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Otto W. Gustafson
Director, Regulatory and
Performance Improvement

PNP 2014-009

January 31, 2014

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

SUBJECT: 40-Year Containment Tendon Surveillance Report

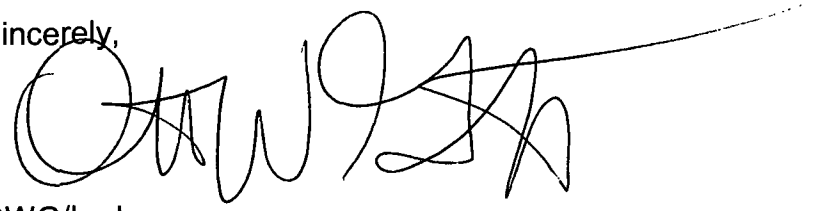
Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

Dear Sir or Madam:

Entergy Nuclear Operations, Inc. has recently completed the subject surveillance for the Palisades Nuclear Plant (PNP). The inservice inspection summary report for the 40-year tendon surveillance is attached. The summary report is prepared in accordance with ASME Section XI, 2004 Edition, no addenda, and 10 CFR 50.55a(b)(2)(viii). The summary report is being submitted in accordance with PNP Technical Specification Administrative Controls section 5.6.7, which requires submittal of a report within 90 days after completion of the tests. Surveillance testing activities were completed on November 5, 2013.

The 40-year Tendon Surveillance Summary Report is provided in Attachment 1.

Sincerely,



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Attachment: 1. 40-Year Tendon Surveillance Summary Report

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

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ATTACHMENT 1
PALISADES NUCLEAR PLANT
ASME SECTION XI, IWL
40-YEAR TENDON SURVEILLANCE SUMMARY REPORT

2013 CONTAINMENT STRUCTURAL INTEGRITY SURVEILLANCE PROGRAM, INSERVICE INSPECTION SUMMARY

Submitted in accordance with American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 2004 edition / no addenda.

1. Date: July 2013 through November 2013

2. Company Headquarters: Entergy Nuclear Operations, Inc.
   1340 Echelon Parkway
   Jackson, Mississippi 39213

3. Plant: Palisades Nuclear Plant
   27780 Blue Star Memorial Highway
   Covert, Michigan 49043

4. Unit No: One

5. Commercial Service Date: December 31, 1971

6. Major Component Inspected:

Component	Manufacturer	Equipment Number
Post-tensioning System	Bechtel	N-54A

7. Completion Date of Examination: November 5, 2013

8. Code Inspector: James W. Niemerg

9. Authorized Inspection Agency: Hartford Steam Boiler of Connecticut
   Hartford, Connecticut

1.0 PURPOSE

Entergy Nuclear Operations, Inc (ENO) Entergy Nuclear Operations, Inc (ENO) has completed inspection activities and is providing this summary report of examinations, inspections and corrective actions related to the 40-year containment tendon surveillance. The surveillance program is required by Palisades Nuclear Plant (PNP) Technical Specification (TS) 5.5.5, "Containment Structural Integrity Surveillance Program." All activities were performed in accordance with ASME Section XI, Subsection IWL, "Requirements for Class CC Concrete Components of Light-Water Cooled Plants," 2004 Edition / no addenda, as modified by 10 CFR 50.55a(b)(2)(viii).

This report is submitted in accordance with TS 5.6.7, "Containment Structural Integrity Surveillance Report," within 90 days after completion of the inspection. The 40-year tendon surveillance inspection activities were completed November 5, 2013.

The inspection activities in the 40-year containment tendon surveillance also included the following inspection activities that were discussed in the 35-year tendon surveillance report submitted to the NRC on January 26, 2009:

> *In order to further monitor tendons D1-38 and V-212, work requests have been initiated to track the tendon inspection and refilling of the tendon sheaths with new grease during the 40-year tendon surveillance.*

2.0 EXAMINATION AND INSPECTION SCOPE

The examination and inspection scope for the 40-year tendon surveillance is summarized in the following table:

2.1 EXAMINATION CATEGORY L-B, UNBONDED POST-TENSIONING SYSTEM

Examination Category	Item Number	Parts Examined	Examination	Examination Requirement	Acceptance Standard	Comments
L-B	L2.10	Dome Tendons D2-03 (Common) D1-38 D1-53 D2-40 D3-44	Tendon	IWL-2522	IWL-3220	Satisfactory
L-B	L2.10	Vertical Tendons V-334 (Common) V-22 V-34 V-182 V-212	Tendon	IWL-2522	IWL-3220	Satisfactory
L-B	L2.10	Horizontal Tendons H-42DF (Common) H-36DF H-42BD H-63AE H-80CE	Tendon	IWL-2522	IWL-3220	Satisfactory
L-B	L2.20	Tendons D1-53 V-34 H-42BD	Wire or Strand	IWL-2523	IWL-3220	Satisfactory
L-B	L2.30	Tendons	Anchorage Hardware and Surrounding Concrete	Detailed Visual (VT-1)	IWL-3220	Satisfactory Condition Reports CR-PLP-2013-03333, CR-PLP-2013-3336, CR-PLP-2013-04226
L-B	L2.40	Tendons	Corrosion Protection Medium	IWL-2525	IWL-3220	Satisfactory
L-B	L2.50	Tendons	Free Water	IWL-2525	IWL-3220	Satisfactory Condition Reports CR-PLP-2013-03335, CR-PLP-2013-04774

