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**CHAPTER II**  
**CONTAINMENT STRUCTURES**

## **II      CONTAINMENT STRUCTURES**

- A.    PRESSURIZED WATER REACTOR CONTAINMENTS
- B.    BOILING WATER REACTOR CONTAINMENTS

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## **II      PRESSURIZED WATER REACTOR CONTAINMENTS**

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- A1.    CONCRETE CONTAINMENTS (REINFORCED AND PRESTRESSED)
- A2.    STEEL CONTAINMENTS
- A3.    COMMON COMPONENTS

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## **A1. CONCRETE CONTAINMENTS (REINFORCED AND PRESTRESSED)**

### **Systems, Structures, and Components**

This section addresses the elements of pressurized water reactor (PWR) concrete containment structures. Concrete containment structures are divided into three elements: (i) concrete, (ii) steel, and (iii) prestressing systems.

### **System Interfaces**

Functional interfaces include the primary containment heating and ventilation system (VII.F3), containment isolation components (V.C), and the containment spray system (V.A). Physical interfaces exist with any structure, system, or component that either penetrates the containment wall, such as the main steam (MS) system (VIII.B1) and the feedwater (FW) system (VIII.D1), or is supported by the containment structure, such as cranes (VII.B). The containment structure basemat typically provides support to the nuclear steam supply system components and containment internal structures.

II CONTAINMENT STRUCTURES								
Table A1 Concrete Containments (Reinforced and Prestressed)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	II.A1.CP-87	3.5-1, 016	Concrete (accessible areas): dome; wall; basemat; ring girders; buttresses	Concrete	Air – indoor uncontrolled, air – outdoor	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S2, "ASME Section XI, Subsection IWL"	No
	II.A1.CP-31	3.5-1, 018	Concrete (accessible areas): dome; wall; basemat; ring girders; buttresses	Concrete	Air – outdoor	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S2, "ASME Section XI, Subsection IWL"	No
M	II.A1.CP-33	3.5-1, 019	Concrete (accessible areas): dome; wall; basemat; ring girders; buttresses	Concrete	Any	Cracking due to expansion from reaction with aggregates	AMP XI.S2, "ASME Section XI, Subsection IWL"	No
	II.A1.CP-32	3.5-1, 020	Concrete (accessible areas): dome; wall; basemat; ring girders; buttresses	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	AMP XI.S2, "ASME Section XI, Subsection IWL"	No

II CONTAINMENT STRUCTURES								
Table A1 Concrete Containments (Reinforced and Prestressed)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.A1.CP-68	3.5-1, 021	Concrete (accessible areas): dome; wall; basemat; ring girders; buttresses; reinforcing steel	Concrete	Air – indoor uncontrolled, air – outdoor	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S2, "ASME Section XI, Subsection IWL"	No
	II.A1.CP-100	3.5-1, 024	Concrete (inaccessible areas): dome; wall; basemat; ring girders; buttresses	Concrete	Air – indoor uncontrolled, air – outdoor, groundwater/soil	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S2, "ASME Section XI, Subsection IWL," and supplemented, as necessary, by AMP XI.S6, "Structures Monitoring"	No

II CONTAINMENT STRUCTURES								
Table A1 Concrete Containments (Reinforced and Prestressed)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	II.A1.CP-147	3.5-1, 011	Concrete (inaccessible areas): dome; wall; basemat; ring girders; buttresses	Concrete	Air – outdoor, groundwater/soil	Loss of material (spalling, scaling) and cracking due to freeze-thaw	Plant-specific aging management program to be evaluated for plants in moderate to severe weathering conditions, <u>or</u> <u>AMP XI.S2, ASME Section XI, Subsection IWL, and/or AMP XI.S6, Structures Monitoring, enhanced as necessary</u>	Yes
M	II.A1.CP-67	3.5-1, 012	Concrete (inaccessible areas): dome; wall; basemat; ring girders; buttresses	Concrete	Any	Cracking due to expansion from reaction with aggregates	Plant-specific aging management program, <u>or</u> <u>AMP XI.S2, ASME Section XI, Subsection IWL, and/or AMP XI.S6, Structures Monitoring, enhanced as necessary</u>	Yes



II CONTAINMENT STRUCTURES								
Table A1 Concrete Containments (Reinforced and Prestressed)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.A1.CP-102	3.5-1, 014	Concrete (inaccessible areas): dome; wall; basemat; ring girders; buttresses	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	Plant-specific aging management program, <u>or</u> <u>AMP XI.S2, "ASME Section XI, Subsection IWL," and/or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
M	II.A1.CP-97	3.5-1, 023	Concrete (inaccessible areas): dome; wall; basemat; ring girders; buttresses; reinforcing steel	Concrete	Any	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S2, "ASME Section XI, Subsection IWL," and supplemented, as necessary, by AMP XI.S6, "Structures Monitoring"	No

II CONTAINMENT STRUCTURES								
Table A1 Concrete Containments (Reinforced and Prestressed)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	II.A1.CP-34	3.5-1, 003	Concrete: dome; wall; basemat; ring girders; buttresses	Concrete	Air – indoor uncontrolled, air – outdoor	Reduction of strength and modulus due to elevated temperature (>150°F general; >200°F local)	Plant-specific aging management program to be evaluated if temperature limits exceeded, or AMP XI.S2, "ASME Section XI, Subsection IWL," and/or AMP XI.S6, "Structures Monitoring," enhanced as necessary	Yes
E	II.A1.CP-101	3.5-1, 001	Concrete: dome; wall; basemat; ring girders; buttresses	Concrete	Soil	Cracking and distortion due to increased stress levels from settlement	AMP XI.S2, "ASME Section XI, Subsection IWL," and supplemented, as necessary, by AMP XI.S6, "Structures Monitoring"	Yes

II CONTAINMENT STRUCTURES								
Table A1 Concrete Containments (Reinforced and Prestressed)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	II.A1.C-07	3.5-1, 002	Concrete: foundation; subfoundation	Concrete; porous concrete	Water – flowing	Reduction of foundation strength and cracking due to differential settlement and erosion of porous concrete subfoundation	AMP XI.S6, "Structures Monitoring"	Yes
M	II.A1.C-11	3.5-1, 008	Prestressing system: tendons	Steel	Air – indoor uncontrolled, air – outdoor	Loss of prestress due to relaxation; shrinkage; creep; elevated temperature	TLAA, SRP-SLR Section 4.5, "Concrete Containment Tendon Prestress," and/or SRP-SLR Section 4.7, "Other Plant-Specific Time-Limited Aging Analyses"	Yes
	II.A1.C-10	3.5-1, 032	Prestressing system: tendons; anchorage components	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to corrosion	AMP XI.S2, "ASME Section XI, Subsection IWL"	No

II CONTAINMENT STRUCTURES								
Table A1 Concrete Containments (Reinforced and Prestressed)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.A1.CP-35	3.5-1, 035	Steel elements (accessible areas): liner; liner anchors; integral attachments	Steel	Air – indoor uncontrolled	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes
E	II.A1.CP-98	3.5-1, 005	Steel elements (inaccessible areas): liner; liner anchors; integral attachments	Steel	Air – indoor uncontrolled	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes

## **A2. STEEL CONTAINMENTS**

### **Systems, Structures, and Components**

This section addresses the elements of pressurized water reactor (PWR) steel containment structures. Steel containment structures are divided into two elements: (i) steel and (ii) concrete.

### **System Interfaces**

Functional interfaces include the primary containment heating and ventilation system (VII.F3), containment isolation components (V.C), and the containment spray system (V.A). Physical interfaces exist with any structure, system, or component that either penetrates the containment wall, such as the main steam (MS) system (VIII.B1) and the feedwater (FW) system (VIII.D1), or is supported by the containment structure, such as cranes (VII.B). The containment structure basemat typically provides support to the nuclear steam supply system components and containment internal structures.

II CONTAINMENT STRUCTURES								
Table A2 Steel Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	II.A2.CP-51	3.5-1, 018	Concrete (accessible areas): basemat	Concrete	Air – outdoor	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S2, "ASME Section XI, Subsection IWL," or AMP XI.S6, "Structures Monitoring"	No
M	II.A2.CP-58	3.5-1, 019	Concrete (accessible areas): basemat	Concrete	Any	Cracking due to expansion from reaction with aggregates	AMP XI.S2, "ASME Section XI, Subsection IWL," or AMP XI.S6, "Structures Monitoring"	No
	II.A2.CP-72	3.5-1, 016	Concrete (accessible areas): basemat	Concrete	Groundwater/soil	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S2, "ASME Section XI, Subsection IWL," or AMP XI.S6, "Structures Monitoring"	No

II CONTAINMENT STRUCTURES								
Table A2 Steel Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	II.A2.CP-155	3.5-1, 020	Concrete (accessible areas): basemat	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	AMP XI.S2, "ASME Section XI, Subsection IWL," or AMP XI.S6, "Structures Monitoring"	No
M	II.A2.CP-74	3.5-1, 021	Concrete (accessible areas): basemat; reinforcing steel	Concrete	Air – indoor uncontrolled, air – outdoor	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S2, "ASME Section XI, Subsection IWL," or AMP XI.S6, "Structures Monitoring"	No

II CONTAINMENT STRUCTURES								
Table A2 Steel Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	II.A2.CP-70	3.5-1, 011	Concrete (inaccessible areas): basemat	Concrete	Air – outdoor, groundwater/soil	Loss of material (spalling, scaling) and cracking due to freeze-thaw	Plant-specific aging management program to be evaluated for plants in moderate to severe weathering conditions, <u>or</u> <u>AMP XI.S2,</u> <u>“ASME</u> <u>Section XI,</u> <u>Subsection</u> <u>IVL “ and/or</u> <u>AMP XI.S6,</u> <u>“Structures</u> <u>Monitoring,”</u> <u>enhanced as</u> <u>necessary</u>	Yes



II CONTAINMENT STRUCTURES								
Table A2 Steel Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.A2.CP-104	3.5-1, 012	Concrete (inaccessible areas): basemat	Concrete	Any	Cracking due to expansion from reaction with aggregates	Plant-specific aging management program, <u>or</u> <u>AMP XI.S2,</u> <u>"ASME</u> <u>Section XI,</u> <u>Subsection</u> <u>IWL," and/or</u> <u>AMP XI.S6,</u> <u>"Structures</u> <u>Monitoring,"</u> <u>enhanced as</u> <u>necessary</u>	Yes
	II.A2.CP-71	3.5-1, 024	Concrete (inaccessible areas): basemat	Concrete	Groundwater/soil	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S2, "ASME Section XI, Subsection IWL," or AMP XI.S6, "Structures Monitoring"	No

II CONTAINMENT STRUCTURES								
Table A2 Steel Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.A2.CP-53	3.5-1, 014	Concrete (inaccessible areas): basemat	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	Plant-specific aging management program, <u>or</u> <a href="#">AMP XI.S2, "ASME Section XI, Subsection IWL," and/or AMP XI.S6, "Structures Monitoring," enhanced as necessary</a>	Yes
M	II.A2.CP-75	3.5-1, 023	Concrete (inaccessible areas): basemat; reinforcing steel	Concrete	Any	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S2, "ASME Section XI, Subsection IWL," or AMP XI.S6, "Structures Monitoring"	No
E	II.A2.CP-69	3.5-1, 001	Concrete: basemat	Concrete	Soil	Cracking and distortion due to increased stress levels from settlement	AMP XI.S2, "ASME Section XI, Subsection IWL," or AMP XI.S6, "Structures Monitoring"	Yes

II CONTAINMENT STRUCTURES								
Table A2 Steel Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	II.A2.C-07	3.5-1, 002	Concrete: foundation; subfoundation	Concrete; porous concrete	Water – flowing	Reduction of foundation strength and cracking due to differential settlement and erosion of porous concrete subfoundation	AMP XI.S6, "Structures Monitoring"	Yes
M	II.A2.CP-35	3.5-1, 035	Steel elements (accessible areas): liner; liner anchors; integral attachments	Steel	Air – indoor uncontrolled	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes
E	II.A2.CP-98	3.5-1, 005	Steel elements (inaccessible areas): liner; liner anchors; integral attachments	Steel	Air – indoor uncontrolled	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes

### **A3. COMMON COMPONENTS**

#### **Systems, Structures, and Components**

This section addresses the common components of pressurized water reactor (PWR) containment structures. The common components include (i) penetration sleeves and bellows, (ii) dissimilar metal welds, (iii) personnel airlock, (iv) equipment hatch, (v) seals, (vi) gaskets, and (vii) moisture barriers.

#### **System Interfaces**

Functional interfaces include the primary containment heating and ventilation system (VII.F3), containment isolation components (V.C), and the containment spray system (V.A). Physical interfaces exist with any structure, system, or component that either penetrates the containment wall, such as the main steam (MS) system (VIII.B1) and the feedwater (FW) system (VIII.D1), or is supported by the containment structure, such as cranes (VII.B). The containment structure basemat typically provides support to the nuclear steam supply system components and containment internal structures.

II CONTAINMENT STRUCTURES								
Table A3 Common Components								
New, Modified, Deleted, Edited  Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.A3.CP-37	3.5-1, 027	Metal liner, metal plate, airlock, equipment hatch, CRD hatch; penetration sleeves; penetration bellows	Steel; stainless steel; dissimilar metal welds	Air – indoor uncontrolled, air – outdoor	Cracking due to cyclic loading (CLB fatigue analysis does not exist)	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	No
M	II.A3.C-13	3.5-1, 009	Metal liner, metal plate, personnel airlock, equipment hatch, CRD hatch, penetration sleeves; penetration bellows	Steel; stainless steel; dissimilar metal welds	Air – indoor uncontrolled, air – outdoor	Cumulative fatigue damage due to fatigue (Only if CLB fatigue analysis exists)	TLAA, SRP-SLR Section 4.6, "Containment Liner Plate and Penetration Fatigue Analysis"	Yes
	II.A3.CP-40	3.5-1, 026	Moisture barriers (caulking, flashing, other sealants)	Elastomer, rubber and other similar materials	Air – indoor uncontrolled	Loss of sealing due to wear, damage, erosion, tear, surface cracks, other defects	AMP XI.S1, "ASME Section XI, Subsection IWE"	No
M	II.A3.CP-36	3.5-1, 035	Penetration sleeves	Steel; dissimilar metal welds	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes

II CONTAINMENT STRUCTURES								
Table A3 Common Components								
New, Modified, Deleted, Edited  Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	II.A3.CP-38	3.5-1, 010	Penetration sleeves; penetration bellows	Stainless steel; dissimilar metal welds	Air – indoor uncontrolled, air – outdoor	Cracking due to SCC	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes
	II.A3.C-16	3.5-1, 028	Personnel airlock, equipment hatch, CRD hatch	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	No
M	II.A3.CP-39	3.5-1, 029	Personnel airlock, equipment hatch, CRD hatch: locks, hinges, closure mechanisms	Steel	Air – indoor uncontrolled, air – outdoor	Loss of leak tightness due to mechanical wear	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	No
	II.A3.CP-148	3.5-1, 031	Pressure-retaining bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE"	No

II CONTAINMENT STRUCTURES								
Table A3 Common Components								
New, Modified, Deleted, Edited  Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.A3.CP-150	3.5-1, 030	Pressure-retaining bolting	Steel	Any	Loss of preload due to self-loosening	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	No
	II.A3.CP-41	3.5-1, 033	Seals and gaskets	Elastomer, rubber and other similar materials	Air – indoor uncontrolled, air – outdoor	Loss of sealing due to wear, damage, erosion, tear, surface cracks, other defects	AMP XI.S4, "10 CFR Part 50, Appendix J"	No
M	II.A3.CP-152	3.5-1, 034	Service Level I coatings	Coatings	Air – indoor uncontrolled, treated water	Loss of coating or lining integrity due to blistering, cracking, flaking, peeling, delamination, rusting, physical damage	AMP XI.S8, "Protective Coating Monitoring and Maintenance"	No

## **II      BOILING WATER REACTOR CONTAINMENTS**

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- B1.    MARK I CONTAINMENTS
- B2.    MARK II CONTAINMENTS
- B3.    MARK III CONTAINMENTS
- B4.    COMMON COMPONENTS

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## **B1     MARK I CONTAINMENTS**

### **Systems, Structures, and Components**

This section addresses the elements of boiling water reactor (BWR) Mark I containment structures. Steel containments are discussed in II.B1.1 and concrete containments are discussed in II.B1.2.

