# CHAPTER II CONTAINMENT STRUCTURES

- II CONTAINMENT STRUCTURES
- A. PRESSURIZED WATER REACTOR CONTAINMENTS
- B. BOILING WATER REACTOR CONTAINMENTS



# II PRESSURIZED WATER REACTOR CONTAINMENTS

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



# 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.

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
М	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

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

Table A1 Concrete Containments (Reinforced and Prestresse
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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, or AMP XI.S2, ""ASME Section XI, Subsection IWL,"" and/or AMP XI.S6, ""Structures Monitoring," enhanced as necessary	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, or AMP XI.S2, ""ASME Section XI, Subsection IWL,"" and/or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	Yes

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

"Structures Monitoring"

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

"Structures Monitoring"

Table A1 Concrete Containments (Reinforced and Prestressed)

New, Modified, Deleted, Edited Item	ltem	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

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

Appendix J"



### 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.

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 Contai	inments							
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	

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New, Modified, Deleted, Edited Item	ltem	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, or AMP XI.S2, ""ASME Section XI, Subsection IWL"," and/or AMP XI.S6, ""Structures Monitoring," enhanced as necessary	Yes

Table A2	Steel Containments

New, Modified, Deleted, Edited Item	ltem	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, or AMP XI.S2, ""ASME Section XI, Subsection IWL"," and/or AMP XI.S6, ""Structures Monitoring," enhanced as necessary	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
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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, or AMP XI.S2, ""ASME Section XI, Subsection IWL,"" and/or AMP XI.S6, ""Structures Monitoring, ""enhanced as necessary	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
Е	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

Table A2 Steel Containments

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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.

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Table A3	Common Components									
New, Modified, Deleted, Edited	ltem	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		
М	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		

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

II Table A3	CONTAINMENT STRUCTURES  Common Components									
New, Modified, Deleted, Edited	ltem	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

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

### **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.

Table B1.1 Mark I Steel Containments

New, Modified, Deleted, Edited	ltem	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

Table B1.1 Mark I Steel Containments

New, Modified, Deleted, Edited	ltem	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
Е	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
М	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

Table B1.2 Mark I Concrete Containments

New, Modified, Deleted, Edited Item	ltem	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

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, or AMP XI.S2, ""ASME Section XI, Subsection IWL," and/or AMP XI.S6, ""Structures Monitoring,""enhanced as necessary	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, or AMP XI.S2, ""ASME Section XI, Subsection IWL"" and/or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	Yes

Table B1.2 Mark I Concrete Containments

New, Modified, Deleted, Edited Item	ltem	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, or AMP XI.S2, ""ASME Section XI, Subsection IWL"," and/or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	Yes
М	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

Table B1.2 Mark I Concrete Containments

New, Modified, Deleted, Edited Item	ltem	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

Table B1.2 Mark I Concrete Containments

New, Modified, Deleted, Edited Item	ltem	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
Е	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.

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

treated water

crevice corrosion

Subsection IWE"

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

Table B2.2 Mark II Concrete Containments

New, Modified, Deleted, Edited Item	ltem	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
М	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

## CONTAINMENT STRUCTURES

Table B2.2 Mark II Concrete Containments

New, Modified, Deleted, Edited Item	ltem	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, 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-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, or AMP XI.S2, ""ASME Section XI, Subsection IWL"," and/or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	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

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## II CONTAINMENT STRUCTURES

New, Modified, Deleted, Edited Item	ltem	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
М	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
Е	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

## I CONTAINMENT STRUCTURES

New, Modified, Deleted, Edited Item	ltem	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

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											
Table B2.2	able B2.2 Mark II Concrete Containments										
New, Modified, Deleted, Edited Item	ltem	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			
Е	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

- B3.1 STEEL CONTAINMENTS
- B3.2 CONCRETE CONTAINMENTS



## **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.

## CONTAINMENT STRUCTURES

Table B3.1 Mark III Steel Containments

New, Modified, Deleted, Edited Item	ltem	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

## CONTAINMENT STRUCTURES

Table B3.1 Mark III Steel Containments

New, Modified, Deleted, Edited Item	ltem	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, or AMP XI.S2, ""ASME Section XI, Subsection IWL"," and/or AMP XI.S6, ""Structures Monitoring," " enhanced as necessary	Yes

