 Stainless steel and copper alloy piping and components and stainless steel tanks and heat exchangers exposed to treated water

The Water Chemistry program (B2.1.2) and the One-Time Inspection program (B2.1.16) will manage loss of material due to pitting and crevice corrosion for stainless steel and copper alloy components exposed to secondary water and demineralized water. The one-time inspection will include selected components at susceptible locations where contaminants could accumulate (e.g. stagnant flow locations and tank bottoms).

- 3.4.2.2.7.2 Stainless steel piping and components exposed to soil

Not applicable. PVNGS has no in-scope stainless steel components exposed to soil in the condensate or auxiliary feedwater system, so the applicable NUREG-1801 lines were not used.

- 3.4.2.2.7.3 Copper alloy piping and components exposed to lubricating oil

Not applicable. PVNGS has no in-scope copper alloy components exposed to lube oil in the steam turbine, feedwater, condensate, or auxiliary feedwater systems, so the applicable NUREG-1801 lines were not used.

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

Not applicable. PVNGS has no in-scope stainless steel components exposed to lube oil in the steam turbine, feedwater, condensate, or auxiliary feedwater systems, so the applicable NUREG-1801 lines were not used.

**3.4.2.2.9 Loss of Material due to General, Pitting, Crevice, and Galvanic Corrosion**

Not applicable to PVNGS, applicable to BWR only.

**3.4.2.2.10 Quality Assurance for Aging Management of Nonsafety-Related Components**

Quality Assurance Program and Administrative Controls are discussed in Section B1.3.

**3.4.2.3 Time-Limited Aging Analysis**

The time-limited aging analyses identified below are associated with the Steam and Power Conversion System component types. The section within Chapter 4, Time-Limited Aging Analyses, is indicated in parenthesis.

- Cumulative fatigue damage (Section 4.3, Metal Fatigue Analysis)

### **3.4.3 Conclusions**

The Steam and Power Conversion System component types that are subject to aging management review have been evaluated. The aging management programs selected to manage the aging effects for the Steam and Power Conversion System component types are identified in the summary Tables and in Section 3.4.2.1.

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

Therefore, based on the demonstration provided in Appendix B, the effects of aging associated with the Steam and Power Conversion System component types will be adequately managed so that there is reasonable assurance that the intended functions will be maintained consistent with the current licensing basis during the period of extended operation.

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*Table 3.4.1 Summary of Aging Management Evaluations in Chapter VIII of NUREG-1801 for Steam and Power Conversion System*

Item Number	Component Type	Aging Effect/ Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.4.1.01	Steel piping, piping components, and piping elements exposed to steam or treated water	Cumulative fatigue damage	TLAA, evaluated in accordance with 10 CFR 54.21(c)	Yes, TLAA	Fatigue of metal components is a TLAA. See further evaluation in subsection 3.4.2.2.1.
3.4.1.02	Steel piping, piping components, and piping elements exposed to steam	Loss of material due to general, pitting and crevice corrosion	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	Yes	Not applicable. PVNGS has no in-scope steel components exposed to steam in the steam turbine or extraction steam systems, so the applicable NUREG-1801 lines were not used.
3.4.1.03	Steel heat exchanger components exposed to treated water	Loss of material due to general, pitting and crevice corrosion	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	Yes	Consistent with NUREG-1801. See further evaluation in subsection 3.4.2.2.2.1.
3.4.1.04	Steel piping, piping components, and piping elements exposed to treated water	Loss of material due to general, pitting and crevice corrosion	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	Yes	Consistent with NUREG-1801. See further evaluation in subsection 3.4.2.2.2.1.
3.4.1.05					Not applicable - BWR only

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*Table 3.4.1 Summary of Aging Management Evaluations in Chapter VIII of NUREG-1801 for Steam and Power Conversion System (Continued)*

Item Number	Component Type	Aging Effect // Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.4.1.06	Steel and stainless steel tanks exposed to treated water	Loss of material due to general (steel only) pitting and crevice corrosion	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	Yes	Consistent with NUREG-1801. See further evaluation in subsection 3.4.2.2.7.1.
3.4.1.07	Steel piping, piping components, and piping elements exposed to lubricating oil	Loss of material due to general, pitting and crevice corrosion	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B.2.1.16)	Yes	Consistent with NUREG-1801 with aging management program exceptions. The aging management program(s) with exceptions to NUREG-1801 include: Lubricating Oil Analysis (B2.1.23). See further evaluation in subsection 3.4.2.2.2.
3.4.1.08	Steel piping, piping components, and piping elements exposed to raw water	Loss of material due to general, pitting, crevice, and microbiologically-influenced corrosion, and fouling	A plant-specific aging management program is to be evaluated.	Yes	Not applicable. PVNGS has no in-scope steel components exposed to raw water in the auxiliary feedwater system, so the applicable NUREG-1801 line was not used.

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*Table 3.4.1 Summary of Aging Management Evaluations in Chapter VIII of NUREG-1801 for Steam and Power Conversion System (Continued)*

Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.4.1.09	Stainless steel and copper alloy heat exchanger tubes exposed to treated water	Reduction of heat transfer due to fouling	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	Yes	Not applicable. PVNGS has no in-scope stainless steel or copper alloy heat exchangers exposed to treated water in the condensate, steam generator blowdown, or auxiliary feedwater systems, so the applicable NUREG-1801 lines were not used.
3.4.1.10	Steel, stainless steel, and copper alloy heat exchanger tubes exposed to lubricating oil	Reduction of heat transfer due to fouling	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B.2.1.16)	Yes	Consistent with NUREG-1801 with aging management program exceptions. The aging management program(s) with exceptions to NUREG-1801 include: Lubricating Oil Analysis (B2.1.23). See further evaluation in subsection 3.4.2.2.4.2.
3.4.1.11	Buried steel piping, piping components, piping elements, and tanks (with or without coating or wrapping) exposed to soil	Loss of material due to general, pitting, crevice, and microbiologically-influenced corrosion	Buried Piping and Tanks Inspection (B2.1.18)	Yes	Not applicable. PVNGS has no in-scope buried steel components or tanks exposed to soil in the condensate or auxiliary feedwater systems, so the applicable NUREG-1801 lines were not used.

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*Table 3.4.1 Summary of Aging Management Evaluations in Chapter VIII of NUREG-1801 for Steam and Power Conversion System (Continued)*

Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.4.1.12	Steel heat exchanger components exposed to lubricating oil	Loss of material due to general, pitting, crevice, and microbiologically-influenced corrosion	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B.2.1.16)	Yes	Consistent with NUREG-1801 with aging management program exceptions. The aging management program(s) with exceptions to NUREG-1801 include: Lubricating Oil Analysis (B2.1.23). See further evaluation in subsection 3.4.2.2.5.2.
3.4.1.13					Not applicable - BWR only
3.4.1.14	Stainless steel piping, piping components, piping elements, tanks, and heat exchanger components exposed to treated water >60°C (>140°F)	Cracking due to stress corrosion cracking	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	Yes	Consistent with NUREG-1801. See further evaluation in subsection 3.4.2.2.6.
3.4.1.15	Aluminum and copper alloy piping, piping components, and piping elements exposed to treated water	Loss of material due to pitting and crevice corrosion	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	Yes	Consistent with NUREG-1801. See further evaluation in subsection 3.4.2.2.7.1.

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*Table 3.4.1 Summary of Aging Management Evaluations in Chapter VIII of NUREG-1801 for Steam and Power Conversion System (Continued)*

Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.4.1.16	Stainless steel piping, piping components, and piping elements; tanks, and heat exchanger components exposed to treated water	Loss of material due to pitting and crevice corrosion	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	Yes	Consistent with NUREG-1801. See further evaluation in subsection 3.4.2.2.7.1.
3.4.1.17	Stainless steel piping, piping components, and piping elements exposed to soil	Loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	Yes	Not applicable. PVNGS has no in-scope stainless steel components exposed to soil in the condensate or auxiliary feedwater system, so the applicable NUREG-1801 lines were not used.
3.4.1.18	Copper alloy piping, piping components, and piping elements exposed to lubricating oil	Loss of material due to pitting and crevice corrosion	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B.2.1.16)	Yes	Not applicable. PVNGS has no in-scope copper alloy components exposed to lube oil in the steam turbine, feedwater, condensate, or auxiliary feedwater systems, so the applicable NUREG-1801 lines were not used.



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*Table 3.4.1 Summary of Aging Management Evaluations in Chapter VIII of NUREG-1801 for Steam and Power Conversion System (Continued)*

Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.4.1.19	Stainless steel piping, piping components, piping elements, and heat exchanger components exposed to lubricating oil	Loss of material due to pitting, crevice, and microbiologically-influenced corrosion	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B.2.1.16)	Yes	Not applicable. PVNGS has no in-scope stainless steel components exposed to lube oil in the steam turbine, feedwater, condensate, or auxiliary feedwater systems, so the applicable NUREG-1801 lines were not used. See further evaluation in subsection 3.4.2.2.8.
3.4.1.20	Steel tanks exposed to air – outdoor (external)	Loss of material/ general, pitting, and crevice corrosion	Aboveground Steel Tanks	No	Not applicable. PVNGS has no in-scope steel tanks exposed to outdoor air in the condensate or auxiliary feedwater systems, so the applicable NUREG-1801 lines were not used.
3.4.1.21	High-strength steel closure bolting exposed to air with steam or water leakage	Cracking due to cyclic loading, stress corrosion cracking	Bolting Integrity (B2.1.7)	No	Not applicable. PVNGS has no in-scope high strength bolting in the steam and power conversion systems, so the applicable NUREG-1801 line was not used.

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*Table 3.4.1 Summary of Aging Management Evaluations in Chapter VIII of NUREG-1801 for Steam and Power Conversion System (Continued)*

Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.4.1.22	Steel bolting and closure bolting exposed to air with steam or water leakage, air – outdoor (external), or air – indoor uncontrolled (external);	Loss of material due to general, pitting and crevice corrosion; loss of preload due to thermal effects, gasket creep, and self-loosening	Bolting Integrity (B2.1.7)	No	Consistent with NUREG-1801 with aging management program exceptions. The aging management program(s) with exceptions to NUREG-1801 include: Bolting Integrity (B2.1.7)
3.4.1.23	Stainless steel piping, piping components, and piping elements exposed to closed-cycle cooling water >60°C (>140°F)	Cracking due to stress corrosion cracking	Closed-Cycle Cooling Water System (B2.1.10)	No	Not applicable. PVNGS has no in-scope stainless steel components exposed to closed cycle cooling water >140°F in the condensate, blowdown, or auxiliary feedwater systems, so the applicable NUREG-1801 lines were not used.
3.4.1.24	Steel heat exchanger components exposed to closed cycle cooling water	Loss of material due to general, pitting, crevice, and galvanic corrosion	Closed-Cycle Cooling Water System (B2.1.10)	No	Consistent with NUREG-1801 with aging management program exceptions. The aging management program(s) with exceptions to NUREG-1801 include: Closed-Cycle Cooling Water System (B2.1.10)

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*Table 3.4.1 Summary of Aging Management Evaluations in Chapter VIII of NUREG-1801 for Steam and Power Conversion System (Continued)*

Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.4.1.25	Stainless steel piping, piping components, piping elements, and heat exchanger components exposed to closed cycle cooling water	Loss of material due to pitting and crevice corrosion	Closed-Cycle Cooling Water System (B2.1.10)	No	Consistent with NUREG-1801 with aging management program exceptions. The aging management program(s) with exceptions to NUREG-1801 include: Closed-Cycle Cooling Water System (B2.1.10)
3.4.1.26	Copper alloy piping, piping components, and piping elements exposed to closed cycle cooling water	Loss of material due to pitting, crevice, and galvanic corrosion	Closed-Cycle Cooling Water System (B2.1.10)	No	Not applicable. PVNGS has no in-scope copper alloy components exposed to closed cycle cooling water in the condensate, blowdown, or auxiliary feedwater systems, so the applicable NUREG-1801 lines were not used.
3.4.1.27	Steel, stainless steel, and copper alloy heat exchanger tubes exposed to closed cycle cooling water	Reduction of heat transfer due to fouling	Closed-Cycle Cooling Water System (B2.1.10)	No	Not applicable. PVNGS has no in-scope copper alloy components exposed to closed cycle cooling water in the condensate, blowdown, or auxiliary feedwater systems, so the applicable NUREG-1801 lines were not used.

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*Table 3.4.1 Summary of Aging Management Evaluations in Chapter VIII of NUREG-1801 for Steam and Power Conversion System (Continued)*

Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.4.1.28	Steel external surfaces exposed to air – indoor uncontrolled (external), condensation (external), or air outdoor (external)	Loss of material due to general corrosion	External Surfaces Monitoring (B2.1.20)	No	Consistent with NUREG-1801 with aging management program exceptions. The aging management program(s) with exceptions to NUREG-1801 include: External Surfaces Monitoring Program (B2.1.20).
3.4.1.29	Steel piping, piping components, and piping elements exposed to steam or treated water	Wall thinning due to flow-accelerated corrosion	Flow-Accelerated Corrosion (B2.1.6)	No	Consistent with NUREG-1801 with aging management program exceptions. The aging management program(s) with exceptions to NUREG-1801 include: Flow-Accelerated Corrosion (B2.1.6)
3.4.1.30	Steel piping, piping components, and piping elements exposed to air outdoor (internal) or condensation (internal)	Loss of material due to general, pitting, and crevice corrosion	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)	No	Consistent with NUREG-1801 with aging management program exceptions. The aging management program(s) with exceptions to NUREG-1801 include: External Surfaces Monitoring Program (B2.1.20).

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*Table 3.4.1 Summary of Aging Management Evaluations in Chapter VIII of NUREG-1801 for Steam and Power Conversion System (Continued)*

Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.4.1.31	Steel heat exchanger components exposed to raw water	Loss of material due to general, pitting, crevice, galvanic, and microbiologically-influenced corrosion, and fouling	Open-Cycle Cooling Water System (B.2.1.9)	No	Not applicable. PVNGS has no in-scope steel heat exchanger components exposed to raw water in the condensate, blowdown, or auxiliary feedwater systems, so the applicable NUREG-1801 lines were not used.
3.4.1.32	Stainless steel and copper alloy piping, piping components, and piping elements exposed to raw water	Loss of material due to pitting, crevice, and microbiologically-influenced corrosion	Open-Cycle Cooling Water System (B.2.1.9)	No	Not applicable. PVNGS has no in-scope stainless steel or copper alloy components exposed to raw water in the steam turbine, condensate, blowdown, or auxiliary feedwater systems, so the applicable NUREG-1801 lines were not used.
3.4.1.33	Stainless steel heat exchanger components exposed to raw water	Loss of material due to pitting, crevice, and microbiologically-influenced corrosion, and fouling	Open-Cycle Cooling Water System (B.2.1.9)	No	Not applicable. PVNGS has no in-scope stainless steel heat exchanger components exposed to raw water in the condensate, blowdown, or auxiliary feedwater systems, so the applicable NUREG-1801 lines were not used.

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*Table 3.4.1 Summary of Aging Management Evaluations in Chapter VIII of NUREG-1801 for Steam and Power Conversion System (Continued)*

Item Number	Component Type	Aging Effect/ Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.4.1.34	Steel, stainless steel, and copper alloy heat exchanger tubes exposed to raw water	Reduction of heat transfer due to fouling	Open-Cycle Cooling Water System (B.2.1.9)	No	Not applicable. PVNGS has no in-scope heat exchanger components exposed to raw water in the condensate, blowdown, or auxiliary feedwater systems, so the applicable NUREG-1801 lines were not used.
3.4.1.35	Copper alloy >15% Zn piping, piping components, and piping elements exposed to closed cycle cooling water, raw water, or treated water	Loss of material due to selective leaching	Selective Leaching of Materials (B2.1.17)	No	Consistent with NUREG-1801 with aging management program exceptions. The aging management program(s) with exceptions to NUREG-1801 include: Selective Leaching of Materials (B2.1.17)
3.4.1.36	Gray cast iron piping, piping components, and piping elements exposed to soil, treated water, or raw water	Loss of material due to selective leaching	Selective Leaching of Materials (B2.1.17)	No	Consistent with NUREG-1801 with aging management program exceptions. The aging management program(s) with exceptions to NUREG-1801 include: Selective Leaching of Materials (B2.1.17)

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*Table 3.4.1 Summary of Aging Management Evaluations in Chapter VIII of NUREG-1801 for Steam and Power Conversion System (Continued)*

Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.4.1.37	Steel, stainless steel, and nickel-based alloy piping, piping components, and piping elements exposed to steam	Loss of material due to pitting and crevice corrosion	Water Chemistry (B.2.1.2)	No	Consistent with NUREG-1801.
3.4.1.38	Steel bolting and external surfaces exposed to air with borated water leakage	Loss of material due to boric acid corrosion	Boric Acid Corrosion (B2.1.4)	No	Not applicable. PVNGS has no in-scope steel components exposed to borated water leakage in the steam and power conversion systems, so the applicable NUREG-1801 lines were not used.
3.4.1.39	Stainless steel piping, piping components, and piping elements exposed to steam	Cracking due to stress corrosion cracking	Water Chemistry (B.2.1.2)	No	Consistent with NUREG-1801.
3.4.1.40	Glass piping elements exposed to air, lubricating oil, raw water, and treated water	None	None	No	Consistent with NUREG-1801.

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*Table 3.4.1 Summary of Aging Management Evaluations in Chapter VIII of NUREG-1801 for Steam and Power Conversion System (Continued)*

Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.4.1.41	Stainless steel, copper alloy, and nickel alloy piping, piping components, and piping elements exposed to air – indoor uncontrolled (external)	None	None	No	Consistent with NUREG-1801.
3.4.1.42	Steel piping, piping components, and piping elements exposed to air – indoor controlled (external)	None	None	No	Not applicable. PVNGS has no in-scope steel components exposed to indoor controlled air in the steam and power conversion systems, so the applicable NUREG-1801 line was not used.
3.4.1.43	Steel and stainless steel piping, piping components, and piping elements in concrete	None	None	No	Consistent with NUREG-1801.
3.4.1.44	Steel, stainless steel, aluminum, and copper alloy piping, piping components, and piping elements exposed to gas	None	None	No	Consistent with NUREG-1801.



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AGING MANAGEMENT OF STEAM AND  
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Table 3.4.2-1 Steam and Power Conversion System – Summary of Aging Management Evaluation – Main Steam System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Accumulator	PB	Carbon Steel	Dry Gas (Int)	None	None	VIII.I-15	3.4.1.44	C
Accumulator	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Closure Bolting	LBS, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VIII.H-4	3.4.1.22	B
Closure Bolting	LBS, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VIII.H-5	3.4.1.22	B
Closure Bolting	LBS, PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G, 1
Filter	LBS, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Filter	LBS, SIA	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-11	3.4.1.04	A
Flexible Hoses	PB	Nickel Alloys	Dry Gas (Int)	None	None	None	None	G
Flexible Hoses	PB	Nickel Alloys	Plant Indoor Air (Ext)	None	None	V.F-11	3.2.1.53	A
Flexible Hoses	PB	Nickel Alloys	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2)	VIII.B1-1	3.4.1.37	A
Insulation	INS	Aluminum	Plant Indoor Air (Ext)	None	None	V.F-2	3.2.1.50	C

**Section 3.4**  
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*Table 3.4.2-1 Steam and Power Conversion System – Summary of Aging Management Evaluation – Main Steam System  
(Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Insulation	INS	Insulation Calcium Silicate	Plant Indoor Air (Ext)	None	None	None	None	J, 2
Orifice	PB, TH	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Orifice	PB, TH	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-11	3.4.1.04	A
Piping	LBS, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Piping	LBS, PB, SIA	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2)	VIII.B1-8	3.4.1.37	A
Piping	LBS, PB, SIA	Carbon Steel	Secondary Water (Int)	Wall thinning	Flow-Accelerated Corrosion (B2.1.6)	VIII.B1-9	3.4.1.29	B
Piping	PB	Carbon Steel	Secondary Water (Int)	Cumulative fatigue damage	Time-Limited Aging Analysis evaluated for the period of extended operation	VIII.B1-10	3.4.1.01	A
Piping	LBS, PB, SIA	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-11	3.4.1.04	A

Section 3.4  
**AGING MANAGEMENT OF STEAM AND  
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*Table 3.4.2-1 Steam and Power Conversion System – Summary of Aging Management Evaluation – Main Steam System  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	LBS, PB, SIA	Carbon Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VIII.B1-7	3.4.1.30	B
Piping	SIA	Copper Alloy	Dry Gas (Int)	None	None	VIII.I-3	3.4.1.44	A
Piping	SIA	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Piping	PB	Stainless Steel	Dry Gas (Int)	None	None	VIII.I-12	3.4.1.44	A
Piping	LBS, PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A
Piping	LBS, PB, SIA	Stainless Steel	Secondary Water (Int)	Cracking	Water Chemistry (B2.1.2)	VIII.B1-2	3.4.1.39	A
Piping	LBS, PB, SIA	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2)	VIII.B1-3	3.4.1.37	A
Piping	LBS, PB, SIA	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-4	3.4.1.16	A
Piping	LBS, PB, SIA	Stainless Steel	Secondary Water (Int)	Cracking	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-5	3.4.1.14	A
Piping	SIA	Stainless Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	V.D1-29	3.2.1.08	E

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**POWER CONVERSION SYSTEM**

*Table 3.4.2-1 Steam and Power Conversion System – Summary of Aging Management Evaluation – Main Steam System  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump	LBS, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A
Pump	LBS, SIA	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-4	3.4.1.16	A
Tubing	PB	Copper Alloy	Dry Gas (Int)	None	None	VIII.I-3	3.4.1.44	A
Tubing	PB	Copper Alloy	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Tubing	PB	Stainless Steel	Dry Gas (Int)	None	None	VIII.I-12	3.4.1.44	A
Tubing	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A
Tubing	PB	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-4	3.4.1.16	A
Tubing	PB	Stainless Steel	Secondary Water (Int)	Cracking	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-5	3.4.1.14	A
Valve	LBS, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Valve	PB	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2)	VIII.B1-8	3.4.1.37	A
Valve	PB	Carbon Steel	Secondary Water (Int)	Wall thinning	Flow-Accelerated Corrosion (B2.1.6)	VIII.B1-9	3.4.1.29	B

**Section 3.4**  
**AGING MANAGEMENT OF STEAM AND**  
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*Table 3.4.2-1 Steam and Power Conversion System – Summary of Aging Management Evaluation – Main Steam System  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	PB	Carbon Steel	Secondary Water (Int)	Cumulative fatigue damage	Time-Limited Aging Analysis evaluated for the period of extended operation	VIII.B1-10	3.4.1.01	C
Valve	LBS, PB, SIA	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-11	3.4.1.04	A
Valve	LBS, PB, SIA	Carbon Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	VIII.B1-7	3.4.1.30	B
Valve	PB	Copper Alloy (Zinc >15%)	Dry Gas (Int)	None	None	VIII.I-3	3.4.1.44	A
Valve	PB	Copper Alloy (Zinc >15%)	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Valve	PB	Stainless Steel	Dry Gas (Int)	None	None	VIII.I-12	3.4.1.44	A
Valve	PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A
Valve	PB	Stainless Steel	Secondary Water (Int)	Cracking	Water Chemistry (B2.1.2)	VIII.B1-2	3.4.1.39	A
Valve	PB	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2)	VIII.B1-3	3.4.1.37	A
Valve	PB	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-4	3.4.1.16	A

**Section 3.4**  
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**POWER CONVERSION SYSTEM**

*Table 3.4.2-1 Steam and Power Conversion System – Summary of Aging Management Evaluation – Main Steam System  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	PB	Stainless Steel	Secondary Water (Int)	Cracking	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-5	3.4.1.14	A
Valve	SIA	Stainless Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	V.D1-29	3.2.1.08	E

**Notes for Table 3.4.2-1:**

**Standard Notes:**

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
- G Environment not in NUREG-1801 for this component and material.
- J Neither the component nor the material and environment combination is evaluated in NUREG-1801.