### **System Interfaces**

Functional interfaces include the primary containment heating and ventilation system (VII.F3), containment isolation components (V.C), and the standby gas treatment system (V.B). Physical interfaces exist with any structure, system, or component that either penetrates the containment wall, such as the main steam (MS) system (VIII.B2) and the feedwater (FW) system (VIII.D2), or is supported by the containment structure. The containment structure basemat may provide support to the nuclear steam supply system components and containment internal structures.

II CONTAINMENT STRUCTURES								
Table B1.1 Mark I Steel Containments								
New, Modified, Deleted, Edited  Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.B1.1.CP-43	3.5-1, 035	Steel elements (accessible areas): drywell shell; drywell head; drywell shell in sand pocket regions	Steel	Air – indoor uncontrolled	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes
E	II.B1.1.C-23	3.5-1, 036	Steel elements: drywell head; downcomers	Steel	Air – indoor uncontrolled	Loss of material due to mechanical wear, including fretting	AMP XI.S1, "ASME Section XI, Subsection IWE"	No
	II.B1.1.CP-44	3.5-1, 041	Steel elements: drywell support skirt	Steel	Concrete	None	None	No
E	II.B1.1.CP-109	3.5-1, 007	Steel elements: torus ring girders; downcomers;	Steel	Air – indoor uncontrolled, treated water	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE"	Yes
M	II.B1.1.CP-48	3.5-1, 006	Steel elements: torus shell	Steel	Air – indoor uncontrolled, treated water	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes

II CONTAINMENT STRUCTURES								
Table B1.1 Mark I Steel Containments								
New, Modified, Deleted, Edited  Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	II.B1.1.CP-49	3.5-1, 027	Steel elements: torus; vent line; vent header; vent line bellows; downcomers	Steel; stainless steel	Air – indoor uncontrolled	Cracking due to cyclic loading (CLB fatigue analysis does not exist)	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	No
E	II.B1.1.C-21	3.5-1, 009	Steel elements: torus; vent line; vent header; vent line bellows; downcomers	Steel; stainless steel	Air – indoor uncontrolled	Cumulative fatigue damage due to fatigue (Only if CLB fatigue analysis exists)	TLAA, SRP-SLR Section 4.6, "Containment Liner Plate and Penetration Fatigue Analysis"	Yes
M	II.B1.1.CP-50	3.5-1, 039	Steel elements: vent line bellows	Stainless steel	Air – indoor uncontrolled	Cracking due to SCC	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes

II CONTAINMENT STRUCTURES								
Table B1.2 Mark I Concrete Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.B1.2.CP-79	3.5-1, 021	Concrete (accessible areas): basemat; reinforcing steel	Concrete	Air – indoor uncontrolled, air – outdoor	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S2, "ASME Section XI, Subsection IWL"	No
E	II.B1.2.CP-59	3.5-1, 019	Concrete (accessible areas): containment; wall; basemat	Concrete	Any	Cracking due to expansion from reaction with aggregates	AMP XI.S2, "ASME Section XI, Subsection IWL"	No
	II.B1.2.CP-54	3.5-1, 020	Concrete (accessible areas): containment; wall; basemat	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	AMP XI.S2, "ASME Section XI, Subsection IWL"	No
M	II.B1.2.CP-80	3.5-1, 023	Concrete (inaccessible areas): basemat; reinforcing steel	Concrete	Any	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S2, "ASME Section XI, Subsection IWL," and supplemented, as necessary, by AMP XI.S6, "Structures Monitoring"	No

II CONTAINMENT STRUCTURES								
Table B1.2 Mark I Concrete Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.B1.2.CP-99	3.5-1, 012	Concrete (inaccessible areas): containment; wall; basemat	Concrete	Any	Cracking due to expansion from reaction with aggregates	Plant-specific aging management program, <u>or AMP XI.S2, "ASME Section XI, Subsection IWL," and/or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
M	II.B1.2.CP-110	3.5-1, 014	Concrete (inaccessible areas): containment; wall; basemat	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	Plant-specific aging management program, <u>or AMP XI.S2, "ASME Section XI, Subsection IWL," and/or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes

II CONTAINMENT STRUCTURES								
Table B1.2 Mark I Concrete Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	II.B1.2.CP-105	3.5-1, 001	Concrete elements: all	Concrete	Soil	Cracking and distortion due to increased stress levels from settlement	AMP XI.S2, "ASME Section XI, Subsection IWL," and supplemented, as necessary, by AMP XI.S6, "Structures Monitoring"	Yes
E	II.B1.2.CP-57	3.5-1, 003	Concrete: containment; wall; basemat	Concrete	Air – indoor uncontrolled, air – outdoor	Reduction of strength and modulus due to elevated temperature (>150°F general; >200°F local)	Plant-specific aging management program to be evaluated if temperature limits exceeded, <u>or AMP XI.S2, "ASME Section XI, Subsection IWL," and/or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
M	II.B1.2.CP-106	3.5-1, 016	Concrete: containment; wall; basemat	Concrete	Air – indoor uncontrolled, air – outdoor, groundwater/soil	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S2, "ASME Section XI, Subsection IWL," or AMP XI.S6, "Structures Monitoring"	No

II CONTAINMENT STRUCTURES								
Table B1.2 Mark I Concrete Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	II.B1.2.C-07	3.5-1, 002	Concrete: foundation; subfoundation	Concrete; porous concrete	Water – flowing	Reduction of foundation strength and cracking due to differential settlement and erosion of porous concrete subfoundation	AMP XI.S6, "Structures Monitoring"	Yes
M	II.B1.2.CP-46	3.5-1, 035	Steel elements (accessible areas): suppression chamber; drywell; drywell head; embedded shell; region shielded by diaphragm floor (as applicable)	Steel	Air – indoor uncontrolled, treated water	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes
	II.B1.2.CP-114	3.5-1, 041	Steel elements (inaccessible areas): support skirt	Steel	Concrete	None	None	No

II CONTAINMENT STRUCTURES								
Table B1.2 Mark I Concrete Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	II.B1.2.CP-63	3.5-1, 005	Steel elements (inaccessible areas): suppression chamber; drywell; drywell head; embedded shell; region shielded by diaphragm floor (as applicable)	Steel	Air – indoor uncontrolled, treated water	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes
	II.B1.2.CP-117	3.5-1, 031	Steel elements: downcomer pipes	Steel	Air – indoor uncontrolled, treated water	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE"	No
E	II.B1.2.C-23	3.5-1, 036	Steel elements: drywell head; downcomers	Steel	Air – indoor uncontrolled	Loss of material due to mechanical wear, including fretting	AMP XI.S1, "ASME Section XI, Subsection IWE"	No
	II.B1.2.C-49	3.5-1, 037	Steel elements: suppression chamber (torus) liner (interior surface)	Steel; stainless steel	Air – indoor uncontrolled, treated water	Loss of material due to general (steel only), pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	No



## **B2 MARK II CONTAINMENTS**

### **Systems, Structures, and Components**

This section addresses the elements of boiling water reactor (BWR) Mark II containment structures. Mark II steel containments are discussed in II.B2.1. Mark II concrete containments are discussed in II.B2.2.

### **System Interfaces**

Functional interfaces include the primary containment heating and ventilation system (VII.F3), containment isolation components (V.C), and the standby gas treatment system (V.B). Physical interfaces exist with any structure, system, or component that either penetrates the containment wall, such as the main steam (MS) system (VIII.B2) and the feedwater (FW) system (VIII.D2), or is supported by the containment structure. The containment structure basemat may provide support to the nuclear steam supply system components and containment internal structures.

II CONTAINMENT STRUCTURES								
Table B2.1 Mark II Steel Containments								
New, Modified, Deleted, Edited  Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.B2.1.CP-46	3.5-1, 035	Steel elements (accessible areas): suppression chamber; drywell; drywell head; embedded shell; region shielded by diaphragm floor (as applicable)	Steel	Air – indoor uncontrolled, treated water	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes
	II.B2.1.CP-114	3.5-1, 041	Steel elements (inaccessible areas): support skirt	Steel	Concrete	None	None	No
E	II.B2.1.CP-63	3.5-1, 005	Steel elements (inaccessible areas): suppression chamber; drywell; drywell head; embedded shell; region shielded by diaphragm floor (as applicable)	Steel	Air – indoor uncontrolled, treated water	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes
	II.B2.1.CP-117	3.5-1, 031	Steel elements: downcomer pipes	Steel	Air – indoor uncontrolled, treated water	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE"	No

II CONTAINMENT STRUCTURES								
Table B2.1 Mark II Steel Containments								
New, Modified, Deleted, Edited  Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	II.B2.1.C-23	3.5-1, 036	Steel elements: drywell head; downcomers	Steel	Air – indoor uncontrolled	Loss of material due to mechanical wear, including fretting	AMP XI.S1, "ASME Section XI, Subsection IWE"	No
	II.B2.1.CP-107	3.5-1, 027	Suppression pool shell	Steel; stainless steel; dissimilar metal welds	Air – indoor uncontrolled, treated water	Cracking due to cyclic loading (CLB fatigue analysis does not exist)	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	No
M	II.B2.1.C-45	3.5-1, 009	Suppression pool shell; unbraced downcomers	Steel; stainless steel; dissimilar metal welds	Air – indoor uncontrolled, treated water	Cumulative fatigue damage due to fatigue (Only if CLB fatigue analysis exists)	TLAA, SRP-SLR Section 4.6, "Containment Liner Plate and Penetration Fatigue Analysis"	Yes
	II.B2.1.CP-142	3.5-1, 040	Unbraced downcomers	Steel; stainless steel; dissimilar metal welds	Air – indoor uncontrolled, treated water	Cracking due to cyclic loading (CLB fatigue analysis does not exist)	AMP XI.S1, "ASME Section XI, Subsection IWE"	No

II CONTAINMENT STRUCTURES								
Table B2.2 Mark II Concrete Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.B2.2.CP-79	3.5-1, 021	Concrete (accessible areas): basemat; reinforcing steel	Concrete	Air – indoor uncontrolled, air – outdoor	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S2, "ASME Section XI, Subsection IWL"	No
E	II.B2.2.CP-59	3.5-1, 019	Concrete (accessible areas): containment; wall; basemat	Concrete	Any	Cracking due to expansion from reaction with aggregates	AMP XI.S2, "ASME Section XI, Subsection IWL"	No
	II.B2.2.CP-54	3.5-1, 020	Concrete (accessible areas): containment; wall; basemat	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	AMP XI.S2, "ASME Section XI, Subsection IWL"	No
M	II.B2.2.CP-80	3.5-1, 023	Concrete (inaccessible areas): basemat; reinforcing steel	Concrete	Any	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S2, "ASME Section XI, Subsection IWL," and supplemented, as necessary, by AMP XI.S6, "Structures Monitoring"	No

II CONTAINMENT STRUCTURES								
Table B2.2 Mark II Concrete Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.B2.2.CP-99	3.5-1, 012	Concrete (inaccessible areas): containment; wall; basemat	Concrete	Any	Cracking due to expansion from reaction with aggregates	Plant-specific aging management program, <u>or AMP XI.S2, "ASME Section XI, Subsection IWL," and/or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
M	II.B2.2.CP-110	3.5-1, 014	Concrete (inaccessible areas): containment; wall; basemat	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	Plant-specific aging management program, <u>or AMP XI.S2, "ASME Section XI, Subsection IWL," and/or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
E	II.B2.2.CP-105	3.5-1, 001	Concrete elements: all	Concrete	Soil	Cracking and distortion due to increased stress levels from settlement	AMP XI.S2, "ASME Section XI, Subsection IWL," and supplemented, as necessary, by AMP XI.S6, "Structures Monitoring"	Yes

II CONTAINMENT STRUCTURES								
Table B2.2 Mark II Concrete Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	II.B2.2.CP-57	3.5-1, 003	Concrete: containment; wall; basemat	Concrete	Air – indoor uncontrolled, air – outdoor	Reduction of strength and modulus due to elevated temperature (>150°F general; >200°F local)	Plant-specific aging management program to be evaluated if temperature limits exceeded, or AMP XI.S2, "ASME Section XI, Subsection IWL," and/or AMP XI.S6, "Structures Monitoring," enhanced as necessary	Yes
M	II.B2.2.CP-106	3.5-1, 016	Concrete: containment; wall; basemat	Concrete	Air – indoor uncontrolled, air – outdoor, groundwater/soil	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S2, "ASME Section XI, Subsection IWL," and supplemented, as necessary, by AMP XI.S6, "Structures Monitoring"	No
E	II.B2.2.C-07	3.5-1, 002	Concrete: foundation; subfoundation	Concrete; porous concrete	Water – flowing	Reduction of foundation strength and cracking due to differential settlement and erosion of porous concrete subfoundation	AMP XI.S6, "Structures Monitoring"	Yes

II CONTAINMENT STRUCTURES								
Table B2.2 Mark II Concrete Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.B2.2.C-11	3.5-1, 008	Prestressing system: tendons	Steel	Air – indoor uncontrolled, air – outdoor	Loss of prestress due to relaxation; shrinkage; creep; elevated temperature	TLAA, SRP-SLR Section 4.5, "Concrete Containment Tendon Prestress," and/or SRP-SLR Section 4.7, "Other Plant-Specific Time-Limited Aging Analyses"	Yes
	II.B2.2.C-10	3.5-1, 032	Prestressing system: tendons; anchorage components	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to corrosion	AMP XI.S2, "ASME Section XI, Subsection IWL"	No
M	II.B2.2.CP-46	3.5-1, 035	Steel elements (accessible areas): suppression chamber; drywell; drywell head; embedded shell; region shielded by diaphragm floor (as applicable)	Steel	Air – indoor uncontrolled, treated water	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes

II CONTAINMENT STRUCTURES								
Table B2.2 Mark II Concrete Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	II.B2.2.CP-114	3.5-1, 041	Steel elements (inaccessible areas): support skirt	Steel	Concrete	None	None	No
E	II.B2.2.CP-63	3.5-1, 005	Steel elements (inaccessible areas): suppression chamber; drywell; drywell head; embedded shell; region shielded by diaphragm floor (as applicable)	Steel	Air – indoor uncontrolled, treated water	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes
	II.B2.2.CP-117	3.5-1, 031	Steel elements: downcomer pipes	Steel	Air – indoor uncontrolled, treated water	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE"	No
E	II.B2.2.C-23	3.5-1, 036	Steel elements: drywell head; downcomers	Steel	Air – indoor uncontrolled	Loss of material due to mechanical wear, including fretting	AMP XI.S1, "ASME Section XI, Subsection IWE"	No
	II.B2.2.C-49	3.5-1, 037	Steel elements: suppression chamber (torus) liner (interior surface)	Steel; stainless steel	Air – indoor uncontrolled, treated water	Loss of material due to general (steel only), pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	No



II CONTAINMENT STRUCTURES								
Table B2.2 Mark II Concrete Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	II.B2.2.CP-64	3.5-1, 040	Steel elements: vent header; downcomers	Steel; stainless steel	Air – indoor uncontrolled, treated water	Cracking due to cyclic loading (CLB fatigue analysis does not exist)	AMP XI.S1, "ASME Section XI, Subsection IWE"	No
E	II.B2.2.C-48	3.5-1, 009	Steel elements: vent header; downcomers	Steel; stainless steel	Air – indoor uncontrolled, treated water	Cumulative fatigue damage due to fatigue (Only if CLB fatigue analysis exists)	TLAA, SRP-SLR Section 4.6, "Containment Liner Plate and Penetration Fatigue Analysis"	Yes

## **II      MARK III CONTAINMENTS**

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B3.1    STEEL CONTAINMENTS

B3.2    CONCRETE CONTAINMENTS

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## **B3. MARK III CONTAINMENTS**

### **Systems, Structures, and Components**

This section addresses the elements of boiling water reactor (BWR) Mark III containment structures. Mark III steel containments are discussed in II.B3.1. Mark III concrete containments are discussed in II.B3.2.