## I CONTAINMENT STRUCTURES

Table B3.1 Mark III Steel Containments

New, Modified, Deleted, Edited Item	ltem	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, or AMP XI.S2, ""ASME Section XI, Subsection IWL" " and/or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	Yes
М	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
Е	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

## I 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
Е	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, or AMP XI.S2, ""ASME Section XI, Subsection IWL"," and/or AMP XI.S6, ""Structures Monitoring," enhanced as necessary	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	ltem	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
Е	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
Е	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	ltem	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
Е	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

## CONTAINMENT STRUCTURES

New, Modified, Deleted, Edited Item	ltem	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, or AMP XI.S2, ""ASME Section XI, Subsection IWL,"" and/or AMP XI.S6, ""Structures  Monitoring,"" enhanced as necessary	Yes

## CONTAINMENT STRUCTURES

New, Modified, Deleted, Edited Item	ltem	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, or AMP XI.S2, ""ASME Section IVL"," and/or AMP XI.S6, ""Structures Monitoring, "" enhanced as necessary-	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, or AMP XI.S2, ""ASME Section XI, Subsection IWL,"" and/or AMP XI.S6, ""Structures Monitoring"," enhanced as necessary	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

New, Modified, Deleted, Edited Item	ltem	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
Е	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
Е	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, or AMP XI.S2, ""ASME Section XI, Subsection IWL,"" and/or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	Yes
Е	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

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.

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

#### **CONTAINMENT STRUCTURES** Table B4 **Common Components** New, Modified. **Aging Management** Deleted, Structure **Edited** SRP Item and/or **Program Further Aging** Effect/Mechanism (AMP)/TLAA Item Item (Table, ID) Component Material **Environment Evaluation** М II.B4.CP-36 3.5-1, 035 Penetration Steel; Air – indoor Loss of material due to AMP XI.S1, "ASME Yes uncontrolled, air sleeves dissimilar Section XI, general, pitting, crevice - outdoor Subsection IWE," and metal corrosion AMP XI.S4. "10 CFR welds Part 50, Appendix J" Ε II.B4.CP-38 3.5-1, 010 Penetration Stainless Air – indoor Cracking due to SCC AMP XI.S1, "ASME Yes uncontrolled, air Section XI, sleeves: steel; Subsection IWE." and penetration dissimilar - outdoor AMP XI.S4, "10 CFR bellows metal Part 50, Appendix J" welds II.B4.C-16 3.5-1, 028 Personnel AMP XI.S1, "ASME Steel Air - indoor Loss of material due to No airlock. uncontrolled, air general, pitting, crevice Section XI. equipment outdoor corrosion Subsection IWE," and AMP XI.S4, "10 CFR hatch, CRD hatch Part 50, Appendix J" М II.B4.CP-39 3.5-1, 029 Personnel Steel Air - indoor Loss of leak tightness AMP XI.S1, "ASME No due to mechanical wear Section XI, airlock, uncontrolled, air equipment outdoor Subsection IWE," and hatch, CRD AMP XI.S4, "10 CFR Part 50, Appendix J" hatch: locks, hinges, closure mechanisms II.B4.CP-148 3.5-1.031 Pressure-Steel Air – indoor Loss of material due to AMP XI.S1. "ASME No retaining bolting uncontrolled, air general, pitting, crevice Section XI.

outdoor

corrosion

Subsection IWE"

II	CONTAINN	MENT STRUCT	URES					
Table B4	Common C	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
М	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

## 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

- 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.

## STRUCTURES AND COMPONENT SUPPORTS

Table A1 Group 1 Structures (BWR Reactor Bldg., PWR Shield Bldg., Control Room/Bldg.)

New, Modified, Deleted, Edited Item	ltem	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

II STRUCTURES AND COMPONENT SUPPO	JRIS

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
М	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	STRUCTUR	RES AND COM	IPONENT SUPPO	RTS				
Table A1	Group 1 St	ructures (BWF	R Reactor Bldg., P	WR 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, or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	Yes
Е	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, or AMP XI.S6, "Structures Monitoring," enhanced as necessary	Yes
Е	III.A1.TP-30	3.5-1, 044	Concrete: all	Concrete	Soil	Cracking and distortion due to increased stress levels from	AMP XI.S6, "Structures Monitoring"	Yes

settlement

## STRUCTURES AND COMPONENT SUPPORTS

Table A1 Group 1 Structures (BWR Reactor Bldg., PWR Shield Bldg., Control Room/Bldg.)

