

COMPONENT SUPPORTS

- B1. Supports for ASME Piping and Components
- 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

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B1. SUPPORTS FOR ASME PIPING AND COMPONENTS

B1.1 Class 1

B1.1.1 Support Members; Welds; Bolted Connections; Support Anchorage to Building Structure

B1.1.2 High Strength Bolting for NSSS Component Supports

B1.1.3 Constant/Variable Load Spring Hangers; Guides; Stops; Sliding Surfaces; Design Clearances; Vibration Isolators

B1.1.4 Building Concrete at Locations of Expansion and Grouted Anchors; Grout Pads for Support Base Plates

B1.2 Class 2 and 3

B1.2.1 Support Members; Welds; Bolted Connections; Support Anchorage to Building Structure

B1.2.2 Constant/Variable Load Spring Hangers; Guides; Stops; Sliding Surfaces; Design Clearances; Vibration Isolators

B1.2.3 Building Concrete at Locations of Expansion and Grouted Anchors; Grout Pads for Support Base Plates

B1.3 Class MC (BWR Containment Supports)

B1.3.1 Support Members; Welds; Bolted Connections; Support Anchorage to Building Structure

B1.3.2 Guides; Stops; Sliding Surfaces; Design Clearances

B1.3.3 Building Concrete at Locations of Expansion and Grouted Anchors; Grout Pads for Support Base Plates

B1. SUPPORTS FOR ASME PIPING AND COMPONENTS

Systems, Structures, and Components

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

System Interfaces

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

III. Structures and Components Supports
B1.1 Supports for ASME Class 1 Piping and Components

Item	Structure and/or Component	Material	Environment	Aging Effect/ Mechanism	Aging Management Program (AMP)	Further Evaluation
B1.1.1-a	Support members; welds; bolted connections; support anchorage to building structure	Carbon steel	Inside containment	Loss of material / Environmental corrosion (i.e., pitting corrosion, general corrosion, etc.)	Chapter XI.S3, "ASME Section XI, Subsection IWF"	No
B1.1.1-b	Support members; welds; bolted connections; support anchorage to building structure	Carbon steel	Inside PWR containment	Loss of material / Boric acid corrosion	Chapter XI.M10, "Boric Acid Corrosion"	No
B1.1.1-c	Support members; welds; bolted connections; support anchorage to building structure	Carbon steel	Inside containment	Cumulative fatigue damage / Fatigue (only if a CLB fatigue analysis exists)	Fatigue is a time-limited aging analysis (TLAA) to be evaluated for the period of extended operation. See the Standard Review Plan, Section 4.3, "Metal Fatigue" for acceptable methods for meeting the requirements of 10 CFR 54.21(c)(1).	Yes, TLAA
B1.1.2-a	High strength bolting for NSSS component supports	Low alloy steel, yield strength >150 ksi	Inside containment	Cracking / Stress corrosion cracking	Chapter XI.M18, "Bolting Integrity"	No

III. Structures and Components Supports
B1.1 Supports for ASME Class 1 Piping and Components

Item	Structure and/or Component	Material	Environment	Aging Effect/ Mechanism	Aging Management Program (AMP)	Further Evaluation
B1.1.3-a	Constant and variable load spring hangers; guides; stops; sliding surfaces; design clearances; vibration isolators	Steel and non-steel materials (e.g., lubrite plates, vibration isolators, etc.)	Inside containment	Loss of mechanical function / Corrosion, distortion, dirt, overload, fatigue due to vibratory and cyclic thermal loads; elastomer hardening	Chapter XI.S3, "ASME Section XI, Subsection IWF"	No
B1.1.4-a	Building concrete at locations of expansion and grouted anchors; grout pads for support base plates	Reinforced concrete; grout	Inside containment	Reduction in concrete anchor capacity due to local concrete degradation / Service-induced cracking or other concrete aging mechanisms	Chapter XI.S6, "Structures Monitoring Program"	No, if within the scope of the applicant's structures monitoring program