### **System Interfaces**

Functional interfaces include the primary containment heating and ventilation system (VII.F3), containment isolation components (V.C), and the standby gas treatment system (V.B). Physical interfaces exist with any structure, system, or component that either penetrates the containment wall, such as the main steam (MS) system (VIII.B2) and the feedwater (FW) system (VIII.D2), or is supported by the containment structure. The containment structure basemat may provide support to the nuclear steam supply system components and containment internal structures.

II CONTAINMENT STRUCTURES								
Table B3.1 Mark III Steel Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	II.B3.1.CP-72	3.5-1, 016	Concrete (accessible areas): basemat	Concrete	Groundwater/soil	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S2, "ASME Section XI, Subsection IWL," or AMP XI.S6, "Structures Monitoring"	No
	II.B3.1.CP-156	3.5-1, 020	Concrete (accessible areas): basemat	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	AMP XI.S2, "ASME Section XI, Subsection IWL," or AMP XI.S6, "Structures Monitoring"	No
E	II.B3.1.CP-66	3.5-1, 019	Concrete (accessible areas): basemat, concrete fill-in annulus	Concrete	Any	Cracking due to expansion from reaction with aggregates	AMP XI.S2, "ASME Section XI, Subsection IWL," or AMP XI.S6, "Structures Monitoring"	No

II CONTAINMENT STRUCTURES								
Table B3.1 Mark III Steel Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.B3.1.CP-74	3.5-1, 021	Concrete (accessible areas): basemat; reinforcing steel	Concrete	Air – indoor uncontrolled, air – outdoor	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S2, "ASME Section XI, Subsection IWL," or AMP XI.S6, "Structures Monitoring"	No
	II.B3.1.CP-71	3.5-1, 024	Concrete (inaccessible areas): basemat	Concrete	Groundwater/soil	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S2, "ASME Section XI, Subsection IWL," or AMP XI.S6, "Structures Monitoring"	No
M	II.B3.1.CP-53	3.5-1, 014	Concrete (inaccessible areas): basemat	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	Plant-specific aging management program, <u>or AMP XI.S2, "ASME Section XI, Subsection IWL," and/or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes

II CONTAINMENT STRUCTURES								
Table B3.1 Mark III Steel Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.B3.1.CP-83	3.5-1, 012	Concrete (inaccessible areas): basemat, concrete fill-in annulus	Concrete	Any	Cracking due to expansion from reaction with aggregates	Plant-specific aging management program, <u>or AMP XI.S2, "ASME Section XI, Subsection IWL," and/or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
M	II.B3.1.CP-75	3.5-1, 023	Concrete (inaccessible areas): basemat; reinforcing steel	Concrete	Any	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S2, "ASME Section XI, Subsection IWL," or AMP XI.S6, "Structures Monitoring"	No
E	II.B3.1.CP-69	3.5-1, 001	Concrete: basemat	Concrete	Soil	Cracking and distortion due to increased stress levels from settlement	AMP XI.S2, "ASME Section XI, Subsection IWL," or AMP XI.S6, "Structures Monitoring"	Yes

II CONTAINMENT STRUCTURES								
Table B3.1 Mark III Steel Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	II.B3.1.CP-65	3.5-1, 003	Concrete: basemat, concrete fill-in annulus	Concrete	Air – indoor uncontrolled, air – outdoor	Reduction of strength and modulus due to elevated temperature (>150°F general; >200°F local)	Plant-specific aging management program to be evaluated if temperature limits exceeded, <u>or AMP XI.S2, "ASME Section XI, Subsection IWL," and/or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
E	II.B3.1.C-07	3.5-1, 002	Concrete: foundation; subfoundation	Concrete; porous concrete	Water – flowing	Reduction of foundation strength and cracking due to differential settlement and erosion of porous concrete subfoundation	AMP XI.S6, "Structures Monitoring"	Yes
M	II.B3.1.CP-43	3.5-1, 035	Steel elements (accessible areas): drywell shell; drywell head	Steel	Air – indoor uncontrolled	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes

II CONTAINMENT STRUCTURES								
Table B3.1 Mark III Steel Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	II.B3.1.CP-113	3.5-1, 004	Steel elements (inaccessible areas): drywell shell; drywell head	Steel	Air – indoor uncontrolled, concrete	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes
M	II.B3.1.C-24	3.5-1, 038	Steel elements: suppression chamber shell (interior surface)	Stainless steel	Air – indoor uncontrolled	Cracking due to SCC	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes
E	II.B3.1.CP-158	3.5-1, 007	Steel elements: suppression chamber shell (interior surface)	Steel	Air – indoor uncontrolled, treated water	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE"	Yes



II CONTAINMENT STRUCTURES								
Table B3.2 Mark III Concrete Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	II.B3.2.CP-84	3.5-1, 024	Concrete (accessible areas): dome; wall; basemat	Concrete	Air – indoor uncontrolled, air – outdoor, groundwater/soil	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S2, "ASME Section XI, Subsection IWL," and supplemented, as necessary, by AMP XI.S6, "Structures Monitoring"	No
	II.B3.2.CP-52	3.5-1, 018	Concrete (accessible areas): dome; wall; basemat	Concrete	Air – outdoor, groundwater/soil	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S2, "ASME Section XI, Subsection IWL"	No
E	II.B3.2.CP-60	3.5-1, 019	Concrete (accessible areas): dome; wall; basemat	Concrete	Any	Cracking due to expansion from reaction with aggregates	AMP XI.S2, "ASME Section XI, Subsection IWL"	No
	II.B3.2.CP-55	3.5-1, 020	Concrete (accessible areas): dome; wall; basemat	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	AMP XI.S2, "ASME Section XI, Subsection IWL"	No
M	II.B3.2.CP-88	3.5-1, 021	Concrete (accessible areas): dome; wall; basemat; reinforcing steel	Concrete	Air – indoor uncontrolled, air – outdoor	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S2, "ASME Section XI, Subsection IWL"	No

II CONTAINMENT STRUCTURES								
Table B3.2 Mark III Concrete Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	II.B3.2.CP-73	3.5-1, 024	Concrete (inaccessible areas): dome; wall; basemat	Concrete	Air – indoor uncontrolled, air – outdoor, groundwater/soil	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S2, "ASME Section XI, Subsection IWL," and supplemented, as necessary, by AMP XI.S6, "Structures Monitoring"	No
E	II.B3.2.CP-135	3.5-1, 011	Concrete (inaccessible areas): dome; wall; basemat	Concrete	Air – outdoor, groundwater/soil	Loss of material (spalling, scaling) and cracking due to freeze-thaw	Plant-specific aging management program to be evaluated for plants in moderate to severe weathering conditions, <u>or AMP XI.S2, "ASME Section XI, Subsection IWL," and/or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes

II CONTAINMENT STRUCTURES								
Table B3.2 Mark III Concrete Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.B3.2.CP-121	3.5-1, 012	Concrete (inaccessible areas): dome; wall; basemat	Concrete	Any	Cracking due to expansion from reaction with aggregates	Plant-specific aging management program significant if it is demonstrated that the in-place concrete can perform its intended function, <u>or AMP XI.S2, "ASME Section XI, Subsection IWL," and/or AMP XI.S6, "Structures Monitoring," enhanced as necessary.</u>	Yes
M	II.B3.2.CP-122	3.5-1, 014	Concrete (inaccessible areas): dome; wall; basemat	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	Plant-specific aging management program, <u>or AMP XI.S2, "ASME Section XI, Subsection IWL," and/or AMP XI.S6, "Structures Monitoring," enhanced as necessary.</u>	Yes
M	II.B3.2.CP-89	3.5-1, 023	Concrete (inaccessible areas): dome; wall; basemat; reinforcing steel	Concrete	Any	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S2, "ASME Section XI, Subsection IWL," and supplemented, as necessary, by AMP XI.S6, "Structures Monitoring"	No

II CONTAINMENT STRUCTURES								
Table B3.2 Mark III Concrete Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	II.B3.2.CP-105	3.5-1, 001	Concrete elements: all	Concrete	Soil	Cracking and distortion due to increased stress levels from settlement	AMP XI.S2, "ASME Section XI, Subsection IWL," and supplemented, as necessary, by AMP XI.S6, "Structures Monitoring"	Yes
E	II.B3.2.CP-108	3.5-1, 003	Concrete: dome; wall; basemat	Concrete	Air – indoor uncontrolled, air – outdoor	Reduction of strength and modulus due to elevated temperature (>150°F general; >200°F local)	Plant-specific aging management program to be evaluated if temperature limits exceeded, <u>or AMP XI.S2, "ASME Section XI, Subsection IWL," and/or AMP XI.S6, "Structures Monitoring," – enhanced as necessary</u>	Yes
E	II.B3.2.C-07	3.5-1, 002	Concrete: foundation; subfoundation	Concrete; porous concrete	Water – flowing	Reduction of foundation strength and cracking due to differential settlement and erosion of porous concrete subfoundation	AMP XI.S6, "Structures Monitoring"	Yes

II CONTAINMENT STRUCTURES								
Table B3.2 Mark III Concrete Containments								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.B3.2.CP-35	3.5-1, 035	Steel elements (accessible areas): liner; liner anchors; integral attachments	Steel	Air – indoor uncontrolled	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes
E	II.B3.2.CP-98	3.5-1, 005	Steel elements (inaccessible areas): liner; liner anchors; integral attachments	Steel	Air – indoor uncontrolled	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes
M	II.B3.2.C-24	3.5-1, 038	Steel elements: suppression chamber shell (interior surface)	Stainless steel	Air – indoor uncontrolled	Cracking due to SCC	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes

## **B4. COMMON COMPONENTS**

### **Systems, Structures, and Components**

This section addresses the common components of boiling water reactor (BWR) containments. The common components include (i) penetration sleeves and bellows, (ii) dissimilar metal welds, (iii) personnel airlock, (iv) equipment hatch, (v) control rod drive (CRD) and hatch, (vi) seals, (vii) gaskets, and (viii) moisture barriers.

### **System Interfaces**

Functional interfaces include the primary containment heating and ventilation system (VII.F3), containment isolation components (V.C), and standby gas treatment system (V.B). Physical interfaces exist with any structure, system, or component that either penetrates the containment wall, such as the main steam (MS) system (VIII.B2) and the feedwater (FW) system (VIII.D2), or is supported by the containment structure. The containment structure basemat may provide support to the nuclear steam supply system components and containment internal structures.

II CONTAINMENT STRUCTURES								
Table B4 Common Components								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.B4.CP-37	3.5-1, 027	Metal liner, metal plate, airlock, equipment hatch, CRD hatch; penetration sleeves; penetration bellows	Steel; stainless steel; dissimilar metal welds	Air – indoor uncontrolled, air – outdoor	Cracking due to cyclic loading (CLB fatigue analysis does not exist)	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	No
M	II.B4.C-13	3.5-1, 009	Metal liner, metal plate, personnel airlock, equipment hatch, CRD hatch, penetration sleeves; penetration bellows	Steel; stainless steel; dissimilar metal welds	Air – indoor uncontrolled, air – outdoor	Cumulative fatigue damage due to fatigue (Only if CLB fatigue analysis exists)	TLAA, SRP-SLR Section 4.6, "Containment Liner Plate and Penetration Fatigue Analysis"	Yes
	II.B4.CP-40	3.5-1, 026	Moisture barriers (caulking, flashing, other sealants)	Elastomer, rubber and other similar materials	Air – indoor uncontrolled	Loss of sealing due to wear, damage, erosion, tear, surface cracks, other defects	AMP XI.S1, "ASME Section XI, Subsection IWE"	No

II CONTAINMENT STRUCTURES								
Table B4 Common Components								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.B4.CP-36	3.5-1, 035	Penetration sleeves	Steel; dissimilar metal welds	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes
E	II.B4.CP-38	3.5-1, 010	Penetration sleeves; penetration bellows	Stainless steel; dissimilar metal welds	Air – indoor uncontrolled, air – outdoor	Cracking due to SCC	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes
	II.B4.C-16	3.5-1, 028	Personnel airlock, equipment hatch, CRD hatch	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	No
M	II.B4.CP-39	3.5-1, 029	Personnel airlock, equipment hatch, CRD hatch: locks, hinges, closure mechanisms	Steel	Air – indoor uncontrolled, air – outdoor	Loss of leak tightness due to mechanical wear	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	No
	II.B4.CP-148	3.5-1, 031	Pressure-retaining bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S1, "ASME Section XI, Subsection IWE"	No



II CONTAINMENT STRUCTURES								
Table B4 Common Components								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	II.B4.CP-150	3.5-1, 030	Pressure-retaining bolting	Steel	Any	Loss of preload due to self-loosening	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	No
	II.B4.CP-41	3.5-1, 033	Seals and gaskets	Elastomer, rubber and other similar materials	Air – indoor uncontrolled, air – outdoor	Loss of sealing due to wear, damage, erosion, tear, surface cracks, other defects	AMP XI.S4, "10 CFR Part 50, Appendix J"	No
M	II.B4.CP-152	3.5-1, 034	Service Level I coatings	Coatings	Air – indoor uncontrolled, treated water	Loss of coating or lining integrity due to blistering, cracking, flaking, peeling, delamination, rusting, physical damage	AMP XI.S8, "Protective Coating Monitoring and Maintenance"	No

**CHAPTER III**  
**STRUCTURES AND COMPONENT SUPPORTS**

### III STRUCTURES AND COMPONENT SUPPORTS

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#### III A. SAFETY-RELATED AND OTHER STRUCTURES

Safety-related structures are those defined pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 54.4(a)(1), and the other structures are those defined pursuant to 10 CFR 54.4(a)(2) and 10 CFR 54.4(a)(3). Structures in this section are organized into nine groups and are discussed separately under subheadings A1 through A9.

#### III B. COMPONENT SUPPORTS

Component supports include supports for American Society of Mechanical Engineers (ASME) piping and components; supports for cable trays, conduit, heating, ventilation, and air conditioning (HVAC) ducts, TubeTrack®, instrument tubing, non-ASME piping and components; anchorage of racks, panels, cabinets, and enclosures for electrical equipment and instrumentation; supports for emergency diesel generator (EDG) and HVAC system components; and supports for platforms, pipe whip restraints, jet impingement shields, masonry walls, and other miscellaneous structures.



