

CHAPTER III B

COMPONENT SUPPORTS

Component Supports

- B1. Supports for ASME Class 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

B1. Supports for ASME Class Piping and Components

B1.1 Class 1

B1.1.1 Support Members; Anchor Bolts; Welds

B1.1.2 High Strength Bolting for Major NSSS Component Supports

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

B1.1.4 Building Concrete Surrounding Anchor Bolts; Grout Pads

B1.2 Class 2 and 3

B1.2.1 Support Members; Anchor Bolts; Welds

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

B1.2.3 Building Concrete Surrounding Anchor Bolts; Grout Pads

B1.3 Class MC (BWR Containment Supports)

B1.3.1 Support Members; Anchor Bolts; Welds

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

B1.3.3 Building Concrete Surrounding Anchor Bolts; Grout Pads

B1. Supports for ASME Class Piping and Components

Systems, Structures, and Components

Review Table III B1 addresses supports and anchorage for ASME Class piping systems and components. Table III B1 is subdivided into Class 1 supports (B1.1), Class 2 and 3 supports (B1.2), and Class MC supports (B1.3). Regions of interest and applicable aging effects are identified in the Table. The aging management review is presented for each applicable combination of region of interest 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

B1.3 Supports for ASME Class MC Piping and Components

| Item | Structure/C omponent | Region of Interest | Material | Environ- ment | Aging Effect | Aging Mechanism | References |
|--------|--|---|-----------------|--------------------------------|---------------------|---|----------------------------------|
| B1.1.1 | Class 1 Piping and component supports | Support Members; Anchor Bolts; Welds | Carbon Steel | Inside Contain- ment | Loss of Material | Environ- mental Corrosion (i.e., pitting corrosion, general corrosion, etc.) | ASME Sect. XI, Subsection IWF |
| B1.1.1 | Class 1 Piping and component supports | Support Members; Anchor Bolts; Welds | Carbon Steel | Inside PWR Contain- ment | Loss of Material | Boric Acid Corrosion | |
| B1.1.1 | Class 1 Piping and component supports | Support Members; Anchor Bolts; Welds (CLB Fatigue Analysis does not exist) | Carbon Steel | Inside Contain- ment | Cracking | Cyclic loading | ASME Sect. XI, Subsection IWF |

III. STRUCTURES AND COMPONENTS SUPPORTS

B1.3 Supports for ASME Class MC Piping and Components

| Aging Management Program (AMP) | Evaluation and Technical Basis | Further Evaluation |
|-----------------------------------|---|---|
| ASME Section XI, Subsection IWF. | See Chapter XI.S3 for an evaluation of ASME Section XI, Subsection IWF. | No |
| Boric Acid Corrosion Program | See Chapter XI.M5 for an evaluation of the Boric Acid Corrosion Program. | No |
| ASME Section XI, Subsection IWF | <p>See Chapter XI.S3 for an evaluation of ASME Section XI, Subsection IWF</p> <p>Evaluation of IWF is augmented as follows:</p> <p>(4) Detection of Aging Effects: VT-3 visual inspection may not detect fine cracks (one option may be to perform VT-1 visual inspections).</p> | Yes, Applicant's program to address Attribute (4) needs to be evaluated |

III. STRUCTURES AND COMPONENTS SUPPORTS

B1.3 Supports for ASME Class MC Piping and Components

| Item | Structure/C omponent | Region of Interest | Material | Environ- ment | Aging Effect | Aging Mechanism | References |
|--------|--|--|---|----------------------------|---------------------------------|---------------------------------|--------------------------|
| B1.1.1 | Class 1 Piping and component supports | Support Members; Anchor Bolts; Welds (CLB Fatigue Analysis exists) | Carbon Steel | Inside Contain- ment | Cumulative Fatigue Damage | Fatigue | Design Code of Record |
| B1.1.2 | Class 1 Piping and component supports | High strength bolting for NSSS component supports | Low alloy steel, tensile strength >150 ksi | Inside contain- ment | Cracking | Stress corrosion cracking | |

III. STRUCTURES AND COMPONENTS SUPPORTS

B1.3 Supports for ASME Class MC Piping and Components

| Aging Management Program (AMP) | Evaluation and Technical Basis | Further Evaluation |
|---|--|-----------------------|
| Components have been designed or evaluated for fatigue for a 40 year design life based on postulated cycles, according to the requirements of the code of record or later approved codes. | Fatigue is a time-limited aging analysis (TLAA) to be performed for the period of license renewal. 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 |
| Bolting Integrity Program | See Chapter XI.M12 for an evaluation of Bolting Integrity Program. | No |