III. Structures and Components Supports
B1.2 Supports for ASME Class 2 and 3 Piping and Components

Item	Structure and/or Component	Material	Environment	Aging Effect/ Mechanism	Aging Management Program (AMP)	Further Evaluation
B1.2.1-a	Support members; welds; bolted connections; support anchorage to building structure	Carbon steel	Inside or outside containment	Loss of material / Environmental corrosion (i.e. pitting corrosion, general corrosion)	Chapter XI.S3, "ASME Section XI, Subsection IWF"	No
B1.2.1-b	Support members; welds; bolted connections; support anchorage to building structure	Carbon steel	Inside PWR containment	Loss of material / Boric acid corrosion	Chapter XI.M10, "Boric Acid Corrosion"	No
B1.2.1-c	Support members; welds; bolted connections; support anchorage to building structure	Carbon steel	Inside or outside containment	Cumulative fatigue damage / Fatigue (only if a CLB fatigue analysis exists)	Fatigue is a time-limited aging analysis (TLAA) to be evaluated for the period of extended operation. See the Standard Review Plan, Section 4.3, "Metal Fatigue" for acceptable methods for meeting the requirements of 10 CFR 54.21(c)(1).	Yes, TLAA
B1.2.2-a	Constant and variable load spring hangers; guides; stops; sliding surfaces; design clearances; vibration isolators	Steel and non-steel materials (e.g., lubrite plates, vibration isolators, etc.)	Inside or outside containment	Loss of mechanical function / Corrosion, distortion, dirt, overload, fatigue due to vibratory and cyclic thermal loads; elastomer hardening	Chapter XI.S3, "ASME Section XI, Subsection IWF"	No
B1.2.3-a	Building concrete at locations of expansion and grouted anchors; grout pads for support base plates	Reinforced concrete; grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation / Service-induced cracking or other concrete aging mechanisms	Chapter XI.S6, "Structures Monitoring Program"	No, if within the scope of the applicant's structures monitoring program

III. Structures and Components Supports

B1.3 Supports for ASME Class MC Components (BWR downcomer bracing; torus seismic restraints; torus support saddles/columns; vent system supports)

Item	Structure and/or Component	Material	Environment	Aging Effect/ Mechanism	Aging Management Program (AMP)	Further Evaluation
B1.3.1-a	Support members; welds; bolted connections; support anchorage to building structure	Carbon steel	Inside or outside containment	Loss of material / Environmental corrosion (i.e. pitting corrosion, general corrosion, etc.)	Chapter XI.S3, "ASME Section XI, Subsection IWF"	No
B1.3.1-b	Support members; welds; bolted connections; support anchorage to building structure	Carbon steel	Inside or outside containment	Cumulative fatigue damage / Fatigue (only if a CLB fatigue analysis exists)	Fatigue is a time-limited aging analysis (TLAA) to be evaluated for the period of extended operation. See the Standard Review Plan, Section 4.3, "Metal Fatigue" for acceptable methods for meeting the requirements of 10 CFR 54.21(c)(1).	Yes, TLAA
B1.3.2-a	Guides; stops; sliding surfaces; design clearances	Steel and non-steel materials (e.g., lubrite plates, etc.)	Inside or outside containment	Loss of mechanical function / Corrosion, distortion, dirt, overload, fatigue due to vibratory and cyclic thermal loads; elastomer hardening	Chapter XI.S3, "ASME Section XI, Subsection IWF"	No
B1.3.3-a	Building concrete at locations of expansion and grouted anchors; grout pads for support base plates	Reinforced concrete; grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation / Service-induced cracking or other concrete aging mechanisms	Chapter XI.S6, "Structures Monitoring Program"	No, if within the scope of the applicant's structures monitoring program

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

B2.1 Support Members; Welds; Bolted Connections; Support Anchorage to Building Structure

B2.2 Building Concrete at Locations of Expansion and Grouted Anchors; Grout Pads for Support Base Plates

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, HVAC ducts, tube track, instrument tubing, and non-ASME piping and components. Applicable aging effects are identified and the aging management review is presented for each applicable combination of support component and aging effect.

System Interfaces

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

III. Structures and Component Supports
B2 Supports for Cable Trays, Conduit, HVAC Ducts, Tube Track, Instrument Tubing, Non-ASME Piping and Components

Item	Structure and/or Component	Material	Environment	Aging Effect/ Mechanism	Aging Management Program (AMP)	Further Evaluation
B2.1-a	Support members; welds; bolted connections; support anchorage to building structure	Carbon steel	Inside or outside containment	Loss of material / Environmental corrosion (i.e., pitting corrosion, general corrosion, etc.)	Chapter XI.S6, "Structures Monitoring Program"	No, if within the scope of the applicant's structures monitoring program
B2.1-b	Support members; welds; bolted connections; support anchorage to building structure	Carbon steel	Inside PWR containment	Loss of material / Boric acid corrosion	Chapter XI.M10, "Boric Acid Corrosion"	No
B2.2-a	Building concrete at locations of expansion and grouted anchors; grout pads for support base plates	Reinforced concrete; grout; masonry	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation / Service-induced cracking or other concrete aging mechanisms	Chapter XI.S6, "Structures Monitoring Program"	No, if within the scope of the applicant's structures monitoring program

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

B3.1 Support Members; Welds; Bolted Connections; Support Anchorage to Building Structure

B3.2 Building Concrete at Locations of Expansion and Grouted Anchors;
Grout Pads for Support Base Plates

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 is presented for each applicable combination of support component and aging effect.