**Plant Specific Notes:**

- 1 Loss of Preload is considered to be applicable for all closure bolting.
- 2 NUREG-1801 does not consider mechanical insulation. The thermal insulation in-scope for license renewal is located in areas with non-aggressive environments (the insulation is not exposed to contaminants). Based on the review of the SERs of recent license renewal applications (Millstone, Dresden and Quad Cities, Cook, ANO-2, and Robinson) and review of the site operating experience, stainless steel insulation, closed cell foam, quilted fiberglass insulation, calcium silicate and insulation jacketing in non-aggressive environments have no aging effects requiring management.

Section 3.4  
AGING MANAGEMENT OF STEAM AND  
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Table 3.4.2-2 Steam and Power Conversion System – Summary of Aging Management Evaluation – Condensate Storage and Transfer System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure Bolting	LBS, SIA	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G
Closure Bolting	LBS, SIA	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VIII.H-1	3.4.1.22	B
Closure Bolting	LBS, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VIII.H-4	3.4.1.22	B
Closure Bolting	LBS, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VIII.H-5	3.4.1.22	B
Closure Bolting	LBS, PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G, 1
Flow Element	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A
Flow Element	PB	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A

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**AGING MANAGEMENT OF STEAM AND**  
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*Table 3.4.2-2 Steam and Power Conversion System – Summary of Aging Management Evaluation – Condensate Storage and Transfer System (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Orifice	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A
Orifice	PB	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A
Piping	LBS, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Piping	LBS, SIA	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-34	3.4.1.04	A
Piping	PB, SIA	Stainless Steel	Atmosphere/ Weather (Ext)	None	None	None	None	G
Piping	PB	Stainless Steel	Encased in Concrete (Ext)	None	None	VIII.I-11	3.4.1.43	A
Piping	LBS, PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A



**Section 3.4**  
**AGING MANAGEMENT OF STEAM AND**  
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*Table 3.4.2-2 Steam and Power Conversion System – Summary of Aging Management Evaluation – Condensate Storage and Transfer System (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	LBS, PB, SIA	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A
Piping	PB, SIA	Stainless Steel	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	V.D1-29	3.2.1.08	E
Pump	PB	Stainless Steel Cast Austenitic	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A
Pump	PB	Stainless Steel Cast Austenitic	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A
Tank Liner	PB	Stainless Steel	Dry Gas (Int)	None	None	VIII.I-12	3.4.1.44	A
Tank Liner	PB	Stainless Steel	Encased in Concrete (Ext)	None	None	VIII.I-11	3.4.1.43	C
Tank Liner	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	C

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**AGING MANAGEMENT OF STEAM AND**  
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*Table 3.4.2-2 Steam and Power Conversion System – Summary of Aging Management Evaluation – Condensate Storage and Transfer System (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tank Liner	PB	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-40	3.4.1.06	A
Tubing	LBS	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A
Tubing	LBS	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A
Valve	LBS, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Valve	LBS, PB	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-34	3.4.1.04	A
Valve	LBS, PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A

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**AGING MANAGEMENT OF STEAM AND**  
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*Table 3.4.2-2 Steam and Power Conversion System – Summary of Aging Management Evaluation – Condensate Storage and Transfer System (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	LBS, PB, SIA	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A
Valve	SIA	Stainless Steel Cast Austenitic	Atmosphere/ Weather (Ext)	None	None	None	None	G
Valve	PB	Stainless Steel Cast Austenitic	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A
Valve	PB	Stainless Steel Cast Austenitic	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.E-29	3.4.1.16	A
Valve	SIA	Stainless Steel Cast Austenitic	Wetted Gas (Int)	Loss of material	Inspection Of Internal Surfaces In Miscellaneous Piping And Ducting Components (B2.1.22)	V.D1-29	3.2.1.08	E

**Section 3.4**  
**AGING MANAGEMENT OF STEAM AND**  
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Notes for Table 3.4.2-2:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
- G Environment not in NUREG-1801 for this component and material.

Plant Specific Note:

- 1 Loss of Preload is considered to be applicable for all closure bolting.

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*Table 3.4.2-3 Steam and Power Conversion System – Summary of Aging Management Evaluation – Auxiliary Feedwater System*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure Bolting	LBS, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VIII.H-4	3.4.1.22	B
Closure Bolting	LBS, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VIII.H-5	3.4.1.22	B
Closure Bolting	LBS, PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	G, 1
Filter	PB	Aluminum	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	None	None	G
Filter	PB	Aluminum	Plant Indoor Air (Ext)	None	None	V.F-2	3.2.1.50	A
Filter	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VIII.G-35	3.4.1.07	B
Filter	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Flexible Hoses	PB	Nickel Alloys	Plant Indoor Air (Ext)	None	None	V.F-11	3.2.1.53	A
Flexible Hoses	PB	Nickel Alloys	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2)	VIII.B1-1	3.4.1.37	A
Flow Element	PB, TH	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A

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**AGING MANAGEMENT OF STEAM AND**  
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*Table 3.4.2-3 Steam and Power Conversion System – Summary of Aging Management Evaluation – Auxiliary Feedwater System  
(Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Flow Element	PB, TH	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.G-32	3.4.1.16	A
Heat Exchanger (AF Turbine Oil Cooler)	HT, PB	Carbon Steel	Lubricating Oil (Ext)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VIII.G-6	3.4.1.12	B
Heat Exchanger (AF Turbine Oil Cooler)	HT, PB	Carbon Steel	Lubricating Oil (Ext)	Reduction of heat transfer	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VIII.G-15	3.4.1.10	B
Heat Exchanger (AF Turbine Oil Cooler)	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VIII.G-6	3.4.1.12	B
Heat Exchanger (AF Turbine Oil Cooler)	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Heat Exchanger (AF Turbine Oil Cooler)	HT, PB	Carbon Steel	Secondary Water (Int)	Reduction of heat transfer	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	None	None	G
Heat Exchanger (AF Turbine Oil Cooler)	HT, PB	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.G-38	3.4.1.04	C

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**AGING MANAGEMENT OF STEAM AND**  
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*Table 3.4.2-3 Steam and Power Conversion System – Summary of Aging Management Evaluation – Auxiliary Feedwater System  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Insulation	INS	Aluminum	Plant Indoor Air (Ext)	None	None	V.F-2	3.2.1.50	C
Insulation	INS	Insulation Calcium Silicate	Plant Indoor Air (Ext)	None	None	None	None	J, 2
Orifice	PB, TH	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VIII.G-35	3.4.1.07	B
Orifice	PB, TH	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Orifice	PB, TH	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2)	VIII.B1-8	3.4.1.37	A
Orifice	PB, TH	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.G-38	3.4.1.04	A
Orifice	PB, TH	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A
Orifice	PB, TH	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.G-32	3.4.1.16	A
Orifice	PB, TH	Stainless Steel Cast Austenitic	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A
Orifice	PB, TH	Stainless Steel Cast Austenitic	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.G-32	3.4.1.16	A

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*Table 3.4.2-3 Steam and Power Conversion System – Summary of Aging Management Evaluation – Auxiliary Feedwater System  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VIII.G-35	3.4.1.07	B
Piping	LBS, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Piping	PB	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2)	VIII.B1-8	3.4.1.37	A
Piping	PB	Carbon Steel	Secondary Water (Int)	Wall thinning	Flow-Accelerated Corrosion (B2.1.6)	VIII.B1-9	3.4.1.29	B
Piping	PB	Carbon Steel	Secondary Water (Int)	Cumulative fatigue damage	Time-Limited Aging Analysis evaluated for the period of extended operation	VIII.G-37	3.4.1.01	A
Piping	LBS, SIA	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.G-38	3.4.1.04	A
Piping	LBS, PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A
Piping	LBS, PB, SIA	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.G-32	3.4.1.16	A
Pump	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VIII.G-35	3.4.1.07	B
Pump	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B



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*Table 3.4.2-3 Steam and Power Conversion System – Summary of Aging Management Evaluation – Auxiliary Feedwater System  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump	PB	Stainless Steel Cast Austenitic	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A
Pump	PB	Stainless Steel Cast Austenitic	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.G-32	3.4.1.16	A
Sight Gauge	LBS	Glass	Plant Indoor Air (Ext)	None	None	VIII.I-5	3.4.1.40	A
Sight Gauge	LBS	Glass	Secondary Water (Int)	None	None	VIII.I-8	3.4.1.40	A
Strainer	LBS, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Strainer	LBS, SIA	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.G-38	3.4.1.04	A
Tubing	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VIII.G-35	3.4.1.07	B
Tubing	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Tubing	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A
Tubing	PB	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.G-32	3.4.1.16	A

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*Table 3.4.2-3 Steam and Power Conversion System – Summary of Aging Management Evaluation – Auxiliary Feedwater System  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Turbine	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Turbine	PB	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2)	VIII.B1-8	3.4.1.37	A
Turbine	PB	Carbon Steel	Secondary Water (Int)	Wall thinning	Flow-Accelerated Corrosion (B2.1.6)	VIII.B1-9	3.4.1.29	B
Valve	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VIII.G-35	3.4.1.07	B
Valve	LBS, PB, SIA	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Valve	LBS, PB, SIA	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2)	VIII.B1-8	3.4.1.37	A
Valve	PB	Carbon Steel	Secondary Water (Int)	Wall thinning	Flow-Accelerated Corrosion (B2.1.6)	VIII.B1-9	3.4.1.29	B
Valve	LBS, PB, SIA	Carbon Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.G-38	3.4.1.04	A
Valve	PB	Cast Iron	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VIII.G-35	3.4.1.07	B
Valve	PB	Cast Iron	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Valve	LBS, PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A

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*Table 3.4.2-3 Steam and Power Conversion System – Summary of Aging Management Evaluation – Auxiliary Feedwater System  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	LBS, PB, SIA	Stainless Steel	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.G-32	3.4.1.16	A

Notes for Table 3.4.2-3:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- G Environment not in NUREG-1801 for this component and material.
- J Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

- 1 Loss of Preload is considered to be applicable for all closure bolting.
- 2 NUREG-1801 does not consider mechanical insulation. The thermal insulation in-scope for license renewal is located in areas with non-aggressive environments (meaning the insulation is not exposed to contaminants). Based on the review of the SERs of recent license renewal applications (Millstone, Dresden and Quad Cities, Cook, ANO-2, and Robinson) and review of the site operating experience, stainless steel insulation, closed cell foam, quilted fiberglass insulation, calcium silicate and insulation jacketing in non-aggressive environments have no aging effects requiring management.

## **3.5            AGING MANAGEMENT OF CONTAINMENTS, STRUCTURES AND COMPONENT SUPPORTS**

### **3.5.1           Introduction**

Section 3.5 provides the results of the aging management reviews for those component types identified in Section 2.4, Scoping and Screening Results – Structures, subject to aging management review. The structures are described in the following sections:

- Containment building (Section 2.4.1)
- Control building (Section 2.4.2)
- Diesel generator building (Section 2.4.3)
- Turbine building (Section 2.4.4)
- Auxiliary building (Section 2.4.5)
- Radwaste building (Section 2.4.6)
- Main steam support structure (Section 2.4.7)
- Station blackout generator structures (Section 2.4.8)
- Fuel building (Section 2.4.9)
- Spray pond and associated water control structures (Section 2.4.10)
- Tank foundations and shells (Section 2.4.11)
- Transformer foundations and electrical structures (Section 2.4.12)
- Yard structures (in-scope) (Section 2.4.13)
- Supports (Section 2.4.14)

Table 3.5.1, Summary of Aging Management Evaluations in Chapter II and III of NUREG-1801 for Containments, Structures, and Component Supports, provides the summary of the programs evaluated in NUREG-1801 that are applicable to component types in this Section. Table 3.5.1 uses the format of Table 1 described in Section 3.0.

### **3.5.2           Results**

The following tables summarize the results of the aging management review for the systems in the containments, structures and component supports area:

- Table 3.5.2-1      Containments, Structures, and Component Supports -  
Summary of Aging Management Evaluation - Containment Building

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- Table 3.5.2-2     Containments, Structures, and Component Supports - Summary of Aging Management Evaluation - Control Building
- Table 3.5.2-3     Containments, Structures, and Component Supports - Summary of Aging Management Evaluation - Diesel Generator Building
- Table 3.5.2-4     Containments, Structures, and Component Supports - Summary of Aging Management Evaluation - Turbine Building
- Table 3.5.2-5     Containments, Structures, and Component Supports - Summary of Aging Management Evaluation - Auxiliary Building
- Table 3.5.2-6     Containments, Structures, and Component Supports - Summary of Aging Management Evaluation - Radwaste Building
- Table 3.5.2-7     Containments, Structures, and Component Supports - Summary of Aging Management Evaluation – Main Steam Support Structure
- Table 3.5.2-8     Containments, Structures, and Component Supports - Summary of Aging Management Evaluation – Station Blackout Generator Structures
- Table 3.5.2-9     Containments, Structures, and Component Supports - Summary of Aging Management Evaluation – Fuel Building
- Table 3.5.2-10    Containments, Structures, and Component Supports - Summary of Aging Management Evaluation – Spray Pond and Associated Water Control Structures
- Table 3.5.2-11    Containments, Structures, and Component Supports - Summary of Aging Management Evaluation – Tank Foundations and Shells
- Table 3.5.2-12    Containments, Structures, and Component Supports - Summary of Aging Management Evaluation – Transformer Foundations and Electrical Structures
- Table 3.5.2-13    Containments, Structures, and Component Supports - Summary of Aging Management Evaluation – Yard Structures (in-scope)
- Table 3.5.2-14    Containments, Structures, and Component Supports - Summary of Aging Management Evaluation - Supports

These tables use the format of Table 2 discussed in Section 3.0.

**3.5.2.1        Materials, Environment, Aging Effects Requiring Management and Aging Management Programs**

The materials from which the component types are fabricated, the environments to which they are exposed, the potential aging effects requiring management, and the aging

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management programs used to manage these aging effects are provided for each of the above structures and commodities in the following subsections.

**3.5.2.1.1 Containment Building**

**Materials**

The materials of construction for the containment building component types are:

- Carbon Steel
- Concrete
- Elastomer
- Glass
- Stainless Steel
- Thermo-Lag

**Environment**

The containment building component types are exposed to the following environments:

- Atmosphere/ Weather (Structural)
- Buried (Structural)
- Encased in Concrete
- Plant Indoor Air (Structural)
- Submerged (Structural)

**Aging Effects Requiring Management**

The following containment building aging effects require management:

- Concrete cracking and spalling
- Cracking
- Cracking due to expansion
- Cracking, loss of bond, and loss of material (spalling, scaling)
- Cracks and distortion
- Increase in porosity and permeability, cracking, loss of material (spalling, scaling)
- Increase in porosity, permeability
- Increased hardness, shrinkage and loss of strength

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- Loss of leak tightness
- Loss of material
- Loss of material (spalling, scaling) and cracking
- Loss of material, cracking
- Loss of sealing; leakage through containment

**Aging Management Programs**

The following aging management programs manage the aging effects for the containment building component types:

- 10 CFR 50, Appendix J (B2.1.30)
- ASME Section XI, Subsection IWE (B2.1.27)
- ASME Section XI, Subsection IWL (B2.1.28)
- Fire Protection (B2.1.12)
- Structures Monitoring Program (B2.1.32)
- Water Chemistry (B2.1.2)

**3.5.2.1.2 Control Building**

**Materials**

The materials of construction for the control building component types are:

- Aluminum
- Carbon Steel
- Concrete
- Concrete Block (Masonry Walls)
- Elastomer
- Fire Barrier (Cementitious Coating)
- Fire Barrier (Ceramic Fiber)
- Gypsum/ Plaster

**Environment**

The control building component types are exposed to the following environments:

- Atmosphere/ Weather (Structural)

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- Buried (Structural)
- Encased in Concrete
- Plant Indoor Air (Structural)

**Aging Effects Requiring Management**

The following control building aging effects require management:

- Concrete cracking and spalling
- Cracking
- Cracking due to expansion
- Cracking, loss of bond, and loss of material (spalling, scaling)
- Cracks and distortion
- Increase in porosity and permeability, cracking, loss of material (spalling, scaling)
- Increased hardness, shrinkage and loss of strength
- Loss of material
- Loss of material (spalling, scaling) and cracking
- Loss of material, cracking
- Loss of sealing

**Aging Management Programs**

The following aging management programs manage the aging effects for the control building component types:

- Fire Protection (B2.1.12)
- Masonry Wall Program (B2.1.31)
- Structures Monitoring Program (B2.1.32)

**3.5.2.1.3 Diesel Generator Building**

**Materials**

The materials of construction for the diesel generator building component types are:

- Carbon Steel
- Concrete
- Elastomer



### **Environment**

The diesel generator building component types are exposed to the following environments:

- Atmosphere/ Weather (Structural)
- Buried (Structural)
- Encased in Concrete
- Plant Indoor Air (Structural)

### **Aging Effects Requiring Management**

The following diesel generator building aging effects require management:

- Concrete cracking and spalling
- Cracking due to expansion
- Cracking, loss of bond, and loss of material (spalling, scaling)
- Cracks and distortion
- Increase in porosity and permeability, cracking, loss of material (spalling, scaling)
- Increased hardness, shrinkage and loss of strength
- Loss of material
- Loss of material (spalling, scaling) and cracking
- Loss of sealing

### **Aging Management Programs**

The following aging management programs manage the aging effects for the diesel generator building component types:

- Fire Protection (B2.1.12)
- Structures Monitoring Program (B2.1.32)

#### **3.5.2.1.4 Turbine Building**

##### **Materials**

The materials of construction for the turbine building component types are:

- Carbon Steel
- Concrete

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- Concrete Block (Masonry Walls)
- Elastomer
- Fire Barrier (Cementitious Coating)

**Environment**

The turbine building component types are exposed to the following environments:

- Atmosphere/ Weather (Structural)
- Buried (Structural)
- Encased in Concrete
- Plant Indoor Air (Structural)

**Aging Effects Requiring Management**

The following turbine building aging effects require management:

- Cracking
- Cracking due to expansion
- Cracking, loss of bond, and loss of material (spalling, scaling)
- Cracks and distortion
- Increase in porosity and permeability, cracking, loss of material (spalling, scaling)
- Increased hardness, shrinkage and loss of strength
- Loss of material
- Loss of material (spalling, scaling) and cracking
- Loss of material, cracking
- Loss of sealing

**Aging Management Programs**

The following aging management programs manage the aging effects for the turbine building component types:

- Fire Protection (B2.1.12)
- Masonry Wall Program (B2.1.31)
- Structures Monitoring Program (B2.1.32)

### **3.5.2.1.5      Auxiliary Building**

#### **Materials**

The materials of construction for the auxiliary building component types are:

- Carbon Steel
- Concrete
- Concrete Block (Masonry Walls)
- Elastomer
- Fire Barrier (Cementitious Coating)
- Gypsum/ Plaster
- Stainless Steel

#### **Environment**

The auxiliary building component types are exposed to the following environments:

- Atmosphere/ Weather (Structural)
- Buried (Structural)
- Encased in Concrete
- Plant Indoor Air (Structural)

#### **Aging Effects Requiring Management**

The following auxiliary building aging effects require management:

- Concrete cracking and spalling
- Cracking
- Cracking due to expansion
- Cracking, loss of bond, and loss of material (spalling, scaling)
- Cracks and distortion
- Increase in porosity and permeability, cracking, loss of material (spalling, scaling)
- Increased hardness, shrinkage and loss of strength
- Loss of material
- Loss of material (spalling, scaling) and cracking
- Loss of material, cracking

- Loss of sealing

#### **Aging Management Programs**

The following aging management programs manage the aging effects for the auxiliary building component types:

- Fire Protection (B2.1.12)
- Masonry Wall Program (B2.1.31)
- Structures Monitoring Program (B2.1.32)

#### **3.5.2.1.6 Radwaste Building**

##### **Materials**

The materials of construction for the radwaste building component types are:

- Aluminum
- Carbon Steel
- Concrete
- Elastomer

##### **Environment**

The radwaste building component types are exposed to the following environments:

- Atmosphere/ Weather (Structural)
- Buried (Structural)
- Plant Indoor Air (Structural)

##### **Aging Effects Requiring Management**

The following radwaste building aging effects require management:

- Concrete cracking and spalling
- Cracking due to expansion
- Cracking, loss of bond, and loss of material (spalling, scaling)
- Cracks and distortion
- Increase in porosity and permeability, cracking, loss of material (spalling, scaling)
- Increased hardness, shrinkage and loss of strength

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- Loss of material
- Loss of material (spalling, scaling) and cracking
- Loss of sealing

**Aging Management Programs**

The following aging management programs manage the aging effects for the radwaste building component types:

- Fire Protection (B2.1.12)
- Structures Monitoring Program (B2.1.32)

**3.5.2.1.7 Main Steam Support Structure**

**Materials**

The materials of construction for the main steam support structure component types are:

- Carbon Steel
- Concrete
- Elastomer

**Environment**

The main steam support structure component types are exposed to the following environments:

- Atmosphere/ Weather (Structural)
- Buried (Structural)
- Encased in Concrete
- Plant Indoor Air (Structural)

**Aging Effects Requiring Management**

The following main steam support structure aging effects require management:

- Concrete cracking and spalling
- Cracking due to expansion
- Cracking, loss of bond, and loss of material (spalling, scaling)
- Cracks and distortion

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- Increase in porosity and permeability, cracking, loss of material (spalling, scaling)
- Increased hardness, shrinkage and loss of strength
- Loss of material
- Loss of material (spalling, scaling) and cracking
- Loss of sealing

**Aging Management Programs**

The following aging management programs manage the aging effects for the main steam support structure component types:

- Fire Protection (B2.1.12)
- Structures Monitoring Program (B2.1.32)

**3.5.2.1.8 Station Blackout Generator Structures**

**Materials**

The materials of construction for the station blackout generator structures component types are:

- Carbon Steel
- Concrete

**Environment**

The station blackout generator structures component types are exposed to the following environments:

- Atmosphere/ Weather (Structural)
- Buried (Structural)
- Encased in Concrete
- Plant Indoor Air (Structural)

**Aging Effects Requiring Management**

The following station blackout generator structures aging effects require management:

- Cracking due to expansion
- Cracking, loss of bond, and loss of material (spalling, scaling)
- Cracks and distortion

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- Increase in porosity and permeability, cracking, loss of material (spalling, scaling)
- Loss of material
- Loss of material (spalling, scaling) and cracking

**Aging Management Programs**

The following aging management program manages the aging effects for the station blackout generator structures component types:

- Structures Monitoring Program (B2.1.32)

**3.5.2.1.9 Fuel Building**

**Materials**

The materials of construction for the fuel building component types are:

- Carbon Steel
- Concrete
- Elastomer
- Stainless Steel

**Environment**

The fuel building component types are exposed to the following environments:

- Atmosphere/ Weather (Structural)
- Buried (Structural)
- Encased in Concrete
- Plant Indoor Air (Structural)
- Treated Borated Water

**Aging Effects Requiring Management**

The following fuel building aging effects require management:

- Concrete cracking and spalling
- Cracking
- Cracking due to expansion
- Cracking, loss of bond, and loss of material (spalling, scaling)

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- Cracks and distortion
- Increase in porosity and permeability, cracking, loss of material (spalling, scaling)
- Increased hardness, shrinkage and loss of strength
- Loss of material
- Loss of material (spalling, scaling) and cracking
- Loss of sealing

**Aging Management Programs**

The following aging management programs manage the aging effects for the fuel building component types:

- Fire Protection (B2.1.12)
- Structures Monitoring Program (B2.1.32)
- Water Chemistry (B2.1.2)

**3.5.2.1.10 Spray Pond and Associated Water Control Structures**

**Materials**

The materials of construction for the spray pond and associated water control structures component types are:

- Carbon Steel
- Concrete
- Copper Alloy
- Elastomer
- Stainless Steel

**Environment**

The spray pond and associated water control structures component types are exposed to the following environments:

