UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE RD. SUITE 210
LISLE, ILLINOIS 60532-4352

February 13, 2019

EA–15–039

Mr. Charles Arnone
Vice President, Operations
Entergy Nuclear Operations, Inc.
Palisades Nuclear Plant
27780 Blue Star Memorial Highway
Covert, MI 49043–9530

SUBJECT: PALISADES NUCLEAR PLANT — NRC INTEGRATED INSPECTION REPORT 05000255/2018004

Dear Mr. Arnone:

On December 31, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Palisades Nuclear Plant. On January 8, 2019, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

Based on the results of this inspection, no findings of significance were identified. The inspectors documented a licensee-identified violation which was determined to be of very low safety significance in this report. The NRC is treating this violation as a Non-Cited Violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest this violation or its significance as documented in this inspection report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement; and the NRC Resident Inspector at the Palisades Nuclear Plant.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with 10 CFR 2.390, “Public Inspections, Exemptions, Requests for Withholding.”

Sincerely,

/RA/

Julio Lara, DRP Division Director
Region III
Division of Reactor Projects

Docket Nos. 50–255
License Nos. DPR–20

Enclosure:
Inspection Report 05000255/2018004

cc: Distribution via LISTSERV®

Letter to Charles Arnone from Julio Lara dated February 13, 2019

SUBJECT: PALISADES NUCLEAR PLANT — NRC INTEGRATED INSPECTION REPORT 05000255/2018004

DISTRIBUTION:
Michael McCoppin
RidsNrrPMPalisades Resource
RidsNrrDorlLpl3
RidsNrrDirsIrib Resource
Darrell Roberts
John Giessner
Jamnes Cameron
Allan Barker
DRPIII
DRSIII
ROPreports.Resource@nrc.gov

ADAMS Accession Number:
☒ Publicly Available ☐ Non-Publicly Available ☐ Sensitive ☒ Non-Sensitive

OFFICE	RIII		RIII		RIII			
NAME	JCameron:lg		DSzwarc		JLara			
DATE	2/11/2019		2/11/2019		2/13/2019			

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50–255
License No:	DPR–20
Report No:	05000255/2018004
Enterprise Identifier:	I–2018–004–0028
Licensee:	Entergy Nuclear Operations, Inc.
Facility:	Palisades Nuclear Plant
Location:	Covert, MI
Dates:	October 1 through December 31, 2018
Inspectors:	P. LaFlamme, Senior Resident Inspector J. Boettcher, Resident Inspector B. Bartlett, Project Engineer M. Domke, Reactor Inspector E. Fernandez, Reactor Inspector I. Hafeez, Reactor Inspector G. Hansen, Senior Emergency Preparedness Inspector T. Ospino, Reactor Inspector V. Myers, Senior Health Physicist J. Rutkowski, Project Engineer
Approved by:	D. Szwarc, Acting Chief Branch 2 Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring licensee's performance by conducting an integrated quarterly inspection at Palisades Nuclear Plant in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to https://www.nrc.gov/reactors/operating/oversight.html for more information. Findings and violations being considered in the NRC's assessment are summarized in the table below. A Licensee-identified non-cited violation is documented in report section: 71111.08.

List of Findings and Violations

No NRC-identified or self-revealing findings were identified during this inspection.

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
URI	05000255/2018004–01	Potential Failure to Identify/Correct Rejectable Flaws in Reactor Pressure Vessel Head Penetration Nozzles	71111.08	Opened
Order	EA–15–039	Confirmatory Order Related to NRC Inspection Report 05000255/2015013 and Office of Investigations Report 3–2012–021	92702	Reviewed

TABLE OF CONTENTS

PLANT STATUS

The plant began the inspection period at rated thermal power and remained at or near rated thermal power until October 13, 2018. On October 13, 2018, the plant was down powered and taken offline for a maintenance outage to replace a leaking seal on control rod drive (CRD) mechanism 40. The plant transitioned into refueling outage (RFO) 1R26 on October 28, 2018. On December 24, 2018, the reactor was taken critical. Due to leaking seals on CRD mechanisms 25 and 37, the reactor was shut down on the same day. On December 27, 2018, the reactor was taken critical. The plant was synchronized to the grid on December 28, 2018. The reactor achieved approximately 80 percent power by the end of the inspection period.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed plant status activities described in IMC 2515 Appendix D, "Plant Status" and conducted routine reviews using IP 71152, "Problem Identification and Resolution." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.01—Adverse Weather Protection

Seasonal Extreme Weather (1 Sample)

The inspectors evaluated readiness for seasonal extreme weather conditions prior to the onset of seasonal cold temperatures the week of November 25, 2018.

Impending Severe Weather (1 Sample)

The inspectors evaluated readiness for impending adverse weather conditions for gale force winds and heavy snow on November 26, 2018.