III. STRUCTURES AND COMPONENTS SUPPORTS

B1.3 Supports for ASME Class MC Piping and Components

| Item | Structure/Component | Region of Interest | Material | Environment | Aging Effect | Aging Mechanism | References |
|--------|---------------------------------------|--|---|--------------------|---|---|-------------------------------|
| B1.1.3 | Class 1 Piping and component supports | 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 | ASME Sect. XI, Subsection IWF |
| B1.1.4 | Class 1 Piping and component supports | Building concrete surrounding anchor bolts; Grout pads | Reinforced concrete and grout | Inside containment | Reduction in concrete anchor capacity due to local concrete degradation | Vibratory loads, thermal cycling of supported system, or other concrete aging mechanisms | |

III. STRUCTURES AND COMPONENTS SUPPORTS

B1.3 Supports for ASME Class MC Piping and Components

| Aging Management Program (AMP) | Evaluation and Technical Basis | Further Evaluation |
|-----------------------------------|--|--|
| ASME Section XI, Subsection IWF. | See Chapter XI.S3 for an evaluation of ASME Section XI, Subsection IWF. | No |
| Structures Monitoring Program | See Chapter XI.S6 for an evaluation of the Structures Monitoring Program | No, if the region of interest/aging effect combination is within the scope of the applicant's Structures Monitoring Program. |

III. STRUCTURES AND COMPONENTS SUPPORTS

B1.3 Supports for ASME Class MC Piping and Components

| Item | Structure/C omponent | Region of Interest | Material | Environ- ment | Aging Effect | Aging Mechanism | References |
|--------|--|---|-----------------|--|---------------------|--|-----------------------------------|
| B1.2.1 | Class 2 & 3 Piping and component supports | Support Members; Anchor Bolts; Welds | Carbon Steel | Inside or Outside contain- ment | Loss of Material | Environ- mental corrosion (i.e. pitting corrosion, general corrosion, etc.) | ASME Sect. XI, Subsection IWF |
| B1.2.1 | Class 2 & 3 Piping and component supports | Support Members; Anchor Bolts; Welds | Carbon Steel | Inside PWR contain- ment | Loss of Material | Boric Acid Corrosion | |
| B1.2.1 | Class 2 & 3 Piping and component supports | Support Members; Anchor Bolts; Welds (CLB Fatigue Analysis does not exist) | Carbon Steel | Inside or Outside contain- ment | Cracking | Cyclic Loading | ASME, Sect. XI, Subsection IWF |

III. STRUCTURES AND COMPONENTS SUPPORTS

B1.3 Supports for ASME Class MC Piping and Components

| Aging Management Program (AMP) | Evaluation and Technical Basis | Further Evaluation |
|-----------------------------------|---|---|
| ASME Section XI, Subsection IWF. | See Chapter XI.S3 for an evaluation of ASME Section XI, Subsection IWF. | No |
| Boric Acid Corrosion Program | See Chapter XI.M5 for an evaluation of the Boric Acid Corrosion Program. | No |
| ASME Section XI, Subsection IWF | <p>See Chapter XI.S3 for an evaluation of ASME Section XI, Subsection IWF</p> <p>Evaluation of IWF is augmented as follows:</p> <p>(4) Detection of Aging Effects: VT-3 visual inspection may not detect fine cracks (one option may be to perform VT-1 visual inspections).</p> | Yes, Applicant's program to address Attribute (4) needs to be evaluated |

III. STRUCTURES AND COMPONENTS SUPPORTS

B1.3 Supports for ASME Class MC Piping and Components

| Item | Structure/C omponent | Region of Interest | Material | Environ- ment | Aging Effect | Aging Mechanism | References |
|--------|--|--|--|--|--|---|----------------------------------|
| B1.2.1 | Class 2 & 3 Piping and component supports | Support Members; Anchor Bolts; Welds (CLB Fatigue Analysis exists) | Carbon Steel | Inside or Outside contain- ment | Cumulative Fatigue Damage | Fatigue | Design Code of Record |
| B1.2.2 | Class 2 & 3 Piping and component supports | 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 contain- ment | Loss of mechani- cal function | Corrosion, distortion, dirt, overload, fatigue due to vibratory and cyclic thermal loads; elastomer hardening | ASME Sect. XI, Subsection IWF |
| B1.2.3 | Class 2 & 3 Piping and component supports | Building concrete surround- ing anchor bolts; Grout pads | Reinforced concrete and grout | Inside or Outside contain- ment | Reduction in concrete anchor capacity due to local concrete degrada- tion | Vibratory loads, thermal cycling of supported system, or other concrete aging mechanisms | |