- Atmosphere/ Weather (Structural)
- Buried (Structural)
- Plant Indoor Air (Structural)
- Raw Water



- Submerged (Structural)

### **Aging Effects Requiring Management**

The following spray pond and associated water control structures aging effects require management:

- Concrete cracking and spalling
- Cracking due to expansion
- Cracking, loss of bond, and loss of material (spalling, scaling)
- Cracks and distortion
- Increase in porosity and permeability, cracking, loss of material (spalling, scaling)
- Increase in porosity and permeability, loss of strength
- Loss of material
- Loss of material (spalling, scaling) and cracking
- Loss of sealing

### **Aging Management Programs**

The following aging management programs manage the aging effects for the spray pond and associated water control structures component types:

- Fire Protection (B2.1.12)
- Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B2.1.33)
- Structures Monitoring Program (B2.1.32)

#### **3.5.2.1.11 Tank Foundations and Shells**

##### **Materials**

The materials of construction for tank foundations and shells component types are:

- Carbon Steel
- Concrete
- Elastomer

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**Environment**

The tank foundations and shells component types are exposed to the following environments:

- Atmosphere/ Weather (Structural)
- Buried (Structural)
- Encased in Concrete
- Plant Indoor Air (Structural)

**Aging Effects Requiring Management**

The following tank foundations and shells aging effects require management:

- Cracking due to expansion
- Cracking, loss of bond, and loss of material (spalling, scaling)
- Cracks and distortion
- Increase in porosity and permeability, cracking, loss of material (spalling, scaling)
- Loss of material
- Loss of material (spalling, scaling) and cracking
- Loss of sealing

**Aging Management Programs**

The following aging management program manages the aging effects for the tank foundations and shells component types:

- Structures Monitoring Program (B2.1.32)

**3.5.2.1.12 Transformer Foundations and Electrical Structures**

**Materials**

The materials of construction for the transformer foundations and electrical structures component types are:

- Carbon Steel
- Concrete
- Elastomer

### **Environment**

The transformer foundations and electrical structures component types are exposed to the following environments:

- Atmosphere/ Weather (Structural)
- Buried (Structural)
- Encased in Concrete

### **Aging Effects Requiring Management**

The following transformer foundations and electrical structures aging effects require management:

- Concrete cracking and spalling
- Cracking due to expansion
- Cracking, loss of bond, and loss of material (spalling, scaling)
- Cracks and distortion
- Increase in porosity and permeability, cracking, loss of material (spalling, scaling)
- Increased hardness, shrinkage and loss of strength
- Loss of material
- Loss of material (spalling, scaling) and cracking
- Loss of sealing

### **Aging Management Programs**

The following aging management programs manage the aging effects for the transformer foundations and electrical structures component types:

- Fire Protection (B2.1.12)
- Structures Monitoring Program (B2.1.32)

#### **3.5.2.1.13 Yard Structures (In-Scope)**

### **Materials**

The materials of construction for the yard structures (in-scope) component types are:

- Carbon Steel
- Concrete

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- Concrete Block (Masonry Walls)
- Elastomer
- Gypsum/ Plaster

**Environment**

The yard structures (in-scope) component types are exposed to the following environments:

- Atmosphere/ Weather (Structural)
- Buried (Structural)
- Encased in Concrete
- Plant Indoor Air (Structural)

**Aging Effects Requiring Management**

The following yard structures (in-scope) aging effects require management:

- Concrete cracking and spalling
- Cracking
- Cracking due to expansion
- Cracking, loss of bond, and loss of material (spalling, scaling)
- Increase in porosity and permeability, cracking, loss of material (spalling, scaling)
- Loss of material
- Loss of material (spalling, scaling) and cracking
- Loss of sealing

**Aging Management Programs**

The following aging management programs manage the aging effects for the yard structures (in-scope) component types:

- Fire Protection (B2.1.12)
- Masonry Wall Program (B2.1.31)
- Structures Monitoring Program (B2.1.32)

### **3.5.2.1.14 Supports**

#### **Materials**

The materials of construction for the supports component types are:

- Aluminum
- Carbon Steel
- Concrete
- High Strength Low Alloy Steel (Bolting)
- Lubrite
- Stainless Steel

#### **Environment**

The supports component types are exposed to the following environments:

- Atmosphere/ Weather (Structural)
- Borated Water Leakage
- Fuel Oil
- Plant Indoor Air (Structural)
- Raw Water

#### **Aging Effects Requiring Management**

The following supports aging effects require management:

- Cracking
- Loss of material
- Loss of mechanical function
- Reduction in concrete anchor capacity

#### **Aging Management Programs**

The following aging management programs manage the aging effects for the supports component types:

- ASME Section XI, Subsection IWF (B2.1.29)
- Bolting Integrity (B2.1.7)
- Boric Acid Corrosion (B2.1.4)

- Structures Monitoring Program (B2.1.32)

### **3.5.2.2 Further Evaluation of Aging Management as Recommended by NUREG-1801**

NUREG-1801 provides the basis for identifying those programs that warrant further evaluation. For the containments, structures and component supports areas, those evaluations are addressed in the following subsections.

#### **3.5.2.2.1 PWR and BWR Containments**

##### **3.5.2.2.1.1 Aging of Inaccessible Concrete Areas**

###### *Aggressive Chemical Attack:*

Reinforced concrete structures at PVNGS were designed, constructed, and inspected in accordance with ACI and ASTM standards, which provide for a good quality, dense, well-cured, and low permeability concrete. Procedural controls ensured quality throughout the batching, mixing, and placement processes. UFSAR Section 3.8 discusses the design requirements for each major structure. Crack control was achieved through proper sizing, spacing, and distribution of reinforcing steel in accordance with ACI 318-71. Concrete structures at PVNGS are not subjected to groundwater for any sustained periods. An engineering study was performed to confirm that groundwater elevations are below the lowest structures. Therefore, further evaluation for the effects of aggressive chemical attack is not required.

###### *Corrosion of Embedded Steel:*

Reinforced concrete structures at PVNGS were designed, constructed, and inspected in accordance with ACI and ASTM standards, which provide for a good quality, dense, well-cured, and low permeability concrete. Procedural controls ensured quality throughout the batching, mixing, and placement processes. UFSAR Section 3.8 discusses the design requirements for each major structure. Crack control was achieved through proper sizing, spacing, and distribution of reinforcing steel in accordance with ACI 318-71. Concrete structures at PVNGS are not subjected to groundwater for any sustained periods. An engineering study was performed to confirm that groundwater elevations are below the lowest structures. Therefore, further evaluation for the effects of corrosion of embedded steel is not required.

**3.5.2.2.1.2 Cracks and Distortion due to Increased Stress Levels from Settlement; Reduction of Foundation Strength, Cracking, and Differential Settlement due to Erosion of Porous Concrete Subfoundations, if not Covered by the Structures Monitoring Program**

*Settlement:*

Further evaluation for the effects of settlement is not required because the concrete components are evaluated under the Structures Monitoring Program, and no permanent de-watering system has been constructed at PVNGS. UFSAR Section 2.5.4.13 describes PVNGS settlement monitoring, which is part of the Structures Monitoring Program.

*Porous Concrete Subfoundations:*

PVNGS does not have porous concrete subfoundations. Therefore, further evaluation for this effect is not required.

**3.5.2.2.1.3 Reduction of Strength and Modulus of Concrete Structures due to Elevated Temperature**

*Elevated Temperatures:*

At PVNGS, the reactor cavity cooling subsystem operates in conjunction with the containment normal cooling units and provides cooling of the primary shield and reactor cavity to limit the concrete temperature to less than the specified maximum of 150F. The system functions continuously during normal plant operation. The reactor cavity temperature is monitored with four cavity high temperature alarm channels that are annunciated in the control room (UFSAR Section 9.4.6.2.2.E). To ensure that temperatures remain below the specified limit, PVNGS Technical Specifications (LCO 3.6.5) require that the containment average air temperature shall not exceed 117° F. PVNGS Design Basis Manual HC, Containment Building HVAC System, Table 5-1, specifies instrumentation to provide control room indication of the reactor cavity temperature, and a control alarm on high temperature with a set point of 115 +/- 5° F. For high temperature pipe at PVNGS, penetrations have been designed to limit the local concrete temperature to 200° F. (Ref. UFSAR Appendix 14A, Response 14A.34). Process piping penetrations were designed with a special flued head and the pipe is insulated to prevent excessive concrete temperatures (UFSAR Section 3.8.1.1.3.3). Therefore, reduction of strength and modulus of concrete structures due to elevated temperature is not an aging effect that requires further evaluation. Accessible concrete components are monitored by the Structures Monitoring Program to confirm the absence of aging effects that could impact the structural integrity / intended function of the component.

#### **3.5.2.2.1.4 Loss of Material due to General, Pitting, and Crevice Corrosion**

*Corrosion in inaccessible areas of steel containment liner:*

Reinforced concrete structures at PVNGS were designed, constructed, and inspected in accordance with ACI and ASTM standards, which provide for a good quality, dense, well-cured, and low permeability concrete. Procedural controls ensured quality throughout the batching, mixing, and placement processes. UFSAR Section 3.8 discusses the design requirements for each major structure. Concrete mixes were designed in accordance with ACI 211.1-74. The ASME Section XI, Subsection IWL Program will identify and manage any cracks in the concrete that could potentially provide a pathway for water to reach inaccessible portions of the steel containment liner. Procedural controls ensure that borated water spills are not common, and when detected are cleaned up in a timely manner. Therefore, further evaluation for corrosion in inaccessible areas of the steel containment liner is not required.

#### **3.5.2.2.1.5 Loss of Prestress due to Relaxation, Shrinkage, Creep, and Elevated Temperature**

Loss of prestress forces due to relaxation, shrinkage, creep, and elevated temperature for PWR prestressed concrete containments and BWR Mark II prestressed concrete containments is a TLAA as defined in 10 CFR 54.3. TLAAs are evaluated in accordance with 10 CFR 54.21(c). The PVNGS containment is a prestressed concrete pressure vessel with ungrouted tendons. Section 4.5 describes the evaluation of this TLAA.

#### **3.5.2.2.1.6 Cumulative Fatigue Damage**

Analysis of fatigue in containment penetrations are TLAAs as defined in 10 CFR 54.3 only if a CLB fatigue analysis exists. TLAAs are evaluated in accordance with 10 CFR 54.21(c). PVNGS containment penetrations for the main steam, main feedwater, and recirculation sump suction penetrations are supported by TLAAs. There are no penetration bellows within the scope of license renewal at PVNGS. Section 4.6.2 describes the evaluation of the main steam and feedwater penetrations. Section 4.6.3 describes the evaluation of the recirculation sump suction penetrations.

#### **3.5.2.2.1.7 Cracking due to Stress Corrosion Cracking (SCC)**

Not applicable. PVNGS has no in-scope stainless steel penetration sleeves, penetration bellows, or dissimilar metal welds subject to stress corrosion cracking, so the applicable NUREG-1801 lines were not used.

#### **3.5.2.2.1.8 Cracking due to Cyclic Loading**

Not applicable. Fatigue of metal components is a TLAA, evaluated in accordance with 10 CFR 54.21(c), so the applicable NUREG-1801 lines were not used.



### **3.5.2.2.1.9 Loss of Material (Scaling, Cracking, and Spalling) due to Freeze Thaw**

#### *Freeze-Thaw:*

PVNGS is located in a weathering region classified as Negligible according to Figure 1 of ASTM C33-03. Therefore, further evaluation for the effects of freeze-thaw is not required.

### **3.5.2.2.1.10 Cracking due to Expansion, and Reaction with Aggregate, and Increase in Porosity and Permeability due to Leaching of Calcium Hydroxide**

#### *Reaction with Aggregates:*

As noted in UFSAR Section 3.8.1.6.1.B, source acceptance of aggregates was based, in part, on petrographic examination in accordance with ASTM C295. 13-CN-101, Technical Specification for Furnishing and Delivering Concrete for APS PVNGS Quality Class Q, Section 7.2.2.c, specifies that aggregate reactivity be determined by ASTM C289 and C227. The concrete aggregates were found to be non-reactive. Therefore, further evaluation for the effects of reaction with aggregates is not required.

#### *Leaching of Calcium Hydroxide:*

Reinforced concrete structures at PVNGS were designed, constructed, and inspected in accordance with ACI and ASTM standards, which provide for a good quality, dense, well-cured, and low permeability concrete. Procedural controls ensured quality throughout the batching, mixing, and placement processes. UFSAR Section 3.8 discusses the design requirements for each major structure. Concrete mixes were designed in accordance with ACI 211.1-74. Concrete structures in groups 1-3, 5, 7-9 at PVNGS are not subjected to flowing water for any sustained periods. An engineering study was performed to confirm that groundwater elevations are below the lowest structures. Therefore, further evaluation for the effects of leaching of calcium hydroxide is not required.

### **3.5.2.2.2 Safety-Related and Other Structures and Component Supports**

#### **3.5.2.2.2.1 Aging of Structures Not Covered by Structures Monitoring Program**

The following aging effects do not require further evaluation because the components are evaluated under the Structures Monitoring Program.

- Corrosion of embedded steel
- Aggressive chemical attack
- Loss of material due to corrosion

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- Freeze-thaw
- Reaction with aggregates
- Settlement

Further evaluation for the effects of erosion of porous concrete subfoundations is not required because PVNGS does not have porous concrete subfoundations.

Further evaluation for lock up due to wear of sliding surfaces is not required because all in-scope sliding surfaces are evaluated under the Structures Monitoring Program (B2.1.32) or under ASME Section XI, Subsection IWF (B2.1.29).

**3.5.2.2.2.2 Aging Management of Inaccessible Areas**

**3.5.2.2.2.2.1 Freeze-Thaw**

*Freeze-Thaw:*

PVNGS is located in a weathering region classified as Negligible according to Figure 1 of ASTM C33-03. Therefore, further evaluation for the effects of freeze-thaw is not required.

**3.5.2.2.2.2.2 Reaction with Aggregates**

*Reaction with Aggregates:*

As noted in UFSAR Section 3.8.1.6.1.B, source acceptance of aggregates was based, in part, on petrographic examination in accordance with ASTM C295. 13-CN-101, Technical Specification for Furnishing and Delivering Concrete for APS PVNGS Quality Class Q, Section 7.2.2.c, specifies that aggregate reactivity be determined by ASTM C289 and C227. The concrete aggregates were found to be non-reactive. Therefore, further evaluation for the effects of reaction with aggregates is not required.

**3.5.2.2.2.2.3 Settlement and settlement due to erosion of porous concrete subfoundations**

*Settlement:*

Competent foundation materials were found to be present at PVNGS for establishing conservative design and construction criteria for support of the facilities. Major structures are founded either on engineered backfill or undeformed basin sediments with a minimum thickness in the power block areas of about 200 feet. These sediments are firm, consolidated, continuous, and show no evidence of shears, faults, joints, folds or other tectonic features. No permanent de-watering system has been constructed at PVNGS. As discussed in UFSAR Section 2.5.4, settlement of all major structures has been monitored since construction. Table 2.5-19 specifies a frequency for settlement monitoring of every five years, following more frequent intervals during the first three years post-construction. The most recent data were collected in December 2003. The total post-construction

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settlements recorded have been well below the 1.5 inch maximum specified in UFSAR Section 2.5.4.11. Therefore, further evaluation for the effects of settlement is not required.

*Porous Concrete Subfoundations:*

PVNGS does not have porous concrete subfoundations. Therefore, further evaluation for this effect is not required.

3.5.2.2.2.4 Aggressive chemical attack and corrosion of embedded steel

*Aggressive Chemical Attack:*

Reinforced concrete structures at PVNGS were designed, constructed, and inspected in accordance with ACI and ASTM standards, which provide for a good quality, dense, well-cured, and low permeability concrete. Procedural controls ensured quality throughout the batching, mixing, and placement processes. UFSAR Section 3.8 discusses the design requirements for each major structure. Crack control was achieved through proper sizing, spacing, and distribution of reinforcing steel in accordance with ACI 318-71. Concrete structures at PVNGS are not subjected to groundwater for any sustained periods. An engineering study was performed to confirm that groundwater elevations are below the lowest structures. Therefore, further evaluation for the effects of aggressive chemical attack is not required.

*Corrosion of Embedded Steel:*

Reinforced concrete structures at PVNGS were designed, constructed, and inspected in accordance with ACI and ASTM standards, which provide for a good quality, dense, well-cured, and low permeability concrete. Procedural controls ensured quality throughout the batching, mixing, and placement processes. UFSAR Section 3.8 discusses the design requirements for each major structure. Crack control was achieved through proper sizing, spacing, and distribution of reinforcing steel in accordance with ACI 318-71. Concrete structures at PVNGS are not subjected to groundwater for any sustained periods. An engineering study was performed to confirm that groundwater elevations are below the lowest structures. Therefore, further evaluation for the effects of corrosion of embedded steel is not required.

3.5.2.2.2.5 Leaching of Calcium Hydroxide

*Leaching of Calcium Hydroxide:*

Reinforced concrete structures at PVNGS were designed, constructed, and inspected in accordance with ACI and ASTM standards, which provide for a good quality, dense, well-cured, and low permeability concrete. Procedural controls ensured quality throughout the batching, mixing, and placement processes. UFSAR Section 3.8 discusses the design requirements for each major structure. Concrete mixes were designed in accordance with ACI 211.1-74. Concrete structures in Groups 1-3, 5, 7-9 at PVNGS are not subjected to

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flowing water for any sustained periods. An engineering study was performed to confirm that groundwater elevations are below the lowest structures. Therefore, further evaluation for the effects of leaching of calcium hydroxide is not required.

**3.5.2.2.2.3 Reduction of Strength and Modulus of Concrete Structures due to Elevated Temperature**

*Containment:*

At PVNGS, the reactor cavity cooling subsystem operates in conjunction with the containment normal cooling units and provides cooling of the primary shield and reactor cavity to limit the concrete temperature to less than the specified maximum of 150°F. The system functions continuously during normal plant operation. The reactor cavity temperature is monitored with four cavity high temperature alarm channels that are annunciated in the control room (Ref. UFSAR Section 9.4.6.2.2.E). To ensure that temperatures remain below the specified limit, PVNGS Technical Specifications (LCO 3.6.5) require that the containment average air temperature shall not exceed 117°F. PVNGS Design Basis Manual HC, Containment Building HVAC System, Table 5-1, specifies instrumentation to provide control room indication of the reactor cavity temperature, and a control alarm on high temperature with a set point of 115 +/- 5°F. For high temperature pipe at PVNGS, penetrations have been designed to limit the local concrete temperature to 200°F. (Ref. UFSAR Appendix 14A, Response 14A.34). Process piping penetrations were designed with a special flued head and the pipe is insulated to prevent excessive concrete temperatures (Ref. UFSAR Section 3.8.1.1.3.3). Therefore, reduction of strength and modulus of concrete structures due to elevated temperature is not an aging effect that requires further evaluation. Accessible concrete components will be monitored by the Structures Monitoring Program to confirm the absence of aging that could impact the structural integrity / intended function of the component.

*Main Steam Support Structure:*

For high temperature pipe at PVNGS, penetrations have been designed to limit the local concrete temperature to 200°F. Process piping penetrations were designed with a 5-way whip restraint and air flowing around the pipe to prevent excessive concrete temperatures under normal operation. In the event of a loss in air flow the exhaust fans that provide air flow will be restored to service within a seven day period. During that time the local concrete temperature, of the affected penetrations shall be monitored on a daily basis to ensure that the maximum concrete temperature does not exceed 300°F. Therefore, reduction of strength and modulus of concrete structures due to elevated temperature is not an aging effect that requires further evaluation. Accessible concrete components are monitored by the Structures Monitoring Program to confirm the absence of aging that could impact the structural integrity / intended function of the component.

UFSAR Table 3.6-2 – “High Energy Lines Outside Containment” identifies the lines outside of containment that have operating temperatures over 200 °F.

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*Turbine Building:*

There are no high energy lines in the turbine building that penetrate concrete barriers, therefore no further evaluation for the effects of Elevated Temperatures are required. (Ref. USFAR Figures 3.6-28 and -30)

*Auxiliary Building:*

Safety injection and shutdown cooling system operates at high temperature/pressure less than 2% of the time, therefore it is not considered a high energy line. (UFSAR Table 3.6-2, See note E)

The high energy lines in the auxiliary building that penetrate concrete barriers are not subjected to high temperatures and therefore no further evaluation for the effects of Elevated Temperatures are required.

*Other Structures:*

Further evaluation for the effects of Elevated Temperatures is not required because high energy lines (Operating Pressure > 275°F and/or Operating Temperature > 200°F) outside Containment are only found in the MSSS, Turbine Building, and Auxiliary Building. (UFSAR Table 3.6-2)

**3.5.2.2.2.4 Aging Management of Inaccessible Areas for Group 6 Structures**

**3.5.2.2.2.4.1 Aggressive chemical attack and corrosion of embedded steel**

*Aggressive Chemical Attack:*

Reinforced concrete structures at PVNGS were designed, constructed, and inspected in accordance with ACI and ASTM standards, which provide for a good quality, dense, well-cured, and low permeability concrete. Procedural controls ensured quality throughout the batching, mixing, and placement processes. UFSAR Section 3.8 discusses the design requirements for each major structure. Crack control was achieved through proper sizing, spacing, and distribution of reinforcing steel in accordance with ACI 318-71. Concrete structures at PVNGS are not subjected to groundwater for any sustained periods. An engineering study was performed to confirm that groundwater elevations are below the lowest structures. Therefore, further evaluation for the effects of aggressive chemical attack is not required.

*Corrosion of Embedded Steel:*

Reinforced concrete structures at PVNGS were designed, constructed, and inspected in accordance with ACI and ASTM standards, which provide for a good quality, dense, well-cured, and low permeability concrete. Procedural controls ensured quality throughout the batching, mixing, and placement processes. UFSAR Section 3.8 discusses the design

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requirements for each major structure. Crack control was achieved through proper sizing, spacing, and distribution of reinforcing steel in accordance with ACI 318-71. Concrete structures at PVNGS are not subjected to groundwater for any sustained periods. An engineering study was performed to confirm that groundwater elevations are below the lowest structures. Therefore, further evaluation for the effects of corrosion of embedded steel is not required.

**3.5.2.2.2.4.2 Freeze-Thaw**

*Freeze-Thaw:*

PVNGS is located in a weathering region classified as Negligible according to Figure 1 of ASTM C33-03. Therefore, further evaluation for the effects of freeze-thaw is not required.

**3.5.2.2.2.4.3 Reaction with Aggregates and Leaching of Calcium Hydroxide**

*Reaction with Aggregates:*

As noted in UFSAR Section 3.8.1.6.1.B, source acceptance of aggregates was based, in part, on petrographic examination in accordance with ASTM C295. 13-CN-101, Technical Specification for Furnishing and Delivering Concrete for APS PVNGS Quality Class Q, Section 7.2.2.c, specifies that aggregate reactivity be determined by ASTM C289 and C227. The concrete aggregates were found to be non-reactive. Therefore, further evaluation for the effects of reaction with aggregates is not required.

*Leaching of Calcium Hydroxide:*

Reinforced concrete structures at PVNGS were designed, constructed, and inspected in accordance with ACI and ASTM standards, which provide for a good quality, dense, well-cured, and low permeability concrete. Procedural controls ensured quality throughout the batching, mixing, and placement processes. UFSAR Section 3.8 discusses the design requirements for each major structure. Concrete mixes were designed in accordance with ACI 211.1-74. Concrete structures in groups 1-3, 5, 7-9 at PVNGS are not subjected to flowing water for any sustained periods. An engineering study was performed to confirm that groundwater elevations are below the lowest structures. Therefore, further evaluation for the effects of leaching of calcium hydroxide is not required.

**3.5.2.2.2.5 Cracking due to Stress Corrosion Cracking and Loss of Material due to Pitting and Crevice Corrosion**

The in-scope tank liners at PVNGS were evaluated in the condensate and CVCS systems and assigned NUREG-1801 lines from chapters VII and VIII. Therefore, further evaluation for the effects of cracking due to stress corrosion cracking and loss of material due to pitting and crevice corrosion is not required.