71111.04—Equipment Alignment

Partial Walkdown (3 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

(1) Cross-tie of Bus 11 and Bus 12 during Transformer 12 work on October 21, 2018;
(2) Right train electrical and shutdown cooling systems during Bus 1D outage on November 6 through 8, 2018; and
(3) Spent fuel pool inventory makeup system on November 23 through 28, 2018.

71111.05AQ—Fire Protection Annual/Quarterly

Quarterly Inspection (4 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

(1) Walkdown of Fire Areas during high risk plant operating state (HRPOS) #1 on October 31, 2018;
(2) Fire Area 14, Containment Building, Elevation 590' on November 20, 2018;
(3) Fire Area 28, West Engineered Safeguards Room, Elevation 570' on November 30, 2018; and
(4) Fire Area 14, Containment Building Elevations 607', 611', 625', and 649' on December 17, 2018.

71111.07—Heat Sink Performance

Heat Sink (1 Sample)

The inspectors evaluated E–54A Component Cooling Water Heat Exchanger performance on November 7, 2018.

71111.08—Inservice Inspection Activities (1 Sample)

The inspectors assessed the effectiveness of the licensee's programs for monitoring degradation of the reactor coolant system boundary, risk-significant piping system boundaries, and the containment boundary by reviewing the following activities from October 29, 2018 to December 13, 2018.

(1) Phased Array Ultrasonic Testing (PAUT) of safe end to elbow dissimilar metal weld Component ID PCS–12-PSL–1H1–2;
(2) Ultrasonic Testing (UT) of feedwater line Component ID FWS–18–FWL–ISI–242;
(3) Review of examination record with a relevant indication accepted for continued service. Phased Array Ultrasonic Testing (PAUT) of safe end to elbow dissimilar metal weld Component ID PCS–12–PSL–1H1–2 (ISI Report 1R24–VE–18–002);
(4) Bare Metal Visual (BMV) examinations of the reactor vessel upper head, WO 52779311–03;
(5) Ultrasonic Examination of fifty three (53) reactor vessel head penetrations;
(6) Eddy Current Testing (ET) of reactor vessel head vent line and j-weld;
(7) Eddy Current Testing (ET) of reactor vessel head penetration no's 34 and 36;
(8) Repair of reactor head penetrations no. 25, 33 and 36, WO 498495;
(9) Welding of Cross Connect Tie-in for the CDS system, WO PLP–00429842;
(10) Review of boric acid evaluations and Corrective Action records for a packing leak found on component MV–PC1068 (CR–PLP–2018–04712), packing leak found on component CV–3039, SIT T–82 (CR–PLP–2018–04713);
(11) Review of corrective action records related to ISI, foreign materials intrusion into safety related systems, or materials degradation of Code components, CR–PLP–2017–02583, Steam Generator Eddy Current Identified Defective tubes, CR–PLP–2018–02809, ISI Section XI Work Packages Administrative Issues, CR–PLP–2018–03069, Failure to pressurize and examine an ASME Section XI Code Class 1 Safety Injection Piping; and
(12) Eddy Current examination (ET) of steam generator tubes for SG A and SG B steam generators.

71111.11—Licensed Operator Requalification Program and Licensed Operator Performance

Operator Requalification (1 Sample)

The inspectors observed and evaluated a simulator scenario on December 3, 2018.

Operator Performance (2 Samples)

The inspectors observed and evaluated the following activities:

(1) Reactor shutdown on October 13, 2018; and
(2) Reduced inventory period #1 on October 30 and 31, 2018.

71111.12—Maintenance Effectiveness

Routine Maintenance Effectiveness (2 Samples)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

(1) Review of periodic assessment from November 30 to December 13, 2018; and
(2) The Auxiliary Feed Water (AFW) actuation system between December 11 and December 20, 2018.

71111.13—Maintenance Risk Assessments and Emergent Work Control (3 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

(1) Emergent troubleshooting and replacement of transformer 12 during the week of October 15, 2018;
(2) Evaluation of removal of door 196A during Component Cooling Water (CCW) system maintenance during the week of October 29, 2018; and
(3) Reduced inventory period #1 on October 30 and 31, 2018.

71111.15—Operability Determinations and Functionality Assessments (4 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

(1) Review of TS LCOs associated with loss of 480V buses on October 15, 2018;
(2) Pipe Restraint Spring Can Setting out of Tolerance Evaluation (LPSI to Reactor Coolant Loop 1B) as documented in CR–PLP–2018–05989 on November 29, 2018;
(3) Door–15, Control Room Heating, Ventilation and Cooling, Mechanical Equipment Room Door Evaluation as documented in CR–PLP–2018–04331 on December 10, 2018; and
(4) Service water leak evaluation on December 17, 2018.

71111.18—Plant Modifications (1 Sample)

The inspectors evaluated the following temporary or permanent modifications:

(1) Replacement of Transformer 12 on October 22, 2018.