### **III SAFETY-RELATED AND OTHER STRUCTURES**

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- A1. GROUP 1 STRUCTURES (BWR REACTOR BLDG., PWR SHIELD BLDG., CONTROL ROOM/BLDG.)
- A2. GROUP 2 STRUCTURES (BWR REACTOR BLDG. WITH STEEL SUPERSTRUCTURE)
- A3. GROUP 3 STRUCTURES (AUXILIARY BLDG., DIESEL GENERATOR BLDG., RADWASTE BLDG., TURBINE BLDG., SWITCHGEAR ROOM, YARD STRUCTURES SUCH AS AFW PUMPHOUSE, UTILITY/PIPING TUNNELS, SECURITY/LIGHTING POLES, MANHOLES, DUCT BANKS; SBO STRUCTURES, SUCH AS TRANSMISSION TOWERS, STARTUP TOWERS CIRCUIT BREAKER FOUNDATION, ELECTRICAL ENCLOSURE)
- A4. GROUP 4 STRUCTURES (CONTAINMENT INTERNAL STRUCTURES, EXCLUDING REFUELING CANAL)
- A5. GROUP 5 STRUCTURES (FUEL STORAGE FACILITY, REFUELING CANAL)
- A6. GROUP 6 STRUCTURES (WATER-CONTROL STRUCTURES)
- A7. GROUP 7 STRUCTURES (CONCRETE TANKS AND MISSILE BARRIERS)
- A8. GROUP 8 STRUCTURES (STEEL TANKS AND MISSILE BARRIERS)
- A9. GROUP 9 STRUCTURES (BWR UNIT VENT STACK)

## **A1. GROUP 1 STRUCTURES (BOILING WATER REACTOR BUILDING, PRESSURIZED WATER REACTOR SHIELD BUILDING, CONTROL ROOM/BUILDING)**

### **Systems, Structures, and Components**

This section addresses the elements of the boiling water reactor (BWR) reactor building, pressurized water reactor (PWR) shield building, and control room/building. For this group, the applicable structural elements are concrete, steel, and masonry walls. The aging management review (AMR) is presented for each applicable combination of structural element and aging effect.

### **System Interfaces**

Physical interfaces exist with any system or component that either penetrates the structure wall or is supported by the structure wall, floor, and roof. The direct interface is through the system or component supports that are anchored to the structure. Structures also protect housed systems or components from internal and external design basis events. In the case of tanks, there is a functional interface with the associated system. Water-control structures are integral parts of the systems that provide plant cooling water and residual heat removal.

III STRUCTURES AND COMPONENT SUPPORTS								
Table A1 Group 1 Structures (BWR Reactor Bldg., PWR Shield Bldg., Control Room/Bldg.)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A1.TP-25	3.5-1, 054	Concrete (accessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	AMP XI.S6, "Structures Monitoring"	No
	III.A1.TP-27	3.5-1, 065	Concrete (accessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No
	III.A1.TP-23	3.5-1, 064	Concrete (accessible areas): exterior above- and below-grade; foundation	Concrete	Air – outdoor	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S6, "Structures Monitoring"	No
	III.A1.TP-24	3.5-1, 063	Concrete (accessible areas): exterior above- and below-grade; foundation	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	AMP XI.S6, "Structures Monitoring"	No
	III.A1.TP-26	3.5-1, 066	Concrete (accessible areas): interior and above-grade exterior	Concrete	Air – indoor uncontrolled, air – outdoor	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table A1 Group 1 Structures (BWR Reactor Bldg., PWR Shield Bldg., Control Room/Bldg.)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A1.TP-204	3.5-1, 043	Concrete (inaccessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	Plant-specific aging management program, or AMP XI.S6, "Structures Monitoring." enhanced as necessary	Yes
	III.A1.TP-212	3.5-1, 065	Concrete (inaccessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No
	III.A1.TP-29	3.5-1, 067	Concrete (inaccessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S6, "Structures Monitoring"	No
M	III.A1.TP-67	3.5-1, 047	Concrete (inaccessible areas): exterior above- and below-grade; foundation	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	Plant-specific aging management program, or AMP XI.S6, "Structures Monitoring." enhanced as necessary	Yes



III STRUCTURES AND COMPONENT SUPPORTS								
Table A1 Group 1 Structures (BWR Reactor Bldg., PWR Shield Bldg., Control Room/Bldg.)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A1.TP-108	3.5-1, 042	Concrete (inaccessible areas): foundation	Concrete	Air – outdoor, groundwater/soil	Loss of material (spalling, scaling) and cracking due to freeze-thaw	Plant-specific aging management program to be evaluated for plants in moderate to severe weathering conditions, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
E	III.A1.TP-114	3.5-1, 048	Concrete: all	Concrete	Air – indoor uncontrolled	Reduction of strength and modulus due to elevated temperature (>150°F general; >200°F local)	Plant-specific aging management program to be evaluated if temperature limits exceeded, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
E	III.A1.TP-30	3.5-1, 044	Concrete: all	Concrete	Soil	Cracking and distortion due to increased stress levels from settlement	AMP XI.S6, "Structures Monitoring"	Yes

III STRUCTURES AND COMPONENT SUPPORTS								
Table A1 Group 1 Structures (BWR Reactor Bldg., PWR Shield Bldg., Control Room/Bldg.)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A1.TP-31	3.5-1, 046	Concrete: foundation; subfoundation	Concrete; porous concrete	Water – flowing	Reduction of foundation strength and cracking due to differential settlement and erosion of porous concrete subfoundation	AMP XI.S6, "Structures Monitoring"	Yes
	III.A1.TP-28	3.5-1, 067	Concrete: interior; above-grade exterior	Concrete	Air – indoor uncontrolled, air – outdoor	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S6, "Structures Monitoring"	No
	III.A1.T-12	3.5-1, 070	Masonry walls: all	Concrete block	Air – indoor uncontrolled, air – outdoor	Cracking due to restraint shrinkage, creep, and aggressive environment	AMP XI.S5, "Masonry Walls"	No
N	III.A1.TP-34	3.5-1, 071	Masonry walls: all	Concrete block	Air – outdoor	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S5, "Masonry Walls"	No
E	III.A1.TP-302	3.5-1, 077	Steel components: all structural steel	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to corrosion	AMP XI.S6, "Structures Monitoring"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table A1 Group 1 Structures (BWR Reactor Bldg., PWR Shield Bldg., Control Room/Bldg.)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A1.TP-261	3.5-1, 088	Structural bolting	Any	Any	Loss of preload due to self-loosening	AMP XI.S6, "Structures Monitoring"	No
M	III.A1.TP-248	3.5-1, 080	Structural bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
	III.A1.TP-274	3.5-1, 082	Structural bolting	Steel; galvanized steel	Air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
D	III.A1.TP-300							

## **A2. GROUP 2 STRUCTURES (BOILING WATER REACTOR BUILDING WITH STEEL SUPERSTRUCTURE)**

### **Systems, Structures, and Components**

This section addresses the elements of the boiling water reactor (BWR) reactor building with steel superstructure. For this group, the applicable structural elements are identified: (i) concrete, (ii) steel, and (iii) masonry walls. The aging management review (AMR) is presented for each applicable combination of structural element and aging effect.

### **System Interfaces**

Physical interfaces exist with any system or component that either penetrates the structure wall or is supported by the structure wall, floor, and roof. The direct interface is through the system or component supports that are anchored to the structure. Structures also protect housed systems and components from internal and external design basis events. In the case of tanks, there is a functional interface with the associated system. Water-control structures are integral parts of the systems that provide plant cooling water and residual heat removal.

III STRUCTURES AND COMPONENT SUPPORTS								
Table A2 Group 2 Structures (BWR Reactor Bldg. With Steel Superstructure)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A2.TP-25	3.5-1, 054	Concrete (accessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	AMP XI.S6, "Structures Monitoring"	No
	III.A2.TP-27	3.5-1, 065	Concrete (accessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No
	III.A2.TP-23	3.5-1, 064	Concrete (accessible areas): exterior above- and below-grade; foundation	Concrete	Air – outdoor	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S6, "Structures Monitoring"	No
	III.A2.TP-24	3.5-1, 063	Concrete (accessible areas): exterior above- and below-grade; foundation	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	AMP XI.S6, "Structures Monitoring"	No
	III.A2.TP-26	3.5-1, 066	Concrete (accessible areas): interior and above-grade exterior	Concrete	Air – indoor uncontrolled, air – outdoor	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table A2 Group 2 Structures (BWR Reactor Bldg. With Steel Superstructure)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A2.TP-204	3.5-1, 043	Concrete (inaccessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	Plant-specific aging management program, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
	III.A2.TP-212	3.5-1, 065	Concrete (inaccessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No
	III.A2.TP-29	3.5-1, 067	Concrete (inaccessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S6, "Structures Monitoring"	No
M	III.A2.TP-67	3.5-1, 047	Concrete (inaccessible areas): exterior above- and below-grade; foundation	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	Plant-specific aging management program, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes

III STRUCTURES AND COMPONENT SUPPORTS								
Table A2 Group 2 Structures (BWR Reactor Bldg. With Steel Superstructure)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A2.TP-108	3.5-1, 042	Concrete (inaccessible areas): foundation	Concrete	Air – outdoor, groundwater/soil	Loss of material (spalling, scaling) and cracking due to freeze-thaw	Plant-specific aging management program to be evaluated for plants in moderate to severe weathering conditions, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
E	III.A2.TP-114	3.5-1, 048	Concrete: all	Concrete	Air – indoor uncontrolled	Reduction of strength and modulus due to elevated temperature (>150°F general; >200°F local)	Plant-specific aging management program to be evaluated if temperature limits exceeded, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
E	III.A2.TP-30	3.5-1, 044	Concrete: all	Concrete	Soil	Cracking and distortion due to increased stress levels from settlement	AMP XI.S6, "Structures Monitoring"	Yes

III STRUCTURES AND COMPONENT SUPPORTS								
Table A2 Group 2 Structures (BWR Reactor Bldg. With Steel Superstructure)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A2.TP-31	3.5-1, 046	Concrete: foundation; subfoundation	Concrete; porous concrete	Water – flowing	Reduction of foundation strength and cracking due to differential settlement and erosion of porous concrete subfoundation	AMP XI.S6, "Structures Monitoring"	Yes
	III.A2.TP-28	3.5-1, 067	Concrete: interior; above-grade exterior	Concrete	Air – indoor uncontrolled, air – outdoor	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S6, "Structures Monitoring"	No
	III.A2.T-12	3.5-1, 070	Masonry walls: all	Concrete block	Air – indoor uncontrolled, air – outdoor	Cracking due to restraint shrinkage, creep, and aggressive environment	AMP XI.S5, "Masonry Walls"	No
N	III.A2.TP-34	3.5-1, 071	Masonry walls: all	Concrete block	Air – outdoor	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S5, "Masonry Walls"	No
E	III.A2.TP-302	3.5-1, 077	Steel components: all structural steel	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to corrosion	AMP XI.S6, "Structures Monitoring"	No



III STRUCTURES AND COMPONENT SUPPORTS								
Table A2 Group 2 Structures (BWR Reactor Bldg. With Steel Superstructure)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A2.TP-261	3.5-1, 088	Structural bolting	Any	Any	Loss of preload due to self-loosening	AMP XI.S6, "Structures Monitoring"	No
M	III.A2.TP-248	3.5-1, 080	Structural bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
	III.A2.TP-274	3.5-1, 082	Structural bolting	Steel; galvanized steel	Air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
D	III.A2.TP-300							

**A3. GROUP 3 STRUCTURES (AUXILIARY BUILDING, DIESEL GENERATOR BUILDING, RADWASTE BUILDING, TURBINE BUILDING, SWITCHGEAR ROOM, YARD STRUCTURES, SUCH AS AUXILIARY FEEDWATER PUMPHOUSE, UTILITY/PIPING TUNNELS, SECURITY/LIGHTING POLES, MANHOLES, DUCT BANKS; STATION BLACKOUT STRUCTURES, SUCH AS TRANSMISSION TOWERS, STARTUP TOWERS CIRCUIT BREAKER FOUNDATION, ELECTRICAL ENCLOSURE)**

**Systems, Structures, and Components**

This section addresses the elements of the auxiliary building, diesel generator building, radwaste building, turbine building, switchgear room, yard structures, and station blackout (SBO) structures. For this group, the applicable structural elements are identified: (i) concrete, (ii) steel, and (iii) masonry walls. The aging management review (AMR) is presented for each applicable combination of structural element and aging effect.

**System Interfaces**

Physical interfaces exist with any system or component that either penetrates the structure wall or is supported by the structure wall, floor, and roof. The direct interface is through the system or component supports that are anchored to the structure. Structures also protect housed structures and components from internal and external design basis events. In the case of tanks, there is a functional interface with the associated system. Water-control structures are integral parts of the systems that provide plant cooling water and residual heat removal.

<b>III STRUCTURES AND COMPONENT SUPPORTS</b>  <b>Table A3 Group 3 Structures (Auxiliary Bldg., Diesel Generator Bldg., Radwaste Bldg., Turbine Bldg., Switchgear Rm., Yard Structures Such As AFW Pumphouse, Utility/Piping Tunnels, Security/Lighting Poles, Manholes, Duct Banks; SBO Structures Such As Transmission Towers, Startup Tower Circuit Breaker Foundation, Electrical Enclosure)</b>								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A3.TP-25	3.5-1, 054	Concrete (accessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	AMP XI.S6, "Structures Monitoring"	No
	III.A3.TP-27	3.5-1, 065	Concrete (accessible areas): below- grade exterior; foundation	Concrete	Groundwater/soil	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No
	III.A3.TP-23	3.5-1, 064	Concrete (accessible areas): exterior above- and below-grade; foundation	Concrete	Air – outdoor	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S6, "Structures Monitoring"	No
	III.A3.TP-24	3.5-1, 063	Concrete (accessible areas): exterior above- and below-grade; foundation	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	AMP XI.S6, "Structures Monitoring"	No

<b>III STRUCTURES AND COMPONENT SUPPORTS</b>  <b>Table A3 Group 3 Structures (Auxiliary Bldg., Diesel Generator Bldg., Radwaste Bldg., Turbine Bldg., Switchgear Rm., Yard Structures Such As AFW Pumphouse, Utility/Piping Tunnels, Security/Lighting Poles, Manholes, Duct Banks; SBO Structures Such As Transmission Towers, Startup Tower Circuit Breaker Foundation, Electrical Enclosure)</b>								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	III.A3.TP-26	3.5-1, 066	Concrete (accessible areas): interior and above-grade exterior	Concrete	Air – indoor uncontrolled, air – outdoor	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No
M	III.A3.TP-204	3.5-1, 043	Concrete (inaccessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	Plant-specific aging management program, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
	III.A3.TP-212	3.5-1, 065	Concrete (inaccessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No
	III.A3.TP-29	3.5-1, 067	Concrete (inaccessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S6, "Structures Monitoring"	No