#### **3.5.2.2.2.6 Aging of Supports Not Covered by the Structures Monitoring Program**

Further evaluation of the following components is not required because they will be inspected per the Structures Monitoring Program.

- Building concrete around support anchorages
- HVAC duct supports
- Instrument supports
- Non-ASME mechanical equipment supports
- Non-ASME supports
- Electrical panels and enclosures

#### **3.5.2.2.2.7 Cumulative Fatigue Damage due to Cyclic Loading**

Analyses of fatigue in component support members, anchor bolts, and welds for Group B1.1, B1.2, and B1.3 component supports (for ASME III Class 1, 2, and 3 piping and components, and for Class MC BWR containment supports) are TLAAAs as defined in 10 CFR 54.3 only if a CLB fatigue analysis exists. The review identified no TLAAAs supporting design of these components at PVNGS.

PVNGS ASME Class 1 piping is designed to code editions and addenda before 1986, which therefore precede cycle limits for allowable stress in supports. Section 4.3.2.7 describes the absence of a cycle-based stress limit for ASME Class 1 supports.

PVNGS ASME Class 2 and 3 piping and components require no fatigue or cycle design analysis for their supports, and no other similar analysis exist for supports for those components at PVNGS.

PVNGS is a PWR and does not have Class MC BWR containment supports.

#### **3.5.2.2.3 Quality Assurance for Aging Management of Nonsafety-Related Components**

Quality Assurance Program and Administrative Controls are discussed in Section B1.3.

#### **3.5.2.3 Time-Limited Aging Analysis**

The time-limited aging analyses identified below are associated with the containments, structures, and component supports component types. The section within Chapter 4, Time-Limited Aging Analyses, is indicated in parenthesis.

- Loss of prestress (Section 4.5, Concrete Containment Tendon Prestress)

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- Cumulative fatigue damage (Section 4.6, Containment Liner Plate, Equipment Hatch And Personnel Air Locks, Penetrations, And Polar Crane Brackets)

### **3.5.3 Conclusions**

The Containments, Structures and Component Supports component types that are subject to aging management review have been evaluated. The aging management programs selected to manage the aging effects for the Containment, Structures and Component Supports component types are identified in the summary Tables and in Section 3.5.2.1.

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

Therefore, based on the demonstration provided in Appendix B, the effects of aging associated with the Containments, Structures and Component Supports component types will be adequately managed so that there is reasonable assurance that the intended functions will be maintained consistent with the current licensing basis during the period of extended operation.



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*Table 3.5.1 Summary of Aging Management Evaluations in Chapters II and III of NUREG-1801 for Containments, Structures, and Component Supports*

Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.5.1.01	Concrete elements: walls, dome, basemat, ring girder, buttresses, containment (as applicable)	Aging of accessible and inaccessible concrete areas due to aggressive chemical attack, and corrosion of embedded steel	ISI (IWL) (B2.1.28) and for inaccessible concrete, an examination of representative samples of below-grade concrete, and periodic monitoring of groundwater, if the environment is non-aggressive. A plant specific program is to be evaluated if environment is aggressive.	Yes	Consistent with NUREG-1801. See further evaluation in subsection 3.5.2.2.1.1.

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*Table 3.5.1 Summary of Aging Management Evaluations in Chapters II and III of NUREG-1801 for Containments, Structures, and Component Supports (Continued)*

Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.5.1.02	Concrete elements; All	Cracks and distortion due to increased stress levels from settlement	Structures Monitoring Program (B2.1.32). If a de-watering system is relied upon for control of settlement, then the licensee is to ensure proper functioning of the de-watering system through the period of extended operation.	Yes, if not within the scope of the applicant's structures monitoring program or a de-watering system is relied upon	Consistent with NUREG-1801. See further evaluation in subsection 3.5.2.2.1.2.
3.5.1.03	Concrete elements: foundation, sub-foundation	Reduction in foundation strength, cracking, differential settlement due to erosion of porous concrete subfoundation	Structures Monitoring Program (B2.1.32). If a de-watering system is relied upon for control of erosion of cement from porous concrete subfoundations, then the licensee is to ensure proper functioning of the de-watering system through the period of extended operation.	Yes, if not within the scope of the applicant's structures monitoring program or a de-watering system is relied upon.	Not applicable. PVNGS has no porous concrete foundations, so the applicable NUREG-1801 lines were not used. See further evaluation in subsection 3.5.2.2.1.2.

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*Table 3.5.1 Summary of Aging Management Evaluations in Chapters II and III of NUREG-1801 for Containments, Structures, and Component Supports (Continued)*

Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.5.1.04	Concrete elements: dome, wall, basemat, ring girder, buttresses, containment, concrete fill-in annulus (as applicable)	Reduction of strength and modulus of concrete due to elevated temperature	A plant-specific aging management program is to be evaluated	Yes	Not applicable. PVNGS has no dome, wall, basemat, ring girder, buttresses, containment, or annulus concrete exposed to elevated temperatures, so the applicable NUREG-1801 lines were not used. See further evaluation in subsection 3.5.2.2.1.3.
3.5.1.05					Not applicable - BWR only
3.5.1.06	Steel elements: steel liner, liner anchors, integral attachments	Loss of material due to general, pitting and crevice corrosion	ISI (IWE) (B2.1.27), and 10 CFR 50, Appendix J (B2.1.30).	Yes, if corrosion is significant for inaccessible areas	Consistent with NUREG-1801 with aging management program exceptions. The aging management program(s) with exceptions to NUREG-1801 include: ASME Section XI, Subsection IWE (B2.1.27). See further evaluation in subsection 3.5.2.2.1.4.

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*Table 3.5.1 Summary of Aging Management Evaluations in Chapters II and III of NUREG-1801 for Containments, Structures, and Component Supports (Continued)*

Item Number	Component Type	Aging Effect/ Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.5.1.07	Prestressed containment tendons	Loss of prestress due to relaxation, shrinkage, creep, and elevated temperature	TLAA, evaluated in accordance with 10 CFR 54.21(c)	Yes, TLAA	Loss of prestress of containment tendons is a TLAA. See further evaluation in subsection 3.5.2.2.1.5.
3.5.1.08					Not applicable - BWR only
3.5.1.09	Steel, stainless steel elements, dissimilar metal welds: penetration sleeves, penetration bellows; suppression pool shell, unbraced downcomers	Cumulative fatigue damage (CLB fatigue analysis exists)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	Yes, TLAA	Fatigue of metal components is a TLAA. However, only design of penetration sleeves is supported by a TLAA. See further evaluation in subsection 3.5.2.2.1.6.
3.5.1.10	Stainless steel penetration sleeves, penetration bellows, dissimilar metal welds	Cracking due to stress corrosion cracking	ISI (IWE) (B2.1.27), and 10 CFR 50, Appendix J (B2.1.30), and additional appropriate examinations/evaluations for bellows assemblies and dissimilar metal welds.	Yes	Not applicable. PVNGS has no in-scope stainless steel penetration sleeves, penetration bellows, or dissimilar metal welds subject to stress corrosion cracking, so the applicable NUREG-1801 lines were not used. See further evaluation in subsection 3.5.2.2.1.7.
3.5.1.11					Not applicable - BWR only

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Item Number	Component Type	Aging Effect // Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.5.1.12	Steel, stainless steel elements, dissimilar metal welds: penetration sleeves, penetration bellows; suppression pool shell, unbraced downcomers	Cracking due to cyclic loading	ISI (IWE) (B2.1.27), and 10 CFR 50, Appendix J (B2.1.30), and supplemented to detect fine cracks	Yes	Not applicable. Fatigue of metal components is a TLAA, evaluated in accordance with 10 CFR 54.21(c), so the applicable NUREG-1801 lines were not used. See further evaluation in subsection 3.5.2.2.1.8.
3.5.1.13					Not applicable - BWR only
3.5.1.14	Concrete elements: dome, wall, basemat ring girder, buttresses, containment (as applicable)	Loss of material (Scaling, cracking, and spalling) due to freeze-thaw	ISI (IWL) (B2.1.28). Evaluation is needed for plants that are located in moderate to severe weathering conditions (weathering index >100 day-inch/yr) (NUREG-1557).	Yes	Consistent with NUREG-1801. See further evaluation in subsection 3.5.2.2.1.9.
3.5.1.15	Concrete elements: walls, dome, basemat, ring girder, buttresses, containment, concrete fill-in annulus (as applicable).	Cracking due to expansion and reaction with aggregate; increase in porosity, permeability due to leaching of calcium hydroxide	ISI (IWL) (B2.1.28) for accessible areas. None for inaccessible areas if concrete was constructed in accordance with the recommendations in ACI 201.2R.	Yes, if concrete was not constructed as stated for inaccessible areas	Consistent with NUREG-1801. See further evaluation in subsection 3.5.2.2.1.10.

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Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.5.1.16	Seals, gaskets, and moisture barriers	Loss of sealing and leakage through containment due to deterioration of joint seals, gaskets, and moisture barriers (caulking, flashing, and other sealants)	ISI (IWE) (B2.1.27), and 10 CFR 50, Appendix J (B2.1.30).	No	Consistent with NUREG-1801 with aging management program exceptions. The aging management program(s) with exceptions to NUREG-1801 include: ASME Section XI, Subsection IWE (B2.1.27)
3.5.1.17	Personnel airlock, equipment hatch and CRD hatch locks, hinges, and closure mechanisms	Loss of leak tightness in closed position due to mechanical wear of locks, hinges and closure mechanisms	10 CFR 50, Appendix J (B2.1.30) and Plant Technical Specifications	No	Consistent with NUREG-1801.
3.5.1.18	Steel penetration sleeves and dissimilar metal welds; personnel airlock, equipment hatch and CRD hatch	Loss of material due to general, pitting, and crevice corrosion	ISI (IWE) (B2.1.27), and 10 CFR 50, Appendix J (B2.1.30).	No	Consistent with NUREG-1801 with aging management program exceptions. The aging management program(s) with exceptions to NUREG-1801 include: ASME Section XI, Subsection IWE (B2.1.27)
3.5.1.19					Not applicable - BWR only
3.5.1.20					Not applicable - BWR only
3.5.1.21					Not applicable - BWR only

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Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.5.1.22	Prestressed containment: tendons and anchorage components	Loss of material due to corrosion	ISI (IWL) (B2.1.28)	No	Consistent with NUREG-1801.
3.5.1.23	All Groups except Group 6: interior and above grade exterior concrete	Cracking, loss of bond, and loss of material (spalling, scaling) due to corrosion of embedded steel	Structures Monitoring Program (B2.1.32)	Yes, if not within the scope of the applicant's structures monitoring program	Consistent with NUREG-1801. See further evaluation in subsection 3.5.2.2.2.1.
3.5.1.24	All Groups except Group 6: interior and above grade exterior concrete	Increase in porosity and permeability, cracking, loss of material (spalling, scaling) due to aggressive chemical attack	Structures Monitoring Program (B2.1.32)	Yes, if not within the scope of the applicant's structures monitoring program	Consistent with NUREG-1801. See further evaluation in subsection 3.5.2.2.2.1.
3.5.1.25	All Groups except Group 6: steel components: all structural steel	Loss of material due to corrosion	Structures Monitoring Program (B2.1.32). If protective coatings are relied upon to manage the effects of aging, the structures monitoring program is to include provisions to address protective coating monitoring and maintenance.	Yes, if not within the scope of the applicant's structures monitoring program	Consistent with NUREG-1801. See further evaluation in subsection 3.5.2.2.2.1.

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Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.5.1.26	All Groups except Group 6: accessible and inaccessible concrete: foundation	Loss of material (spalling, scaling) and cracking due to freeze-thaw	Structures Monitoring Program (B2.1.32). Evaluation is needed for plants that are located in moderate to severe weathering conditions (weathering index >100 day-inch/yr) (NUREG-1557).	Yes, if not within the scope of the applicant's structures monitoring program or for inaccessible areas of plants located in moderate to severe weathering conditions	Consistent with NUREG-1801. See further evaluation in subsection 3.5.2.2.2.1.
3.5.1.27	All Groups except Group 6: accessible and inaccessible interior/exterior concrete	Cracking due to expansion due to reaction with aggregates	Structures Monitoring Program (B2.1.32)	Yes, if not within the scope of the applicant's structures monitoring program or concrete was not constructed as stated for inaccessible areas	Consistent with NUREG-1801. See further evaluation in subsection 3.5.2.2.2.1.



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*Table 3.5.1 Summary of Aging Management Evaluations in Chapters II and III of NUREG-1801 for Containments, Structures, and Component Supports (Continued)*

Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.5.1.28	Groups 1-3, 5-9: All	Cracks and distortion due to increased stress levels from settlement	Structures Monitoring Program (B2.1.32). If a de-watering system is relied upon for control of settlement, then the licensee is to ensure proper functioning of the de-watering system through the period of extended operation.	Yes, if not within the scope of the applicant's structures monitoring program or a de-watering system is relied upon	Consistent with NUREG-1801. See further evaluation in subsection 3.5.2.2.2.1.
3.5.1.29	Groups 1-3, 5-9: foundation	Reduction in foundation strength, cracking, differential settlement due to erosion of porous concrete subfoundation	Structures Monitoring Program (B2.1.32). If a de-watering system is relied upon for control of settlement, then the licensee is to ensure proper functioning of the de-watering system through the period of extended operation.	Yes, if not within the scope of the applicant's structures monitoring program or a de-watering system is relied upon	Not applicable. PVNGS has no porous concrete foundations, so the applicable NUREG-1801 lines were not used.
3.5.1.30	Group 4: Radial beam seats in BWR drywell; RPV support shoes for PWR with nozzle supports; Steam generator supports	Lock-up due to wear	Structures Monitoring Program (B2.1.32)	Yes, if not within the scope of ISI or structures monitoring program	Not applicable. PVNGS did not use Lubrite on the RPV support shoes or steam generator supports, so the applicable NUREG-1801 line was not used.

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Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.5.1.31	Groups 1-3, 5, 7-9: below-grade concrete components, such as exterior walls below grade and foundation	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)/ aggressive chemical attack;	Structures Monitoring Program (B2.1.32); Examination of representative samples of below-grade concrete, and periodic monitoring of groundwater, if the environment is non-aggressive. A plant specific program is to be evaluated if environment is aggressive.	Yes	Consistent with NUREG-1801. See further evaluation in subsection 3.5.2.2.2.4.
3.5.1.32	Groups 1-3, 5, 7-9: exterior above and below grade reinforced concrete foundations	Increase in porosity and permeability, and loss of strength due to leaching of calcium hydroxide	Structures Monitoring Program (B2.1.32) for accessible areas. None for inaccessible areas if concrete was constructed in accordance with the recommendations in ACI 201.2R-77.	Yes, if concrete was not constructed as stated for inaccessible areas	Not applicable. Concrete structures in groups 1-3, 5, 7-9 at PVNGS are not subjected to flowing water for any sustained periods, so the applicable NUREG-1801 lines were not used. See further evaluation in subsection 3.5.2.2.2.5.

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Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.5.1.33	Groups 1-5: concrete	Reduction of strength and modulus of concrete due to elevated temperature	A plant-specific aging management program is to be evaluated	Yes	Not applicable. PVNGS has no concrete exposed to elevated temperatures, so the applicable NUREG-1801 lines were not used. See further evaluation in subsection 3.5.2.2.2.3.
3.5.1.34	Group 6: Concrete; all	Increase in porosity and permeability, cracking, loss of material due to aggressive chemical attack; cracking, loss of bond, loss of material due to corrosion of embedded steel	Inspection of Water-Control Structures (B2.1.33)	Yes	Consistent with NUREG-1801. See further evaluation in subsection 3.5.2.2.2.4.1.
3.5.1.35	Group 6: exterior above and below grade concrete foundation	Loss of material (spalling, scaling) and cracking due to freeze-thaw	Inspection of Water-Control Structures (B2.1.33)	Yes, for inaccessible areas of plants located in moderate to severe weathering conditions	Consistent with NUREG-1801. See further evaluation in subsection 3.5.2.2.2.4.2.

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*Table 3.5.1 Summary of Aging Management Evaluations in Chapters II and III of NUREG-1801 for Containments, Structures, and Component Supports (Continued)*

<b>Item Number</b>	<b>Component Type</b>	<b>Aging Effect / Mechanism</b>	<b>Aging Management Program</b>	<b>Further Evaluation Recommended</b>	<b>Discussion</b>
3.5.1.36	Group 6: all accessible/inaccessible reinforced concrete	Cracking due to expansion/reaction with aggregates	Inspection of Water-Control Structures (B2.1.33)	Yes, if concrete was not constructed as stated for inaccessible areas	Consistent with NUREG-1801. See further evaluation in subsection 3.5.2.2.2.4.3.
3.5.1.37	Group 6: exterior above and below grade reinforced concrete foundation interior slab	Increase in porosity and permeability, loss of strength due to leaching of calcium hydroxide	Inspection of Water-Control Structures (B2.1.33)	Yes, if concrete was not constructed as stated for inaccessible areas	Consistent with NUREG-1801. See further evaluation in subsection 3.5.2.2.2.4.3.
3.5.1.38	Groups 7, 8: Tank liners	Cracking due to stress corrosion cracking; loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated	Yes	Not applicable. The in-scope tank liners at PVNGS were evaluated in the condensate and CVCS systems and assigned NUREG-1801 lines from Chapters VII and VIII. Therefore, the NUREG-1801 lines from Chapter III were not used.

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*Table 3.5.1 Summary of Aging Management Evaluations in Chapters II and III of NUREG-1801 for Containments, Structures, and Component Supports (Continued)*

Item Number	Component Type	Aging Effect/ Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.5.1.39	Support members; welds; bolted connections; support anchorage to building structure	Loss of material due to general and pitting corrosion	Structures Monitoring Program (B2.1.32)	Yes, if not within the scope of the applicant's structures monitoring program	Consistent with NUREG-1801. See further evaluation in subsection 3.5.2.2.2.6.
3.5.1.40	Building concrete at locations of expansion and grouted anchors; grout pads for support base plates	Reduction in concrete anchor capacity due to local concrete degradation/ service-induced cracking or other concrete aging mechanisms	Structures Monitoring Program (B2.1.32)	Yes, if not within the scope of the applicant's structures monitoring program	Consistent with NUREG-1801. See further evaluation in subsection 3.5.2.2.2.6.
3.5.1.41	Vibration isolation elements	Reduction or loss of isolation function/ radiation hardening, temperature, humidity, sustained vibratory loading	Structures Monitoring Program (B2.1.32)	Yes, if not within the scope of the applicant's structures monitoring program	Not applicable. PVNGS has no in-scope vibration isolation elements, so the applicable NUREG-1801 lines were not used.
3.5.1.42	Groups B1.1, B1.2, and B1.3: support members: anchor bolts, welds	Cumulative fatigue damage (CLB fatigue analysis exists)	TLAA, evaluated in accordance with 10 CFR 54.21(c)	Yes, TLAA	Fatigue of support members is not a TLAA as defined in 10 CFR 54.3. See further evaluation in subsection 3.5.2.2.2.7.

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Item Number	Component Type	Aging Effect/ Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.5.1.43	Groups 1-3, 5, 6: all masonry block walls	Cracking due to restraint shrinkage, creep, and aggressive environment	Masonry Wall Program (B2.1.31)	No	Consistent with NUREG 1801 for inspections performed under the Masonry Wall Program (B2.1.31). NUREG 1801 does not provide a line in which concrete masonry is inspected per the Fire Protection program. Therefore, for CMU walls that provide a fire barrier function, the Fire Protection program (B2.1.12) has been added.
3.5.1.44	Group 6 elastomer seals, gaskets, and moisture barriers	Loss of sealing due to deterioration of seals, gaskets, and moisture barriers (caulking, flashing, and other sealants)	Structures Monitoring Program (B2.1.32)	No	Consistent with NUREG-1801.
3.5.1.45	Group 6: exterior above and below grade concrete foundation; interior slab	Loss of material due to abrasion, cavitation	Inspection of Water-Control Structures (B2.1.33)	No	Consistent with NUREG-1801.

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Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.5.1.46	Group 5: Fuel pool liners	Cracking due to stress corrosion cracking; loss of material due to pitting and crevice corrosion	Water Chemistry (B2.1.2) and monitoring of spent fuel pool water level in accordance with technical specifications and leakage from the leak chase channels.	No	Consistent with NUREG-1801.
3.5.1.47	Group 6: all metal structural members	Loss of material due to general (steel only), pitting and crevice corrosion	Inspection of Water-Control Structures (B2.1.33)	No	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program, Structures Monitoring Program (B2.1.32) is credited.
3.5.1.48	Group 6: earthen water control structures - dams, embankments, reservoirs, channels, canals, and ponds	Loss of material, loss of form due to erosion, settlement, sedimentation, frost action, waves, currents, surface runoff, Seepage	Inspection of Water-Control Structures (B2.1.33)	No	Not applicable. PVNGS has no earthen dams, embankments, reservoirs, channels, canals, or ponds in-scope for license renewal, so the applicable NUREG-1801 lines were not used. The spray ponds are concrete structures.
3.5.1.49					Not applicable - BWR only

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Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.5.1.50	Groups B2, and B4: galvanized steel, aluminum, stainless steel support members; welds; bolted connections; support anchorage to building structure	Loss of material due to pitting and crevice corrosion	Structures Monitoring Program (B2.1.32)	No	Consistent with NUREG-1801, except for the Class 2 and 3 components. For these, consistent for material, environment and aging effect, but a different aging management program was used. Class 2 and 3 components are evaluated under ASME Section XI, Subsection IWF (B2.1.29). For other components, Structures Monitoring Program (B2.1.32) is credited, which is consistent with NUREG-1801.
3.5.1.51	Group B1.1: high strength low-alloy bolts	Cracking due to stress corrosion cracking; loss of material due to general corrosion	Bolting Integrity (B2.1.7)	No	Consistent with NUREG-1801 with aging management program exceptions. The aging management program(s) with exceptions to NUREG-1801 include: Bolting Integrity (B2.1.7)



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Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.5.1.52	Groups B2, and B4: sliding support bearings and sliding support surfaces	Loss of mechanical function due to corrosion, distortion, dirt, overload, fatigue due to vibratory and cyclic thermal loads	Structures Monitoring Program (B2.1.32)	No	Consistent with NUREG-1801.
3.5.1.53	Groups B1.1, B1.2, and B1.3: support members: welds; bolted connections; support anchorage to building structure	Loss of material due to general and pitting corrosion	ISI (IWF) (B2.1.29)	No	Consistent with NUREG-1801.
3.5.1.54	Groups B1.1, B1.2, and B1.3: Constant and variable load spring hangers; guides; stops;	Loss of mechanical function due to corrosion, distortion, dirt, overload, fatigue due to vibratory and cyclic thermal loads	ISI (IWF) (B2.1.29)	No	Consistent with NUREG-1801.
3.5.1.55	Steel, galvanized steel, and aluminum support members; welds; bolted connections; support anchorage to building structure	Loss of material due to boric acid corrosion	Boric Acid Corrosion (B2.1.4)	No	Consistent with NUREG-1801.

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Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.5.1.56	Groups B1.1, B1.2, and B1.3: Sliding surfaces	Loss of mechanical function due to corrosion, distortion, dirt, overload, fatigue due to vibratory and cyclic thermal loads	ISI (IWF) (B2.1.29)	No	Consistent with NUREG-1801.
3.5.1.57	Groups B1.1, B1.2, and B1.3: Vibration isolation elements	Reduction or loss of isolation function/ radiation hardening, temperature, humidity, sustained vibratory loading	ISI (IWF) (B2.1.29)	No	Not applicable. PVNGS has no in-scope vibration isolation elements, so the applicable NUREG-1801 lines were not used.
3.5.1.58	Galvanized steel and aluminum support members; welds; bolted connections; support anchorage to building structure exposed to air - indoor uncontrolled	None	None	No	Consistent with NUREG-1801.
3.5.1.59	Stainless steel support members; welds; bolted connections; support anchorage to building structure	None	None	No	Consistent with NUREG-1801.