III. STRUCTURES AND COMPONENTS SUPPORTS

B1.3 Supports for ASME Class MC Piping and Components

| Aging Management Program (AMP) | Evaluation and Technical Basis | Further Evaluation |
|---|--|--|
| Components have been designed or evaluated for fatigue for a 40 year design life based on postulated cycles, according to the requirements of the code of record or later approved codes. | Fatigue is a time-limited aging analysis (TLAA) to be performed for the period of license renewal. 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 |
| ASME Section XI, Subsection IWF. | See Chapter XI.S3 for an evaluation of ASME Section XI, Subsection IWF. | No |
| Structures Monitoring Program | See Chapter XI.S6 for an evaluation of the Structures Monitoring Program | No, if the region of interest/aging effect combination is within the scope of the applicant's Structures Monitoring Program. |

III. STRUCTURES AND COMPONENTS SUPPORTS

B1.3 Supports for ASME Class MC Piping and Components

| Item | Structure/C omponent | Region of Interest | Material | Environ- ment | Aging Effect | Aging Mechanism | References |
|--------|--|---|-----------------|--|---------------------------------|--|-----------------------------------|
| B1.3.1 | BWR Contain- ments; Downcomer Bracing; Torus Seismic Restraints; Torus Support Saddles/ Columns; Vent System Supports | Support Members; Anchor Bolts; Welds | Carbon Steel | Inside or Outside contain- ment | Loss of Material | Environ- mental corrosion (i.e. pitting corrosion, general corrosion, etc.) | ASME, Sect. XI, Subsection IWF |
| B1.3.1 | BWR Contain- ments; Downcomer Bracing; Torus Seismic Restraints; Torus Support Saddles/ Columns; Vent System Supports | Support Members; Anchor Bolts; Welds (CLB Fatigue Analysis does not exist) | Carbon Steel | Inside or Outside contain- ment | Cracking | Cyclic Loading | ASME, Sect. XI, Subsection IWF |
| B1.3.1 | BWR Contain- ments; Downcomer Bracing; Torus Seismic Restraints; Torus Support Saddles/ Columns; Vent System Supports | Support Members; Anchor Bolts; Welds (CLB Fatigue Analysis exists) | Carbon Steel | Inside or Outside contain- ment | Cumulative Fatigue Damage | Fatigue | Design Code of Record |

III. STRUCTURES AND COMPONENTS SUPPORTS

B1.3 Supports for ASME Class MC Piping and Components

| Aging Management Program (AMP) | Evaluation and Technical Basis | Further Evaluation |
|---|---|---|
| ASME Section XI, Subsection IWF. | See Chapter XI.S3 for an evaluation of ASME Section XI, Subsection IWF. | No |
| ASME Section XI, Subsection IWF | <p>See Chapter XI.S3 for an evaluation of ASME Section XI, Subsection IWF</p> <p>Evaluation of IWF is augmented as follows:</p> <p>(4) Detection of Aging Effects: VT-3 visual inspection may not detect fine cracks (one option may be to perform VT-1 visual inspections).</p> | Yes, Applicant's program to address Attribute (4) needs to be evaluated |
| Components have been designed or evaluated for fatigue for a 40 year design life based on postulated cycles, according to the requirements of the code of record or later approved codes. | Fatigue is a time-limited aging analysis (TLAA) to be performed for the period of license renewal. 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 |

III. STRUCTURES AND COMPONENTS SUPPORTS

B1.3 Supports for ASME Class MC Piping and Components

| Item | Structure/Component | Region of Interest | Material | Environment | Aging Effect | Aging Mechanism | References |
|--------|--|--|--|-------------------------------|---|---|-------------------------------|
| B1.3.2 | BWR Containments; Downcomer Bracing; Torus Seismic Restraints; Torus Support Saddles/ Columns; Vent System Supports | 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 | ASME Sect. XI, Subsection IWF |
| B1.3.3 | BWR Containments; Downcomer Bracing; Torus Seismic Restraints; Torus Support Saddles/ Columns; Vent System Supports | Building concrete surrounding anchor bolts; Grout pads | Reinforced concrete and grout | Inside or Outside containment | Reduction in concrete anchor capacity due to local concrete degradation | Vibratory loads, thermal cycling of supported system, or other concrete aging mechanisms | |