71111.19—Post Maintenance Testing (5 Samples)

The inspectors evaluated the following post maintenance tests:

(1) MO–7A–1 after T–302, 1–1 DG Overspeed Trip Test on October 1, 2018;
(2) QO-15 after planned maintenance on P-52A CCW pump on October 3, 2018;
(3) Transformer 12 testing after installation on October 22, 2018;
(4) QO–5 after maintenance on CV-3070, High Pressure Safety Injection (HPSI) subcooling valve on December 14, 2018; and
(5) P–8D AFW Pump Post-Modification Flow Testing, November 26 through December 23, 2018.

71111.20—Refueling and Other Outage Activities (1 Sample)

The inspectors evaluated a maintenance outage for CRD-40 seal repair activities and RFO 1R26 activities from October 13, 2018 to December 28, 2018.

71111.22—Surveillance Testing

The inspectors evaluated the following surveillance tests:

Routine (2 Samples)

(1) RE–83B, Battery No. ED–02 service testing on October 24, 2018; and
(2) RT–8D, Engineered Safeguards Test – Right Channel on November 10, 2018.

Reactor Coolant System Leak Detection (1 Sample)

(1) Administrative Procedure 4.19 actions associated with increased leakage due to Control Rod Drive 40, from October 9 through October 13, 2018.

Containment Isolation Valve (1 Sample)

(1) RO–32–51, LLRT – Local Leak Rate Test Procedure for Penetration MZ–51 (Equipment Hatch), on December 21, 2018.

71114.04—Emergency Action Level and Emergency Plan Changes (1 Sample)

The inspector completed the evaluation of submitted Emergency Action Level and Emergency Plan changes on November 19, 2018. This evaluation does not constitute NRC approval.

RADIATION SAFETY

71124.01—Radiological Hazard Assessment and Exposure Controls

Radiological Hazard Assessment (1 Sample)

The inspectors evaluated radiological hazards assessments and controls.

Instructions to Workers (1 Sample)

The inspectors evaluated worker instructions.

Radiological Hazards Control and Work Coverage (1 Sample)

The inspectors evaluated radiological hazards control and work coverage.

High Radiation Area and Very High Radiation Area Controls (1 Sample)

The inspectors evaluated risk-significant high radiation area and very high radiation area controls.

Radiation Worker Performance and Radiation Protection Technician Proficiency (1 Sample)

The inspectors evaluated radiation worker performance and radiation protection technician proficiency.

71124.02—Occupational As Low As Reasonably Achievable Planning and Controls

Implementation of As Low As Reasonably Achievable and Radiological Work Controls (1 Sample)

The inspectors reviewed As Low As Reasonably Achievable and Radiological (ALARA) practices and radiological work controls by reviewing the following activities:

(1) Removal of manways and installation of nozzle dams, RWP 20180454, S/G Primary Side Activities;
(2) Reactor disassembly, RWP 20180433, Refuel Project: Disassembly Of The Reactor Head and Associated Work Activities; and
(3) Reactor head surveys, RWP 20180449, Reactor Head Inspection: Volumetric Inspection Activities and Setup For Emergent Reactor Head Repairs.

Radiation Worker Performance (1 Sample)

The inspectors evaluated radiation worker and radiation protection technician performance.

71124.03—In-Plant Airborne Radioactivity Control and Mitigation

Engineering Controls (1 Sample)

The inspectors evaluated airborne controls and monitoring.

Use of Respiratory Protection Devices (1 Sample)

The inspectors evaluated respiratory protection.

OTHER ACTIVITIES – BASELINE

71151—Performance Indicator Verification (5 Samples)

The inspectors verified licensee performance indicators submittals listed below:

(1) MS06: Emergency AC Power Systems–1 Sample, October 1, 2017 – September 30, 2018;
(2) MS10: Cooling Water Support Systems–1 Sample, October 1, 2017 – September 30, 2018;

(3) BI02: Reactor Coolant System (RCS) Leak Rate Sample – 1 Sample, July 1, 2017 – June 30, 2018;
(4) OR01: Occupational Exposure Control Effectiveness – 1 Sample, October 1, 2017 – September 30, 2018; and
(5) PR01: RETS/ODCM Radiological Effluent Occurrences – 1 Sample, October 1, 2017 – September 30, 2018.

71152—Problem Identification and Resolution

Semiannual Trend Review (1 Sample)

The inspectors reviewed the licensee's corrective action program for trends that might be indicative of a more significant safety issue.

Annual Follow-Up of Selected Issues (1 Sample)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issue:

(1) CR–PLP–2017–03984, Potential Fuel Failures during Cycle 26, documented on August 25, 2017.