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*Table 3.5.2-1 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Containment Building*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Compressible Joints/Seals	SH, SPB	Elastomer	Plant Indoor Air (Structural) (Ext)	Loss of sealing; Leakage through containment	ASME Section XI, Subsection IWE (B2.1.27) and 10 CFR 50, Appendix J (B2.1.30)	II.A3-7	3.5.1.16	B
Concrete Elements	FB, MB, SH, SLD, SPB, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking due to expansion	ASME Section XI, Subsection IWL (B2.1.28)	II.A1-3	3.5.1.15	A
Concrete Elements	FB, MB, SH, SLD, SPB, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracks and distortion	Structures Monitoring Program (B2.1.32)	II.A1-5	3.5.1.02	A
Concrete Elements	FB, MB, SH, SLD, SPB, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Increase in porosity, permeability	ASME Section XI, Subsection IWL (B2.1.28)	II.A1-6	3.5.1.15	A
Concrete Elements	FB, MB, SH, SLD, SPB, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	ASME Section XI, Subsection IWL (B2.1.28)	II.A1-7	3.5.1.01	A

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*Table 3.5.2-1 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Containment Building (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	FB, MB, SH, SLD, SPB, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Concrete cracking and spalling	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-30	3.3.1.66	B
Concrete Elements	FB, MB, SH, SLD, SPB, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-31	3.3.1.67	B
Concrete Elements	FLB, SH, SLD, SPB, SS	Concrete	Buried (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	ASME Section XI, Subsection IWL (B2.1.28)	II.A1-2	3.5.1.14	A
Concrete Elements	FLB, SH, SLD, SPB, SS	Concrete	Buried (Structural) (Ext)	Cracking due to expansion	ASME Section XI, Subsection IWL (B2.1.28)	II.A1-3	3.5.1.15	A
Concrete Elements	FLB, SH, SLD, SPB, SS	Concrete	Buried (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	ASME Section XI, Subsection IWL (B2.1.28)	II.A1-4	3.5.1.01	A
Concrete Elements	FLB, SH, SLD, SPB, SS	Concrete	Buried (Structural) (Ext)	Cracks and distortion	Structures Monitoring Program (B2.1.32)	II.A1-5	3.5.1.02	A

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*Table 3.5.2-1 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Containment Building (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Concrete Elements	FLB, SH, SLD, SPB, SS	Concrete	Buried (Structural) (Ext)	Increase in porosity, permeability	ASME Section XI, Subsection IWL (B2.1.28)	II.A1-6	3.5.1.15	A
Concrete Elements	FB, MB, SH, SLD, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	ASME Section XI, Subsection IWL (B2.1.28)	II.A1-3	3.5.1.15	A
Concrete Elements	FB, MB, SH, SLD, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	ASME Section XI, Subsection IWL (B2.1.28)	II.A1-4	3.5.1.01	A
Concrete Elements	FB, HLBS, MB, SH, SLD, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracks and distortion	Structures Monitoring Program (B2.1.32)	II.A1-5	3.5.1.02	A
Concrete Elements	FB, MB, SH, SLD, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	ASME Section XI, Subsection IWL (B2.1.28)	II.A1-7	3.5.1.01	A
Concrete Elements	FB, HLBS, MB, SLD, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A4-2	3.5.1.27	A

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*Table 3.5.2-1    Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Containment Building (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	FB, HLBS, MB, SLD, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A4-3	3.5.1.23	A
Concrete Elements	FB, HLBS, MB, SH, SLD, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Concrete cracking and spalling	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-28	3.3.1.65	B
Concrete Elements	FB, HLBS, MB, SH, SLD, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-29	3.3.1.67	B
Fire Barrier Coatings/ Wraps	FB	Thermo-Lag	Plant Indoor Air (Structural) (Ext)	Loss of material, cracking	Fire Protection (B2.1.12)	None	None	J, 1
Fire Barrier Seals	ES, FB, SH	Elastomer	Atmosphere/ Weather (Structural) (Ext)	Increased hardness, shrinkage and loss of strength	Fire Protection (B2.1.12)	VII.G-2	3.3.1.61	B
Fire Barrier Seals	ES, FB	Elastomer	Plant Indoor Air (Structural) (Ext)	Increased hardness, shrinkage and loss of strength	Fire Protection (B2.1.12)	VII.G-1	3.3.1.61	B

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*Table 3.5.2-1 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Containment Building (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Hatch - Emergency Airlock	MB, SLD, SPB, SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of leak tightness	10 CFR 50, Appendix J (B2.1.30)	II.A3-5	3.5.1.17	A
Hatch - Emergency Airlock	MB, SLD, SPB, SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	ASME Section XI, Subsection IWE (B2.1.27) and 10 CFR 50, Appendix J (B2.1.30)	II.A3-6	3.5.1.18	B
Hatch - Emergency Airlock	MB, SLD, SPB, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of leak tightness	10 CFR 50, Appendix J (B2.1.30)	II.A3-5	3.5.1.17	A
Hatch - Emergency Airlock	MB, SLD, SPB, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	ASME Section XI, Subsection IWE (B2.1.27) and 10 CFR 50, Appendix J (B2.1.30)	II.A3-6	3.5.1.18	B
Hatch - Emergency Airlock	SPB	Glass	Plant Indoor Air (Structural) (Ext)	None	None	V.F-6	3.2.1.52	C
Hatch - Equipment	SPB, SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of leak tightness	10 CFR 50, Appendix J (B2.1.30)	II.A3-5	3.5.1.17	A

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*Table 3.5.2-1    Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Containment Building (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Hatch - Equipment	SPB, SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	ASME Section XI, Subsection IWE (B2.1.27) and 10 CFR 50, Appendix J (B2.1.30)	II.A3-6	3.5.1.18	B
Hatch - Equipment	SPB, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of leak tightness	10 CFR 50, Appendix J (B2.1.30)	II.A3-5	3.5.1.17	A
Hatch - Equipment	SPB, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	ASME Section XI, Subsection IWE (B2.1.27) and 10 CFR 50, Appendix J (B2.1.30)	II.A3-6	3.5.1.18	B
Hatch - Equipment	MB, SLD	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A7-1	3.5.1.27	A
Hatch - Equipment	MB, SLD	Concrete	Atmosphere/ Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A7-5	3.5.1.26	A
Hatch - Equipment	MB, SLD	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A7-8	3.5.1.23	A



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*Table 3.5.2-1 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Containment Building (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Hatch - Equipment	MB, SLD	Concrete	Atmosphere/ Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A7-9	3.5.1.24	A
Hatch - Personnel Airlock	FB, MB, SLD, SPB, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of leak tightness	10 CFR 50, Appendix J (B2.1.30)	II.A3-5	3.5.1.17	A
Hatch - Personnel Airlock	FB, MB, SLD, SPB, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	ASME Section XI, Subsection IWE (B2.1.27) and 10 CFR 50, Appendix J (B2.1.30)	II.A3-6	3.5.1.18	B
Hatch - Personnel Airlock	SPB	Glass	Plant Indoor Air (Structural) (Ext)	None	None	V.F-6	3.2.1.52	C
Liner Containment	SH, SPB	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Liner Containment	SH, SPB	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	ASME Section XI, Subsection IWE (B2.1.27) and 10 CFR 50, Appendix J (B2.1.30)	II.A1-11	3.5.1.06	B
Liner Refueling	SH	Stainless Steel	Encased in Concrete (Ext)	None	None	VII.J-17	3.3.1.96	C

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*Table 3.5.2-1    Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Containment Building (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Liner Refueling	SH	Stainless Steel	Plant Indoor Air (Structural) (Ext)	None	None	VII.J-15	3.3.1.94	C
Liner Refueling	SH	Stainless Steel	Submerged (Structural) (Ext)	Cracking	Water Chemistry (B2.1.2) and Monitoring of the Spent Fuel Pool Water Level	III.A5-13	3.5.1.46	A
Penetration	SLD, SPB, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	ASME Section XI, Subsection IWE (B2.1.27) and 10 CFR 50, Appendix J (B2.1.30)	II.A3-1	3.5.1.18	B
Penetration	SLD, SPB, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Cumulative fatigue damage	Time-Limited Aging Analysis evaluated for the period of extended operation	II.A3-4	3.5.1.09	A
Penetration	SLD, SPB, SS	Stainless Steel	Plant Indoor Air (Structural) (Ext)	None	None	VII.J-15	3.3.1.94	C
Pipe Whip Restraints & Jet Shields	MB, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A4-5	3.5.1.25	A
Pipe Whip Restraints & Jet Shields	MB, SS	Stainless Steel	Plant Indoor Air (Structural) (Ext)	None	None	VII.J-15	3.3.1.94	C
Stairs/ Platforms/ Grates	NSRS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A4-5	3.5.1.25	A

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*Table 3.5.2-1    Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Containment Building (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Structural Steel	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Structural Steel	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A4-5	3.5.1.25	A
Tendons	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of prestress	Time-Limited Aging Analysis evaluated for the period of extended operation	II.A1-9	3.5.1.07	A
Tendons	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	ASME Section XI, Subsection IWL (B2.1.28)	II.A1-10	3.5.1.22	A

Notes for Table 3.5.2-1:

Standard Notes:

- A     Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B     Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C     Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- J     Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

- 1     NUREG-1801 does not address aging of Thermo-Lag materials.

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*Table 3.5.2-2      Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Control Building*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Barrier	MB	Aluminum	Atmosphere/Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B4-7	3.5.1.50	C
Caulking/Sealant	HLBS, SH, SPB	Elastomer	Atmosphere/Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Caulking/Sealant	HLBS, SH, SPB	Elastomer	Plant Indoor Air (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Compressible Joints/Seals	SH	Elastomer	Atmosphere/Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Compressible Joints/Seals	SH	Elastomer	Buried (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Compressible Joints/Seals	SH	Elastomer	Plant Indoor Air (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Concrete Block (Masonry Walls)	FB, SH, SS	Concrete Block (Masonry Walls)	Plant Indoor Air (Structural) (Ext)	Cracking	Fire Protection (B2.1.12) and Masonry Wall Program (B2.1.31)	III.A1-11	3.5.1.43	E, 1
Concrete Elements	FB, MB, SH, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A1-2	3.5.1.27	A

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*Table 3.5.2-2 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Control Building  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	FB, MB, SH, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A1-6	3.5.1.26	A
Concrete Elements	FB, MB, SH, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A1-9	3.5.1.23	A
Concrete Elements	FB, MB, SH, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A1-10	3.5.1.24	A
Concrete Elements	FB, MB, SH, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Concrete cracking and spalling	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-30	3.3.1.66	B
Concrete Elements	FB, MB, SH, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-31	3.3.1.67	B
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A1-2	3.5.1.27	A
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Cracks and distortion	Structures Monitoring Program (B2.1.32)	III.A1-3	3.5.1.28	A

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*Table 3.5.2-2 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Control Building  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A1-4	3.5.1.31	A
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A1-5	3.5.1.31	A
Concrete Elements	FB, FLB, SH, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A1-2	3.5.1.27	A
Concrete Elements	FB, FLB, SH, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A1-9	3.5.1.23	A
Concrete Elements	FB, FLB, SH, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A1-10	3.5.1.24	A
Concrete Elements	FB, FLB, SH, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Concrete cracking and spalling	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-28	3.3.1.65	B

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*Table 3.5.2-2 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Control Building  
(Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Concrete Elements	FB, FLB, SH, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-29	3.3.1.67	B
Doors	SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A1-12	3.5.1.25	A
Doors	MB, SH, SPB	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A1-12	3.5.1.25	A
Fire Barrier Coatings/ Wraps	FB	Fire Barrier (Cementitious Coating)	Plant Indoor Air (Structural) (Ext)	Loss of material, cracking	Fire Protection (B2.1.12)	None	None	J, 2
Fire Barrier Doors	FB, HLBS, MB, SH, SPB	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A1-12	3.5.1.25	A
Fire Barrier Doors	FB, HLBS, MB, SH, SPB	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12)	VII.G-3	3.3.1.63	B
Fire Barrier Seals	FB	Elastomer	Plant Indoor Air (Structural) (Ext)	Increased hardness, shrinkage and loss of strength	Fire Protection (B2.1.12)	VII.G-1	3.3.1.61	B
Fire Barrier Seals	FB	Fire Barrier (Ceramic Fiber)	Plant Indoor Air (Structural) (Ext)	Loss of material, cracking	Fire Protection (B2.1.12)	None	None	J, 2

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*Table 3.5.2-2 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Control Building  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Gypsum/Plaster Barrier	FB, NSRS, SH, SPB	Gypsum/Plaster	Plant Indoor Air (Structural) (Ext)	Cracking	Fire Protection (B2.1.12)	None	None	J
Hatch	FLB, MB, SH	Carbon Steel	Atmosphere/Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A1-12	3.5.1.25	A
Hatch	SH, SPB	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A1-12	3.5.1.25	A
Hatches/Plugs	SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A1-2	3.5.1.27	A
Hatches/Plugs	SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A1-6	3.5.1.26	A
Hatches/Plugs	SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A1-9	3.5.1.23	A
Hatches/Plugs	SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A1-10	3.5.1.24	A
Hatches/Plugs	SH	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A1-2	3.5.1.27	A



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*Table 3.5.2-2 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Control Building  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Hatches/Plugs	SH	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A1-9	3.5.1.23	A
Hatches/Plugs	SH	Concrete	Plant Indoor Air (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A1-10	3.5.1.24	A
Metal Siding	SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A1-12	3.5.1.25	A
Metal Siding	SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A1-12	3.5.1.25	A
Penetrations Electrical	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A1-12	3.5.1.25	A
Penetrations Electrical	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Penetrations Electrical	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A1-12	3.5.1.25	A
Penetrations Mechanical	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A1-12	3.5.1.25	A

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*Table 3.5.2-2 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Control Building  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Penetrations Mechanical	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Penetrations Mechanical	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A1-12	3.5.1.25	A
Roofing Membrane	SH	Elastomer	Atmosphere/ Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Stairs/ Platforms/ Grates	NSRS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A1-12	3.5.1.25	A
Structural Steel	MB, SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A1-12	3.5.1.25	A
Structural Steel	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Structural Steel	SH, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A1-12	3.5.1.25	A

**Section 3.5**  
**AGING MANAGEMENT OF CONTAINMENTS,**  
**STRUCTURES AND COMPONENT SUPPORTS**

Notes for Table 3.5.2-2:

Standard Note Text

- |   |                                                                                                                                                                                                  |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A | Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.                                                                   |
| B | Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.                                                             |
| C | Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.                                                  |
| E | Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program. |
| J | Neither the component nor the material and environment combination is evaluated in NUREG-1801.                                                                                                   |

Plant Specific Notes:

- |   |                                                                                                                                                  |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | The NUREG-1801 does not provide a line in which Concrete Masonry is inspected per the Fire Protection program.                                   |
| 2 | NUREG-1801 does not provide a line in which Fire Barriers (Ceramic Fiber or Cementitious Coating) are inspected per the Fire Protection program. |

**Section 3.5**  
**AGING MANAGEMENT OF CONTAINMENTS,**  
**STRUCTURES AND COMPONENT SUPPORTS**

*Table 3.5.2-3      Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Diesel Generator Building*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Caulking/Sealant	FLB, SH	Elastomer	Atmosphere/Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Caulking/Sealant	FLB, SH	Elastomer	Buried (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Caulking/Sealant	FLB, SH	Elastomer	Plant Indoor Air (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Compressible Joints/Seals	ES, SH	Elastomer	Atmosphere/Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Compressible Joints/Seals	ES, SH	Elastomer	Plant Indoor Air (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Concrete Elements	FB, MB, SH, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	FB, MB, SH, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking)	Structures Monitoring Program (B2.1.32)	III.A3-6	3.5.1.26	A

**Section 3.5**  
**AGING MANAGEMENT OF CONTAINMENTS,**  
**STRUCTURES AND COMPONENT SUPPORTS**

*Table 3.5.2-3 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Diesel Generator Building (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	FB, MB, SH, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Concrete Elements	FB, MB, SH, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Concrete Elements	FB, MB, SH, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Concrete cracking and spalling	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-30	3.3.1.66	B
Concrete Elements	FB, MB, SH, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-31	3.3.1.67	B
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Cracks and distortion	Structures Monitoring Program (B2.1.32)	III.A3-3	3.5.1.28	A

**Section 3.5**  
**AGING MANAGEMENT OF CONTAINMENTS,**  
**STRUCTURES AND COMPONENT SUPPORTS**

*Table 3.5.2-3 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Diesel Generator Building (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-4	3.5.1.31	A
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-5	3.5.1.31	A
Concrete Elements	FB, FLB, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	FB, FLB, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Concrete Elements	FB, FLB, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Concrete Elements	FB, FLB, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Concrete cracking and spalling	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-28	3.3.1.65	B

Section 3.5  
AGING MANAGEMENT OF CONTAINMENTS,  
STRUCTURES AND COMPONENT SUPPORTS

Table 3.5.2-3 *Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Diesel Generator Building (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	FB, FLB, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-29	3.3.1.67	B
Doors	MB, SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Doors	MB, SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Fire Barrier Doors	FB, MB, SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Fire Barrier Doors	FB, MB, SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12)	VII.G-4	3.3.1.63	B
Fire Barrier Doors	FB, FLB, MB, SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Fire Barrier Doors	FB, FLB, MB, SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12)	VII.G-3	3.3.1.63	B
Fire Barrier Seals	FB	Elastomer	Atmosphere/ Weather (Structural) (Ext)	Increased hardness, shrinkage and loss of strength	Fire Protection (B2.1.12)	VII.G-2	3.3.1.61	B

Section 3.5  
**AGING MANAGEMENT OF CONTAINMENTS,  
STRUCTURES AND COMPONENT SUPPORTS**

*Table 3.5.2-3 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Diesel Generator Building (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Fire Barrier Seals	FB	Elastomer	Plant Indoor Air (Structural) (Ext)	Increased hardness, shrinkage and loss of strength	Fire Protection (B2.1.12)	VII.G-1	3.3.1.61	B
Hatch	MB, SH	Carbon Steel	Atmosphere/Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Hatch	SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Hatches/Plugs	MB, SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Hatches/Plugs	MB, SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A3-6	3.5.1.26	A
Hatches/Plugs	MB, SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Hatches/Plugs	MB, SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A



**Section 3.5**  
**AGING MANAGEMENT OF CONTAINMENTS,**  
**STRUCTURES AND COMPONENT SUPPORTS**

*Table 3.5.2-3 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Diesel Generator Building (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Hatches/Plugs	MB, SH	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Hatches/Plugs	MB, SH	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Hatches/Plugs	MB, SH	Concrete	Plant Indoor Air (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Penetrations Electrical	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Penetrations Electrical	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Penetrations Electrical	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Penetrations Mechanical	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Penetrations Mechanical	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C

**Section 3.5**  
**AGING MANAGEMENT OF CONTAINMENTS,**  
**STRUCTURES AND COMPONENT SUPPORTS**

*Table 3.5.2-3 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Diesel Generator Building (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Penetrations Mechanical	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Roofing Membrane	SH	Elastomer	Atmosphere/ Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Stairs/Platforms/Grates	NSRS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Structural Steel	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Structural Steel	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Structural Steel	SH, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A

**Section 3.5**  
**AGING MANAGEMENT OF CONTAINMENTS,**  
**STRUCTURES AND COMPONENT SUPPORTS**

Notes for Table 3.5.2-3:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.

Plant Specific Notes:

None

**Section 3.5**  
**AGING MANAGEMENT OF CONTAINMENTS,**  
**STRUCTURES AND COMPONENT SUPPORTS**

*Table 3.5.2-4      Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Turbine Building*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Block (Masonry Walls)	FB, SH, SS	Concrete Block (Masonry Walls)	Atmosphere/ Weather (Structural) (Ext)	Cracking	Fire Protection (B2.1.12) and Masonry Wall Program (B2.1.31)	III.A3-11	3.5.1.43	E, 1
Concrete Block (Masonry Walls)	FB, SH, SS	Concrete Block (Masonry Walls)	Plant Indoor Air (Structural) (Ext)	Cracking	Fire Protection (B2.1.12) and Masonry Wall Program (B2.1.31)	III.A3-11	3.5.1.43	E, 1
Concrete Elements	SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A3-6	3.5.1.26	A
Concrete Elements	SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Concrete Elements	SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A

**Section 3.5**  
**AGING MANAGEMENT OF CONTAINMENTS,**  
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*Table 3.5.2-4 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Turbine Building  
(Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Concrete Elements	SS	Concrete	Buried (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	SS	Concrete	Buried (Structural) (Ext)	Cracks and distortion	Structures Monitoring Program (B2.1.32)	III.A3-3	3.5.1.28	A
Concrete Elements	SS	Concrete	Buried (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-4	3.5.1.31	A
Concrete Elements	SS	Concrete	Buried (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-5	3.5.1.31	A
Concrete Elements	SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A

**Section 3.5**  
**AGING MANAGEMENT OF CONTAINMENTS,**  
**STRUCTURES AND COMPONENT SUPPORTS**

*Table 3.5.2-4 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Turbine Building  
(Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Concrete Elements	SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Doors	SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Doors	SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Fire Barrier Coatings/ Wraps	FB	Fire Barrier (Cementitious Coating)	Plant Indoor Air (Structural) (Ext)	Loss of material, cracking	Fire Protection (B2.1.12)	None	None	J, 2
Fire Barrier Doors	FB, SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Fire Barrier Doors	FB, SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12)	VII.G-4	3.3.1.63	B
Fire Barrier Doors	FB, SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Fire Barrier Doors	FB, SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12)	VII.G-3	3.3.1.63	B

Section 3.5  
AGING MANAGEMENT OF CONTAINMENTS,  
STRUCTURES AND COMPONENT SUPPORTS

Table 3.5.2-4 *Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Turbine Building*  
(Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Fire Barrier Seals	FB	Elastomer	Atmosphere/ Weather (Structural) (Ext)	Increased hardness, shrinkage and loss of strength	Fire Protection (B2.1.12)	VII.G-2	3.3.1.61	B
Fire Barrier Seals	FB	Elastomer	Plant Indoor Air (Structural) (Ext)	Increased hardness, shrinkage and loss of strength	Fire Protection (B2.1.12)	VII.G-1	3.3.1.61	B
Hatch	SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Hatch	SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Metal Siding	SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Metal Siding	SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Penetrations Electrical	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Penetrations Electrical	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Penetrations Mechanical	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C

Section 3.5  
**AGING MANAGEMENT OF CONTAINMENTS,  
STRUCTURES AND COMPONENT SUPPORTS**

*Table 3.5.2-4 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Turbine Building  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Penetrations Mechanical	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Roofing Membrane	SH	Elastomer	Atmosphere/ Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Structural Steel	SH, SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Structural Steel	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Structural Steel	SH, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A

Notes for Table 3.5.2-4:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
- J Neither the component nor the material and environment combination is evaluated in NUREG-1801.



**Section 3.5**  
**AGING MANAGEMENT OF CONTAINMENTS,**  
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Plant Specific Notes:

- 1 NUREG-1801 does not provide a line in which Concrete Masonry is inspected per the Fire Protection program.
- 2 NUREG-1801 does not provide a line in which Fire Barriers (Ceramic Fiber or Cementitious Coating) are inspected per the Fire Protection program.