New, Modified, Deleted, Edited Item	ltem	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:	Concrete	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
Е	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	STRUCTUR	RES AND COM	IPONENT SUPPO	RTS				
Table A1	Group 1 St	ructures (BWF	R Reactor Bldg., P	WR 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
Е	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.

## STRUCTURES AND COMPONENT SUPPORTS

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

## STRUCTURES AND COMPONENT SUPPORTS

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, or AMP XI.S6, "Structures Monitoring." enhanced as necessary	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, or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	Yes

## III STRUCTURES AND COMPONENT SUPPORTS

New, Modified, Deleted, Edited Item	ltem	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, or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	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, or AMP XI.S6, ""Structures Monitoring,""= enhanced as necessary	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

## STRUCTURES AND COMPONENT SUPPORTS

New, Modified, Deleted, Edited Item	ltem	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:	Concrete	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

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

New, Modified, Deleted, Edited Item	ltem	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

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
М	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, or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	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

New, Modified, Deleted, Edited Item	ltem	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, or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	Yes
М	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, or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	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, or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	Yes

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

New, Modified, Deleted, Edited Item	ltem	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
М	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.

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

above- and belowgrade; foundation to leaching of calcium

hydroxide and

carbonation

"Structures

as necessary

Monitoring," enhanced

III Table A4			MPONENT SUPPORT		ling Refueling Ca	anal)		
New, Modified, Deleted, Edited Item	ltem	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, or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	Yes
Е	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 or other selected AMPs, enhanced as necessary	Yes
М	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	STRUCTUI	RES AND CO	MPONENT SUPPOR	ΓS								
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 Effect/Mechanism Aging Aging Management Program (AMP)/TLAA Evaluation												
М	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.

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

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

foundation

Monitoring,"

enhanced as necessary

carbonation

III.A5.TP-30

Е

3.5-1, 044

Concrete: all

III	STRUCTUR	RES AND COMP	PONENT SUPPOR	TS				
Table A5	Group 5 Str	ructures (Fuel S	Storage Facility, R	efueling Canal)				
New, Modified, Deleted, Edited Item	ltem	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, or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	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, or AMP XI.S6, "Structures Monitoring," enhanced as necessary	Yes

Soil

Concrete

Cracking and distortion due to

increased stress

levels from settlement

AMP XI.S6,

"Structures

Monitoring"

Yes

Table A5 Group 5 Structures (Fuel Storage Facility, Refueling Canal)

New, Modified, Deleted, Edited Item	ltem	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:	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:	Concrete block	Air – outdoor	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S5, "Masonry Walls"	No

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
Е	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
Е	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
М	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.

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

Table A6 Group 6 Structures (Water-Control Structures)

New, Modified, Deleted, Edited Item	ltem	SRP Item (Table, ID)	Structure and/or Component	Material	Environment	Aging Effect/Mechanism	Aging Management Program (AMP)/TLAA	Further Evaluation
М	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	STRUCTUE	RES AND COM	IPONENT SUPPORT	S				
Table A6	Group 6 St	ructures (Wate	er-Control Structures	s)				
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
М	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, or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	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, or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	Yes

III	STRUCTUE	RES AND COM	IPONENT SUPPORT	S				
Table A6	Group 6 St	ructures (Wate	er-Control Structures	s)				
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

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

programs.

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

III Table A6			IPONENT SUPPORT					
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
М	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.