OTHER ACTIVITIES—TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

92702—Follow Up on Traditional Enforcement Actions Including Violations, Deviations, Confirmatory Action Letters, Confirmatory Orders, and Alternative Dispute Resolution
Confirmatory Orders 92702

The inspectors reviewed the licensee's implementation of its corrective action program related to the Safety Injection Refueling Water Tank Leak, Enforcement Action 15–039, Inspection Report 05000255/2015013 and Office of Investigations Report 3–2012–012. The inspectors reviewed the licensee's actions in response to the Confirmatory Order to ascertain that the licensee's responses and stated corrective and preventative actions were timely and appropriate. No significant comments were noted. No violations or deviations were identified.

INSPECTION RESULTS

71111.08—Inservice Inspection Activities

Unresolved Item (Opened)	Potential Failure to Identify/Correct Rejectable Flaws in Reactor Pressure Vessel Head Penetration Nozzles 05000255/2018004–01	IP 71111.08
Description: On Saturday, November 10, 2018, during a planned bare metal visual examination of the reactor pressure vessel (RPV) head required by NRC regulations, a boric acid deposit indicative of a flaw and through-wall leakage was discovered at control rod drive mechanism (CRDM) nozzle-to-reactor head penetration 25 and no other indications of leakage were identified at any other nozzle location. The licensee reported this condition to the NRC in accordance with 10 CFR 50.72(b)(3)(ii)(A) as a condition of the nuclear power plant, including its principal safety barriers, being seriously degraded. The plant was in cold shutdown for a refueling outage at the time of discovery, and the licensee reported that this issue had no impact to the health and safety of the public. The licensee also performed planned ultrasonic (UT) examination of the reactor head penetration nozzles that were		

required by NRC regulations. As a flaw had not been identified during original review of the UT data for that nozzle, analysts performed a re-evaluation and identified an ultrasonic testing leak path (UTLP) signal originating between the penetration nozzle outer diameter and the reactor vessel closure head (RVCH) at nozzle 25. The UTLP signal represented a change in the geometry of the interference fit, typically caused by fluid between the penetration and the RVCH boundary and was indicative of a through-wall reactor coolant system leak. In addition, the licensee's UT examination recorded a through-wall axial UT indication in the tube wall of penetration nozzle 25 consistent with service induced cracking (i.e. primary water stress corrosion cracking (PWSCC)). Subsequently, the licensee provided supplemental training to the analysts with respect to the characteristics of this type and location of degradation, who then performed re-evaluation of the other nozzles. Based on the re-evaluation, the analysts identified some nozzles for additional independent third party review by the Electrical Power Research Institute to confirm the existence of flaws, and in some instances performed supplemental eddy current testing to help make that determination. Ultimately, the licensee also identified axial indications consistent with PWSCC originating from the inside nozzle surface that were preliminarily determined to be greater than 75 percent through-wall at penetration nozzles 33 and 36. The licensee removed these flaws and completed weld repairs at these three nozzle locations prior to restart from the outage.

An NRC engineering inspector, specialized in metallurgy, was present, observing the RPV bare metal visual examination when the boric acid deposit/CRDM penetration through wall leakage was identified. The inspector also inspected in-process UT examination and evaluation activities for the nozzles. Additionally, NRC specialists inspected/observed repair and post-weld examination activities. As such, NRC inspectors gained confidence that the extent of RPV head degradation had been identified and repaired prior to restart from the outage.

On November 29, 2018, the licensee's UT vendor completed a review of previous UT data to determine if the flaw indications (e.g. PWSCC) in nozzles 25, 33 and 36 had existed, but were not identified as flaws during prior UT examinations. The licensee's UT vendor determined that the axial flaw in nozzle 33 initiated from the inside nozzle surface below the J-groove weld elevation and progressed (grew) towards the J-groove-weld interface (at nozzle outside diameter) and that this flaw was present in the UT data acquired each outage since 2007 but mischaracterized and not recognized as a flaw. The licensee's vendor report stated that this condition was also applicable to the axial UT flaw indications (e.g. PWSCC) in nozzles 25 and 36. The licensee indicated that this issue would be reviewed under actions assigned to CR–PLP–2018–05857 "Recordable boron indication at head penetration number 25." Specifically, the licensee assigned an action to this CR to conduct an apparent cause analysis and an action to review the vendor cause evaluation for this condition. The licensee's due date for completion of these actions was March of 2019.

Additional review of licensee records is planned to determine if the licensee complied with applicable NRC regulations for previous periods of plant operation with a through-wall flaw (PWSCC) in penetration nozzle 25 and with PWSCC present at the inside nozzle surface of penetration nozzles 33 and 36.

Planned Closure Actions: The NRC inspectors will seek additional information from the licensee and perform additional reviews to evaluate compliance with NRC regulations.

Licensee Actions: Corrective Actions – Apparent cause analysis and an action to review the vendor cause evaluation for this condition.