Section 3.5  
**AGING MANAGEMENT OF CONTAINMENTS,  
STRUCTURES AND COMPONENT SUPPORTS**

*Table 3.5.2-5    Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Auxiliary Building*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Caulking/Sealant	SH	Elastomer	Atmosphere/Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Caulking/Sealant	FLB, SH	Elastomer	Plant Indoor Air (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Compressible Joints/Seals	ES, SH	Elastomer	Atmosphere/Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Compressible Joints/Seals	ES, SH	Elastomer	Buried (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Compressible Joints/Seals	ES, SH	Elastomer	Plant Indoor Air (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Concrete Block (Masonry Walls)	FB, SH, SS	Concrete Block (Masonry Walls)	Plant Indoor Air (Structural) (Ext)	Cracking	Fire Protection (B2.1.12) and Masonry Wall Program (B2.1.31)	III.A3-11	3.5.1.43	E, 1
Concrete Elements	FB, FLB, MB, SH, SPB, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	FB, FLB, MB, SH, SPB, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking)	Structures Monitoring Program (B2.1.32)	III.A3-6	3.5.1.26	A

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*Table 3.5.2-5 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Auxiliary Building  
(Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Concrete Elements	FB, FLB, MB, SH, SPB, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Concrete Elements	FB, FLB, MB, SH, SPB, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Concrete Elements	FB, FLB, MB, SH, SPB, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Concrete cracking and spalling	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-30	3.3.1.66	B
Concrete Elements	FB, FLB, MB, SH, SPB, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-31	3.3.1.67	B
Concrete Elements	FLB, SH, SS	Concrete	Buried (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	FLB, SH, SS	Concrete	Buried (Structural) (Ext)	Cracks and distortion	Structures Monitoring Program (B2.1.32)	III.A3-3	3.5.1.28	A

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*Table 3.5.2-5 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Auxiliary Building  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	FLB, SH, SS	Concrete	Buried (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-4	3.5.1.31	A
Concrete Elements	FLB, SH, SS	Concrete	Buried (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-5	3.5.1.31	A
Concrete Elements	FB, FLB, HLBS, SH, SLD, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	FB, FLB, HLBS, SH, SLD, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Concrete Elements	FB, FLB, HLBS, SH, SLD, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A

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*Table 3.5.2-5 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Auxiliary Building  
(Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Concrete Elements	FB, FLB, HLBS, SH, SLD, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Concrete cracking and spalling	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-28	3.3.1.65	B
Concrete Elements	FB, FLB, HLBS, SH, SLD, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-29	3.3.1.67	B
Doors	FLB, SH, SPB	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Doors	SH, SPB	Stainless Steel	Plant Indoor Air (Structural) (Ext)	None	None	VII.J-15	3.3.1.94	C
Fire Barrier Coatings/ Wraps	FB	Fire Barrier (Cementitious Coating)	Plant Indoor Air (Structural) (Ext)	Loss of material, cracking	Fire Protection (B2.1.12)	None	None	J
Fire Barrier Doors	FB, HLBS, SH, SPB	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Fire Barrier Doors	FB, HLBS, SH, SPB	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12)	VII.G-4	3.3.1.63	B
Fire Barrier Doors	FB, HLBS, MB, SH, SPB	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A

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*Table 3.5.2-5 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Auxiliary Building  
(Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Fire Barrier Doors	FB, HLBS, MB, SH, SPB	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12)	VII.G-3	3.3.1.63	B
Fire Barrier Seals	FB	Elastomer	Atmosphere/Weather (Structural) (Ext)	Increased hardness, shrinkage and loss of strength	Fire Protection (B2.1.12)	VII.G-2	3.3.1.61	B
Fire Barrier Seals	FB	Elastomer	Plant Indoor Air (Structural) (Ext)	Increased hardness, shrinkage and loss of strength	Fire Protection (B2.1.12)	VII.G-1	3.3.1.61	B
Gypsum/Plaster Barrier	FB, SH	Gypsum/Plaster	Plant Indoor Air (Structural) (Ext)	Cracking	Fire Protection (B2.1.12)	None	None	J, 2
Hatch	SH, SPB	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Hatches/Plugs	FLB, MB, SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Hatches/Plugs	FLB, MB, SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A3-6	3.5.1.26	A
Hatches/Plugs	FLB, MB, SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A

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*Table 3.5.2-5 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Auxiliary Building  
(Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Hatches/Plugs	FLB, MB, SH	Concrete	Atmosphere/ Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Hatches/Plugs	FLB, MB, SH	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Hatches/Plugs	FLB, MB, SH	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Hatches/Plugs	FLB, MB, SH	Concrete	Plant Indoor Air (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Penetrations Electrical	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Penetrations Electrical	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Penetrations Electrical	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A

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Table 3.5.2-5 *Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Auxiliary Building*  
(Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Penetrations Mechanical	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Penetrations Mechanical	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Penetrations Mechanical	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Roofing Membrane	SH	Elastomer	Atmosphere/ Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Stairs/ Platforms/ Grates	NSRS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Stairs/ Platforms/ Grates	NSRS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Structural Steel	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Structural Steel	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Structural Steel	SH, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A



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Notes for Table 3.5.2-5:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
- J Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

- 1 The NUREG-1801 does not provide a line in which Concrete Masonry is inspected per the Fire Protection program.
- 2 NUREG-1801 does not provide a line in which Gypsum/Plaster Barriers are inspected per the Fire Protection program.

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*Table 3.5.2-6      Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Radwaste Building*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	SH, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	SH, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A3-6	3.5.1.26	A
Concrete Elements	SH, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Concrete Elements	SH, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Cracks and distortion	Structures Monitoring Program (B2.1.32)	III.A3-3	3.5.1.28	A

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*Table 3.5.2-6 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Radwaste Building (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-4	3.5.1.31	A
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-5	3.5.1.31	A
Concrete Elements	FB, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	FB, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Concrete Elements	FB, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A

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*Table 3.5.2-6 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Radwaste Building (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	FB, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Concrete cracking and spalling	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-28	3.3.1.65	B
Concrete Elements	FB, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-29	3.3.1.67	B
Doors	SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Doors	SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Fire Barrier Doors	FB, SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Fire Barrier Doors	FB, SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12)	VII.G-3	3.3.1.63	B
Fire Barrier Seals	FB	Elastomer	Plant Indoor Air (Structural) (Ext)	Increased hardness, shrinkage and loss of strength	Fire Protection (B2.1.12)	VII.G-1	3.3.1.61	B
Hatch	SH	Aluminum	Plant Indoor Air (Structural) (Ext)	None	None	III.B5-2	3.5.1.58	C
Hatch	SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A

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*Table 3.5.2-6 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Radwaste Building (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Hatch	SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Hatches/Plugs	SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Hatches/Plugs	SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A3-6	3.5.1.26	A
Hatches/Plugs	SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Hatches/Plugs	SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Hatches/Plugs	SH	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Hatches/Plugs	SH	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A

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*Table 3.5.2-6 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation - Radwaste Building (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Hatches/Plugs	SH	Concrete	Plant Indoor Air (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Roofing Membrane	SH	Elastomer	Atmosphere/ Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Structural Steel	SH, SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Structural Steel	SH, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A

Notes for Table 3.5.2-6:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.

Plant Specific Notes:

None

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*Table 3.5.2-7      Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Main Steam Support Structure*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Caulking/Sealant	SH	Elastomer	Atmosphere/Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Caulking/Sealant	SH	Elastomer	Buried (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Caulking/Sealant	FLB, SH	Elastomer	Plant Indoor Air (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Compressible Joints/Seals	ES, SH	Elastomer	Atmosphere/Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Compressible Joints/Seals	ES, SH	Elastomer	Buried (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Compressible Joints/Seals	ES, SH	Elastomer	Plant Indoor Air (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Concrete Elements	FB, HLBS, MB, SH, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	FB, HLBS, MB, SH, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking)	Structures Monitoring Program (B2.1.32)	III.A3-6	3.5.1.26	A

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Table 3.5.2-7 *Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Main Steam Support Structure (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	FB, HLBS, MB, SH, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Concrete Elements	FB, HLBS, MB, SH, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Concrete Elements	FB, HLBS, MB, SH, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Concrete cracking and spalling	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-30	3.3.1.66	B
Concrete Elements	FB, HLBS, MB, SH, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-31	3.3.1.67	B
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Cracks and distortion	Structures Monitoring Program (B2.1.32)	III.A3-3	3.5.1.28	A



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*Table 3.5.2-7 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Main Steam Support Structure (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-4	3.5.1.31	A
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-5	3.5.1.31	A
Concrete Elements	FB, FLB, HLBS, SH, SLD, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	FB, FLB, HLBS, SH, SLD, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Concrete Elements	FB, FLB, HLBS, SH, SLD, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A

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*Table 3.5.2-7 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Main Steam Support Structure (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Concrete Elements	FB, FLB, HLBS, SH, SLD, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Concrete cracking and spalling	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-28	3.3.1.65	B
Concrete Elements	FB, FLB, HLBS, SH, SLD, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-29	3.3.1.67	B
Doors	MB, SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Doors	FLB, HLBS, MB, SH, SPB	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Fire Barrier Doors	FB, SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Fire Barrier Doors	FB, SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12)	VII.G-3	3.3.1.63	B
Fire Barrier Seals	FB	Elastomer	Atmosphere/ Weather (Structural) (Ext)	Increased hardness, shrinkage and loss of strength	Fire Protection (B2.1.12)	VII.G-2	3.3.1.61	B

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*Table 3.5.2-7 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Main Steam Support Structure (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Fire Barrier Seals	FB	Elastomer	Plant Indoor Air (Structural) (Ext)	Increased hardness, shrinkage and loss of strength	Fire Protection (B2.1.12)	VII.G-1	3.3.1.61	B
Hatch	FLB, HLBS, SH, SPB	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Hatches/Plugs	MB, SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Hatches/Plugs	MB, SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A3-6	3.5.1.26	A
Hatches/Plugs	MB, SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Hatches/Plugs	MB, SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Hatches/Plugs	MB, SH	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A

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*Table 3.5.2-7 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Main Steam Support Structure (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Hatches/Plugs	MB, SH	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Hatches/Plugs	MB, SH	Concrete	Plant Indoor Air (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Penetrations Electrical	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Penetrations Electrical	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Penetrations Electrical	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Penetrations Mechanical	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Penetrations Mechanical	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Penetrations Mechanical	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A

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*Table 3.5.2-7 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Main Steam Support Structure (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Roofing Membrane	SH	Elastomer	Atmosphere/ Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Stairs/ Platforms/ Grates	NSRS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Structural Steel	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Structural Steel	SH, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A

Notes for Table 3.5.2-7:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.

Plant Specific Notes:

None

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*Table 3.5.2-8      Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Station  
Blackout Generator Structures*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Concrete Elements	SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A3-6	3.5.1.26	A
Concrete Elements	SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Concrete Elements	SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Concrete Elements	SS	Concrete	Buried (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	SS	Concrete	Buried (Structural) (Ext)	Cracks and distortion	Structures Monitoring Program (B2.1.32)	III.A3-3	3.5.1.28	A

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*Table 3.5.2-8 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Station Blackout  
Generator Structures (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	SS	Concrete	Buried (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-4	3.5.1.31	A
Concrete Elements	SS	Concrete	Buried (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-5	3.5.1.31	A
Concrete Elements	SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Concrete Elements	SS	Concrete	Plant Indoor Air (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Doors	SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A

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Table 3.5.2-8 *Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Station Blackout Generator Structures (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Doors	SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Metal Siding	SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Structural Steel	SH, SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Structural Steel	SH, SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Structural Steel	SH, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A

Notes for Table 3.5.2-8:

Standard Note Text

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.

Plant Specific Notes:

None



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**Table 3.5.2-9**      *Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Fuel Building*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Caulking/Sealant	FLB, SH	Elastomer	Atmosphere/Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Caulking/Sealant	FLB, SH	Elastomer	Buried (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Caulking/Sealant	FLB, SH	Elastomer	Plant Indoor Air (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Compressible Joints/Seals	SH, SPB	Elastomer	Treated Borated Water (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Concrete Elements	MB, SH, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A5-2	3.5.1.27	A
Concrete Elements	MB, SH, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A5-6	3.5.1.26	A
Concrete Elements	MB, SH, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A5-9	3.5.1.23	A
Concrete Elements	MB, SH, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A5-10	3.5.1.24	A
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A5-2	3.5.1.27	A

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Table 3.5.2-9 *Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Fuel Building*  
(Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Cracks and distortion	Structures Monitoring Program (B2.1.32)	III.A5-3	3.5.1.28	A
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A5-4	3.5.1.31	A
Concrete Elements	SH, SS	Concrete	Buried (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A5-5	3.5.1.31	A
Concrete Elements	FB, FLB, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A5-2	3.5.1.27	A
Concrete Elements	FB, FLB, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A5-9	3.5.1.23	A
Concrete Elements	FB, FLB, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A5-10	3.5.1.24	A

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*Table 3.5.2-9 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Fuel Building  
(Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Concrete Elements	FB, FLB, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Concrete cracking and spalling	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-28	3.3.1.65	B
Concrete Elements	FB, FLB, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-29	3.3.1.67	B
Doors	SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A5-12	3.5.1.25	A
Doors	MB, SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A5-12	3.5.1.25	A
Fire Barrier Doors	FB, HLBS, SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A5-12	3.5.1.25	A
Fire Barrier Doors	FB, HLBS, SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12)	VII.G-3	3.3.1.63	B
Fire Barrier Seals	FB	Elastomer	Atmosphere/ Weather (Structural) (Ext)	Increased hardness, shrinkage and loss of strength	Fire Protection (B2.1.12)	VII.G-2	3.3.1.61	B
Fire Barrier Seals	FB	Elastomer	Plant Indoor Air (Structural) (Ext)	Increased hardness, shrinkage and loss of strength	Fire Protection (B2.1.12)	VII.G-1	3.3.1.61	B

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*Table 3.5.2-9 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Fuel Building*  
(Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Gate	SPB	Stainless Steel	Treated Borated Water (Ext)	Cracking	Water Chemistry (B2.1.2) and Monitoring of the Spent Fuel Pool Water Level	III.A5-13	3.5.1.46	A
Hatch	MB, SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A5-12	3.5.1.25	A
Hatch	FB, FLB, MB, SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A5-12	3.5.1.25	A
Hatch	FB, FLB, MB, SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12)	VII.G-3	3.3.1.63	B
Hatches/Plugs	MB, SH	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A5-2	3.5.1.27	A
Hatches/Plugs	MB, SH	Concrete	Atmosphere/ Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A5-6	3.5.1.26	A
Hatches/Plugs	MB, SH	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A5-9	3.5.1.23	A
Hatches/Plugs	MB, SH	Concrete	Atmosphere/ Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A5-10	3.5.1.24	A

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*Table 3.5.2-9 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Fuel Building  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Hatches/Plugs	MB, SH	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A5-2	3.5.1.27	A
Hatches/Plugs	MB, SH	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A5-9	3.5.1.23	A
Hatches/Plugs	MB, SH	Concrete	Plant Indoor Air (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A5-10	3.5.1.24	A
Liner Spent Fuel Pool	SPB	Stainless Steel	Encased in Concrete (Ext)	None	None	VII.J-17	3.3.1.96	C
Liner Spent Fuel Pool	SPB	Stainless Steel	Plant Indoor Air (Structural) (Ext)	None	None	VII.J-15	3.3.1.94	C
Liner Spent Fuel Pool	SPB	Stainless Steel	Treated Borated Water (Ext)	Cracking	Water Chemistry (B2.1.2) and Monitoring of the Spent Fuel Pool Water Level	III.A5-13	3.5.1.46	A
Penetrations Electrical	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A5-12	3.5.1.25	A
Penetrations Electrical	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Penetrations Electrical	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A5-12	3.5.1.25	A

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*Table 3.5.2-9 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Fuel Building  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Penetrations Mechanical	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A5-12	3.5.1.25	A
Penetrations Mechanical	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Penetrations Mechanical	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A5-12	3.5.1.25	A
Roofing Membrane	SH	Elastomer	Atmosphere Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Stairs/ Platforms/ Grates	NSRS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A5-12	3.5.1.25	A
Structural Steel	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A5-12	3.5.1.25	A
Structural Steel	ES	Carbon Steel	Buried (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	None	None	J
Structural Steel	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Structural Steel	SH, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A5-12	3.5.1.25	A

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Notes for Table 3.5.2-9:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- J Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

None

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**Table 3.5.2-10**    *Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Spray Pond and Associated Water Control Structures*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Caulking/Sealant	SH	Elastomer	Atmosphere/Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Caulking/Sealant	HS, SPB	Elastomer	Buried (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Caulking/Sealant	HS, SPB	Elastomer	Submerged (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Concrete Elements	HS, MB, SH, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B2.1.33)	III.A6-1	3.5.1.34	A
Concrete Elements	HS, MB, SH, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking due to expansion	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B2.1.33)	III.A6-2	3.5.1.36	A
Concrete Elements	HS, MB, SH, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B2.1.33)	III.A6-5	3.5.1.35	A



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*Table 3.5.2-10 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Spray Pond and Associated Water Control Structures (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	HS, SS	Concrete	Buried (Structural) (Ext)	Cracking due to expansion	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B2.1.33)	III.A6-2	3.5.1.36	A
Concrete Elements	HS, SS	Concrete	Buried (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B2.1.33)	III.A6-3	3.5.1.34	A
Concrete Elements	HS, SS	Concrete	Buried (Structural) (Ext)	Cracks and distortion	Structures Monitoring Program (B2.1.32)	III.A6-4	3.5.1.28	A
Concrete Elements	FB, HS, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B2.1.33)	III.A6-1	3.5.1.34	A
Concrete Elements	FB, HS, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B2.1.33)	III.A6-2	3.5.1.36	A

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*Table 3.5.2-10 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Spray Pond and Associated Water Control Structures (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	FB, HS, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Concrete cracking and spalling	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-28	3.3.1.65	B
Concrete Elements	FB, HS, SH, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-29	3.3.1.67	B
Concrete Elements	HS, SS	Concrete	Submerged (Structural) (Ext)	Cracking due to expansion	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B2.1.33)	III.A6-2	3.5.1.36	A
Concrete Elements	HS, SS	Concrete	Submerged (Structural) (Ext)	Increase in porosity and permeability, loss of strength	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B2.1.33)	III.A6-6	3.5.1.37	A
Concrete Elements	HS, SS	Concrete	Submerged (Structural) (Ext)	Loss of material	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B2.1.33)	III.A6-7	3.5.1.45	A
Hatch	SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A6-11	3.5.1.47	E, 1

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*Table 3.5.2-10 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Spray Pond and Associated Water Control Structures (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Hatch	SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A6-11	3.5.1.47	E, 1
Hatches/Plugs	SH	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B2.1.33)	III.A6-1	3.5.1.34	A
Hatches/Plugs	SH	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking due to expansion	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B2.1.33)	III.A6-2	3.5.1.36	A
Hatches/Plugs	SH	Concrete	Atmosphere/ Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B2.1.33)	III.A6-5	3.5.1.35	A
Hatches/Plugs	MB, SH,	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B2.1.33)	III.A6-1	3.5.1.34	A
Hatches/Plugs	MB, SH,	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B2.1.33)	III.A6-2	3.5.1.36	A

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*Table 3.5.2-10 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Spray Pond and Associated Water Control Structures (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Screen	FIL	Copper Alloy	Raw Water (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	None	None	J, 2
Structural Steel	MB, SH, SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A6-11	3.5.1.47	E, 1
Structural Steel	SH, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A6-11	3.5.1.47	E, 1
Structural Steel	NSRS	Carbon Steel	Submerged (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A6-11	3.5.1.47	E, 1
Structural Steel	DF	Stainless Steel	Atmosphere/ Weather (Structural) (Ext)	None	None	None	None	G

Notes for Table 3.5.2-10:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
- G Environment not in NUREG-1801 for this component and material.
- J Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

- 1 NUREG 1801, line III.A6-11 specifies Reg Guide 1.127 as the program for metal components in water-control structures. Reg Guide 1.127 does not address metal components, so the Structures Monitoring Program is used.
- 2 NUREG-1801 does not provide a line in which copper alloy screens are inspected per the Structures Monitoring Program.

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*Table 3.5.2-11    Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Tank Foundations and Shells*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Concrete (Condensate Storage Tank)	MB, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A7-1	3.5.1.27	A
Concrete (Condensate Storage Tank)	MB, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A7-5	3.5.1.26	A
Concrete (Condensate Storage Tank)	MB, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A7-8	3.5.1.23	A
Concrete (Condensate Storage Tank)	MB, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A7-9	3.5.1.24	A
Concrete (Condensate Storage Tank)	SS	Concrete	Buried (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A7-1	3.5.1.27	A
Concrete (Condensate Storage Tank)	SS	Concrete	Buried (Structural) (Ext)	Cracks and distortion	Structures Monitoring Program (B2.1.32)	III.A7-2	3.5.1.28	A

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*Table 3.5.2-11 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Tank Foundations and Shells (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete (Condensate Storage Tank)	SS	Concrete	Buried (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A7-3	3.5.1.31	A
Concrete (Condensate Storage Tank)	SS	Concrete	Buried (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A7-4	3.5.1.31	A
Concrete (Reactor Makeup Water Tank)	SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A8-1	3.5.1.27	A
Concrete (Reactor Makeup Water Tank)	SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A8-5	3.5.1.26	A
Concrete (Reactor Makeup Water Tank)	SS	Concrete	Buried (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A8-1	3.5.1.27	A

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*Table 3.5.2-11 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Tank Foundations and Shells (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Concrete (Reactor Makeup Water Tank)	SS	Concrete	Buried (Structural) (Ext)	Cracks and distortion	Structures Monitoring Program (B2.1.32)	III.A8-2	3.5.1.28	A
Concrete (Reactor Makeup Water Tank)	SS	Concrete	Buried (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A8-3	3.5.1.31	A
Concrete (Reactor Makeup Water Tank)	SS	Concrete	Buried (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A8-4	3.5.1.31	A
Concrete (Refueling Water Tank)	MB, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A7-1	3.5.1.27	A
Concrete (Refueling Water Tank)	MB, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A7-5	3.5.1.26	A
Concrete (Refueling Water Tank)	MB, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A7-8	3.5.1.23	A

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*Table 3.5.2-11 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Tank Foundations and Shells (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete (Refueling Water Tank)	MB, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A7-9	3.5.1.24	A
Concrete (Refueling Water Tank)	SS	Concrete	Buried (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A7-1	3.5.1.27	A
Concrete (Refueling Water Tank)	SS	Concrete	Buried (Structural) (Ext)	Cracks and distortion	Structures Monitoring Program (B2.1.32)	III.A7-2	3.5.1.28	A
Concrete (Refueling Water Tank)	SS	Concrete	Buried (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A7-3	3.5.1.31	A
Concrete (Refueling Water Tank)	SS	Concrete	Buried (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A7-4	3.5.1.31	A
Hatch	SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A8-8	3.5.1.25	A



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*Table 3.5.2-11 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Tank Foundations and Shells (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Roofing Membrane	SH	Elastomer	Atmosphere/ Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Structural Steel	MB, SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A7-10	3.5.1.25	A
Structural Steel	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Structural Steel	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A7-10	3.5.1.25	A

Notes for Table 3.5.2-11:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.

Plant Specific Notes:

None

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**Table 3.5.2-12**    *Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Transformer Foundations and Electrical Structures*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Caulking/Sealant	SH	Elastomer	Atmosphere/Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Caulking/Sealant	SH	Elastomer	Buried (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Concrete Elements	FB, NSRS, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	FB, NSRS, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A3-6	3.5.1.26	A
Concrete Elements	FB, NSRS, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Concrete Elements	FB, NSRS, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A

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*Table 3.5.2-12 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Transformer Foundations and Electrical Structures (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	FB, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Concrete cracking and spalling	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-30	3.3.1.66	B
Concrete Elements	FB, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-31	3.3.1.67	B
Concrete Elements	NSRS, SS	Concrete	Buried (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	SS	Concrete	Buried (Structural) (Ext)	Cracks and distortion	Structures Monitoring Program (B2.1.32)	III.A3-3	3.5.1.28	A
Concrete Elements	NSRS, SS	Concrete	Buried (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-4	3.5.1.31	A
Concrete Elements	NSRS, SS	Concrete	Buried (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-5	3.5.1.31	A
Duct Banks and Manholes	SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A

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*Table 3.5.2-12 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Transformer Foundations and Electrical Structures (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Duct Banks and Manholes	SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A3-6	3.5.1.26	A
Duct Banks and Manholes	SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Duct Banks and Manholes	SH	Concrete	Atmosphere/Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Duct Banks and Manholes	SH	Concrete	Buried (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Duct Banks and Manholes	SH	Concrete	Buried (Structural) (Ext)	Cracks and distortion	Structures Monitoring Program (B2.1.32)	III.A3-3	3.5.1.28	A
Duct Banks and Manholes	SH	Concrete	Buried (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-4	3.5.1.31	A
Duct Banks and Manholes	SH	Concrete	Buried (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-5	3.5.1.31	A

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*Table 3.5.2-12 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Transformer Foundations and Electrical Structures (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Fire Barrier Seals	FB	Elastomer	Atmosphere/ Weather (Structural) (Ext)	Increased hardness, shrinkage and loss of strength	Fire Protection (B2.1.12)	VII.G-2	3.3.1.61	B
Structural Steel	NSRS, SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Structural Steel	NSRS, SH	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Transmission Tower	NSRS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A

Notes for Table 3.5.2-12:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.

