

NRR-DMPSPeM Resource

From: Rankin, Jennivine
Sent: Wednesday, April 11, 2018 8:57 AM
To: ERICKSON, JEFFREY S (JERICKS@entergy.com); MIKSA, JAMES P (jmiksa@entergy.com)
Subject: Palisades Nuclear Plant - Request for additional information regarding proposed alternative for relevant condition (EPID L-2017-LLR-0142)
Attachments: Final PNP RAI Round 2.docx

Good morning,

By letter dated December 1, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17335A013), as supplemented by letter dated March 27, 2018 (ADAMS Accession No. ML17335A013), Entergy Nuclear Operations, Inc. (the licensee), submitted Request No. RR 5-6 for Palisades Nuclear Plant to the U.S. Nuclear Regulatory Commission (NRC) for review and approval, pursuant to the requirements of Title 10 of the *Code of Federal Regulations*, Section 50.55a(z)(2). The licensee's application requested that the NRC authorize its proposed alternative to the successive inspection requirement of Paragraph IWB-2420(b) of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection [ISI] of Nuclear Power Plant Components," for a "relevant condition." The relevant condition refers to a piece of primary coolant pump impeller that is lodged in the interior of the reactor pressure vessel.

Based on its review of the amendment request, the NRC staff has determined that additional information is required to complete the review. A draft request for additional information (RAI) was transmitted on April 6, 2018, and a clarification call was held on April 10, 2018. As a result of the clarification phone call, the RAI was modified slightly to further clarify that the information needed by the staff relates to the basis for modeling the impeller piece as a beam loaded by a fixed displacement. As agreed upon, please submit your response to the RAI by April 30, 2018. If you wish to alter the date of your response, please contact me at (301) 415-1530.

Please treat this e-mail as formal transmittal of the RAIs.

Thanks,
Jennie

Jennie Rankin, Project Manager
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Hearing Identifier: NRR_DMPS
Email Number: 284

Mail Envelope Properties (BL2PR09MB09617CDE051F86D09926AA7398BD0)

Subject: Palisades Nuclear Plant - Request for additional information regarding proposed alternative for relevant condition (EPID L-2017-LLR-0142)
Sent Date: 4/11/2018 8:57:26 AM
Received Date: 4/11/2018 8:57:28 AM
From: Rankin, Jennivine

Created By: Jennivine.Rankin@nrc.gov

Recipients:
"ERICKSON, JEFFREY S (JERICKS@entergy.com)" <JERICKS@entergy.com>
Tracking Status: None
"MIKSA, JAMES P (jmiksa@entergy.com)" <jmiksa@entergy.com>
Tracking Status: None

Post Office: BL2PR09MB0961.namprd09.prod.outlook.com

Files	Size	Date & Time
MESSAGE	1851	4/11/2018 8:57:28 AM
Final PNP RAI Round 2.docx		36106

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

REQUEST FOR ADDITIONAL INFORMATION
PROPOSED ASME CODE ALTERNATIVE REQUEST NUMBER RR 5-6
ALTERNATIVE TO THE REEXAMINATION FREQUENCY FOR A RELEVANT CONDITION
FOREIGN MATERIAL LODGED IN THE REACTOR PRESSURE VESSEL
FIFTH 10-YEAR INSERVICE INSPECTION INTERVAL
PALISADES NUCLEAR PLANT
ENTERGY NUCLEAR OPERATIONS, INC.
RENEWED FACILITY OPERATING LICENSE NO. DPR-20
DOCKET NO. 50-255

By letter dated December 1, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17335A013), as supplemented by letter dated March 27, 2018 (ADAMS Accession No. ML17335A013), Entergy Nuclear Operations, Inc., submitted Request No. RR 5-6 for Palisades Nuclear Plant (PNP) to the U.S. Nuclear Regulatory Commission (NRC) for review and approval, pursuant to the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a(z)(2). The licensee's application (also referred to as RR 5-6) requested that the NRC authorize its proposed alternative to the successive inspection requirement of Paragraph IWB-2420(b) of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, "Rules for Inservice Inspection [ISI] of Nuclear Power Plant Components," (also referred to as the Code), for a "relevant condition" – a piece of primary coolant pump (PCP) impeller that is lodged in the interior of the reactor pressure vessel. The proposed alternative is applicable for the remainder of fifth 10-year ISI interval at PNP, which commenced on December 13, 2015 and ends on December 12, 2025. In accordance with 10 CFR 50.55a(z)(2), the licensee submitted its proposed alternative based on its determination that compliance with the specified Code requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The NRC staff has determined that additional information is required in order to complete its review of this proposed alternative. The staff's request for additional information (RAI) is provided below.

Regulatory and Technical Basis for Follow-Up RAI-2a

Pursuant to 10 CFR 50.55a(g)(4), inservice inspection of ASME Code Class 1, 2, and 3 components shall meet the requirements set forth in the ASME Code, Section XI, including the analytical evaluation requirement of Code Paragraph IWB-3142.4 for acceptance of relevant conditions found by visual examination. The licensee's analytical basis for its proposed alternative relies on the results of its 2014 operability evaluation for meeting the analytical evaluation requirement of Code Paragraph IWB-3142.4. For acceptance of conditions by analytical evaluation, IWB-3142.4 also requires that reexaminations of such conditions be performed during successive inspection periods in accordance with IWB-2420 to determine whether any changes to the conditions have occurred that would require further corrective action. The staff must review certain information from the 2014 analytical evaluation in order to

determine whether this condition will remain acceptable for continued service for the duration of this proposed alternative (through December 2025).

Follow-Up RAI-2a:

In your response to RAI 2a, dated March 27, 2018, regarding the fracture analysis for the PCP impeller piece, you described the fatigue crack growth rate analysis performed. For the limiting case of an assumed fragment thickness of 1 inch, you stated that the crack growth rate is very low (less than 5×10^{-4} inches per loading cycle) and essentially arrests at a depth of approximately 0.75 inches (75% through wall).

From the information provided, it is not clear to the staff why the crack arrests at 75% through wall. Please include the basis for assuming that the fracture of this piece can be modeled as a beam loaded by a fixed displacement, considering that your December 1, 2017, application reports a fluid force of 350 pounds acting on the piece. Alternatively, please provide another method to demonstrate that the piece would be unlikely to fracture.

In addition, please address how you considered the margin against fracture; or if the crack arrests in the piece, please address whether the margin against fracture would become unbounded.