Table A7 Group 7 Structures (Concrete Tanks and Missile Barriers)

New, Modified, Deleted, Edited Item	ltem	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

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

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

porous concrete subfoundation

III.A7.TP-274

III.A7.TP-300

D

3.5-1, 082

Structural

bolting

Steel:

steel

galvanized

#### STRUCTURES AND COMPONENT SUPPORTS Table A7 **Group 7 Structures (Concrete Tanks and Missile Barriers)** New, Modified. Aging Deleted, Management Structure **Edited** SRP Item and/or **Program** Further Aging Effect/Mechanism Item Item (Table, ID) Component Material Environment (AMP)/TLAA **Evaluation** Increase in porosity III.A7.TP-28 3.5-1, 067 Concrete: Concrete Air – indoor AMP XI.S6, No interior; aboveuncontrolled, air and permeability; "Structures cracking; loss of - outdoor Monitoring" grade exterior material (spalling, scaling) due to aggressive chemical attack 3.5-1, 077 Ε III.A7.TP-302 Steel AMP XI.S6. Steel Air – indoor Loss of material due No components: all uncontrolled, air to corrosion "Structures structural steel Monitoring" outdoor Ε III.A7.T-23 3.5-1. 052 Steel Stainless steel Water - standing Cracking due to Plant-specific Yes components: SCC: loss of material aging tank liner due to pitting and management crevice corrosion program AMP XI.S6, Ε III.A7.TP-261 3.5-1, 088 Structural Loss of preload due No Any Any "Structures bolting to self-loosening Monitoring" М III.A7.TP-248 3.5-1.080 Structural AMP XI.S6, No Steel Air – indoor Loss of material due bolting uncontrolled, air to general, pitting, "Structures crevice corrosion outdoor Monitoring"

Air – outdoor

AMP XI.S6,

"Structures

Monitoring"

No

Loss of material due

to general, pitting, crevice corrosion

# 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.

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

and carbonation

foundation

Table A8 Group 8 Structures (Steel Tanks and Missile Barriers)

New, Modified, Deleted, Edited Item	ltem	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, or AMP XI.S6, "Structures Monitoring," enhanced as necessary	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, or AMP XI.S6, "Structures Monitoring," enhanced as necessary	Yes

Table A8 Group 8 Structures (Steel Tanks and Missile Barriers)

New, Modified, Deleted, Edited Item	ltem	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, or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	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
Е	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

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
Е	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
Е	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
М	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.

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

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, or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	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
М	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, or AMP XI.S6, ""Structures Monitoring,"" enhanced as necessary	Yes

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

subfoundation

D

III.A9.TP-300

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

#### **III COMPONENT SUPPORTS**

- 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.

New, Modified, Deleted, Edited Item	ltem	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
М	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
М	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
Е	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

New, Modified, Deleted, Edited Item	ltem	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
М	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
М	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

New, Modified, Deleted, Edited Item	ltem	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

New, Modified, Deleted, Edited Item	ltem	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
М	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

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	
Е	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	

New, Modified, Deleted, Edited Item	ltem	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
М	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

New, Modified, Deleted, Edited Item	ltem	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
М	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

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	

New, Modified, Deleted, Edited Item	ltem	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	

New, Modified, Deleted, Edited Item	ltem	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

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
М	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
Е	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

New, Modified, Deleted, Edited Item	ltem	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

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

New, Modified, Deleted, Edited Item	ltem	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.

Table B2 Support for Cable Trays, Conduit, HVAC Ducts, Tube Track, Instrument Tubing, Non-ASME Piping and Components

New, Modified, Deleted, Edited Item	ltem	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
М	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

#### 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, **Aging Management** Structure **Edited** SRP Item and/or **Program** Further Aging Effect/Mechanism (AMP)/TLAA Item Item (Table, ID) Component Material Environment **Evaluation** AMP XI.S6, III.B2.TP-274 3.5-1, 082 Structural Steel; Air – outdoor Loss of material due No bolting galvanized to general, pitting, "Structures crevice corrosion Monitoring" steel III.B2.T-37a Ν 3.5-1, 100 Loss of material due AMP XI.M32. "One-Support Aluminum. Air, Yes stainless steel condensation Time Inspection" members; to pitting and crevice welds; bolted corrosion, cracking due to SCC connections; support anchorage to building structure Ν III.B2.T-37b 3.5-1. 100 Support Aluminum, Air. Loss of material due AMP XI.S6. Yes members; stainless steel to pitting and crevice "Structures condensation welds; bolted corrosion, cracking Monitoring" connections: due to SCC support anchorage to building structure III.B2.T-37c 3.5-1, 100 AMP XI.M36, Yes Ν Support Aluminum, Air, Loss of material due members; stainless steel to pitting and crevice "External Surfaces condensation welds; bolted corrosion, cracking Monitoring of connections; due to SCC Mechanical Components" support anchorage to building structure