Corrective Action Reference: CR–PLP–2018–05857 “Recordable boron indication at head penetration number 25.”

Licensee Identified Non-Cited Violation	71111.08
This violation of very low safety significance was identified by the licensee and has been entered into the licensee corrective action program and is being treated as a Non-Cited Violation (NCV), consistent with Section 2.3.2 of the Enforcement Policy.	
Violation: Title 10 CFR 50.55(a)(g)(4) “Inservice inspection standards requirement for operating plants” requires in part, “Throughout the service life of a boiling or pressurized water-cooled nuclear power facility, components (including supports) that are classified as ASME Code Class 1, Class 2, and Class 3 must meet the requirements, except design and access provisions and preservice examination requirements, set forth in Section XI of editions and addenda of the ASME BPV Code…”. The 2007 edition through 2008 addenda of the ASME Code, Section XI, Article IWB–5222(b) required “The Class 1 pressure retaining boundary which is not pressurized when the system valves are in the position required for normal reactor startup shall be pressurized and examined at or near the end of the inspection interval.” Contrary to the above, for the 4th Code Interval, from December 13, 2006 through December 13, 2017 for portions of the ASME Code Class 1 piping system, the licensee failed to meet the ASME Code Section XI requirement to pressurize and examine portions of the pressure boundary which is not pressurized when valves are in the required position during normal startup. Specifically, the licensee failed to pressurize and examine an ASME Section XI Code Class 1 Safety Injection piping consisting of 1) the 2” and under piping between the normally closed first and second vent, drain and test isolation valve and 2) the 12” piping between the first and second injection check valves. Significance/Severity: The inspectors determined the performance deficiency was more than minor because it adversely affected the Equipment Performance attribute of the Initiating Events Cornerstone, to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors assessed the significance of the finding using SDP Appendix A and concluded the violation was of very low safety significance (Green). Corrective Action Reference: CR–PLP–2018–03069; Certain Sections of Piping have not been System Leakage Tested; dated June 28, 2018	

71152—Problem Identification and Resolution

Observation	71152 – Semi Annual Trend Review
The inspectors’ review was focused on human performance and equipment reliability, but also considered the results of daily inspector CAP item screening and licensee trending efforts. The inspectors’ review nominally considered the 6 month period of July 2018 through December 2018, although some examples expanded beyond those dates when warranted by the scope of the trend. The inspectors reviewed condition reports, trend reports, and human performance evaluations to address performance and equipment reliability at the site. During the inspection period, the NRC inspectors noted a few challenges to equipment reliability. Specifically the inspectors	

observed and reviewed activities associated with CRD mechanism 40 leakage monitoring, unit shutdown, and repairs; transformer 12 failure and subsequent replacement; main-feed pump cracked blade identification and repair; and reactor head control drive nozzle leakage identification and repairs during the refueling outage. For the latter two instances, the inspectors noted both equipment issues were identified during planned inspections within outage scope during the refueling outage. Although these issues illustrated a challenge to equipment reliability, the inspectors concluded that no adverse trends were identified during this assessment period.

Observation	71152 – Annual Sample Review
On August 17, 2017, the licensee identified elevated Xenon–133 and Xenon–135 gas levels during weekly trending of primary coolant system radiochemistry samples. All samples trended were within Technical Specification activity limits. Further review identified a potential fuel assembly failure, as documented in CR–PLP–2017–03984. The licensee completed an adverse cause analysis (ACA) to identify possible causes, review extent of condition and extent of cause, and identify corrective actions for this issue. Additionally, the licensee completed an Operational Decision Making Instruction (ODMI) to monitor chemistry results and track actions based on this potential fuel failure. During the remainder of the operating cycle, the licensee documented additional potential fuel failures in CR–PLP–2017–04341 and CR–PLP–2018–00389. The ODMI was updated to include this information for monitoring and trending purposes. The inspectors reviewed the associated CAP documents and determined that the issue was accurately documented in a timely manner. The licensee identified a possible cause of the failure to be debris fretting. Corrective actions included inspection of all fuel assemblies in the reactor during the operating cycle and a focused self assessment on foreign material exclusion performance. The inspectors reviewed the results of the fuel inspections completed during RFO 1R26 and discussed these results with the licensee. In addition, the inspectors reviewed the results of the self assessment, discussed improvements made associated with foreign material exclusion performance, and monitored the licensee's foreign material exclusion performance throughout RFO 1R26. The inspectors determined that the corrective actions were appropriate based on the safety significance of the issue.	

EXIT MEETINGS AND DEBRIEFS

The inspectors confirmed that proprietary information was controlled to protect from public disclosure. No proprietary information was documented in this report.

- On November 15, 2018, the inspectors presented the radiation protection program inspection results to Mr. C. Arnone, Site Vice President, and other members of the licensee staff.