Plant Specific Notes:

None

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*Table 3.5.2-13    Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Yard Structures (In-Scope)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Caulking/Sealant	FLB, SH, SPB	Elastomer	Atmosphere/Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Caulking/Sealant	FLB, SH	Elastomer	Buried (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Caulking/Sealant	FLB, SH, SPB	Elastomer	Plant Indoor Air (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Compressible Joints/Seals	ES, SH	Elastomer	Atmosphere/Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Compressible Joints/Seals	ES, SH	Elastomer	Buried (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Compressible Joints/Seals	ES, SH	Elastomer	Plant Indoor Air (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Concrete Block (Masonry Walls)	SH, SS	Concrete Block (Masonry Walls)	Atmosphere/Weather (Structural) (Ext)	Cracking	Masonry Wall Program (B2.1.31)	III.A3-11	3.5.1.43	A
Concrete Block (Masonry Walls)	FB, SH, SS	Concrete Block (Masonry Walls)	Plant Indoor Air (Structural) (Ext)	Cracking	Fire Protection (B2.1.12) and Masonry Wall Program (B2.1.31)	III.A3-11	3.5.1.43	E, 1

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Table 3.5.2-13 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Yard Structures  
(In-Scope) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	FB, MB, SH, SPB, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material (spalling, scaling) and cracking	Structures Monitoring Program (B2.1.32)	III.A3-6	3.5.1.26	A
Concrete Elements	FB, MB, SH, SPB, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Concrete Elements	FB, MB, SH, SPB, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Concrete Elements	FB, MB, SH, SPB, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Concrete cracking and spalling	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-30	3.3.1.66	B
Concrete Elements	FB, MB, SH, SPB, SS	Concrete	Atmosphere/Weather (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12) and Structures Monitoring Program (B2.1.32)	VII.G-31	3.3.1.67	B
Concrete Elements	FLB, SH, SS	Concrete	Buried (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A

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*Table 3.5.2-13 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Yard Structures  
(In-Scope) (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Concrete Elements	FLB, SH, SS	Concrete	Buried (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-4	3.5.1.31	A
Concrete Elements	FLB, SH, SS	Concrete	Buried (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-5	3.5.1.31	A
Concrete Elements	FLB, SH, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Concrete Elements	FLB, SH, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Concrete Elements	FLB, SH, SPB, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Doors	SH	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A



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*Table 3.5.2-13 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Yard Structures  
(In-Scope) (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Doors	SH, SPB	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Fire Barrier Doors	FB, SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Fire Barrier Doors	FB, SH	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Fire Protection (B2.1.12)	VII.G-3	3.3.1.63	B
Gypsum/Plaster Barrier	FB, SH	Gypsum/Plaster	Plant Indoor Air (Structural) (Ext)	Cracking	Fire Protection (B2.1.12)	None	None	J
Hatch	MB, SH, SPB	Carbon Steel	Atmosphere/Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Hatch	FLB, MB, SH, SPB	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Hatches/Plugs	FLB, MB, SH, SPB	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Hatches/Plugs	FLB, MB, SH, SPB	Concrete	Atmosphere/Weather (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Hatches/Plugs	FLB, MB, SH, SPB	Concrete	Atmosphere/Weather (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A

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*Table 3.5.2-13 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Yard Structures  
(In-Scope) (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Hatches/Plugs	FLB, MB, SH, SPB	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A
Hatches/Plugs	FLB, MB, SH, SPB	Concrete	Plant Indoor Air (Structural) (Ext)	Cracking, loss of bond, and loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-9	3.5.1.23	A
Hatches/Plugs	FLB, MB, SH, SPB	Concrete	Plant Indoor Air (Structural) (Ext)	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)	Structures Monitoring Program (B2.1.32)	III.A3-10	3.5.1.24	A
Penetrations Electrical	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Penetrations Electrical	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Penetrations Electrical	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Penetrations Mechanical	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Penetrations Mechanical	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Penetrations Mechanical	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A

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*Table 3.5.2-13 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Yard Structures (In-Scope) (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Roofing Membrane	SH	Elastomer	Atmosphere/Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Structural Steel	SS	Carbon Steel	Atmosphere/Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A
Structural Steel	SS	Carbon Steel	Encased in Concrete (Ext)	None	None	VII.J-21	3.3.1.96	C
Structural Steel	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.A3-12	3.5.1.25	A

Notes for Table 3.5.2-13:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
- J Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Note:

- 1 The NUREG-1801 does not provide a line in which Concrete Masonry is inspected per the Fire Protection program.

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Table 3.5.2-14 *Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Supports*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Cable Trays & Supports	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B2-10	3.5.1.39	A
Cable Trays & Supports	NSRS, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B2-10	3.5.1.39	A
Cable Trays & Supports	SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Reduction in concrete anchor capacity	Structures Monitoring Program (B2.1.32)	III.B2-1	3.5.1.40	A
Cable Trays & Supports	NSRS, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Reduction in concrete anchor capacity	Structures Monitoring Program (B2.1.32)	III.B2-1	3.5.1.40	A
Conduit And Supports	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B2-10	3.5.1.39	A
Conduit And Supports	NSRS, SH, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B2-10	3.5.1.39	A
Conduit And Supports	SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Reduction in concrete anchor capacity	Structures Monitoring Program (B2.1.32)	III.B2-1	3.5.1.40	A
Conduit And Supports	NSRS, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Reduction in concrete anchor capacity	Structures Monitoring Program (B2.1.32)	III.B2-1	3.5.1.40	A

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*Table 3.5.2-14    Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Supports  
(Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Electrical Panels & Enclosures	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B3-7	3.5.1.39	A
Electrical Panels & Enclosures	NSRS, SH, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B3-7	3.5.1.39	A
Electrical Panels & Enclosures	SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Reduction in concrete anchor capacity	Structures Monitoring Program (B2.1.32)	III.B3-1	3.5.1.40	A
Electrical Panels & Enclosures	NSRS, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Reduction in concrete anchor capacity	Structures Monitoring Program (B2.1.32)	III.B3-1	3.5.1.40	A
High Strength Bolting	SS	High Strength Low Alloy Steel (Bolting)	Plant Indoor Air (Structural) (Ext)	Cracking	Bolting Integrity (B2.1.7)	III.B1.1-3	3.5.1.51	B
High Strength Bolting	SS	High Strength Low Alloy Steel (Bolting)	Plant Indoor Air (Structural) (Ext)	Loss of material	Bolting Integrity (B2.1.7)	III.B1.1-4	3.5.1.51	B
Instrument Panels & Racks	NSRS, SH, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B3-7	3.5.1.39	A

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*Table 3.5.2-14    Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Supports  
(Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Instrument Panels & Racks	NSRS, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Reduction in concrete anchor capacity	Structures Monitoring Program (B2.1.32)	III.B3-1	3.5.1.40	A
Supports	ES, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of mechanical function	ASME Section XI, Subsection IWF (B2.1.29)	III.B1.1-2	3.5.1.54	A
Supports	ES, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of mechanical function	ASME Section XI, Subsection IWF (B2.1.29)	III.B1.2-2	3.5.1.54	A
Supports	ES, SS	Lubrite	Plant Indoor Air (Structural) (Ext)	Loss of mechanical function	ASME Section XI, Subsection IWF (B2.1.29)	III.B1.1-5	3.5.1.56	A
Supports	ES, SS	Lubrite	Plant Indoor Air (Structural) (Ext)	Loss of material, cracking	ASME Section XI, Subsection IWF (B2.1.29)	III.B1.2-3	3.5.1.56	A
Supports	ES, SS	Lubrite	Plant Indoor Air (Structural) (Ext)	Loss of mechanical function	Structures Monitoring Program (B2.1.32)	III.B2-2	3.5.1.52	A
Supports ASME 1	SS	Carbon Steel	Borated Water Leakage (Ext)	Loss of material	Boric Acid Corrosion (B2.1.4)	III.B1.1-14	3.5.1.55	A
Supports ASME 1	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	ASME Section XI, Subsection IWF (B2.1.29)	III.B1.1-13	3.5.1.53	A
Supports ASME 1	SS	Concrete	Plant Indoor Air (Structural) (Ext)	Reduction in concrete anchor capacity	Structures Monitoring Program (B2.1.32)	III.B1.1-1	3.5.1.40	A

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Table 3.5.2-14    *Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Supports*  
(Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Supports ASME 1	SS	Stainless Steel	Borated Water Leakage (Ext)	None	None	III.B1.1-10	3.5.1.59	A
Supports ASME 1	SS	Stainless Steel	Plant Indoor Air (Structural) (Ext)	None	None	III.B1.1-9	3.5.1.59	A
Supports ASME 2 & 3	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	ASME Section XI, Subsection IWF (B2.1.29)	III.B1.2-10	3.5.1.53	A
Supports ASME 2 & 3	SS	Carbon Steel	Borated Water Leakage (Ext)	Loss of material	Boric Acid Corrosion (B2.1.4)	III.B1.2-11	3.5.1.55	A
Supports ASME 2 & 3	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	ASME Section XI, Subsection IWF (B2.1.29)	III.B1.2-10	3.5.1.53	A
Supports ASME 2 & 3	SS	Carbon Steel	Raw Water (Ext)	Loss of material	ASME Section XI, Subsection IWF (B2.1.29)	None	None	G
Supports ASME 2 & 3	SS	Concrete	Plant Indoor Air (Structural) (Ext)	Reduction in concrete anchor capacity	Structures Monitoring Program (B2.1.32)	III.B1.2-1	3.5.1.40	A
Supports ASME 2 & 3	SS	Stainless Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	ASME Section XI, Subsection IWF (B2.1.29)	III.B4-7	3.5.1.50	E, 1
Supports ASME 2 & 3	SS	Stainless Steel	Borated Water Leakage (Ext)	None	None	III.B1.2-8	3.5.1.59	A
Supports ASME 2 & 3	SS	Stainless Steel	Plant Indoor Air (Structural) (Ext)	None	None	III.B1.2-7	3.5.1.59	A

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*Table 3.5.2-14    Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Supports  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Supports ASME 2 & 3	SS	Stainless Steel	Raw Water (Ext)	Loss of material	ASME Section XI, Subsection IWF (B2.1.29)	None	None	G
Supports HVAC Duct	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B2-10	3.5.1.39	A
Supports HVAC Duct	NSRS, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B2-10	3.5.1.39	A
Supports HVAC Duct	NSRS, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Reduction in concrete anchor capacity	Structures Monitoring Program (B2.1.32)	III.B2-1	3.5.1.40	A
Supports HVAC Duct	SS	Stainless Steel	Plant Indoor Air (Structural) (Ext)	None	None	III.B2-8	3.5.1.59	A
Supports Instrument	SS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B2-10	3.5.1.39	A
Supports Instrument	SS	Carbon Steel	Borated Water Leakage (Ext)	Loss of material	Boric Acid Corrosion (B2.1.4)	III.B2-11	3.5.1.55	A
Supports Instrument	NSRS, SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B2-10	3.5.1.39	A
Supports Instrument	NSRS, SS	Concrete	Plant Indoor Air (Structural) (Ext)	Reduction in concrete anchor capacity	Structures Monitoring Program (B2.1.32)	III.B2-1	3.5.1.40	A
Supports Instrument	SS	Stainless Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B2-7	3.5.1.50	A



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*Table 3.5.2-14    Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Supports  
(Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Supports Instrument	SS	Stainless Steel	Borated Water Leakage (Ext)	None	None	III.B2-9	3.5.1.59	A
Supports Instrument	NSRS, SS	Stainless Steel	Plant Indoor Air (Structural) (Ext)	None	None	III.B2-8	3.5.1.59	A
Supports Insulation	SS	Aluminum	Plant Indoor Air (Structural) (Ext)	None	None	III.B1.1-6	3.5.1.58	A
Supports Mech Equip Class 1	SS	Carbon Steel	Borated Water Leakage (Ext)	Loss of material	Boric Acid Corrosion (B2.1.4)	III.B1.1-14	3.5.1.55	A
Supports Mech Equip Class 1	SS	Concrete	Plant Indoor Air (Structural) (Ext)	Reduction in concrete anchor capacity	Structures Monitoring Program (B2.1.32)	III.B1.1-1	3.5.1.40	A
Supports Mech Equip Class 1	SS	Stainless Steel	Borated Water Leakage (Ext)	None	None	III.B1.1-10	3.5.1.59	A
Supports Mech Equip Class 2 & 3	SS	Carbon Steel	Borated Water Leakage (Ext)	Loss of material	Boric Acid Corrosion (B2.1.4)	III.B1.2-11	3.5.1.55	A
Supports Mech Equip Class 2 & 3	SS	Carbon Steel	Fuel Oil (Ext)	Loss of material	ASME Section XI, Subsection IWF (B2.1.29)	None	None	G
Supports Mech Equip Class 2 & 3	SS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	ASME Section XI, Subsection IWF (B2.1.29)	III.B1.2-10	3.5.1.53	A
Supports Mech Equip Class 2 & 3	SS	Concrete	Plant Indoor Air (Structural) (Ext)	Reduction in concrete anchor capacity	Structures Monitoring Program (B2.1.32)	III.B1.2-1	3.5.1.40	A

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*Table 3.5.2-14    Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Supports  
(Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Supports Mech Equip Class 2 & 3	SS	Stainless Steel	Borated Water Leakage (Ext)	None	None	III.B1.2-8	3.5.1.59	A
Supports Mech Equip Class 2 & 3	SS	Stainless Steel	Fuel Oil (Ext)	Loss of material	ASME Section XI, Subsection IWF (B2.1.29)	None	None	G
Supports Mech Equip Class 2 & 3	SS	Stainless Steel	Plant Indoor Air (Structural) (Ext)	None	None	III.B1.2-7	3.5.1.59	A
Supports Mech Equip Non ASME	NSRS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B4-10	3.5.1.39	A
Supports Mech Equip Non ASME	NSRS	Carbon Steel	Borated Water Leakage (Ext)	Loss of material	Boric Acid Corrosion (B2.1.4)	III.B4-11	3.5.1.55	A
Supports Mech Equip Non ASME	NSRS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B4-10	3.5.1.39	A
Supports Mech Equip Non ASME	NSRS	Concrete	Plant Indoor Air (Structural) (Ext)	Reduction in concrete anchor capacity	Structures Monitoring Program (B2.1.32)	III.B4-1	3.5.1.40	A
Supports Mech Equip Non ASME	NSRS	Stainless Steel	Atmosphere/ Weather. (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B4-7	3.5.1.50	A

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*Table 3.5.2-14    Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Supports  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Supports Mech Equip Non ASME	NSRS	Stainless Steel	Borated Water Leakage (Ext)	None	None	III.B4-9	3.5.1.59	A
Supports Mech Equip Non ASME	NSRS	Stainless Steel	Plant Indoor Air (Structural) (Ext)	None	None	III.B4-8	3.5.1.59	A
Supports Non ASME	NSRS	Carbon Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B2-10	3.5.1.39	A
Supports Non ASME	NSRS	Carbon Steel	Borated Water Leakage (Ext)	Loss of material	Boric Acid Corrosion (B2.1.4)	III.B2-11	3.5.1.55	A
Supports Non ASME	NSRS	Carbon Steel	Plant Indoor Air (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B2-10	3.5.1.39	A
Supports Non ASME	NSRS	Carbon Steel	Raw Water (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	None	None	G
Supports Non ASME	NSRS	Concrete	Plant Indoor Air (Structural) (Ext)	Reduction in concrete anchor capacity	Structures Monitoring Program (B2.1.32)	III.B2-1	3.5.1.40	A
Supports Non ASME	NSRS	Stainless Steel	Atmosphere/ Weather (Structural) (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	III.B2-7	3.5.1.50	A
Supports Non ASME	NSRS	Stainless Steel	Borated Water Leakage (Ext)	None	None	III.B2-9	3.5.1.59	A
Supports Non ASME	NSRS	Stainless Steel	Plant Indoor Air (Structural) (Ext)	None	None	III.B2-8	3.5.1.59	A

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Table 3.5.2-14 *Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Supports (Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Supports Non ASME	NSRS	Stainless Steel	Raw Water (Ext)	Loss of material	Structures Monitoring Program (B2.1.32)	None	None	G

Notes for Table 3.5.2-14:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
- G Environment not in NUREG-1801 for this component and material.

Plant Specific Notes:

- 1 NUREG-1801 does not provide a line to evaluate stainless steel components outdoors under ASME Section XI, Subsection IWF.

## **3.6 AGING MANAGEMENT OF ELECTRICAL AND INSTRUMENTATION AND CONTROLS**

### **3.6.1 Introduction**

Section 3.6 provides the results of the aging management reviews for those component types identified in Section 2.5, Scoping and Screening Results – Electrical and Instrument and Control Systems, subject to aging management review. The electrical component types subject to aging management review are discussed in the following sections:

- Connections (metallic parts) (Section 2.5.1.1)
- Connector (Section 2.5.1.2)
- High Voltage Insulators (Section 2.5.1.4)
- Insulated Cable and Connections (Section 2.5.1.5) (includes the following):
  - Electrical cables and connections not subject to 10 CFR 50.49 EQ requirements
  - Electrical cables and connections used in instrumentation circuits not subject to 10 CFR 50.49 EQ requirements that are sensitive to reduction in conductor insulation resistance
  - Inaccessible Medium-Voltage Electrical Cables not subject to 10 CFR 50.49 EQ requirements
- Metal Enclosed Bus (Section 2.5.1.6) (includes the following):
  - Bus bar and connections
  - Bus enclosure
  - Bus Insulation and insulators
- Penetrations Electrical (Section 2.5.1.7)
- Switchyard Bus and Connections (Section 2.5.1.8)
- Terminal Block (Section 2.5.1.9)
- Transmission Conductors and Connections (Section 2.5.1.10)

Table 3.6.1, Summary of Aging Management Evaluations in Chapter VI of NUREG-1801 for Electrical Components, provides the summary of the programs evaluated in NUREG-1801 that are applicable to component types in this Section. Table 3.6.1 uses the format of Table 1 described in Section 3.0.

### **3.6.2 Results**

The following table summarizes the results of the aging management review for the component types in the Electrical and Instrumentation and Controls area.

- Table 3.6.2-1 Electrical and Instrument and Controls – Summary of Aging Management Evaluation – Electrical Components

This table uses the format of Table 2 discussed in Section 3.0.

#### **3.6.2.1 Materials, Environment, Aging Effects Requiring Management and Aging Management Programs**

The materials from which the component types are fabricated, the environments to which they are exposed, the potential aging effects requiring management, and the aging management programs used to manage these aging effects are provided for each of the above electrical component commodities in the following subsections.

##### **3.6.2.1.1 Cable Connections (Metallic Parts)**

###### **Materials**

The materials of construction for the cable connections (metallic parts) are:

- Various Metals Used For Electrical Contacts

###### **Environment**

The cable connections (metallic parts) are exposed to the following environment:

- Plant Indoor Air
- Atmosphere/ Weather (Ext)

###### **Aging Effects Requiring Management**

The following cable connections (metallic parts) aging effect requires management:

- Loosening of bolted connections

###### **Aging Management Programs**

The following aging management program manages the aging effects for the cable connections (metallic parts):

- Electrical Connections Not Subject to 10 CFR 50.49 EQ Requirements (B2.1.35)

### **3.6.2.1.2 Connectors**

#### **Materials**

The materials of construction for the connectors are:

- Various Metals Used For Electrical Contacts

#### **Environment**

The connectors are exposed to the following environment:

- Borated Water Leakage

#### **Aging Effects Requiring Management**

The following connectors aging effect requires management:

- Corrosion Of Connector Contact Surfaces

#### **Aging Management Programs**

The following aging management program manages the aging effects for the connectors:

- Boric Acid Corrosion (B2.1.4)

### **3.6.2.1.3 High Voltage Insulator**

#### **Materials**

The materials of construction for the high voltage insulators are:

- Carbon Steel (Galvanized)
- Cement (Electrical Insulators)
- Porcelain

#### **Environment**

The high voltage insulators are exposed to the following environment:

- Atmosphere/ Weather (Ext)

#### **Aging Effects Requiring Management**

The following high voltage insulator aging effects require management:

- None

### **Aging Management Programs**

The following aging management program manages the aging effects for the high voltage insulators:

- None

### **Technical justification for no aging effects requiring management**

The PVNGS is located in an area where the outdoor environment is not subject to industry air pollution or salt spray. Contamination buildup on the high-voltage insulators is not a problem due to sufficient rainfall periodically washing the insulators. Additionally there is no salt spray at the plant since the plant is not located near the ocean. Degradation of insulator quality in the absence of salt deposits and surface contamination is not an aging effect requiring management.

Industry experience has shown that transmission conductors are designed and installed not to swing significantly and cause wear, due to wind induced abrasion and fatigue. The PVNGS transmission conductors are designed and installed not to swing significantly and cause wear due to wind induced abrasion and fatigue. Therefore, loss of material due to wind induced abrasion and fatigue is not an applicable aging effect requiring management.

### **3.6.2.1.4 Insulated Cables and Connections**

#### **3.6.2.1.4.1 Electrical cables and connections not subject to 10 CFR 50.49 EQ requirements**

##### **Materials**

The materials of construction for the electrical cable and connections not subject to 10 CFR 50.49 EQ requirements are:

- Various Organic Polymers

##### **Environment**

The electrical cable and connections not subject to 10 CFR 50.49 EQ requirements are exposed to the following environment:

- Adverse Localized Environment

### **Aging Effects Requiring Management**

The following electrical cable and connections not subject to 10 CFR 50.49 EQ requirements aging effects require management:

- Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure



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**Aging Management Programs**

The following aging management program manages the aging effects for the cable and connections not subject to 10 CFR 50.49 EQ requirements:

- Electrical Cables and Connections Not Subject to 10 CFR 50.49 EQ Requirements (B2.1.24)

3.6.2.1.4.2 Electrical cables and connections used in instrumentation circuits not subject to 10 CFR 50.49 EQ requirements that are sensitive to reduction in conductor insulation resistance

**Materials**

The materials of construction for the electrical cables and connections used in sensitive instrumentation circuits not subject to 10 CFR 50.49 EQ requirements are:

- Various Organic Polymers

**Environment**

The electrical cables and connections used in sensitive instrumentation circuits not subject to 10 CFR 50.49 EQ requirements are exposed to the following environment:

- Adverse Localized Environment

**Aging Effects Requiring Management**

The following electrical cables and connections used in sensitive instrumentation circuits not subject to 10 CFR 50.49 EQ requirements aging effects require management:

- Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure

**Aging Management Programs**

The following aging management program manages the aging effects for the cable and connections used in sensitive instrumentation circuits not subject to 10 CFR 50.49 EQ requirements:

- Electrical Cables and Connections Not Subject to 10 CFR 50.49 EQ Requirements Used in Instrumentation Circuits (B2.1.25)

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**3.6.2.1.4.3 Inaccessible Medium Voltage Electrical Cables not subject to 10 CFR 50.49 EQ requirements**

**Materials**

The materials of construction for the inaccessible medium voltage electrical cables not subject to 10 CFR 50.49 EQ requirements are:

- Various Organic Polymers

**Environment**

The inaccessible medium voltage electrical cables not subject to 10 CFR 50.49 EQ requirements are exposed to the following environment:

- Adverse Localized Environment

**Aging Effects Requiring Management**

The following inaccessible medium voltage electrical cables not subject to 10 CFR 50.49 EQ requirements aging effects require management:

- Localized damage and breakdown of insulation leading to electrical failure

**Aging Management Programs**

The following aging management program manages the inaccessible medium voltage electrical cables not subject to 10 CFR 50.49 EQ requirements:

- Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 EQ Requirements (B2.1.26)

**3.6.2.1.5 Metal Enclosed Bus**

**Materials**

The materials of construction for metal enclosed bus are:

- Aluminum
- Carbon Steel
- Stainless Steel
- Various Metals Used for Electrical Contacts
- Elastomer
- Various Insulation Material (Electrical)

### **Environment**

Metal enclosed bus is exposed to the following environment:

- Atmosphere/ Weather (Ext)

### **Aging Effects Requiring Management**

The following metal enclosed bus aging effects require management:

- Loosening of bolted connections
- Loss of material
- Hardening and loss of strength
- Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure

### **Aging Management Programs**

The following aging management program manages the metal enclosed bus:

- Metal Enclosed Bus (B2.1.36)

### **3.6.2.1.6 Penetrations Electrical**

#### **Materials**

The materials of construction for the penetrations electrical are:

- Various Organic Polymers

#### **Environment**

The penetrations electrical are exposed to the following environment:

- Adverse Localized Environment (Ext)

### **Aging Effects Requiring Management**

The following penetrations electrical aging effects require management:

- Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure

### **Aging Management Programs**

The following aging management program manages the penetrations electrical:

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- Electrical Cables and Connections Not Subject to 10 CFR 50.49 EQ Requirements (B2.1.24)

#### **3.6.2.1.7 Switchyard Bus and Connections**

##### **Materials**

The materials of construction for the switchyard bus and connections are:

- Aluminum
- Stainless Steel

##### **Environment**

The switchyard bus and connections are exposed to the following environment:

- Atmosphere/ Weather (Ext)

##### **Aging Effects Requiring Management**

The following switchyard bus and connections aging effect require management:

- None

##### **Aging Management Programs**

- None

##### **Technical justification for no aging effects requiring management**

The PVNGS outdoor environment is not subject to industry air pollution or saline environment. Aluminum bus material does not experience any appreciable aging effects in this environment.