Table B2	Support fo	or Cable Trays, C	Conduit, HVAC Du	icts, Tube Track,	Instrument Tubin	g, Non-ASME Piping a	nd Components	
New, Modified, Deleted, Edited Item	ltem	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

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III	STRUCTU	RES AND COMP	PONENT SUPPOR	RTS				
Table B2	Support fo	or Cable Trays, C	Conduit, HVAC Du	icts, Tube Track,	Instrument Tubin	g, Non-ASME Piping ar	nd Components	
New, Modified, Deleted, Edited Item	ltem	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

# 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.

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

corrosion, cracking

due to SCC

Monitoring"

connections; support

anchorage to

building structure

## Table B3 Anchorage of Racks, Panels, Cabinets, and Enclosures for Electrical Equipment and Instrumentation

STRUCTURES AND COMPONENT SUPPORTS

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
М	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
М	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
М	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	STRUCTUR	ES AND COMP	ONENT SUPPORTS									
Table B3	Table B3 Anchorage of Racks, Panels, Cabinets, and Enclosures for Electrical Equipment and Instrumentation											
New, Modified, Deleted, Edited Item	ied, ed, Structure Aging Management SRP Item and/or Aging Management Further											
	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	STRUCTU	RES AND CO	MPONENT SUPPO	ORTS				
Table B4	Supports f	or Emergenc	y Diesel Generato	r, HVAC Systen	n Components, a	and Other Miscellaneous N	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
М	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

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

Table B4	Supports	for Emergenc	y Diesel Generato	or, HVAC System	n Components, a	and Other Miscellaneous M	Mechanical Equipment	
New, Modified, Deleted, Edited Item	ltem	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	STRUCTU	RES AND CO	MPONENT SUPPO	ORTS				
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
М	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	lodified, Deleted, Edited SRP Item and/or Aging Aging Management Further								
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.

Table B5 Supports for Platforms, Pipe Whip Restraints, Jet Impingement Shields, Masonry Walls, and Other Miscellaneous Structures

New, Modifie d, Deleted , Edited Item	ltem	SRP Item (Tabl e, ID)	Structure and/or Compone nt	Material	Environme nt	Aging Effect/Mechani sm	Aging Manageme nt Program (AMP)/TLA A	Further Evaluati on
	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 uncontrolle d, 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 uncontrolle d, 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; galvanize d 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 connection s; support anchorage to building structure	Aluminu m, stainless steel	Air, condensati on	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 connection s; support anchorage to building structure	Aluminu m, stainless steel	Air, condensati on	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.S6, "Structures Monitoring"	Yes

Table B5 Supports for Platforms, Pipe Whip Restraints, Jet Impingement Shields, Masonry Walls, and Other Miscellaneous Structures

New, Modifie d, Deleted , Edited Item	ltem	SRP Item (Tabl e, ID)	Structure and/or Compone nt	Material	Environme nt	Aging Effect/Mechani sm	Aging Manageme nt Program (AMP)/TLA A	Further Evaluati on
N	III.B5.T- 37c	3.5-1, 100	Support members; welds; bolted connection s; support anchorage to building structure	Aluminu m, stainless steel	Air, condensati on	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.M36, "External Surfaces Monitoring of Mechanical Component s"	Yes
М	III.B5.T P-8	3.5-1, 095	Support members; welds; bolted connection s; support anchorage to building structure	Galvaniz ed steel	Air – indoor uncontrolle d	None	None	No
М	III.B5.T P-3	3.5-1, 089	Support members; welds; bolted connection s; support anchorage to building structure	Galvaniz ed 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 connection s; 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, Modifie d, Deleted , Edited Item	ltem	SRP Item (Tabl e, ID)	Structure and/or Compone nt	Material	Environme nt	Aging Effect/Mechani sm	Aging Manageme nt Program (AMP)/TLA A	Further Evaluati on
	III.B5.T P-43	3.5-1, 092	Support members; welds; bolted connection s; support anchorage to building structure	Steel	Air – indoor uncontrolle d, 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 connection s; 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							