<b>III STRUCTURES AND COMPONENT SUPPORTS</b>  <b>Table A3 Group 3 Structures (Auxiliary Bldg., Diesel Generator Bldg., Radwaste Bldg., Turbine Bldg., Switchgear Rm., Yard Structures Such As AFW Pumphouse, Utility/Piping Tunnels, Security/Lighting Poles, Manholes, Duct Banks; SBO Structures Such As Transmission Towers, Startup Tower Circuit Breaker Foundation, Electrical Enclosure)</b>								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A3.TP-67	3.5-1, 047	Concrete (inaccessible areas): exterior above- and below-grade; foundation	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	Plant-specific aging management program, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
M	III.A3.TP-108	3.5-1, 042	Concrete (inaccessible areas): foundation	Concrete	Air – outdoor, groundwater/soil	Loss of material (spalling, scaling) and cracking due to freeze-thaw	Plant-specific aging management program to be evaluated for plants in moderate to severe weathering conditions, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
E	III.A3.TP-114	3.5-1, 048	Concrete: all	Concrete	Air – indoor uncontrolled	Reduction of strength and modulus due to elevated temperature (>150°F general; >200°F local)	Plant-specific aging management program to be evaluated if temperature limits exceeded, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes

<b>III STRUCTURES AND COMPONENT SUPPORTS</b>  <b>Table A3 Group 3 Structures (Auxiliary Bldg., Diesel Generator Bldg., Radwaste Bldg., Turbine Bldg., Switchgear Rm., Yard Structures Such As AFW Pumphouse, Utility/Piping Tunnels, Security/Lighting Poles, Manholes, Duct Banks; SBO Structures Such As Transmission Towers, Startup Tower Circuit Breaker Foundation, Electrical Enclosure)</b>								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A3.TP-30	3.5-1, 044	Concrete: all	Concrete	Soil	Cracking and distortion due to increased stress levels from settlement	AMP XI.S6, "Structures Monitoring"	Yes
E	III.A3.TP-31	3.5-1, 046	Concrete: foundation; subfoundation	Concrete; porous concrete	Water – flowing	Reduction of foundation strength and cracking due to differential settlement and erosion of porous concrete subfoundation	AMP XI.S6, "Structures Monitoring"	Yes
	III.A3.TP-28	3.5-1, 067	Concrete: interior; above-grade exterior	Concrete	Air – indoor uncontrolled, air – outdoor	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S6, "Structures Monitoring"	No
	III.A3.T-12	3.5-1, 070	Masonry walls: all	Concrete block	Air – indoor uncontrolled, air – outdoor	Cracking due to restraint shrinkage, creep, and aggressive environment	AMP XI.S5, "Masonry Walls"	No

<b>III STRUCTURES AND COMPONENT SUPPORTS</b>  <b>Table A3 Group 3 Structures (Auxiliary Bldg., Diesel Generator Bldg., Radwaste Bldg., Turbine Bldg., Switchgear Rm., Yard Structures Such As AFW Pumphouse, Utility/Piping Tunnels, Security/Lighting Poles, Manholes, Duct Banks; SBO Structures Such As Transmission Towers, Startup Tower Circuit Breaker Foundation, Electrical Enclosure)</b>								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
N	III.A3.TP-34	3.5-1, 071	Masonry walls: all	Concrete block	Air – outdoor	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S5, "Masonry Walls"	No
E	III.A3.TP-302	3.5-1, 077	Steel components: all structural steel	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to corrosion	AMP XI.S6, "Structures Monitoring"	No
	III.A3.TP-219	3.5-1, 079	Steel components: piles	Steel	Soil, groundwater	Loss of material due to corrosion	AMP XI.S6, "Structures Monitoring"	No
E	III.A3.TP-261	3.5-1, 088	Structural bolting	Any	Any	Loss of preload due to self-loosening	AMP XI.S6, "Structures Monitoring"	No
M	III.A3.TP-248	3.5-1, 080	Structural bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
	III.A3.TP-274	3.5-1, 082	Structural bolting	Steel; galvanized steel	Air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
D	III.A3.TP-300							

#### **A4. GROUP 4 STRUCTURES (CONTAINMENT INTERNAL STRUCTURES, EXCLUDING REFUELING CANAL)**

##### **Systems, Structures, and Components**

This section addresses the elements of the containment internal structures, excluding refueling canal. For this group, the applicable structural elements are identified: (i) concrete and (ii) steel elements. The aging management review (AMR) is presented for each applicable combination of structural element and aging effect.

##### **System Interfaces**

Physical interfaces exist with any system or component that either penetrates the structure wall or is supported by the structure wall, floor, and roof. The direct interface is through the system or component supports that are anchored to the structure. Structures also protect housed systems and components from internal and external design basis events. In the case of tanks, there is a functional interface with the associated system. Water-control structures are integral parts of the systems that provide plant cooling water and residual heat removal.



III STRUCTURES AND COMPONENT SUPPORTS								
Table A4 Group Structures (Containment Internal Structures, Excluding Refueling Canal)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A4.TP-25	3.5-1, 054	Concrete (accessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	AMP XI.S6, "Structures Monitoring"	No
	III.A4.TP-26	3.5-1, 066	Concrete (accessible areas): interior and above-grade exterior	Concrete	Air – indoor uncontrolled, air – outdoor	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No
M	III.A4.TP-204	3.5-1, 043	Concrete (inaccessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	Plant-specific aging management program, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
M	III.A4.TP-305	3.5-1, 047	Concrete (inaccessible areas): exterior above- and below-grade; foundation	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	Plant-specific aging management program, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes

III STRUCTURES AND COMPONENT SUPPORTS								
Table A4 Group Structures (Containment Internal Structures, Excluding Refueling Canal)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A4.TP-114	3.5-1, 048	Concrete: all	Concrete	Air – indoor uncontrolled	Reduction of strength and modulus due to elevated temperature (>150°F general; >200°F local)	Plant-specific aging management program to be evaluated if temperature limits exceeded, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
E	III.A4.TP-30	3.5-1, 044	Concrete: all	Concrete	Soil	Cracking and distortion due to increased stress levels from settlement	AMP XI.S6, "Structures Monitoring"	Yes
	III.A4.TP-28	3.5-1, 067	Concrete: interior; above-grade exterior	Concrete	Air – indoor uncontrolled, air – outdoor	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S6, "Structures Monitoring"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table A4 Group Structures (Containment Internal Structures, Excluding Refueling Canal)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
N	III.A4.T-35	3.5-1, 097	Group 4: Concrete (reactor cavity area proximate to the reactor vessel): reactor (primary/biological) shield wall; sacrificial shield wall; reactor vessel support/pedestal structure	Concrete	Air – indoor uncontrolled	Reduction of strength; loss of mechanical properties due to irradiation (i.e., radiation interactions with material and radiation-induced heating)	Plant-specific aging management program <a href="#">or other selected AMPs, enhanced as necessary</a>	Yes
M	III.A4.TP-301	3.5-1, 073	Service Level I coatings	Coatings	Air – indoor uncontrolled, treated water	Loss of coating or lining integrity due to blistering, cracking, flaking, peeling, delamination, rusting, physical damage	AMP XI.S8, "Protective Coating Monitoring and Maintenance"	No
M	III.A4.TP-35	3.5-1, 076	Sliding surfaces: radial beam seats in BWR drywell	Lubrite; Fluorogold; Lubrofluor	Air – indoor uncontrolled	Loss of mechanical function due to corrosion, distortion, dirt or debris accumulation, overload, wear	AMP XI.S6, "Structures Monitoring"	No
E	III.A4.TP-302	3.5-1, 077	Steel components: all structural steel	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to corrosion	AMP XI.S6, "Structures Monitoring"	No
E	III.A4.TP-261	3.5-1, 088	Structural bolting	Any	Any	Loss of preload due to self-loosening	AMP XI.S6, "Structures Monitoring"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table A4 Group Structures (Containment Internal Structures, Excluding Refueling Canal)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A4.TP-248	3.5-1, 080	Structural bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
	III.A4.TP-274	3.5-1, 082	Structural bolting	Steel; galvanized steel	Air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
D	III.A4.TP-300							

## **A5. GROUP 5 STRUCTURES (FUEL STORAGE FACILITY, REFUELING CANAL)**

### **Systems, Structures, and Components**

This section addresses the elements of the fuel storage facility and refueling canal. For this group, the applicable structural elements are identified: (i) concrete, (ii) steel, and (iii) masonry walls. The aging management review (AMR) is presented for each applicable combination of structural element and aging effect.

### **System Interfaces**

Physical interfaces exist with any system or component that either penetrates the structure wall or is supported by the structure wall, floor, and roof. The direct interface is through the system or component supports that are anchored to the structure. Structures also protect housed structures and components from internal and external design basis events. In the case of tanks, there is a functional interface with the associated system. Water-control structures are integral parts of the systems that provide plant cooling water and residual heat removal.

III STRUCTURES AND COMPONENT SUPPORTS								
Table A5 Group 5 Structures (Fuel Storage Facility, Refueling Canal)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A5.TP-25	3.5-1, 054	Concrete (accessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	AMP XI.S6, "Structures Monitoring"	No
	III.A5.TP-27	3.5-1, 065	Concrete (accessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No
	III.A5.TP-23	3.5-1, 064	Concrete (accessible areas): exterior above- and below-grade; foundation	Concrete	Air – outdoor	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S6, "Structures Monitoring"	No
	III.A5.TP-24	3.5-1, 063	Concrete (accessible areas): exterior above- and below-grade; foundation	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	AMP XI.S6, "Structures Monitoring"	No
	III.A5.TP-26	3.5-1, 066	Concrete (accessible areas): interior and above-grade exterior	Concrete	Air – indoor uncontrolled, air – outdoor	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table A5 Group 5 Structures (Fuel Storage Facility, Refueling Canal)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A5.TP-204	3.5-1, 043	Concrete (inaccessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	Plant-specific aging management program, or AMP XI.S6, "Structures Monitoring," enhanced as necessary	Yes
	III.A5.TP-212	3.5-1, 065	Concrete (inaccessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No
	III.A5.TP-29	3.5-1, 067	Concrete (inaccessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S6, "Structures Monitoring"	No
M	III.A5.TP-67	3.5-1, 047	Concrete (inaccessible areas): exterior above- and below-grade; foundation	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	Plant-specific aging management program, or AMP XI.S6, "Structures Monitoring," enhanced as necessary	Yes

III STRUCTURES AND COMPONENT SUPPORTS								
Table A5 Group 5 Structures (Fuel Storage Facility, Refueling Canal)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A5.TP-108	3.5-1, 042	Concrete (inaccessible areas): foundation	Concrete	Air – outdoor, groundwater/soil	Loss of material (spalling, scaling) and cracking due to freeze-thaw	Plant-specific aging management program to be evaluated for plants in moderate to severe weathering conditions, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
E	III.A5.TP-114	3.5-1, 048	Concrete: all	Concrete	Air – indoor uncontrolled	Reduction of strength and modulus due to elevated temperature (>150°F general; >200°F local)	Plant-specific aging management program to be evaluated if temperature limits exceeded, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
E	III.A5.TP-30	3.5-1, 044	Concrete: all	Concrete	Soil	Cracking and distortion due to increased stress levels from settlement	AMP XI.S6, "Structures Monitoring"	Yes



III STRUCTURES AND COMPONENT SUPPORTS								
Table A5 Group 5 Structures (Fuel Storage Facility, Refueling Canal)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A5.TP-31	3.5-1, 046	Concrete: foundation; subfoundation	Concrete; porous concrete	Water – flowing	Reduction of foundation strength and cracking due to differential settlement and erosion of porous concrete subfoundation	AMP XI.S6, "Structures Monitoring"	Yes
	III.A5.TP-28	3.5-1, 067	Concrete: interior; above-grade exterior	Concrete	Air – indoor uncontrolled, air – outdoor	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S6, "Structures Monitoring"	No
	III.A5.T-12	3.5-1, 070	Masonry walls: all	Concrete block	Air – indoor uncontrolled, air – outdoor	Cracking due to restraint shrinkage, creep, and aggressive environment	AMP XI.S5, "Masonry Walls"	No
	III.A5.TP-34	3.5-1, 071	Masonry walls: all	Concrete block	Air – outdoor	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S5, "Masonry Walls"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table A5 Group 5 Structures (Fuel Storage Facility, Refueling Canal)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A5.T-14	3.5-1, 078	Stainless steel fuel pool liner	Stainless steel	Treated water, treated borated water	Cracking due to SCC; loss of material due to pitting and crevice corrosion	AMP XI.M2, "Water Chemistry," and monitoring of the spent fuel pool water level and leakage from the leak chase channels.	No
E	III.A5.TP-302	3.5-1, 077	Steel components: all structural steel	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to corrosion	AMP XI.S6, "Structures Monitoring"	No
E	III.A5.TP-261	3.5-1, 088	Structural bolting	Any	Any	Loss of preload due to self-loosening	AMP XI.S6, "Structures Monitoring"	No
M	III.A5.TP-248	3.5-1, 080	Structural bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
	III.A5.TP-274	3.5-1, 082	Structural bolting	Steel; galvanized steel	Air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
D	III.A5.TP-300							

## **A6. GROUP 6 STRUCTURES (WATER-CONTROL STRUCTURES)**

### **Systems, Structures, and Components**

This section addresses the elements of water-control structures. For this group, the applicable structural elements are identified: (i) concrete, (ii) steel, (iii) masonry walls, and (iv) earthen water-control structures (e.g., dams, embankments, reservoirs). The aging management review (AMR) is presented for each applicable combination of structural element and aging effect.

### **System Interfaces**

Physical interfaces exist with any system or component that either penetrates the structure wall or is supported by the structure wall, floor, and roof. The direct interface is through the system or component supports that are anchored to the structure. Structures also protect housed structures and components from internal and external design basis events. In the case of tanks, there is a functional interface with the associated system. Water-control structures are integral parts of the systems that provide plant cooling water and residual heat removal.