III. STRUCTURES AND COMPONENTS SUPPORTS

B1.3 Supports for ASME Class MC Piping and Components

| Aging Management Program (AMP) | Evaluation and Technical Basis | Further Evaluation |
|-----------------------------------|--|--|
| ASME Section XI, Subsection IWF | See Chapter XI.S3 for an evaluation of ASME Section XI, Subsection IWF. | No |
| Structures Monitoring Program | See Chapter XI.S6 for an evaluation of the Structures Monitoring Program | No, if the region of interest/aging effect combination is 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; Anchor Bolts; Welds

B2.2 Bolted Friction Connections (e.g. Struts)

B2.3 Building Concrete Surrounding Anchor Bolts; Grout Pads

B2. Supports for Cable Trays, Conduit, HVAC Ducts, TubeTrack, Instrument Tubing, Non-ASME Piping and Components

Systems, Structures, and Components

Review Table III B2 addresses supports and anchorage for cable trays, conduit, HVAC ducts, Tube Track, instrument tubing, and non-ASME piping and components. Regions of interest and applicable aging effects are identified in the Table. The aging management review is presented for each applicable combination of region of interest 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/Component | Region of Interest | Material | Environment | Aging Effect | Aging Mechanism | References |
|------|--|--------------------------------------|--------------|-------------------------------|------------------|--|------------|
| B2.1 | Supports for Cable Trays, Conduit, HVAC Ducts, Tube Track, Instrument Tubing, Non-ASME Piping and Components | Support members; Anchor bolts; Welds | Carbon Steel | Inside or Outside containment | Loss of Material | Environmental Corrosion (i.e., pitting corrosion, general corrosion, etc.) | |
| B2.1 | Supports for Cable Trays, Conduit, HVAC Ducts, Tube Track, Instrument Tubing, Non-ASME Piping and Components | Support members; Anchor bolts; Welds | Carbon Steel | Inside PWR containment | Loss of Material | Boric Acid Corrosion | |

III. STRUCTURES AND COMPONENT SUPPORTS

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

| Aging Management Program (AMP) | Evaluation and Technical Basis | Further Evaluation |
|-----------------------------------|--|--|
| Structures Monitoring Program | See Chapter XI.S6 for an evaluation of the Structures Monitoring Program | No, if the region of interest/aging effect combination is within the scope of the applicant's Structures Monitoring Program. |
| Boric Acid Corrosion Program | See Chapter XI.M5 for an evaluation of the Boric Acid Corrosion Program. | No |

III. STRUCTURES AND COMPONENT SUPPORTS

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

| Item | Structure/Component | Region of Interest | Material | Environment | Aging Effect | Aging Mechanism | References |
|------|--|--|-------------------------------------|-------------------------------|---|--|------------|
| B2.1 | Supports for Cable Trays, Conduit, HVAC Ducts, Tube Track, Instrument Tubing, Non-ASME Piping and Components | Support members; Anchor bolts; Welds | Carbon Steel | Inside or Outside containment | Cracking | Cyclic loading | |
| B2.2 | Supports for Cable Trays, Conduit, HVAC Ducts, Tube Track, Instrument Tubing, Non-ASME Piping and Components | Bolted friction connections (e.g., struts) | Steel | Inside or Outside containment | Loosening/slipping of connections | Thermal cycling/vibration | |
| B2.3 | Supports for Cable Trays, Conduit, HVAC Ducts, Tube Track, Instrument Tubing, Non-ASME Piping and Components | Building concrete surrounding anchor bolts; Grout pads | Reinforced concrete, grout, masonry | Inside or Outside containment | Reduction in concrete anchor capacity due to local concrete degradation | Vibratory loads, thermal cycling of supported system, or other concrete aging mechanisms | |