- On November 30, 2018, the inspectors presented the emergency preparedness program inspection results to Mr. O. Gustafson, Director of Regulatory and Performance Improvement, and other members of the licensee staff.

- On January 8, 2019, the inspectors presented the inspection results, including inservice inspection activities, to Mr. C. Arnone, Site Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

71111.01—Adverse Weather Protection

- AOP-38; Acts of Nature; Revision 14
- CR-PLP-2018-05037; Seal Separated on Level Transmitter Box to Primary Water Storage Tank; 10/24/18
- CR-PLP-2018-05043; Sheetmetal Detached from Turbine Bldg During High Winds; 10/24/18
- SOP-23; Cold Weather Checklist – Electrical; Revision 58
- SOP-3; Safety Injection and Shutdown Cooling System; Revision 105
- WO 52724879; Perform Cold Weather Checksheets; 11/30/2018
- WO 52788236; Perform Cold Weather Checksheets; 11/30/2018

71111.04—Equipment Alignment

- AOP-26 Attachment 1; Loss of Spent Fuel Pool Cooling; Revision 3
- CR-PLP-2018-06201; SFP Level Measuring Device Found at Bottom of SFP; 11/20/18
- E-1; 480 Volt Motor Control Center Warehouse; Sheet 1; Revision 87
- E-1; Plant Single Line Diagram; Sheet 3; Revision 4
- E-4; 480 Volt Load Center; Sheet 2; Revision 41
- E-4; Relay Diagram, 480 Volt Load Centers; Sheet 1; Revision 45
- GOP-14; Shutdown Cooling Operations; Revision 53
- M-203; Piping & Instrument Diagram; Safety Injection, Containment Spray and Shutdown Cooling System; Sheet 2; Revision 28
- M-204; Piping & Instrument Diagram; Safety Injection Containment Spray and Shutdown Cooling System; Sheet 1; Revision 88
- M-214; Piping & Instrument Diagram; Lube Oil, Fuel Oil & Diesel Generator Systems; Sheet 1, Revision 81
- PCSO-5 Attachment 2; Service Water System to Spent Fuel Pool Equipment and Hose Arrangement; Revision 7
- SOP 3; Safety Injection and Shutdown Cooling System; Revision 105
- SOP-22; Emergency Diesel Generators; Revision 75
- SOP-27; Fuel Pool System; Revision 72
- SOP-30; Station Power; Revision 89

71111.05AQ—Fire Protection Annual/Quarterly

- Admin. 4.49; Non-Power Operation Fire Risk Management; Revision 0
- CR-PLP-2018-05284; Question Concerning the HRPOS Non-Compliance Reviews; 10/31/2018
- CR-PLP-2018-05369; Piping Downstream of MV-SW264 Containment Building Fire Water Supply Pipe, Low Ultrasonic Measurement; 11/01/2018
- GOP-14; Shutdown Cooling Operations; Revision 53
- Pre-Fire Plan 14; Reactor Containment Building; Elevation 649’
- Pre-Fire Plan 14; Reactor Containment Building Elevation 590’
- Pre-Fire Plan 14; Reactor Containment Building; Elevations 607’ & 611’
- Pre-Fire Plan 14; Reactor Containment Building; Elevation 625’
- Pre-Fire Plan 28; West Engineered Safeguards Room; Elevation 570’
- WO 512198; MV-SW264, Piping Downstream of Valve Thinning; 11/11/2018

71111.07—Heat Sink Performance

- CR-PLP-2018-05685; During Inspection of E-54A, 3 of the Existing Brazed Tubesheet Plugs were Leaking; 11/07/2018
- ENO-50-PN1-02; Final Inspection Report Component Cooling Water Cooler HX-E-54A
- SEP-HX-PLP-001; PLP Heat Exchanger Condition Assessment Program; Revision 3
- VEN-M14; Component Cooling Heat Exchanger E-54A; Sheet 2; Revision 76
- WO 52473708; E-54A Clean Component Cooling Water Heat Exchanger Tubes; 01/25/2014
- WO 52761276; E-54A, Clean Component Cooling Water Heat Exchanger Tubes; 11/07/2018