Switchyard bus connections employ good bolting practices consistent with the recommendations of EPRI 1003471, "Electrical Connector Application Guidelines". The connections are treated with corrosion inhibitors to avoid connection oxidation and torqued to avoid loss of pre-load, at the time of installation. The switchyard bus bolted connections are designed and installed using lock washers that prevent loss of preload. The stainless steel connection material does not experience any appreciable aging effects in this environment.

#### **3.6.2.1.8 Terminal Blocks**

##### **Materials**

The materials of construction for the terminal blocks are:

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- Various Insulation Materials (Electrical)

**Environment**

The terminal blocks are exposed to the following environment:

- Adverse Localized Environment (Ext)

**Aging Effects Requiring Management**

The following terminal blocks aging effects require management:

- Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure

**Aging Management Programs**

The following aging management program manages the aging effects for the terminal blocks:

- Electrical Cables and Connections Not Subject to 10 CFR 50.49 EQ Requirements (B2.1.24)

**3.6.2.1.9 Transmission Conductors and Connections**

**Materials**

The materials of construction for the transmission conductors and connections are:

- Aluminum Conductor Steel Reinforced

**Environment**

The transmission conductors and connections are exposed to the following environment:

- Atmosphere/ Weather (Ext)

**Aging Effects Requiring Management**

The following transmission conductors and connections aging effect require management:

- None

**Aging Management Programs**

- None

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**Technical justification for no aging effects requiring management**

The most prevalent mechanism contributing to loss of conductor strength of an Aluminum Conductor Steel Reinforced (ACSR) transmission conductor is corrosion, which includes corrosion of the steel core and aluminum strand pitting. ACSR conductor degradation begins as a loss of zinc from the galvanized steel core wires. Corrosion rates depend largely on air quality, which involves suspended particles in the air, SO<sub>2</sub> concentration, rain, fog chemistry, and other weather conditions. The PVNGS outdoor environment is not subject to industry air pollution or saline environment that would cause significant corrosion of the transmission conductors.

The National Electrical Safety Code (NESC) requires that tension on installed conductors be a maximum of 60% of the ultimate conductor strength. The NESC also sets the maximum tension a conductor must be designed to withstand under medium load requirements, which includes consideration of ice, wind, and temperature.

At PVNGS, the ACSR transmission conductors are 2-2156 KCMIL per phase with a core of 19 steel strands having an ultimate conductor strength of 60,300 lbs. The PVNGS ACSR transmission conductors within the scope of license renewal are installed so that conductor tension does not exceed 18,000 lbs at the NESC medium loading condition (30% of the ultimate conductor strength).

Tests performed by Ontario Hydroelectric on ACSR transmission conductors with a core of 7 steel strands averaging 70 to 80 years old showed a 30% loss of ultimate conductor strength due to corrosion. Assuming a 30% loss of ultimate conductor strength (18,090 lbs) due to corrosion over 60 years the PVNGS ACSR transmission conductors have adequate design margin to offset the loss of strength due to corrosion and still meet the NESC requirement of not exceeding 60% of the ultimate conductor strength  $((60,300 - 18,090) * 60\% = 25,326 \text{ lbs})$ . Therefore, corrosion is not a credible aging effect that requires management for the period of extended operation.

Transmission conductor and switchyard bus connections at the time of installation are treated with corrosion inhibitors to avoid connection oxidation and torqued to avoid loss of pre-load. Based on temperature data in the UFSAR Chapter 2.3, the transmission connections and switchyard bus does not experience thermal cycling. The transmission connections and switchyard bus are subject to average monthly temperatures ranging from 105 °F in July and August to 38 °F in January with minimal ohmic heating. Therefore, increased resistance of connections due to oxidation or loss of pre-load is not an aging effect requiring management for the period of extended operation. These connections are periodically evaluated via thermography as part of the preventive maintenance activities. The periodic thermography will continue into the period of extended operation.

**3.6.2.2 Further Evaluation of Aging Management as Recommended by  
NUREG-1801**

NUREG-1801 provides the basis for identifying those programs that warrant further evaluation. For the electrical and control systems, those evaluations are addressed in the following subsections.

**3.6.2.2.1 Electrical Equipment Subject to Environmental Qualification**

Environmental qualification (EQ) is a TLAA as defined in 10 CFR 54.3. Equipment qualification for degradation due to various aging mechanisms to which electrical equipment is subject is evaluated in accordance with 10 CFR 54.21(c)(1). The PVNGS EQ program meets requirements of 10 CFR 50.49.

Section 4.4 describes the TLAA evaluation of electrical equipment subject to 10 CFR 50.49 environmental qualification.

**3.6.2.2.2 Degradation of Insulator Quality due to Presence of Any Salt  
Deposits and Surface Contamination, and Loss of Material due to  
Mechanical Wear**

The PVNGS is located in an area where the outdoor environment is not subject to industry air pollution or salt spray. Contamination buildup on the high-voltage insulators is not a problem due to sufficient rainfall in the spring and summer washing the insulators. Additionally there is no salt spray at the plant since the plant is not located near the ocean. Degradation of insulator quality in the absence of salt deposits and surface contamination is not an aging effect requiring management.

Industry experience has shown that transmission conductors are designed and installed not to swing significantly and cause wear, due to wind induced abrasion and fatigue. The PVNGS transmission conductors are designed and installed not to swing significantly and cause wear due to wind induced abrasion and fatigue. Therefore, loss of material due to wind induced abrasion and fatigue is not an applicable aging effect requiring management.

**3.6.2.2.3 Loss of Material due to Wind Induced Abrasion and Fatigue, Loss  
of Conductor Strength due to Corrosion, and Increased  
Resistance of Connection due to Oxidation or Loss of Pre-load**

Industry experience has shown that transmission conductors are designed and installed not to swing significantly and cause wear due to wind induced abrasion and fatigue. Therefore, loss of material due to wind induced abrasion and fatigue is not an applicable aging effect requiring management for the period of extended operation.

The most prevalent mechanism contributing to loss of conductor strength of an Aluminum Conductor Steel Reinforced (ACSR) transmission conductor is corrosion, which includes

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corrosion of the steel core and aluminum strand pitting. ACSR conductor degradation begins as a loss of zinc from the galvanized steel core wires. Corrosion rates depend largely on air quality, which involves suspended particles in the air, SO<sub>2</sub> concentration, rain, fog chemistry, and other weather conditions. The PVNGS outdoor environment is not subject to industry air pollution or saline environment that would cause significant corrosion of the transmission conductors.

The National Electrical Safety Code (NESC) requires that tension on installed conductors be a maximum of 60% of the ultimate conductor strength. The NESC also sets the maximum tension a conductor must be designed to withstand under medium load requirements, which includes consideration of ice, wind, and temperature.

At PVNGS, the ACSR transmission conductors are 2-2156 KCMIL per phase with a core of 19 steel strands having an ultimate conductor strength of 60,300 lbs. The PVNGS ACSR transmission conductors within the scope of license renewal are installed so that conductor tension does not exceed 18,000 lbs at the NESC medium loading condition (30% of the ultimate conductor strength).

Tests performed by Ontario Hydroelectric on ACSR transmission conductors with a core of 7 steel strands averaging 70 to 80 years old showed a 30% loss of ultimate conductor strength due to corrosion. Assuming a 30% loss of ultimate conductor strength (18,090 lbs) due to corrosion over 60 years the PVNGS ACSR transmission conductors have adequate design margin to offset the loss of strength due to corrosion and still meet the NESC requirement of not exceeding 60% of the ultimate conductor strength  $((60,300 - 18,090)(0.60) = 25,326 \text{ lbs})$ . Therefore, corrosion is not a credible aging effect that requires management for the period of extended operation.

Transmission conductor and switchyard bus connections at the time of installation are treated with corrosion inhibitors to avoid connection oxidation and torqued to avoid loss of pre-load. Based on temperature data in the UFSAR Chapter 2.3, the transmission connections and switchyard bus does not experience thermal cycling. The transmission connections and switchyard bus are subject to average monthly temperatures ranging from 105 °F in July and August to 38 °F in January with minimal ohmic heating. Therefore, increased resistance of connections due to oxidation or loss of pre-load is not an aging effect requiring management for the period of extended operation. These connections are periodically evaluated via thermography as part of the preventive maintenance activities. The periodic thermography will continue into the period of extended operation.

The PVNGS outdoor environment is not subject to industry air pollution or saline environment. Aluminum bus material, galvanized steel support hardware and aluminum connection material do not experience any appreciable aging effects in this environment.

Switchyard bus connections employ good bolting practices consistent with the recommendations of EPRI 1003471, "Electrical Connector Application Guidelines". The connections are treated with corrosion inhibitors to avoid connection oxidation and torqued to avoid loss of pre-load, at the time of installation. The switchyard bus bolted connections





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are designed and installed to prevent loss of preload. The aluminum connection material does not experience any appreciable aging effects in this environment.

**3.6.2.2.4 Quality Assurance for Aging Management of Nonsafety-Related Components**

Quality Assurance Program and Administrative Controls are discussed in Section B1.3.

**3.6.2.3 Time-Limited Aging Analysis**

The time-limited aging analyses identified below are associated with the electrical and instrument and controls component types. The section within Chapter 4, Time-Limited Aging Analyses, is indicated in parenthesis.

- Environmental Qualification of Electrical and Instrumentation and Control Equipment (Section 4.4, Environmental Qualification (EQ) of Electric Equipment)

**3.6.3 Conclusions**

The Electrical and Instrument and Controls component types that are subject to aging management review have been evaluated. The aging management programs selected to manage the aging effects for the Electrical and Instrument and Controls component types are identified in the summary Table 3.6.1 and in Section 3.6.2.1.

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

Therefore, based on the demonstration provided in Appendix B, the effects of aging associated with the Electrical and Instrument and Controls component types will be adequately managed so that there is reasonable assurance that the intended functions will be maintained consistent with the current licensing basis during the period of extended operation.

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*Table 3.6.1 Summary of Aging Management Evaluations in Chapter VI of NUREG-1801 for Electrical Components*

Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.6.1.01	Electrical equipment subject to 10 CFR 50.49 environmental qualification (EQ) requirements	Degradation due to various aging mechanisms	Environmental Qualification Of Electric Components (B3.2)	Yes, TLAA	Environmental qualification of electric components is a TLAA. See further evaluation in Section 3.6.2.2.1.
3.6.1.02	Electrical cables, connections and fuse holders (insulation) not subject to 10 CFR 50.49 EQ requirements	Reduced insulation resistance and electrical failure due to various physical, thermal, radiolytic, photolytic, and chemical mechanisms	Electrical Cables and Connections Not Subject To 10 CFR 50.49 EQ Requirements (B2.1.24)	No	Consistent with NUREG-1801.
3.6.1.03	Conductor insulation for electrical cables and connections used in instrumentation circuits not subject to 10 CFR 50.49 EQ requirements that are sensitive to reduction in conductor insulation resistance (IR)	Reduced insulation resistance and electrical failure due to various physical, thermal, radiolytic, photolytic, and chemical mechanisms	Electrical Cables And Connections Used In Instrumentation Circuits Not Subject To 10 CFR 50.49 EQ Requirements (B2.1.25)	No	Consistent with NUREG-1801.

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Table 3.6.1 Summary of Aging Management Evaluations in Chapter VI of NUREG-1801 for Electrical Components (Continued)

Item Number	Component Type	Aging Effect// Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.6.1.04	Conductor insulation for inaccessible medium voltage (2 kV to 35 kV) cables (e.g., installed in conduit or direct buried) not subject to 10 CFR 50.49 EQ requirements	Localized damage and breakdown of insulation leading to electrical failure due to moisture intrusion, water trees	Inaccessible Medium Voltage Cables Not Subject To 10 CFR 50.49 EQ Requirements (B2.1.26)	No	Consistent with NUREG-1801.
3.6.1.05	Connector contacts for electrical connectors exposed to borated water leakage	Corrosion of connector contact surfaces due to intrusion of borated water	Boric Acid Corrosion (B2.1.4)	No	Consistent with NUREG-1801.
3.6.1.06	Fuse Holders (Not Part of a Larger Assembly): Fuse holders – metallic clamp	Fatigue due to ohmic heating, thermal cycling, electrical transients, frequent manipulation, vibration, chemical contamination, corrosion, and oxidation	Fuse Holders	No	Not applicable. All fuse holders including the fuses installed for electrical penetration protection are part of larger assemblies, so the applicable NUREG-1801 lines were not used.
3.6.1.07	Metal enclosed bus - Bus/connections	Loosening of bolted connections due to thermal cycling and ohmic heating	Metal Enclosed Bus (B2.1.36)	No	Consistent with NUREG-1801.

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*Table 3.6.1 Summary of Aging Management Evaluations in Chapter VI of NUREG-1801 for Electrical Components (Continued)*

Item Number	Component Type	Aging Effect// Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.6.1.08	Metal enclosed bus – Insulation/insulators	Reduced insulation resistance and electrical failure due to various physical, thermal, radiolytic, photolytic, and chemical mechanisms	Metal Enclosed Bus (B2.1.36)	No	Consistent with NUREG-1801.
3.6.1.09	Metal enclosed bus – Enclosure assemblies	Loss of material due to general corrosion	Structures Monitoring Program (B2.1.32)	No	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program. Aging Management Program for Metal Enclosed Bus (B2.1.36) is credited.
3.6.1.10	Metal enclosed bus – Enclosure assemblies	Hardening and loss of strength due to elastomers degradation	Structures Monitoring Program (B2.1.32)	No	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program. Aging Management Program for Metal Enclosed Bus (B2.1.36) is credited.
3.6.1.11	High voltage insulators	Degradation of insulation quality due to presence of any salt deposits and surface contamination, Loss of material caused by mechanical wear due to wind blowing on transmission conductors	A plant-specific aging management program is to be evaluated.	Yes	Exception to NUREG-1801. Aging effect in NUREG-1801 for this material and environment combination is not applicable. See further evaluation in Section 3.6.2.2.2.

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*Table 3.6.1 Summary of Aging Management Evaluations in Chapter VI of NUREG-1801 for Electrical Components (Continued)*

Item Number	Component Type	Aging Effect / Mechanism	Aging Management Program	Further Evaluation Recommended	Discussion
3.6.1.12	Transmission conductors and connections, Switchyard bus and connections	Loss of material due to wind induced abrasion and fatigue, Loss of conductor strength due to corrosion, Increased resistance of connection due to oxidation or loss of preload	A plant-specific aging management program is to be evaluated.	Yes	Exception to NUREG-1801. Aging effect in NUREG-1801 for this material and environment combination is not applicable. See further evaluation in Section 3.6.2.2.3.
3.6.1.13	Cable Connections – Metallic parts	Loosening of bolted connections due to thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion, and oxidation	Electrical Cable Connections Not Subject To 10 CFR 50.49 Environmental Qualification Requirements (B2.1.35)	No	Consistent with NUREG-1801.
3.6.1.14	Fuse Holders (Not Part of a Larger Assembly) Insulation material	None	None	NA – No AEM or AMP	Not applicable. All fuse holders including the fuses installed for electrical penetration protection are part of larger assemblies, so the applicable NUREG-1801 lines were not used.

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*Table 3.6.2-1 – Electrical and Instrument and Controls – Summary of Aging Management Evaluation – Electrical Components*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
10 CFR 50.49 Electrical Equipment	EC, IN	Various Organic Polymers and Metallic Materials	Adverse Localized Environment (Ext)	Various degradation	Time-Limited Aging Analysis evaluated for the period of extended operation.	VI.B-1	3.6.1.01	A
Cable Connections (Metallic Parts)	EC	Various Metals Used for Electrical Contacts	Atmosphere/ Weather (Ext)	Loosening of bolted connections	Electrical Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B2.1.35)	VI.A-1	3.6.1.13	A
Cable Connections (Metallic Parts)	EC	Various Metals Used for Electrical Contacts	Plant Indoor Air (Ext)	Loosening of bolted connections	Electrical Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B2.1.35)	VI.A-1	3.6.1.13	A
Connector	EC	Various Metals Used for Electrical Contacts	Borated Water Leakage (Ext)	Corrosion of connector contact surfaces	Boric Acid Corrosion (B2.1.4)	VI.A-5	3.6.1.05	A
High Voltage Insulator	NSRS	Carbon Steel (Galvanized)	Atmosphere/ Weather (Ext)	None	None	VI.A-9	3.6.1.11	I, 1
High Voltage Insulator	NSRS	Carbon Steel (Galvanized)	Atmosphere/ Weather (Ext)	None	None	VI.A-10	3.6.1.11	I, 1

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*Table 3.6.2-1 – Electrical and Instrument and Controls – Summary of Aging Management Evaluation – Electrical Components  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
High Voltage Insulator	IN	Cement (Electrical Insulators)	Atmosphere/Weather (Ext)	None	None	VI.A-9	3.6.1.11	I, 1
High Voltage Insulator	IN	Cement (Electrical Insulators)	Atmosphere/Weather (Ext)	None	None	VI.A-10	3.6.1.11	I, 1
High Voltage Insulator	IN	Porcelain	Atmosphere/Weather (Ext)	None	None	VI.A-9	3.6.1.11	I, 1
High Voltage Insulator	IN	Porcelain	Atmosphere/Weather (Ext)	None	None	VI.A-10	3.6.1.11	I, 1
Insulated Cable and Connections	EC, IN	Various Organic Polymers	Adverse Localized Environment (Ext)	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure	Electrical Cables and Connections Not Subject to 10 CFR 50.49 EQ Requirements (B2.1.24)	VI.A-2	3.6.1.02	A

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*Table 3.6.2-1 – Electrical and Instrument and Controls – Summary of Aging Management Evaluation – Electrical Components  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Insulated Cable and Connections	EC, IN	Various Organic Polymers	Adverse Localized Environment (Ext)	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure	Electrical Cables and Connections Not Subject to 10 CFR 50.49 EQ Requirements Used in Instrumentation Circuits (B2.1.25)	VI.A-3	3.6.1.03	A
Insulated Cable and Connections	EC, IN	Various Organic Polymers	Adverse Localized Environment (Ext)	Localized damage and breakdown of insulation leading to electrical failure	Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 EQ Requirements (B2.1.26)	VI.A-4	3.6.1.04	A
Metal Enclosed Bus (Bus/Connections)	EC	Aluminum	Atmosphere/Weather (Ext)	Loosening of bolted connections	Metal Enclosed Bus (B2.1.36)	VI.A-11	3.6.1.07	A
Metal Enclosed Bus (Bus/Connections)	EC	Carbon Steel	Atmosphere/Weather (Ext)	Loosening of bolted connections	Metal Enclosed Bus (B2.1.36)	VI.A-11	3.6.1.07	A
Metal Enclosed Bus (Bus/Connections)	EC	Stainless Steel	Atmosphere/Weather (Ext)	Loosening of bolted connections	Metal Enclosed Bus (B2.1.36)	VI.A-11	3.6.1.07	A



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*Table 3.6.2-1 – Electrical and Instrument and Controls – Summary of Aging Management Evaluation – Electrical Components (Continued)*

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Metal Enclosed Bus (Bus/Connections)	EC	Various Metals Used for Electrical Contacts	Atmosphere/Weather (Ext)	Loosening of bolted connections	Metal Enclosed Bus (B2.1.36)	VI.A-11	3.6.1.07	A
Metal Enclosed Bus (Enclosure)	NSRS	Aluminum	Atmosphere/Weather (Ext)	Loss of material	Metal Enclosed Bus (B2.1.36)	None	None	J
Metal Enclosed Bus (Enclosure)	NSRS	Carbon Steel	Atmosphere/Weather (Ext)	Loss of material	Metal Enclosed Bus (B2.1.36)	VI.A-13	3.6.1.09	E, 3
Metal Enclosed Bus (Enclosure)	ES	Elastomer	Atmosphere/Weather (Ext)	Hardening and loss of strength	Metal Enclosed Bus (B2.1.36)	VI.A-12	3.6.1.10	E, 3
Metal Enclosed Bus (Insulation/Insulators)	IN	Various Insulation Material (Electrical)	Atmosphere/Weather (Ext)	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure	Metal Enclosed Bus (B2.1.36)	VI.A-14	3.6.1.08	A

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Table 3.6.2-1 – Electrical and Instrument and Controls – Summary of Aging Management Evaluation – Electrical Components  
(Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Penetrations Electrical	EC, IN	Various Organic Polymers	Adverse Localized Environment (Ext)	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure	Electrical Cables and Connections Not Subject to 10 CFR 50.49 EQ Requirements (B2.1.24)	VI.A-2	3.6.1.02	C
Switchyard Bus and Connections	EC	Aluminum	Atmosphere/ Weather (Ext)	None	None	VI.A-15	3.6.1.12	I, 2
Switchyard Bus and Connections	EC	Stainless Steel	Atmosphere/ Weather (Ext)	None	None	VI.A-15	3.6.1.12	I, 2
Terminal Block	IN	Various Insulation Material (Electrical)	Adverse Localized Environment (Ext)	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure	Electrical Cables and Connections Not Subject to 10 CFR 50.49 EQ Requirements (B2.1.24)	VI.A-6	3.6.1.02	C

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*Table 3.6.2-1 – Electrical and Instrument and Controls – Summary of Aging Management Evaluation – Electrical Components  
(Continued)*

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Transmission Conductors and Connections	EC	Aluminum Conductor Steel Reinforced	Atmosphere/ Weather (Ext)	None	None	VI.A-16	3.6.1.12	I, 2

Notes for Table 3.6.2-1:

Standard Notes:

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
- I Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
- J Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:

- 1 See further evaluation 3.6.2.2.2
- 2 See further evaluation 3.6.2.2.3
- 3 PVNGS will use the Metal Enclosed Bus program (B2.1.36) to manage the aging effects for all metal enclosed bus components.

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