III. STRUCTURES AND COMPONENT SUPPORTS

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

| Aging Management Program (AMP) | Evaluation and Technical Basis | Further Evaluation |
|--------------------------------|--|--|
| Structures Monitoring Program | See Chapter XI.S6 for an evaluation of the Structures Monitoring Program | No, if the region of interest/aging effect combination is within the scope of the applicant's Structures Monitoring Program. |
| Structures Monitoring Program | See Chapter XI.S6 for an evaluation of the Structures Monitoring Program | No, if the region of interest/aging effect combination is within the scope of the applicant's Structures Monitoring Program. |
| Structures Monitoring Program | See Chapter XI.S6 for an evaluation of the Structures Monitoring Program | No, if the region of interest/aging effect combination is within the scope of the applicant's Structures Monitoring Program. |

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

B3.1 Support Members; Anchor Bolts; Welds

B3.2 Building Concrete Surrounding Anchor Bolts; Grout Pads

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

Systems, Structures, and Components

Review Table III B3 addresses supports and anchorage for racks, panels, cabinets, and enclosures for electrical equipment and instrumentation. Regions of interest and applicable aging effects are identified in the Table. The aging management review is presented for each applicable combination of region of interest 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/Component | Region of Interest | Material | Environment | Aging Effect | Aging Mechanism | References |
|------|---|--|-------------------------------------|-------------------------------|---|--|------------|
| B3.1 | Anchorage of Racks, Panels, Cabinets, and Enclosures for Electrical Equipment and Instrumentation | Support members; Anchor bolts; Welds | Carbon Steel | Inside or Outside containment | Loss of Material | Environmental Corrosion (i.e., pitting corrosion, general corrosion, etc.) | |
| B3.1 | Anchorage of Racks, Panels, Cabinets, and Enclosures for Electrical Equipment and Instrumentation | Support members; Anchor bolts; Welds | Carbon Steel | Inside PWR containment | Loss of Material | Boric Acid Corrosion | |
| B3.2 | Anchorage of Racks, Panels, Cabinets, and Enclosures for Electrical Equipment and Instrumentation | Building concrete surrounding anchor bolts; Grout pads | Reinforced concrete, grout, masonry | Inside or Outside containment | Reduction in concrete anchor capacity due to local concrete degradation | Vibratory loads, thermal cycling of supported system, or other concrete aging mechanisms | |

III. STRUCTURES AND COMPONENT SUPPORTS

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

| Aging Management Program (AMP) | Evaluation and Technical Basis | Further Evaluation |
|--------------------------------|--|--|
| Structures Monitoring Program | See Chapter XI.S6 for an evaluation of the Structures Monitoring Program | No, if the region of interest/aging effect combination is within the scope of the applicant's Structures Monitoring Program. |
| Boric Acid Corrosion Program | See Chapter XI.M5 for an evaluation of the Boric Acid Corrosion Program. | No |
| Structures Monitoring Program | See Chapter XI.S6 for an evaluation of the Structures Monitoring Program | No, if the region of interest/aging effect combination is within the scope of the applicant's Structures Monitoring Program. |

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

B4.1 Support Members; Anchor Bolts; Welds

B4.2 Vibration Isolation Elements

B4.3 Building Concrete Surrounding Anchor Bolts; Grout Pads

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

Systems, Structures, and Components

Review Table III B4 addresses supports and anchorage for miscellaneous mechanical equipment. Regions of interest and applicable aging effects are identified in the Table. The aging management review is presented for each applicable combination of region of interest 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/Component | Region of Interest | Material | Environment | Aging Effect | Aging Mechanism | References |
|------|---|--------------------------------------|--------------|-------------------------------|------------------|---|------------|
| B4.1 | Supports for Emergency Diesel Generator (EDG), HVAC System Components, and Other Miscellaneous Mechanical Equipment | Support members; Anchor bolts; Welds | Carbon Steel | Inside or Outside containment | Loss of Material | Environmental Corrosion (i.e., pitting corrosion, general corrosion, etc.,) | |
| B4.1 | Supports for Emergency Diesel Generator (EDG), HVAC System Components, and Other Miscellaneous Mechanical Equipment | Support members; Anchor bolts; Welds | Carbon Steel | Inside PWR containment | Loss of Material | Boric Acid Corrosion | |

III. STRUCTURES AND COMPONENTS SUPPORTS

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

| Aging Management Program (AMP) | Evaluation and Technical Basis | Further Evaluation |
|--------------------------------|--|--|
| Structures Monitoring Program | See Chapter XI.S6 for an evaluation of the Structures Monitoring Program | No, if the region of interest/aging effect combination is within the scope of the applicant's Structures Monitoring Program. |
| Boric Acid Corrosion Program | See Chapter XI.M5 for an evaluation of the Boric Acid Corrosion Program. | No |