71111.08—Inservice Inspection Activities

- 54-ISI-178-009; Ultrasonic Examination of Temper Bead Weld Repair on PWR Upper Head Nozzles and BWR Lower Head Nozzles; Revision 9
- 54-ISI-30-023; Written Practice for the Qualification and Certification of NDE Personnel for ASME BPVC Section XI; 05/16/2018
- 54-ISI-400-022; Multi-Frequency Eddy Current Examination of Tubing; 06/27/2017
- 54-ISI-460-006; Multi-Frequency Eddy Current Orthogonal Coil Array Probe Examination of Nozzle Welds and Regions; 04/03/2018
- 54-ISI-494-002; Multi-Frequency Eddy Current Array ID Probe Examination of Vent Line and RVLIS Nozzle Bores; 04/03/2018
- 54-ISI-604-011; Automated Examination of Open Tube RPV Closure Head Penetrations; 09/17/2015
- 55-PQ7296-002; Procedure Qualification Record; Revision 2
- 55-WP3/43/F43TBSC3-005; Weld Procedure Specification; Revision 5
- 660-00-PT-25-001; Liquid Penetrant Examination for component RPVCH Penetration 25; 12/06/2018
- BOP-VE-18-008; Ultrasonic Examination calibration for component RPVCH Penetration 25; 12/06/2018
- BOP-VE-18-009; Ultrasonic Examination for component RPVCH Penetration 25; 12/06/2018
- BOP-VE-18-028; Ultrasonic Examination for component RPVCH Penetration 33; 12/11/2018
- BOP-VE-18-030; Ultrasonic Examination for component RPVCH Penetration 36; 12/12/2018
- CEP-NDE-0404; Manual Ultrasonic Examination of Ferritic Piping Welds (ASME XI); 10/01/2018
- CEP-NDL-0955; Visual Examination (VE) of Bare-Metal Surfaces; 07/19/2018
- CR-PLP-2018-3069; Missed System Leakage Test for Safety Injection Piping; Revision 0
- ISI Report 1R24-VE-18-002; PAUT of Safe End to Elbow Dissimilar Metal Weld; 09/30/2015
- ISI Report 1R26-VE-18-002; PAUT of Safe End to Elbow Dissimilar Metal Weld; 11/02/2018
- LMT-10-PAUT-007; Fully Encoded Phased Array Ultrasonic Examination of Dissimilar Metal Piping Welds; 04/10/2018
- Welding Procedure Specification WPS-CS-1/1-B; Manual Gas Tungsten Arc Welding (GTAW) of P-No. 1 carbon steels; 04/29/2010

71111.11—Licensed Operator Requalification Program and Licensed Operator Performance

- GOP-4; Mode 2 to Mode 1; Revision 24
- GOP-8; Power Reduction and Plant Shutdown to Mode 2 or Mode 3 ≥ 525°F; Revision 39
- SOP-1B; Primary Coolant System – Cooldown; Revision 21

71111.12—Maintenance Effectiveness

- 2018 PI&R Readiness Assessment; 11/29/2017

- CR-PLP-2018-04273; Maintainence Rule Functional Failure of Nitrogen Station 1A Regulator Extent of Condition Review; 9/19/18
- CR-PLP-2018-06141; Exceeded Maintenance Rule Performance Criteria for Auxiliary Feedwater Actuation System; 11/18/18
- EN-DC-207; Maintenance Rule Periodic Assessment; Revision 3
- Palisades Maintenance Rule Periodic Assessment; 01/01/2015 – 09/30/2016
- Palisades Maintenance Rule Periodic Assessment; 10/01/2016 – 06/30/2018
- PLP-RPT-12-00026; EGAD-EP-10 Palisades Maintenance Rule Scoping Document; Revision 3
- Quarter 2-2018 System Health Report for Auxiliary Feedwater System; 11/5/2018
- WT-WTPLP-2017-00183; Maintenance Rule Program Work Task Tracking; 04/11/2017

71111.13—Maintenance Risk Assessments and Emergent Work Control

- Admin 4.02; Control of Equipment; Revision 81
- AOP-11; Loss of 480V Buses; Revision 1
- CR-PLP-2018-04791; Protected Equipment Postings for LCC-19 (480 Volt Load Control Center No.19) and 52-2524 (Cond. Unit VC-11 for AHU V-95) did not have Robust Barriers in Place; October 16, 2018
- EC-79158; Risk Assessment of the Acceptable Duration to Remove DOOR-196A During Refueling Outage; Revision 0
- GOP-14; Shutdown Cooling Operations; Revision 53

71111.15—Operability Determinations and Functionality Assessments

- CR-PLP-2016-01442; Door-15 (Equipment Room Missile Shield/Radiation) Will not Close; 03/24/2016
- CR-PLP-2018-04331; Door-15, Equipment Room Missile Shield/Radiation Would not Open; 09/21/2018
- CR-PLP-2018-04345; Door-15, Mechanical Equipment Room Door Would not Fully Close; 09/21/2018
- CR-PLP-2018-04458; The West Mechanical Equipment Room Door (Door-15) Failed in the Closed and Locked Position; 09/28/2018
- CR-PLP-2018-04542; Maintenance Rule Functional Failure of Door-15; 10/04/2018
- CR-PLP-2018-04747; Control Room Entered AOP-11 for an Apparent Loss of Load Centers 12 and 20; 10/15/2018
- CR-PLP-2018-04750; Breaker 152-201 “Bus 1D to S/P XFMR 12 & 20;” 10/15/2018
- CR-PLP-2018-04955; Door-175, Missile Door (and Security / Control Room Envelope Door) into the Tech Support Center is not Securing; 10/21/2018
- CR-PLP-2018-04956; Vital Area Door 175 was Removed from Service After it Failed to Secure After Use; 10/21/2018
- CR-PLP-2018-05989; Spring Can Setting is out of Tolerance for Pipe Restraing ESS-6-SIS-1B1-1PR (H702.2); 11/14/2018
- CR-PLP-2018-06552; Service Water Leak into West Safeguards Room Operablilty Evaluation; 12/07/18
- E-1; Plant Single Line Diagram; Sheet 3; Revision 4
- E-1; Single Line Meter & Relay Diagram; 480 Volt Motor Control Center Warehouse; Sheet 1; Revision 87
- EA-SP03367-CC4-H702.2; Qualification of Pipe Support Mark #CC4-H702.2; 07/07/1992
- Operations Log; Various Dates
- SEP-HAB-PLP-001; Control Room Envelope Habitability Program; Revision 0