III STRUCTURES AND COMPONENT SUPPORTS								
Table A6 Group 6 Structures (Water-Control Structures)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
N	III.A6.T-34	3.5-1, 096	Concrete (accessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	AMP XI.S7, "Inspection of Water-Control Structures Associated with Nuclear Power Plants"	No
N	III.A6.TP-25	3.5-1, 054	Concrete (accessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	AMP XI.S6, "Structures Monitoring"	No
E	III.A6.TP-38	3.5-1, 059	Concrete (accessible areas): all	Concrete	Any	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S7, "Inspection of Water-Control Structures Associated with Nuclear Power Plants" or the FERC / US Army Corp of Engineers dam inspections and maintenance programs.	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table A6 Group 6 Structures (Water-Control Structures)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A6.TP-36	3.5-1, 060	Concrete (accessible areas): exterior above- and below-grade; foundation	Concrete	Any	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S7, "Inspection of Water-Control Structures Associated with Nuclear Power Plants" or the FERC / US Army Corp of Engineers dam inspections and maintenance programs.	No
M	III.A6.TP-37	3.5-1, 061	Concrete (accessible areas): exterior above- and below-grade; foundation; interior slab	Concrete	Any	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	AMP XI.S7, "Inspection of Water-Control Structures Associated with Nuclear Power Plants" or the FERC / US Army Corp of Engineers dam inspections and maintenance programs.	No
	III.A6.TP-104	3.5-1, 065	Concrete (inaccessible areas): all	Concrete	Air – indoor uncontrolled, air – outdoor, groundwater/soil	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table A6 Group 6 Structures (Water-Control Structures)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A6.TP-220	3.5-1, 050	Concrete (inaccessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	Plant-specific aging management program, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
	III.A6.TP-107	3.5-1, 067	Concrete (inaccessible areas): all	Concrete	Groundwater/soil	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S6, "Structures Monitoring"	No
M	III.A6.TP-110	3.5-1, 049	Concrete (inaccessible areas): exterior above- and below-grade; foundation; interior slab	Concrete	Air – outdoor, groundwater/soil	Loss of material (spalling, scaling) and cracking due to freeze-thaw	Plant-specific aging management program to be evaluated for plants in moderate to severe weathering conditions, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes

III STRUCTURES AND COMPONENT SUPPORTS								
Table A6 Group 6 Structures (Water-Control Structures)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A6.TP-109	3.5-1, 051	Concrete (inaccessible areas): exterior above- and below-grade; foundation; interior slab	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	Plant-specific aging management program, or AMP XI.S6, "Structures Monitoring," enhanced as necessary	Yes
E	III.A6.TP-30	3.5-1, 044	Concrete: all	Concrete	Soil	Cracking and distortion due to increased stress levels from settlement	AMP XI.S6, "Structures Monitoring"	Yes
E	III.A6.T-20	3.5-1, 056	Concrete: exterior above- and below-grade; foundation; interior slab	Concrete	Water – flowing	Loss of material due to abrasion; cavitation	AMP XI.S7, "Inspection of Water-Control Structures Associated with Nuclear Power Plants" or the FERC / US Army Corp of Engineers dam inspections and maintenance programs.	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table A6 Group 6 Structures (Water-Control Structures)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A6.TP-31	3.5-1, 046	Concrete: foundation; subfoundation	Concrete; porous concrete	Water – flowing	Reduction of foundation strength and cracking due to differential settlement and erosion of porous concrete subfoundation	AMP XI.S6, "Structures Monitoring"	Yes
M	III.A6.T-22	3.5-1, 058	Earthen water- control structures: dams; embankments; reservoirs; channels; canals; ponds	Various	Air – outdoor, water – flowing or standing	Loss of material; loss of form due to erosion, settlement, sedimentation, frost action, waves, currents, surface runoff, seepage	AMP XI.S7, "Inspection of Water-Control Structures Associated with Nuclear Power Plants" or the FERC / US Army Corp of Engineers dam inspections and maintenance programs.	No



III STRUCTURES AND COMPONENT SUPPORTS								
Table A6 Group 6 Structures (Water-Control Structures)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A6.TP-223	3.5-1, 062	Group 6: Wooden Piles; sheeting	Wood	Air – outdoor, water – flowing or standing, groundwater/soil	Loss of material; change in material properties due to weathering, chemical degradation, and insect infestation repeated wetting and drying, fungal decay	AMP XI.S7, "Inspection of Water-Control Structures Associated with Nuclear Power Plants" or the FERC / US Army Corp of Engineers dam inspections and maintenance programs.	No
	III.A6.T-12	3.5-1, 070	Masonry walls: all	Concrete block	Air – indoor uncontrolled, air – outdoor	Cracking due to restraint shrinkage, creep, and aggressive environment	AMP XI.S5, "Masonry Walls"	No
N	III.A6.TP-34	3.5-1, 071	Masonry walls: all	Concrete block	Air – outdoor	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S5, "Masonry Walls"	No
M	III.A6.TP-7	3.5-1, 072	Seals; gaskets; moisture barriers (caulking, flashing, and other sealants)	Elastomer, rubber and other similar materials	Any	Loss of sealing due to wear, damage, erosion, tear, surface cracks, other defects	AMP XI.S6, "Structures Monitoring"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table A6 Group 6 Structures (Water-Control Structures)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A6.TP-261	3.5-1, 088	Structural bolting	Any	Any	Loss of preload due to self-loosening	AMP XI.S6, "Structures Monitoring"	No
M	III.A6.TP-248	3.5-1, 080	Structural bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
E	III.A6.TP-221	3.5-1, 083	Structural bolting	Steel	Air – indoor uncontrolled, air – outdoor, water – flowing or standing	Loss of material due to general, pitting, crevice corrosion	AMP XI.S7, "Inspection of Water-Control Structures Associated with Nuclear Power Plants" or the FERC / US Army Corp of Engineers dam inspections and maintenance programs.	No

## **A7. GROUP 7 STRUCTURES (CONCRETE TANKS AND MISSILE BARRIERS)**

### **Systems, Structures, and Components**

This section addresses the elements of concrete tanks and missile barriers. For this group, the applicable structural elements are identified: (i) concrete and (ii) steel. The aging management review (AMR) is presented for each applicable combination of structural element and aging effect.

### **System Interfaces**

Physical interfaces exist with any system or component that either penetrates the structure wall or is supported by the structure wall, floor, and roof. The direct interface is through the system or component supports that are anchored to the structure. Structures also protect housed structures and components from internal and external design basis events. In the case of tanks, there is a functional interface with the associated system. Water-control structures are integral parts of the systems that provide plant cooling water and residual heat removal.

III STRUCTURES AND COMPONENT SUPPORTS								
Table A7 Group 7 Structures (Concrete Tanks and Missile Barriers)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A7.TP-25	3.5-1, 054	Concrete (accessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	AMP XI.S6, "Structures Monitoring"	No
	III.A7.TP-27	3.5-1, 065	Concrete (accessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No
	III.A7.TP-23	3.5-1, 064	Concrete (accessible areas): exterior above- and below-grade; foundation	Concrete	Air – outdoor	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S6, "Structures Monitoring"	No
	III.A7.TP-24	3.5-1, 063	Concrete (accessible areas): exterior above- and below-grade; foundation	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	AMP XI.S6, "Structures Monitoring"	No
	III.A7.TP-26	3.5-1, 066	Concrete (accessible areas): interior and above-grade exterior	Concrete	Air – indoor uncontrolled, air – outdoor	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table A7 Group 7 Structures (Concrete Tanks and Missile Barriers)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A7.TP-204	3.5-1, 043	Concrete (inaccessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	Plant-specific aging management program, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
	III.A7.TP-212	3.5-1, 065	Concrete (inaccessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No
	III.A7.TP-29	3.5-1, 067	Concrete (inaccessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S6, "Structures Monitoring"	No
M	III.A7.TP-67	3.5-1, 047	Concrete (inaccessible areas): exterior above- and below-grade; foundation	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	Plant-specific aging management program, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes

III STRUCTURES AND COMPONENT SUPPORTS								
Table A7 Group 7 Structures (Concrete Tanks and Missile Barriers)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A7.TP-108	3.5-1, 042	Concrete (inaccessible areas): foundation	Concrete	Air – outdoor, groundwater/soil	Loss of material (spalling, scaling) and cracking due to freeze-thaw	Plant-specific aging management program to be evaluated for plants in moderate to severe weathering conditions, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
E	III.A7.TP-30	3.5-1, 044	Concrete: all	Concrete	Soil	Cracking and distortion due to increased stress levels from settlement	AMP XI.S6, "Structures Monitoring"	Yes
E	III.A7.TP-31	3.5-1, 046	Concrete: foundation; subfoundation	Concrete; porous concrete	Water – flowing	Reduction of foundation strength and cracking due to differential settlement and erosion of porous concrete subfoundation	AMP XI.S6, "Structures Monitoring"	Yes

III STRUCTURES AND COMPONENT SUPPORTS								
Table A7 Group 7 Structures (Concrete Tanks and Missile Barriers)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	III.A7.TP-28	3.5-1, 067	Concrete: interior; above-grade exterior	Concrete	Air – indoor uncontrolled, air – outdoor	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S6, "Structures Monitoring"	No
E	III.A7.TP-302	3.5-1, 077	Steel components: all structural steel	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to corrosion	AMP XI.S6, "Structures Monitoring"	No
E	III.A7.T-23	3.5-1, 052	Steel components: tank liner	Stainless steel	Water – standing	Cracking due to SCC; loss of material due to pitting and crevice corrosion	Plant-specific aging management program	Yes
E	III.A7.TP-261	3.5-1, 088	Structural bolting	Any	Any	Loss of preload due to self-loosening	AMP XI.S6, "Structures Monitoring"	No
M	III.A7.TP-248	3.5-1, 080	Structural bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
	III.A7.TP-274	3.5-1, 082	Structural bolting	Steel; galvanized steel	Air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
D	III.A7.TP-300							

## **A8. GROUP 8 STRUCTURES (STEEL TANKS AND MISSILE BARRIERS)**

### **Systems, Structures, and Components**

This section addresses the elements of steel tanks and missile barriers. For this group, the applicable structural elements are identified: (i) concrete and (ii) steel. The aging management review (AMR) is presented for each applicable combination of structural element and aging effect.

### **System Interfaces**

Physical interfaces exist with any system or component that either penetrates the structure wall or is supported by the structure wall, floor, and roof. The direct interface is through the system or component supports that are anchored to the structure. Structures also protect housed structures and components from internal and external design basis events. In the case of tanks, there is a functional interface with the associated system. Water-control structures are integral parts of the systems that provide plant cooling water and residual heat removal.



III STRUCTURES AND COMPONENT SUPPORTS								
Table A8 Group 8 Structures (Steel Tanks and Missile Barriers)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A8.TP-25	3.5-1, 054	Concrete (accessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	AMP XI.S6, "Structures Monitoring"	No
	III.A8.TP-27	3.5-1, 065	Concrete (accessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No
	III.A8.TP-23	3.5-1, 064	Concrete (accessible areas): exterior above- and below-grade; foundation	Concrete	Air – outdoor	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S6, "Structures Monitoring"	No
	III.A8.TP-24	3.5-1, 063	Concrete (accessible areas): exterior above- and below-grade; foundation	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	AMP XI.S6, "Structures Monitoring"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table A8 Group 8 Structures (Steel Tanks and Missile Barriers)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A8.TP-204	3.5-1, 043	Concrete (inaccessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	Plant-specific aging management program, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
	III.A8.TP-212	3.5-1, 065	Concrete (inaccessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No
	III.A8.TP-29	3.5-1, 067	Concrete (inaccessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S6, "Structures Monitoring"	No
M	III.A8.TP-67	3.5-1, 047	Concrete (inaccessible areas): exterior above- and below-grade; foundation	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	Plant-specific aging management program, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes

III STRUCTURES AND COMPONENT SUPPORTS								
Table A8 Group 8 Structures (Steel Tanks and Missile Barriers)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A8.TP-108	3.5-1, 042	Concrete (inaccessible areas): foundation	Concrete	Air – outdoor, groundwater/soil	Loss of material (spalling, scaling) and cracking due to freeze-thaw	Plant-specific aging management program to be evaluated for plants in moderate to severe weathering conditions, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
E	III.A8.TP-30	3.5-1, 044	Concrete: all	Concrete	Soil	Cracking and distortion due to increased stress levels from settlement	AMP XI.S6, "Structures Monitoring"	Yes
E	III.A8.TP-31	3.5-1, 046	Concrete: foundation; subfoundation	Concrete; porous concrete	Water – flowing	Reduction of foundation strength and cracking due to differential settlement and erosion of porous concrete subfoundation	AMP XI.S6, "Structures Monitoring"	Yes
E	III.A8.TP-302	3.5-1, 077	Steel components: all structural steel	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to corrosion	AMP XI.S6, "Structures Monitoring"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table A8 Group 8 Structures (Steel Tanks and Missile Barriers)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A8.T-23	3.5-1, 052	Steel components: tank liner	Stainless steel	Water – standing	Cracking due to SCC; loss of material due to pitting and crevice corrosion	Plant-specific aging management program	Yes
E	III.A8.TP-261	3.5-1, 088	Structural bolting	Any	Any	Loss of preload due to self-loosening	AMP XI.S6, "Structures Monitoring"	No
M	III.A8.TP-248	3.5-1, 080	Structural bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
	III.A8.TP-274	3.5-1, 082	Structural bolting	Steel; galvanized steel	Air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
D	III.A8.TP-300							

## **A9. GROUP 9 STRUCTURES (BOILING WATER REACTOR UNIT VENT STACK)**

### **Systems, Structures, and Components**

This section addresses the elements of the boiling water reactor (BWR) unit vent stack. For this group, the applicable structural element is identified: concrete. The aging management review (AMR) is presented for each applicable combination of structural element and aging effect.

### **System Interfaces**

Physical interfaces exist with any system or component that either penetrates the structure wall or is supported by the structure wall, floor, and roof. The direct interface is through the system or component supports that are anchored to the structure. Structures also protect housed structures and components from internal and external design basis events. In the case of tanks, there is a functional interface with the associated system. Water-control structures are integral parts of the systems that provide plant cooling water and residual heat removal.

III STRUCTURES AND COMPONENT SUPPORTS								
Table A9 Group 9 Structures (BWR Unit Vent Stack)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
E	III.A9.TP-25	3.5-1, 054	Concrete (accessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	AMP XI.S6, "Structures Monitoring"	No
	III.A9.TP-27	3.5-1, 065	Concrete (accessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No
	III.A9.TP-23	3.5-1, 064	Concrete (accessible areas): exterior above- and below-grade; foundation	Concrete	Air – outdoor	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S6, "Structures Monitoring"	No
	III.A9.TP-24	3.5-1, 063	Concrete (accessible areas): exterior above- and below-grade; foundation	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	AMP XI.S6, "Structures Monitoring"	No
	III.A9.TP-26	3.5-1, 066	Concrete (accessible areas): interior and above-grade exterior	Concrete	Air – indoor uncontrolled, air – outdoor	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table A9 Group 9 Structures (BWR Unit Vent Stack)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A9.TP-204	3.5-1, 043	Concrete (inaccessible areas): all	Concrete	Any	Cracking due to expansion from reaction with aggregates	Plant-specific aging management program, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
	III.A9.TP-212	3.5-1, 065	Concrete (inaccessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No
	III.A9.TP-29	3.5-1, 067	Concrete (inaccessible areas): below-grade exterior; foundation	Concrete	Groundwater/soil	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S6, "Structures Monitoring"	No
M	III.A9.TP-67	3.5-1, 047	Concrete (inaccessible areas): exterior above- and below-grade; foundation	Concrete	Water – flowing	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	Plant-specific aging management program, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes

III STRUCTURES AND COMPONENT SUPPORTS								
Table A9 Group 9 Structures (BWR Unit Vent Stack)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.A9.TP-108	3.5-1, 042	Concrete (inaccessible areas): foundation	Concrete	Air – outdoor, groundwater/soil	Loss of material (spalling, scaling) and cracking due to freeze-thaw	Plant-specific aging management program to be evaluated for plants in moderate to severe weathering conditions, <u>or AMP XI.S6, "Structures Monitoring," enhanced as necessary</u>	Yes
E	III.A9.TP-30	3.5-1, 044	Concrete: all	Concrete	Soil	Cracking and distortion due to increased stress levels from settlement	AMP XI.S6, "Structures Monitoring"	Yes
E	III.A9.TP-31	3.5-1, 046	Concrete: foundation; subfoundation	Concrete; porous concrete	Water – flowing	Reduction in foundation strength, cracking due to differential settlement, erosion of porous concrete subfoundation	AMP XI.S6, "Structures Monitoring"	Yes



III STRUCTURES AND COMPONENT SUPPORTS								
Table A9 Group 9 Structures (BWR Unit Vent Stack)								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	III.A9.TP-28	3.5-1, 067	Concrete: interior; above-grade exterior	Concrete	Air – indoor uncontrolled, air – outdoor	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S6, "Structures Monitoring"	No
E	III.A9.TP-261	3.5-1, 088	Structural bolting	Any	Any	Loss of preload due to self-loosening	AMP XI.S6, "Structures Monitoring"	No
M	III.A9.TP-248	3.5-1, 080	Structural bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
	III.A9.TP-274	3.5-1, 082	Structural bolting	Steel; galvanized steel	Air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
D	III.A9.TP-300							

### **III COMPONENT SUPPORTS**

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- B1. SUPPORTS FOR ASME PIPING AND COMPONENTS
  - B1.1 CLASS 1
  - B1.2 CLASS 2 AND CLASS 3
  - B1.3 CLASS MC (BWR CONTAINMENT SUPPORTS)
- B2. SUPPORTS FOR CABLE TRAYS, CONDUIT, HVAC DUCTS, TUBETRACK®, INSTRUMENT TUBING, NON-ASME PIPING AND COMPONENTS
- B3. ANCHORAGE OF RACKS, PANELS, CABINETS, AND ENCLOSURES FOR ELECTRICAL EQUIPMENT AND INSTRUMENTATION
- B4. SUPPORTS FOR EMERGENCY DIESEL GENERATOR (EDG), HVAC SYSTEM COMPONENTS, AND OTHER MISCELLANEOUS MECHANICAL EQUIPMENT
- B5. SUPPORTS FOR PLATFORMS, PIPE WHIP RESTRAINTS, JET IMPINGEMENT SHIELDS, MASONRY WALLS, AND OTHER MISCELLANEOUS STRUCTURES

## **B1. SUPPORTS FOR ASME PIPING AND COMPONENTS**

### **Systems, Structures, and Components**

This section addresses supports and anchorage for American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) piping systems and components. It is subdivided into Class 1 (III.B1.1), Class 2 and Class 3 (III.B1.2), and Class MC (III.B1.3). Applicable aging effects are identified and the aging management review (AMR) is presented for each applicable combination of support component and aging effect.