III. STRUCTURES AND COMPONENTS SUPPORTS

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

| Item | Structure/Component | Region of Interest | Material | Environment | Aging Effect | Aging Mechanism | References |
|------|---|--|-----------------------------|-------------------------------|---|--|------------|
| B4.1 | Supports for Emergency Diesel Generator (EDG), HVAC System Components, and Other Miscellaneous Mechanical Equipment | Support members; Anchor bolts; Welds | Carbon Steel | Inside or Outside containment | Cracking | Cyclic loading | |
| B4.2 | Supports for Emergency Diesel Generator (EDG), HVAC System Components, and Other Miscellaneous Mechanical Equipment | 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 | |
| B4.3 | Supports for Emergency Diesel Generator (EDG), HVAC System Components, and Other Miscellaneous Mechanical Equipment | Building concrete surrounding anchor bolts; Grout pads | Reinforced concrete, grout | Inside or Outside containment | Reduction in concrete anchor capacity due to local concrete degradation | Vibratory loads, thermal cycling of supported system, or other concrete aging mechanisms | |

III. STRUCTURES AND COMPONENTS SUPPORTS

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

| Aging Management Program (AMP) | Evaluation and Technical Basis | Further Evaluation |
|--------------------------------|--|--|
| Structures Monitoring Program | See Chapter XI.S6 for an evaluation of the Structures Monitoring Program | No, if the region of interest/aging effect combination is within the scope of the applicant's Structures Monitoring Program. |
| Structures Monitoring Program | See Chapter XI.S6 for an evaluation of the Structures Monitoring Program | No, if the region of interest/aging effect combination is within the scope of the applicant's Structures Monitoring Program. |
| Structures Monitoring Program | See Chapter XI.S6 for an evaluation of the Structures Monitoring Program | No, if the region of interest/aging effect combination is within the scope of the applicant's Structures Monitoring Program. |

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

B5.1 Support Members; Anchor Bolts; Welds

B5.2 Building Concrete Surrounding Anchor Bolts; Grout Pads

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

Systems, Structures, and Components

Review Table III B5 addresses supports and anchorage for miscellaneous structures. Regions of interest and applicable aging effects are identified in the Table. The aging management review is presented for each applicable combination of region of interest 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

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

| Item | Structure/Component | Region of Interest | Material | Environment | Aging Effect | Aging Mechanism | References |
|------|--|--|----------------------------|-------------------------------|---|--|------------|
| B5.1 | Supports for Platforms, Pipe Whip Restraints, Jet Impingement Shields, Masonry Walls, and Other Miscellaneous Structures | Support members; Anchor bolts; Welds | Carbon Steel | Inside or Outside containment | Loss of Material | Environmental Corrosion (i.e., pitting corrosion, general corrosion, etc.) | |
| B5.1 | Supports for Platforms, Pipe Whip Restraints, Jet Impingement Shields, Masonry Walls, and Other Miscellaneous Structures | Support members; Anchor bolts; Welds | Carbon Steel | Inside PWR containment | Loss of Material | Boric Acid Corrosion | |
| B5.2 | Supports for Platforms, Pipe Whip Restraints, Jet Impingement Shields, Masonry Walls, and Other Miscellaneous Structures | Building concrete surrounding anchor bolts; Grout pads | Reinforced concrete, grout | Inside or Outside containment | Reduction in concrete anchor capacity due to local concrete degradation | Vibratory loads, thermal cycling of supported system, or other concrete aging mechanisms | |

III. STRUCTURES AND COMPONENT SUPPORTS

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

| Aging Management Program (AMP) | Evaluation and Technical Basis | Further Evaluation |
|--------------------------------|--|--|
| Structures Monitoring Program | See Chapter XI.S6 for an evaluation of the Structures Monitoring Program | No, if the region of interest/aging effect combination is within the scope of the applicant's Structures Monitoring Program. |
| Boric Acid Corrosion Program | See Chapter XI.M5 for an evaluation of the Boric Acid Corrosion Program. | No |
| Structures Monitoring Program | See Chapter XI.S6 for an evaluation of the Structures Monitoring Program | No, if the region of interest/aging effect combination is within the scope of the applicant's Structures Monitoring Program. |

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