System Interfaces

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

III. Structures and Component Supports
B3 Anchorage of Racks, Panels, Cabinets, and Enclosures for Electrical Equipment and Instrumentation

Item	Structure and/or Component	Material	Environment	Aging Effect/ Mechanism	Aging Management Program (AMP)	Further Evaluation
B3.1-a	Support members; welds; bolted connections; support anchorage to building structure	Carbon steel	Inside or outside containment	Loss of material / Environmental corrosion (i.e., pitting corrosion, general corrosion, etc.)	Chapter XI.S6, "Structures Monitoring Program"	No, if within the scope of the applicant's structures monitoring program
B3.1-b	Support members; welds; bolted connections; support anchorage to building structure	Carbon steel	Inside PWR containment	Loss of material / Boric acid corrosion	Chapter XI.M10, "Boric Acid Corrosion"	No
B3.2-a	Building concrete at locations of expansion and grouted anchors; grout pads for support base plates	Reinforced concrete; grout; masonry	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation / Service-induced cracking or other concrete aging mechanisms	Chapter XI.S6, "Structures Monitoring Program"	No, if within the scope of the applicant's structures monitoring program

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B4. SUPPORTS FOR EMERGENCY DIESEL GENERATOR (EDG), HVAC SYSTEM COMPONENTS, AND OTHER MISCELLANEOUS MECHANICAL EQUIPMENT

B4.1 Support Members; Welds; Bolted Connections; Support Anchorage to Building Structure

B4.2 Vibration Isolation Elements

B4.3 Building Concrete at Locations of Expansion and Grouted Anchors; Grout Pads for Support Base Plates

B4. SUPPORTS FOR EMERGENCY DIESEL GENERATOR (EDG), HVAC SYSTEM COMPONENTS, AND OTHER MISCELLANEOUS MECHANICAL EQUIPMENT

Systems, Structures, and Components

This section addresses supports and anchorage for miscellaneous mechanical equipment. Applicable aging effects are identified and the aging management review is presented for each applicable combination of support component and aging effect.

System Interfaces

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

**III. Structures and Components Supports
 B4 Supports for Emergency Diesel Generator (EDG), HVAC System Components,
 and Other Miscellaneous Mechanical Equipment**

Item	Structure and/or Component	Material	Environment	Aging Effect/ Mechanism	Aging Management Program (AMP)	Further Evaluation
B4.1-a	Support members; welds; bolted connections; support anchorage to building structure	Carbon steel	Inside or outside containment	Loss of material / Environmental corrosion (i.e., pitting corrosion, general corrosion, etc.)	Chapter XI.S6, "Structures Monitoring Program"	No, if within the scope of the applicant's Structures Monitoring Program
B4.1-b	Support members; welds; bolted connections; support anchorage to building structure	Carbon steel	Inside PWR containment	Loss of material / Boric acid corrosion	Chapter XI.M10, "Boric Acid Corrosion"	No
B4.2-a	Vibration isolation elements	Non-metallic (e.g., Rubber)	Inside or outside containment	Reduction or loss of isolation function / Radiation hardening, temperature, humidity, sustained vibratory loading	Chapter XI.S6, "Structures Monitoring Program"	No, if within the scope of the applicant's structures monitoring program
B4.3-a	Building concrete at locations of expansion and grouted anchors; grout pads for support base plates	Reinforced concrete; grout	Inside or outside containment	Reduction in concrete anchor capacity due to local concrete degradation / Service-induced cracking or other concrete aging mechanisms	Chapter XI.S6, "Structures Monitoring Program"	No, if within the scope of the applicant's structures monitoring program

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

B5.1 Support Members; Welds; Bolted Connections; Support Anchorage to Building Structure

B5.2 Building Concrete at Locations of Expansion and Grouted Anchors; Grout Pads for Support Base Plates

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 miscellaneous structures. Applicable aging effects are identified and the aging management review is presented for each applicable combination of support component and aging effect.

System Interfaces

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

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

Item	Structure and/or Component	Material	Environment	Aging Effect/ Mechanism	Aging Management Program (AMP)	Further Evaluation
B5.1-a	Support members; welds; bolted connections; support anchorage to building structure	Carbon steel	Inside or outside containment	Loss of material / Environmental corrosion (i.e., pitting corrosion, general corrosion, etc.)	Chapter XI.S6, "Structures Monitoring Program"	No, if within the scope of the applicant's structures monitoring program
B5.1-b	Support members; welds; bolted connections; support anchorage to building structure	Carbon steel	Inside PWR containment	Loss of material / Boric acid corrosion	Chapter XI.M10, "Boric Acid Corrosion"	No
B5.2-a	Building concrete at locations of expansion and grouted anchors; grout pads for support base plates	Reinforced concrete; grout	Inside or Outside containment	Reduction in concrete anchor capacity due to local concrete degradation / Service-induced cracking or other concrete aging mechanisms	Chapter XI.S6, "Structures Monitoring Program"	No, if within the scope of the applicant's structures monitoring program

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