### **System Interfaces**

Physical interfaces exist with the structure, system, or component being supported and with the building structural element to which the support is anchored. A primary function of supports is to provide anchorage of the supported element for internal and external design basis events so that the supported element can perform its intended function.

III STRUCTURES AND COMPONENT SUPPORTS								
Table B1.1 Class 1								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	III.B1.1.TP-42	3.5-1, 055	Building concrete at locations of expansion and grouted anchors; grout pads for support base plates	Concrete; grout	Air – indoor uncontrolled, air – outdoor	Reduction in concrete anchor capacity due to local concrete degradation/ service-induced cracking or other concrete aging mechanisms	AMP XI.S6, "Structures Monitoring"	No
M	III.B1.1.T-28	3.5-1, 057	Constant and variable load spring hangers; guides; stops	Steel	Air – indoor uncontrolled, air – outdoor	Loss of mechanical function due to corrosion, distortion, dirt or debris accumulation, overload, wear	AMP XI.S3, "ASME Section XI, Subsection IWF"	No
M	III.B1.1.TP-41	3.5-1, 068	High-strength structural bolting	High-strength steel	Air	Cracking due to SCC	AMP XI.S3, "ASME Section XI, Subsection IWF"	No
M	III.B1.1.TP-45	3.5-1, 075	Sliding surfaces	Lubrite®; graphitic tool steel; Fluorogold; Lubrofluor	Air – indoor uncontrolled, air – outdoor	Loss of mechanical function due to corrosion, distortion, dirt or debris accumulation, overload, wear	AMP XI.S3, "ASME Section XI, Subsection IWF"	No
E	III.B1.1.TP-229	3.5-1, 087	Structural bolting	Any	Any	Loss of preload due to self-loosening	AMP XI.S3, "ASME Section XI, Subsection IWF"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table B1.1 Class 1								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	III.B1.1.TP-232	3.5-1, 085	Structural bolting	Stainless steel	Treated water	Loss of material due to pitting, crevice corrosion	AMP XI.M2, "Water Chemistry," and AMP XI.S3, "ASME Section XI, Subsection IWF"	No
M	III.B1.1.TP-226	3.5-1, 081	Structural Bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S3, "ASME Section XI, Subsection IWF"	No
M	III.B1.1.TP-235	3.5-1, 086	Structural bolting	Steel; galvanized steel	Air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S3, "ASME Section XI, Subsection IWF"	No
N	III.B1.1.T-36a	3.5-1, 099	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.M32, "One-Time Inspection"	Yes
N	III.B1.1.T-36b	3.5-1, 099	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.S3, "ASME Section XI, Subsection IWF"	Yes

III STRUCTURES AND COMPONENT SUPPORTS								
Table B1.1 Class 1								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
N	III.B1.1.T-36c	3.5-1, 099	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.M36, "External Surfaces Monitoring of Mechanical Components"	Yes
M	III.B1.1.TP-8	3.5-1, 095	Support members; welds; bolted connections; support anchorage to building structure	Galvanized steel	Air – indoor uncontrolled	None	None	No
M	III.B1.1.TP-3	3.5-1, 089	Support members; welds; bolted connections; support anchorage to building structure	Galvanized steel	Air with borated water leakage	Loss of material due to boric acid corrosion	AMP XI.M10, "Boric Acid Corrosion"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table B1.1 Class 1								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.B1.1.TP-4	3.5-1, 098	Support members; welds; bolted connections; support anchorage to building structure	Stainless steel, aluminum alloy	Air with borated water leakage	None	None	No
M	III.B1.1.T-26	3.5-1, 053	Support members; welds; bolted connections; support anchorage to building structure	Steel	Air – indoor uncontrolled	Cumulative fatigue damage due to cyclic loading (Only if CLB fatigue analysis exists)	TLAA, SRP-SLR Section 4.3 "Metal Fatigue," and/or Section 4.7 "Other Plant-Specific Time-Limited Aging Analyses"	Yes
	III.B1.1.T-24	3.5-1, 091	Support members; welds; bolted connections; support anchorage to building structure	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting corrosion	AMP XI.S3, "ASME Section XI, Subsection IWF"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table B1.1 Class 1								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	III.B1.1.T-25	3.5-1, 089	Support members; welds; bolted connections; support anchorage to building structure	Steel	Air with borated water leakage	Loss of material due to boric acid corrosion	AMP XI.M10, "Boric Acid Corrosion"	No
E	III.B1.1.TP-10	3.5-1, 090	Support members; welds; bolted connections; support anchorage to building structure	Steel; stainless steel	Treated water	Loss of material due to general (steel only), pitting, crevice corrosion	AMP XI.M2, "Water Chemistry," and AMP XI.S3, "ASME Section XI, Subsection IWF"	No
	III.B1.1.T-33	3.5-1, 094	Vibration isolation elements	Non-metallic (e.g., rubber)	Air – indoor uncontrolled, air – outdoor	Reduction or loss of isolation function due to radiation hardening, temperature, humidity, sustained vibratory loading	AMP XI.S3, "ASME Section XI, Subsection IWF"	No



III STRUCTURES AND COMPONENT SUPPORTS								
Table B1.2 Class 2 and Class 3								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	III.B1.2.TP-42	3.5-1, 055	Building concrete at locations of expansion and grouted anchors; grout pads for support base plates	Concrete; grout	Air – indoor uncontrolled, air – outdoor	Reduction in concrete anchor capacity due to local concrete degradation/ service-induced cracking or other concrete aging mechanisms	AMP XI.S6, "Structures Monitoring"	No
M	III.B1.2.T-28	3.5-1, 057	Constant and variable load spring hangers; guides; stops	Steel	Air – indoor uncontrolled, air – outdoor	Loss of mechanical function due to corrosion, distortion, dirt or debris accumulation, overload, wear	AMP XI.S3, "ASME Section XI, Subsection IWF"	No
M	III.B1.2.TP-45	3.5-1, 075	Sliding surfaces	Lubrite®; graphitic tool steel; Fluorogold; Lubrofluor	Air – indoor uncontrolled, air – outdoor	Loss of mechanical function due to corrosion, distortion, dirt or debris accumulation, overload, wear	AMP XI.S3, "ASME Section XI, Subsection IWF"	No
E	III.B1.2.TP-229	3.5-1, 087	Structural bolting	Any	Any	Loss of preload due to self-loosening	AMP XI.S3, "ASME Section XI, Subsection IWF"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table B1.2 Class 2 and Class 3								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	III.B1.2.TP-232	3.5-1, 085	Structural bolting	Stainless steel	Treated water	Loss of material due to pitting, crevice corrosion	AMP XI.M2, "Water Chemistry," and AMP XI.S3, "ASME Section XI, Subsection IWF"	No
M	III.B1.2.TP-226	3.5-1, 081	Structural bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S3, "ASME Section XI, Subsection IWF"	No
M	III.B1.2.TP-235	3.5-1, 086	Structural bolting	Steel; galvanized steel	Air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S3, "ASME Section XI, Subsection IWF"	No
N	III.B1.2.T-36a	3.5-1, 099	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.M32, "One-Time Inspection"	Yes

III STRUCTURES AND COMPONENT SUPPORTS								
Table B1.2 Class 2 and Class 3								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
N	III.B1.2.T-36b	3.5-1, 099	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.S3, "ASME Section XI, Subsection IWF"	Yes
N	III.B1.2.T-36c	3.5-1, 099	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.M36, "External Surfaces Monitoring of Mechanical Components"	Yes
M	III.B1.2.TP-8	3.5-1, 095	Support members; welds; bolted connections; support anchorage to building structure	Galvanized steel	Air – indoor uncontrolled	None	None	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table B1.2 Class 2 and Class 3								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.B1.2.TP-3	3.5-1, 089	Support members; welds; bolted connections; support anchorage to building structure	Galvanized steel	Air with borated water leakage	Loss of material due to boric acid corrosion	AMP XI.M10, "Boric Acid Corrosion"	No
M	III.B1.2.TP-4	3.5-1, 098	Support members; welds; bolted connections; support anchorage to building structure	Stainless steel, aluminum alloy	Air with borated water leakage	None	None	No
M	III.B1.2.T-26	3.5-1, 053	Support members; welds; bolted connections; support anchorage to building structure	Steel	Air – indoor uncontrolled	Cumulative fatigue damage due to cyclic loading (Only if CLB fatigue analysis exists)	TLAA, SRP-SLR Section 4.3 "Metal Fatigue," and/or Section 4.7 "Other Plant-Specific Time-Limited Aging Analyses"	Yes

III STRUCTURES AND COMPONENT SUPPORTS								
Table B1.2 Class 2 and Class 3								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	III.B1.2.T-24	3.5-1, 091	Support members; welds; bolted connections; support anchorage to building structure	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting corrosion	AMP XI.S3, "ASME Section XI, Subsection IWF"	No
	III.B1.2.T-25	3.5-1, 089	Support members; welds; bolted connections; support anchorage to building structure	Steel	Air with borated water leakage	Loss of material due to boric acid corrosion	AMP XI.M10, "Boric Acid Corrosion"	No
	III.B1.2.T-33	3.5-1, 094	Vibration isolation elements	Non-metallic (e.g., rubber)	Air – indoor uncontrolled, air – outdoor	Reduction or loss of isolation function due to radiation hardening, temperature, humidity, sustained vibratory loading	AMP XI.S3, "ASME Section XI, Subsection IWF"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table B1.3 Class MC								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	III.B1.3.TP-42	3.5-1, 055	Building concrete at locations of expansion and grouted anchors; grout pads for support base plates	Concrete; grout	Air – indoor uncontrolled, air – outdoor	Reduction in concrete anchor capacity due to local concrete degradation/ service-induced cracking or other concrete aging mechanisms	AMP XI.S6, "Structures Monitoring"	No
M	III.B1.3.T-28	3.5-1, 057	Constant and variable load spring hangers; guides; stops	Steel	Air – indoor uncontrolled, air – outdoor	Loss of mechanical function due to corrosion, distortion, dirt or debris accumulation, overload, wear	AMP XI.S3, "ASME Section XI, Subsection IWF"	No
M	III.B1.3.TP-45	3.5-1, 075	Sliding surfaces	Lubrite®; graphitic tool steel; Fluorogold; Lubrofluor	Air – indoor uncontrolled, air – outdoor	Loss of mechanical function due to corrosion, distortion, dirt or debris accumulation, overload, wear	AMP XI.S3, "ASME Section XI, Subsection IWF"	No
E	III.B1.3.TP-229	3.5-1, 087	Structural bolting	Any	Any	Loss of preload due to self-loosening	AMP XI.S3, "ASME Section XI, Subsection IWF"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table B1.3 Class MC								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	III.B1.3.TP-232	3.5-1, 085	Structural bolting	Stainless steel	Treated water	Loss of material due to pitting, crevice corrosion	AMP XI.M2, "Water Chemistry," and AMP XI.S3, "ASME Section XI, Subsection IWF"	No
M	III.B1.3.TP-226	3.5-1, 081	Structural bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S3, "ASME Section XI, Subsection IWF"	No
M	III.B1.3.TP-235	3.5-1, 086	Structural bolting	Steel; galvanized steel	Air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S3, "ASME Section XI, Subsection IWF"	No
N	III.B1.3.T-36a	3.5-1, 099	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.M32, "One-Time Inspection"	Yes
N	III.B1.3.T-36b	3.5-1, 099	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.S3, "ASME Section XI, Subsection IWF"	Yes

III STRUCTURES AND COMPONENT SUPPORTS								
Table B1.3 Class MC								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
N	III.B1.3.T-36c	3.5-1, 099	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.M36, "External Surfaces Monitoring of Mechanical Components"	Yes
M	III.B1.3.TP-8	3.5-1, 095	Support members; welds; bolted connections; support anchorage to building structure	Galvanized steel	Air – indoor uncontrolled	None	None	No
M	III.B1.3.TP-3	3.5-1, 089	Support members; welds; bolted connections; support anchorage to building structure	Galvanized steel	Air with borated water leakage	Loss of material due to boric acid corrosion	AMP XI.M10, "Boric Acid Corrosion"	No
M	III.B1.3.TP-4	3.5-1, 098	Support members; welds; bolted connections; support anchorage to building structure	Stainless steel, aluminum alloy	Air with borated water leakage	None	None	No



III STRUCTURES AND COMPONENT SUPPORTS								
Table B1.3 Class MC								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.B1.3.T-26	3.5-1, 053	Support members; welds; bolted connections; support anchorage to building structure	Steel	Air – indoor uncontrolled	Cumulative fatigue damage due to cyclic loading (Only if CLB fatigue analysis exists)	TLAA, SRP-SLR Section 4.3 "Metal Fatigue," and/or Section 4.7 "Other Plant-Specific Time-Limited Aging Analyses"	Yes
	III.B1.3.T-24	3.5-1, 091	Support members; welds; bolted connections; support anchorage to building structure	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting corrosion	AMP XI.S3, "ASME Section XI, Subsection IWF"	No
	III.B1.3.T-33	3.5-1, 094	Vibration isolation elements	Non-metallic (e.g., rubber)	Air – indoor uncontrolled, air – outdoor	Reduction or loss of isolation function due to radiation hardening, temperature, humidity, sustained vibratory loading	AMP XI.S3, "ASME Section XI, Subsection IWF"	No

## **B2. SUPPORTS FOR CABLE TRAYS, CONDUIT, HVAC DUCTS, TUBETRACK®, INSTRUMENT TUBING, NON-ASME PIPING AND COMPONENTS**

### **Systems, Structures, and Components**

This section addresses supports and anchorage for cable trays, conduit, heating, ventilation, and air-conditioning ducts, TubeTrack®, instrument tubing, and non-American Society of Mechanical Engineers Boiler and Pressure Vessel Code (non-ASME Code) piping and components. Applicable aging effects are identified and the aging management review (AMR) is presented for each applicable combination of support component and aging effect.

### **System Interfaces**

Physical interfaces exist with the structure, system, or component being supported and with the building structural element to which the support is anchored. A primary function of supports is to provide anchorage of the supported element for internal and external design basis events so that the supported element can perform its intended function.

