AMP XI.S1, ASME Section XI, Subsection IWE
Alternative to Inspection: Fatigue Waiver

Overview of purpose of change: Add fatigue waiver analysis as an alternative to performing surface examinations for managing cracking of dissimilar metal welds, steel, and stainless steel components that are subject to cyclic loading but have no current licensing basis fatigue analysis.

Basis Document Input: Revise NUREG-2221 as follows:

Add the following text to Table 2-30, AMP XI.S1, ASME Section XI, Subsection IWE

Element 3 Parameters Monitored or Inspected:

Summary of Significant Change:	Technical Basis for Change:
Allow a fatigue waiver analysis to demonstrate that cracking due to cyclic loading is not an aging effect requiring management.	When all six conditions in ASME Section III, Subsection N-415.1 are shown to be satisfied for all applicable materials, a detailed fatigue analysis is not required, and cracking due to cyclic loading is not an aging effect requiring management.

Element 4 Detection of Aging Effects:

Summary of Significant Change:	Technical Basis for Change:
As an alternative to surface examinations or Appendix J leak rate tests, a fatigue waiver analysis may be performed to demonstrate that cracking due to cyclic loading is not an aging effect requiring management.	The Containment contains dissimilar metal welds, steel, and stainless steel components that are subject to cyclic loading but have no current licensing basis fatigue analysis. The six conditions in ASME Section III, Subsection N-415.1 can be analyzed to determine the need for a detailed fatigue analysis. When all six conditions are shown to be satisfied for all applicable materials, a detailed fatigue analysis is not required for the containment due to stress fluctuations caused by temperature, pressure, and design earthquake cycles. This fatigue waiver analysis demonstrates that cracking due to cyclic loading is not an aging effect requiring management, and surface examinations of these components are not required.

References:

[1] NUREG-2191, Section XI.S1, Generic Aging Lessons Learned for Subsequent License Renewal (GALL-SLR) Report, U. S. Nuclear Regulatory Commission, July 2017

[2] ASME Section III, Subsection N-415.1

DRAFT

Document Changes:

NUREG-2191, GALL-SLR

Revise XI.S1 ASME Section XI, Subsection IWE, Element 3, Parameters Monitored or Inspected, first paragraph as follows:

Table IWE-2500-1 references the applicable sections in IWE-2300 and IWE-3500 that identify the parameters examined or monitored. Noncoated surfaces are examined for evidence of cracking, discoloration, wear, pitting, excessive corrosion, arc strikes, gouges, surface discontinuities, dents, and other signs of surface irregularities including discernible liner plate bulges. Painted or coated surfaces, including those inside BWR suppression chambers, are examined for evidence of flaking, blistering, peeling, discoloration, and other signs of potential distress of the underlying metal shell or liner system, including discernible liner plate bulges. Steel, stainless steel (SS), and dissimilar metal weld pressure-retaining components that are subject to cyclic loading but have no CLB fatigue analysis (i.e., components covered by Standard Review Plan for Review of Subsequent License Renewal Applications for Nuclear Power Plants (SRP-SLR) Table 3.5-1, items 27 and 40, and corresponding GALL-SLR items; as applicable), are monitored for cracking, unless a fatigue waiver analysis is performed to demonstrate that cracking due to cyclic loading is not an aging effect requiring management. The moisture barriers are examined for wear, damage, erosion, tear, surface cracks, or other defects that permit intrusion of moisture in the inaccessible areas of the pressure retaining surfaces of the metal containment shell or liner. Pressure-retaining bolting is examined for loosening and material conditions that cause the bolted connection to affect either containment leak-tightness or structural integrity.

Revise XI.S1 ASME Section XI, Subsection IWE, Element 4, Detection of Aging Effects, third paragraph as follows:

The requirements of ASME Code Section XI, Subsection IWE and 10 CFR 50.55a are supplemented to perform surface examination once every inspection interval, in addition to visual examinations, to detect cracking in steel, SS, and dissimilar metal weld pressure-retaining components that are subject to cyclic loading but have no CLB fatigue analysis (i.e., components covered by SRP-SLR Table 3.5-1, items 27 and 40, and corresponding GALL-SLR items; as applicable to the plant). Where feasible, appropriate Appendix J leak rate tests (GALL-SLR Report AMP XI.S4) conducted at least once every inspection interval and capable of detection of cracking may be performed or credited in lieu of the supplemental surface examination; the type of leak test determined to be appropriate is identified with the basis for components for which this option is used. As an alternative to surface examinations or Appendix J leak rate tests, a fatigue waiver analysis may be performed to demonstrate that cracking due to cyclic loading is not an aging effect requiring management.

DRAFT