3.0 ADDITIONAL ACTIONS (For Water Scope)

In addition to the regularly scheduled surveillance, the following tests and examinations were conducted to address previous corrective action requirements associated with the post-tensioning system.

Examination Category	Item Number	Parts Examined	Examination	Examination Requirement	Acceptance Standard	Comments
L-B	L2.50	Tendons D1-38 V-212	Free water	IWL-2525	IWL-3220	Free water was identified in D1-38 and V-212 during the 35-year surveillance. Reference CR-PLP-2008-03641. During the 40-year surveillance, water was identified in D1-38 only. The Corrosion Protection Medium was Satisfactory.

4.0 EXAMINATION AND INSPECTION RESULTS AND CORRECTIVE ACTIONS

4.1 The following items did not meet the acceptance criteria of ASME Section XI IWL-3221.3(e), which states, "There is no evidence of free water."

As documented in condition reports CR-PLP-2013-04774 and CR-PLP-2013-03335, during the inspection of tendon D1-38 (Shop) and D2-03 (Field), free water was discovered. D1-38 contained 20 ounces of free water, and D2-03 contained 64 ounces of water. The sample of water from D1-38 was determined to have a pH of 12.3 and the sample from D2-03 had a pH of 12.0. Both of these values are determined to be less prone to cause corrosion of tendon components. No free water was identified in the opposite end of these tendons. Grease sample analysis results were acceptable for all tendons inspected, with 100% grease coating noted. Visual examinations were completed on all anchorage hardware with acceptable results except for one missing button head (V-22) discussed below and documented in CR-PLP-2013-04226. All inspected tendons were also refilled with grease and had acceptable grease replacement versus grease loss ratios. Water infiltration has been documented during previous tendon surveillances at PNP. The cause of water infiltration has been attributed to degraded grease can gaskets, migration through concrete cold joints, and tendon sheathing. Grease forms a protective coating for tendons and associated components, and this function has not been compromised by the presence of free water.

As required by 10 CFR 50.55a(b)(2)(viii)(E), ENO has considered the possibility that this condition may exist in inaccessible areas. Based on the results of inspections and tests, it is concluded that the water in tendons D1-38 and D2-03 is due to their locations and the existence of horizontal cold joints near the tendon end anchorages. The cold joints and tendon grease sheathings are not water tight, and can allow water infiltration when sufficient void space exists. Even if this condition exists in inaccessible areas, it is expected that tendons would meet performance requirements based on 100% grease coverage in a similar manner to that documented for accessible areas.

4.2 The following items did not meet the acceptance criteria of ASME Section XI IWL-3211, which states, "The condition of the concrete surface and tendon end anchorage areas is acceptable if the responsible engineer determines that there is no evidence of damage or degradation, corrosion protection medium leakage, or end-cap deformation sufficient to warrant further evaluation or performance of repair/replacement activities."

The missing tendon button head from V-22, documented in CR-PLP-2013-04226, was determined to be of no consequence. When looking at the original tendon cards provided during the plant construction, up to five button heads can be missing with the tendon remaining operational. This button head is the only button head missing. Additionally, this tendon met all requirements for tendon force measurement as required by IWI-3221.1, "Tendon Force and Elongation."

The tendon anchorage hardware corrosion of V-334, documented in CR-PLP-2013-03336, was determined to be of no consequence, as well as the cement crack adjacent to V-182, documented under CR-PLP-2013-03333. Both of these conditions were determined to not affect the structural integrity of the tendons or the containment building itself.

As required by 10 CFR 50.55a(b)(2)(viii)(E), ENO has considered the possibility that this condition may exist in inaccessible areas. Based on the results of inspections, it is concluded that the level of leakage in inaccessible areas could be the same as accessible areas. However, even if this condition exists in inaccessible areas, it is expected that tendons would meet performance requirements in a similar manner to that documented for accessible areas.

5.0 SUMMARY

The TS 5.5.5, "Containment Structural Integrity Surveillance Program," demonstrates continued containment operability by providing assurance that the containment is capable of fulfilling designed operating and accident functions. Based on an evaluation of the 40-year tendon surveillance results, and after reviewing the acceptable disposition of non-conforming items, ENO concludes that the containment structure has not experienced abnormal degradation related to the post-tensioning system and continues to be operable.