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PNP 2014-001

April 3, 2014

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Response to Second Request for Additional Information – Reactor Vessel Internals – ME9569

Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

References:

1. Entergy Nuclear Operations, Inc. letter to NRC, "Revised Program Plan for Aging Management of Reactor Vessel Internals," September 13, 2012 (ADAMS Accession Number ML12257A352)

2. NRC e-mail, "Palisades – Request for Additional Information – ME9569 - Revised Program Plan for Aging Management of Reactor Vessel Internals," March 4, 2013 (ADAMS Accession Number ML13063A318)

3. Entergy Nuclear Operations, Inc. letter to NRC, "Response to Request for Additional Information – Revised Program Plan for Aging Management of Reactor Vessel Internals," April 4, 2013 (ADAMS Accession Number ML13094A414)

4. NRC e-mail, "Palisades – Request for Additional Information – Reactor Vessel Internals - ME9569 – Email Resend," December 12, 2013 (ADAMS Accession Number ML13346A644)

5. Entergy Nuclear Operations, Inc. Letter to NRC, "Summary of January 2, 2014 Teleconference with Nuclear Regulatory Staff on Palisades - Request for Additional Information – Reactor Vessel Internals – ME9569 Response Schedule," January 07, 2014 (ADAMS Accession Number ML14007A151)

Dear Sir or Madam:

In Reference 1, Entergy Nuclear Operations, Inc. (ENO) submitted to the Nuclear Regulatory Commission (NRC) a revised program plan for aging management of reactor vessel internals.

In Reference 2, the NRC issued a request for additional information (RAI). ENO responded to the RAI in Reference 3.

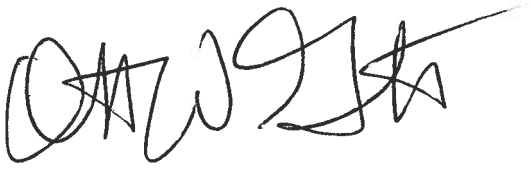
In Reference 4, the NRC issued a second RAI with a 30-day required response. In Reference 5, ENO documented a teleconference during which the NRC accepted a request to extend the second RAI response from 30 days to 120 days.

The response to the second RAI is provided in the Attachment.

This submittal contains no proprietary information.

This submittal contains no new or revised commitments.

Sincerely,



owg/jpm

Attachment: Response to Second Request for Additional Information – Reactor Vessel Internals – ME9569

cc: Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC

ATTACHMENT

Response to Second Request for Additional Information
– Reactor Vessel Internals – ME9569

By letter dated September 13, 2012, Entergy Nuclear Operations, Inc. (ENO) submitted to the Nuclear Regulatory Commission (NRC) a revised program plan for aging management of reactor vessel internals. By electronic mail, dated December 12, 2013, the Nuclear Regulatory Commission (NRC) submitted a second request for additional information. The requested information is provided below.

1. **NRC Information Request – RAI-2.1**

As discussed in References 1 and 2, the staff has identified two additional questions that all CE and Westinghouse design plants referencing topical report MRP-227-A must answer to close Applicant/Licensee Action Item 1 related to plant-specific applicability of the topical report. If the answer to either or both questions is yes, then further evaluation will be necessary to demonstrate the applicability of MRP-227-A to Palisades. The staff therefore requests the following information:

1. Do the Palisades RVI have non-weld or bolting austenitic stainless steel components with 20% cold work or greater, and if so do the affected components have operating stresses greater than 30 ksi?

2. Has Palisades ever utilized atypical design or fuel management that could make the assumptions of MRP-227-A regarding core loading/core design non-representative for that plant, including power changes/uprates?

References

1. 2/25/2013 Summary of Telecom with EPRI and Westinghouse Electric Company, March 15, 2013 (ADAMS Accession No. ML13067A262)
2. MRP-227-A Applicability Guidelines for Combustion Engineering and Westinghouse Pressurized Water Reactor Designs, Enclosure to MRP Letter 2013-025, October 14, 2013

ENO Response

1. No, Palisades' reactor vessel internals (RVI) do not contain any non-weld or bolting austenitic stainless steel components with 20% cold work or greater.

   To support this conclusion, Electric Power Research Institute (EPRI) letter MRP 2013-025, "MRP-227-A Applicability Guidelines for Combustion Engineering and Westinghouse Pressurized Water Reactor Designs," response guidance was used as guidance to fully demonstrate PNP specific applicability by performing a detailed review of all RVI stainless steel component drawings, procurement specifications, and listed material standards. The review included a categorization and reexamination of the screening process that had been used under MRP-191, "Materials Reliability Program: Screening Categorization and Ranking of Reactor Internals Components of

Westinghouse and Combustion Engineering PWR Design," and MRP-227-A, "Materials Reliability Program: Pressurized Water Reactors Internals Inspection and Evaluation Guidelines," to determine those components that may be most susceptible due to fabrication or replacement, and whether any additional components or locations may fall outside the criteria that were chosen for generic screening purposes. The review determined that PNP does not have materials with greater than 20% cold working.

2. No, Palisades has not utilized atypical design or fuel management, including power changes/uprates, which are non-representative of the assumptions of MRP-227-A.

   To support this conclusion, the assumptions of MRP-227-A, along with the additional guidance provided by MRP 2013-025, were evaluated. The assumptions of MRP-227-A were evaluated against fuel design changes, core designs, and plant operation. Palisades Nuclear Plant (PNP) highest calculated reactor core power density remains below the MRP-191 assumption of 83.0 W/cm^3. Additionally, PNP operated 14 years with a high leakage core, followed by 25 plus years of low (or ultra-low) leakage cores, resulting in much less fluence than assumed in MRP-227-A. The MRP 2013-025 screening criteria for Combustion Engineering plants was also met, except for fuel cycles prior to fuel cycle 14. For fuel cycles prior to fuel cycle 14 the distance between the active fuel and the fuel alignment plate was slightly below the assumed 12.4 inches (by a maximum of 0.57" for fuel cycle 1). Since fuel cycle 14, this screening criterion has been met. Even though this screening criteria was not met prior to fuel cycle 14, PNP is still bounded by the MRP 2013-025 analysis because the screening criteria used a fuel power density that was 27% higher than PNP's fuel density during fuel cycle 1 when the maximum deviation from the screening criteria occurred. This 27% margin more than offsets the increased flux due to the active fuel being closer to the alignment plate. Therefore, even with the active fuel slightly closer to the upper alignment plate than analyzed for MRP 2013-025 for the first 13 fuel cycles, PNP reactor vessel upper internals would have received less fluence than analyzed in MRP 2013-025.