III STRUCTURES AND COMPONENT SUPPORTS								
Table B2 Support for Cable Trays, Conduit, HVAC Ducts, Tube Track, Instrument Tubing, Non-ASME Piping and Components								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	III.B2.TP-42	3.5-1, 055	Building concrete at locations of expansion and grouted anchors; grout pads for support base plates	Concrete; grout	Air – indoor uncontrolled, air – outdoor	Reduction in concrete anchor capacity due to local concrete degradation/ service-induced cracking or other concrete aging mechanisms	AMP XI.S6, "Structures Monitoring"	No
M	III.B2.TP-46	3.5-1, 074	Sliding support bearings; sliding support surfaces	Lubrite®; graphitic tool steel; Fluorogold; Lubrofluor	Air – indoor uncontrolled	Loss of mechanical function due to corrosion, distortion, dirt or debris accumulation, overload, wear	AMP XI.S6, "Structures Monitoring"	No
M	III.B2.TP-47	3.5-1, 074	Sliding support bearings; sliding support surfaces	Lubrite®; graphitic tool steel; Fluorogold; Lubrofluor	Air – outdoor	Loss of mechanical function due to corrosion, distortion, dirt or debris accumulation, overload, wear	AMP XI.S6, "Structures Monitoring"	No
E	III.B2.TP-261	3.5-1, 088	Structural bolting	Any	Any	Loss of preload due to self-loosening	AMP XI.S6, "Structures Monitoring"	No
M	III.B2.TP-248	3.5-1, 080	Structural bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table B2 Support for Cable Trays, Conduit, HVAC Ducts, Tube Track, Instrument Tubing, Non-ASME Piping and Components								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	III.B2.TP-274	3.5-1, 082	Structural bolting	Steel; galvanized steel	Air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
N	III.B2.T-37a	3.5-1, 100	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.M32, "One-Time Inspection"	Yes
N	III.B2.T-37b	3.5-1, 100	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.S6, "Structures Monitoring"	Yes
N	III.B2.T-37c	3.5-1, 100	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.M36, "External Surfaces Monitoring of Mechanical Components"	Yes

III STRUCTURES AND COMPONENT SUPPORTS								
Table B2 Support for Cable Trays, Conduit, HVAC Ducts, Tube Track, Instrument Tubing, Non-ASME Piping and Components								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.B2.TP-8	3.5-1, 095	Support members; welds; bolted connections; support anchorage to building structure	Galvanized steel	Air – indoor uncontrolled	None	None	No
M	III.B2.TP-6	3.5-1, 093	Support members; welds; bolted connections; support anchorage to building structure	Galvanized steel	Air – outdoor	Loss of material due to pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
M	III.B2.TP-3	3.5-1, 089	Support members; welds; bolted connections; support anchorage to building structure	Galvanized steel	Air with borated water leakage	Loss of material due to boric acid corrosion	AMP XI.M10, "Boric Acid Corrosion"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table B2 Support for Cable Trays, Conduit, HVAC Ducts, Tube Track, Instrument Tubing, Non-ASME Piping and Components								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.B2.TP-4	3.5-1, 098	Support members; welds; bolted connections; support anchorage to building structure	Stainless steel, aluminum alloy	Air with borated water leakage	None	None	No
	III.B2.TP-43	3.5-1, 092	Support members; welds; bolted connections; support anchorage to building structure	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting corrosion	AMP XI.S6, "Structures Monitoring"	No
	III.B2.T-25	3.5-1, 089	Support members; welds; bolted connections; support anchorage to building structure	Steel	Air with borated water leakage	Loss of material due to boric acid corrosion	AMP XI.M10, "Boric Acid Corrosion"	No
D	III.B2.TP-300							

### **B3. ANCHORAGE OF RACKS, PANELS, CABINETS, AND ENCLOSURES FOR ELECTRICAL EQUIPMENT AND INSTRUMENTATION**

#### **Systems, Structures, and Components**

This section addresses supports and anchorage for racks, panels, cabinets, and enclosures for electrical equipment and instrumentation. Applicable aging effects are identified and the aging management review (AMR) is presented for each applicable combination of support component and aging effect.

#### **System Interfaces**

Physical interfaces exist with the structure, system, or component being supported and with the building structural element to which the support is anchored. A primary function of supports is to provide anchorage of the supported element for internal and external design basis events so that the supported element can perform its intended function.

III STRUCTURES AND COMPONENT SUPPORTS								
Table B3 Anchorage of Racks, Panels, Cabinets, and Enclosures for Electrical Equipment and Instrumentation								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	III.B3.TP-42	3.5-1, 055	Building concrete at locations of expansion and grouted anchors; grout pads for support base plates	Concrete; grout	Air – indoor uncontrolled, air – outdoor	Reduction in concrete anchor capacity due to local concrete degradation/ service-induced cracking or other concrete aging mechanisms	AMP XI.S6, "Structures Monitoring"	No
E	III.B3.TP-261	3.5-1, 088	Structural bolting	Any	Any	Loss of preload due to self-loosening	AMP XI.S6, "Structures Monitoring"	No
M	III.B3.TP-248	3.5-1, 080	Structural bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
	III.B3.TP-274	3.5-1, 082	Structural bolting	Steel; galvanized steel	Air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
N	III.B3.T-37a	3.5-1, 100	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.M32, "One-Time Inspection"	Yes
N	III.B3.T-37b	3.5-1, 100	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.S6, "Structures Monitoring"	Yes



III STRUCTURES AND COMPONENT SUPPORTS								
Table B3 Anchorage of Racks, Panels, Cabinets, and Enclosures for Electrical Equipment and Instrumentation								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
N	III.B3.T-37c	3.5-1, 100	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.M36, "External Surfaces Monitoring of Mechanical Components"	Yes
M	III.B3.TP-8	3.5-1, 095	Support members; welds; bolted connections; support anchorage to building structure	Galvanized steel	Air – indoor uncontrolled	None	None	No
M	III.B3.TP-3	3.5-1, 089	Support members; welds; bolted connections; support anchorage to building structure	Galvanized steel	Air with borated water leakage	Loss of material due to boric acid corrosion	AMP XI.M10, "Boric Acid Corrosion"	No
M	III.B3.TP-4	3.5-1, 098	Support members; welds; bolted connections; support anchorage to building structure	Stainless steel, aluminum alloy	Air with borated water leakage	None	None	No
	III.B3.TP-43	3.5-1, 092	Support members; welds; bolted connections; support anchorage to building structure	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting corrosion	AMP XI.S6, "Structures Monitoring"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table B3 Anchorage of Racks, Panels, Cabinets, and Enclosures for Electrical Equipment and Instrumentation								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	III.B3.T-25	3.5-1, 089	Support members; welds; bolted connections; support anchorage to building structure	Steel	Air with borated water leakage	Loss of material due to boric acid corrosion	AMP XI.M10, "Boric Acid Corrosion"	No
D	III.B3.TP-300							

#### **B4. SUPPORTS FOR EMERGENCY DIESEL GENERATOR, HEATING, VENTILATION, AND AIR CONDITIONING SYSTEM COMPONENTS, AND OTHER MISCELLANEOUS MECHANICAL EQUIPMENT**

##### **Systems, Structures, and Components**

This section addresses supports and anchorage for the emergency diesel generator (EDG) and heating, ventilation, and air conditioning (HVAC) system components, and other miscellaneous mechanical equipment. Applicable aging effects are identified and the aging management review (AMR) is presented for each applicable combination of support component and aging effect.

##### **System Interfaces**

Physical interfaces exist with the structure, system, or component being supported and with the building structural element to which the support is anchored. A primary function of supports is to provide anchorage of the supported element for internal and external design basis events so that the supported element can perform its intended function.

III STRUCTURES AND COMPONENT SUPPORTS								
Table B4 Supports for Emergency Diesel Generator, HVAC System Components, and Other Miscellaneous Mechanical Equipment								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
	III.B4.TP-42	3.5-1, 055	Building concrete at locations of expansion and grouted anchors; grout pads for support base plates	Concrete; grout	Air – indoor uncontrolled, air – outdoor	Reduction in concrete anchor capacity due to local concrete degradation/ service-induced cracking or other concrete aging mechanisms	AMP XI.S6, "Structures Monitoring"	No
M	III.B4.TP-46	3.5-1, 074	Sliding support bearings; sliding support surfaces	Lubrite®; graphitic tool steel; Fluorogold; Lubrofluor	Air – indoor uncontrolled	Loss of mechanical function due to corrosion, distortion, dirt or debris accumulation, overload, wear	AMP XI.S6, "Structures Monitoring"	No
M	III.B4.TP-47	3.5-1, 074	Sliding support bearings; sliding support surfaces	Lubrite®; graphitic tool steel; Fluorogold; Lubrofluor	Air – outdoor	Loss of mechanical function due to corrosion, distortion, dirt or debris accumulation, overload, wear	AMP XI.S6, "Structures Monitoring"	No
E	III.B4.TP-261	3.5-1, 088	Structural bolting	Any	Any	Loss of preload due to self-loosening	AMP XI.S6, "Structures Monitoring"	No
M	III.B4.TP-248	3.5-1, 080	Structural bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
	III.B4.TP-274	3.5-1, 082	Structural bolting	Steel; galvanized steel	Air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table B4 Supports for Emergency Diesel Generator, HVAC System Components, and Other Miscellaneous Mechanical Equipment								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
N	III.B4.T-37a	3.5-1, 100	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.M32, "One-Time Inspection"	Yes
N	III.B4.T-37b	3.5-1, 100	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.S6, "Structures Monitoring"	Yes
N	III.B4.T-37c	3.5-1, 100	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.M36, "External Surfaces Monitoring of Mechanical Components"	Yes

III STRUCTURES AND COMPONENT SUPPORTS								
Table B4 Supports for Emergency Diesel Generator, HVAC System Components, and Other Miscellaneous Mechanical Equipment								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.B4.TP-8	3.5-1, 095	Support members; welds; bolted connections; support anchorage to building structure	Galvanized steel	Air – indoor uncontrolled	None	None	No
M	III.B4.TP-6	3.5-1, 093	Support members; welds; bolted connections; support anchorage to building structure	Galvanized steel	Air – outdoor	Loss of material due to pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
M	III.B4.TP-3	3.5-1, 089	Support members; welds; bolted connections; support anchorage to building structure	Galvanized steel	Air with borated water leakage	Loss of material due to boric acid corrosion	AMP XI.M10, "Boric Acid Corrosion"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table B4 Supports for Emergency Diesel Generator, HVAC System Components, and Other Miscellaneous Mechanical Equipment								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.B4.TP-4	3.5-1, 098	Support members; welds; bolted connections; support anchorage to building structure	Stainless steel, aluminum alloy	Air with borated water leakage	None	None	No
	III.B4.TP-43	3.5-1, 092	Support members; welds; bolted connections; support anchorage to building structure	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting corrosion	AMP XI.S6, "Structures Monitoring"	No
	III.B4.T-25	3.5-1, 089	Support members; welds; bolted connections; support anchorage to building structure	Steel	Air with borated water leakage	Loss of material due to boric acid corrosion	AMP XI.M10, "Boric Acid Corrosion"	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table B4 Supports for Emergency Diesel Generator, HVAC System Components, and Other Miscellaneous Mechanical Equipment								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
M	III.B4.TP-44	3.5-1, 094	Vibration isolation elements	Non-metallic (e.g., rubber)	Air – indoor uncontrolled, air – outdoor	Reduction or loss of isolation function due to radiation hardening, temperature, humidity, sustained vibratory loading	AMP XI.S6, "Structures Monitoring"	No
D	III.B4.TP-300							



## **B5. SUPPORTS FOR PLATFORMS, PIPE WHIP RESTRAINTS, JET IMPINGEMENT SHIELDS, MASONRY WALLS, AND OTHER MISCELLANEOUS STRUCTURES**

### **Systems, Structures, and Components**

This section addresses supports and anchorage for platforms, pipe whip restraints, jet impingement shields, masonry walls, and other miscellaneous structures. Applicable aging effects are identified and the aging management review (AMR) is presented for each applicable combination of support component and aging effect.

### **System Interfaces**

Physical interfaces exist with the structure, system, or component being supported and with the building structural element to which the support is anchored. A primary function of supports is to provide anchorage of the supported element for internal and external design basis events so that the supported element can perform its intended function.

III STRUCTURES AND COMPONENT SUPPORTS								
Table B5 Supports for Platforms, Pipe Whip Restraints, Jet Impingement Shields, Masonry Walls, and Other Miscellaneous Structures								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLA A	Further Evaluation
	III.B5.T P-42	3.5-1, 055	Building concrete at locations of expansion and grouted anchors; grout pads for support base plates	Concrete; grout	Air – indoor uncontrolled, air – outdoor	Reduction in concrete anchor capacity due to local concrete degradation/ service-induced cracking or other concrete aging mechanisms	AMP XI.S6, "Structures Monitoring"	No
E	III.B5.T P-261	3.5-1, 088	Structural bolting	Any	Any	Loss of preload due to self-loosening	AMP XI.S6, "Structures Monitoring"	No
M	III.B5.T P-248	3.5-1, 080	Structural bolting	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
	III.B5.T P-274	3.5-1, 082	Structural bolting	Steel; galvanized steel	Air – outdoor	Loss of material due to general, pitting, crevice corrosion	AMP XI.S6, "Structures Monitoring"	No
N	III.B5.T-37a	3.5-1, 100	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.M32, "One-Time Inspection"	Yes
N	III.B5.T-37b	3.5-1, 100	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.S6, "Structures Monitoring"	Yes

III STRUCTURES AND COMPONENT SUPPORTS								
Table B5 Supports for Platforms, Pipe Whip Restraints, Jet Impingement Shields, Masonry Walls, and Other Miscellaneous Structures								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLA A	Further Evaluation
N	III.B5.T-37c	3.5-1, 100	Support members; welds; bolted connections; support anchorage to building structure	Aluminum, stainless steel	Air, condensation	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.M36, "External Surfaces Monitoring of Mechanical Components"	Yes
M	III.B5.T P-8	3.5-1, 095	Support members; welds; bolted connections; support anchorage to building structure	Galvanized steel	Air – indoor uncontrolled	None	None	No
M	III.B5.T P-3	3.5-1, 089	Support members; welds; bolted connections; support anchorage to building structure	Galvanized steel	Air with borated water leakage	Loss of material due to boric acid corrosion	AMP XI.M10, "Boric Acid Corrosion"	No
M	III.B5.T P-4	3.5-1, 098	Support members; welds; bolted connections; support anchorage to building structure	Stainless steel, aluminum alloy	Air with borated water leakage	None	None	No

III STRUCTURES AND COMPONENT SUPPORTS								
Table B5 Supports for Platforms, Pipe Whip Restraints, Jet Impingement Shields, Masonry Walls, and Other Miscellaneous Structures								
New, Modified, Deleted, Edited Item	Item	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLA A	Further Evaluation
	III.B5.T P-43	3.5-1, 092	Support members; welds; bolted connections; support anchorage to building structure	Steel	Air – indoor uncontrolled, air – outdoor	Loss of material due to general, pitting corrosion	AMP XI.S6, "Structures Monitoring"	No
	III.B5.T-25	3.5-1, 089	Support members; welds; bolted connections; support anchorage to building structure	Steel	Air with borated water leakage	Loss of material due to boric acid corrosion	AMP XI.M10, "Boric Acid Corrosion"	No
D	III.B5.T P-300							