Millstone Power Station Unit 2 (MPS2)

Inspection Interval Extension Alternative Request for Steam Generator Pressure Retaining Welds and Full Penetration Welded Nozzles

NRC Pre-Submittal Meeting

May 26, 2020

Dominion Energy®

Meeting Objectives

- Dominion Energy Nuclear Connecticut, Inc. (DENC) will be requesting approval of an alternative request for MPS2 to increase the inspection interval for steam generator Class 1 and 2 pressure-retaining welds and full penetration welded nozzles
- Key Goals for This Meeting:
  - Brief NRC on proposed alternative request, supporting information, and proposed timeline
  - Discuss the request prior to formal submittal
  - Ensure common understanding of the MPS2 request, technical scope and regulatory expectations

Affected Components

- Steam generator Class 1 and 2 pressure-retaining welds and full penetration welded nozzles (2 loop CE unit)
- ASME Section XI IWB-2500(a), Table IWB-2500-1 and IWC-2500(a), Table IWC-2500-1

ASME Category	Item No.	Description
B-B	B2.31	Steam generators (primary side), head welds, circumferential
B-B	B2.40	Steam generators (primary side), tubesheet-to-head weld
B-D	B3.130	Steam generators (primary side), nozzle-to-vessel welds
C-A	C1.10	Shell circumferential welds
C-A	C1.20	Head circumferential welds
C-A	C1.30	Tubesheet-to-shell weld
C-B	C2.21	Nozzle-to-shell (nozzle to head or nozzle to nozzle) welds
C-B	C2.22	Nozzle inside radius sections

Proposed Alternative

- Increase the inspection interval for these examination items to 30 years (from the current ASME Code Section XI 10-year requirement) for the remainder of the fifth and through the following sixth 10-year inspection interval
  - The duration of the proposed alternative would end on March 31, 2040, pending MPS2 subsequent license renewal beyond July 31, 2035
- Proposed alternative will demonstrate an acceptable level of quality and safety in accordance with 10 CFR 50.55a(z)(1)

Basis for Request & Precedent

- EPRI Report 3002015906, Technical Bases for Inspection Requirements for PWR Steam Generator Class 1 Nozzle-to-Vessel Welds and Class 1 and Class 2 Vessel Head, Shell, Tubesheet-to-Head and Tubesheet-to-Shell Welds, October 2019 (publicly available)
  - ➢ Applicable to Category B-B, B-D, and C-A items
- EPRI Report 3002014590, Technical Bases for Inspection requirements for PWR Steam Generator Feedwater and Main Steam Nozzle-to-Shell Welds and Inside Radius Sections, April 2019 (publicly available)
  - ➢ Applicable to Category C-B items
- No approved precedents for this type of request at present
  - ➢ A similar alternative request is currently under review for Vogtle 1 and 2 (ML19347B105) - for examination category C-B components (using EPRI Report 3002014590) only

Technical Justification

- The EPRI reports provide the following technical justification:
  - Industry examination history and previous industry initiatives have optimized examination requirements for similar components
  - Degradation mechanism, probabilistic fracture mechanics (PFM), and deterministic fracture mechanics (DFM) evaluations for these welds and nozzles conclude that no other inspections are required until 80 years to meet the NRC safety goal of 10^{-6} failures per reactor year
  - All welds and components considered in these reports are very flaw-tolerant
- The probabilistic fracture mechanics software used to compile the EPRI reports is consistent with the PFM White Paper provided by EPRI to the NRC

Applicability & Inspection History

- MPS2 request will demonstrate that plant specific configurations and operating conditions are bounded by the criteria of the EPRI technical justification reports
- MPS2 inspection history shows that no flaws exceeding the ASME Section XI acceptance standards were identified during any examinations
- Conclusion: ASME Section XI inspection schedules can be optimized (to at least 30 years) while continuing to provide an acceptable level of quality and safety

Schedule

- Submittal of alternative request to the NRC expected by end of June 2020

- NRC approval requested by no later than August 1, 2021, to support the fall 2021 MPS2 refueling outage

Questions?