71111.18—Plant Modifications

- 1D/201/150-151; Station Power Transformer #12; Revision 4
- CR-PLP-2018-01458; Engineering Specification SPEC-16-00001-PL was not Issued Prior to Engineering Change Closure as Recommended by Controlling Procedures; 03/26/2018
- CR-PLP-2018-04747; At Approximately 12:13 the Control Room Entered AOP-11 for an Apparent Loss of Load Centers 12 and 20; 10/15/2018
- CR-PLP-2018-04750; Breaker 152-201 “Bus 1D to S/P XFMR 12 & 20,” Tripped on Instantaneous Overcurrent; 10/15/2018
- CR-PLP-2018-04761; An Incorrect Breaker Number is Shown for ELU-17 in eSOMS and E-44 Sheet 80A; 10/15/2018
- CR-PLP-2018-04897; Scheme A 1201 on E-12, Sheet 2 does not Match Vendor Connection; 10/192018
- CR-PLP-2-018-05034; An Arc Strike was Made in the South West Bottom Ventilation Screen; 10/24/2018
- CR-PLP-RPT-18-00026; Fire Risk Impact of Replacement EX-12 Transformer; Revision 0
- E-4; 400 Volt Load Center; Sheet 2; Revision 37
- E-4; Relay Diagram 480 Volt Load Centers; Sheet 1; Revision 38
- EC 79928; Station Power Transformer EX-12 Replacement; Revision 0

71111.19—Post Maintenance Testing

- CR-PLP-2018-04979; Minor Amounts of Dust and Paint Chips Noted on the Internal Portions of the Recently Reassembled EX-12 Transformer; 10/22/2018
- CR-PLP-2018-05057; Criteria of Step 4.9.2.1 was not met; 10/24/2018
- CR-PLP-2018-05186; Non-Energized Testing did not Meet Acceptance Criteria; 10/28/2018
- EC 43977; K-6B, Document Maximum Engine Speed Limitation and Overspeed Setting Range; Revision 0
- EC 55441; Install High Head Auxiliary Feedwater Pump P-8D and Shed and Cross Connect Tanks T-2 to T-939-NFPA 805 Project; Revision 0
- ECT 55441-01; Post Modivication Test Procedure P-8D, Diesel Driven Auxiliary Feedwater Pump and Associated Check Valves; Revision 0
- MO-7A-1; Emergency Diesel Generator 1-1; Revision 99
- QO-5; Valve Test Procedure (Includes Containment Isolation Valves); Revision 105
- T-302; Emergency Diesel Generator 1-1 Overspeed Trip Setpoint Verification; Revision 17
- WO 510774; EB-12; Acrid Smell Around Load Center After Bus Transfer; 10/15/2018
- WO 510823; EX-12: Replace Transformer; 10/22/2018
- WO 52646043; VOP-3070; Overhaul Valve Actuator; 08/29/2018
- WO 52753129; P-52A, Cooling Water Pump PMT; 10/03/18
- WO 52753970; T-302 – D/G 1-1, Emergency D/G Overspeed Trip Setpoint Test; 10/01/2018

71111.20—Refueling and Other Outage Activities

- Admin. 4.02; Control of Equipment; Revision 81
- Admin. 4.49; Non-Power Operation Fire Risk Management; Revision 0
- CR-PLP-2018-06081; Suspected Wear Observed on Fuel Assembly CC56; 11/16/18
- CR-PLP-2018-06087; Containment Moisture Barrier Seal Degradation Evaluation; 11/16/18
- CR-PLP-2018-06375; During the As-Left Inspection Cleanliness Conditions were not as Expected; 11/28/2018
- EN-OM-123; Fatigue Management Program; Revision 14
- EN-OP-116; Infrequently Performed Tests or Evolutions; Revision 15

- EN-RE-324; PWR New Fuel and Core Component Receipt Inspection; Revision 5
- EOP Supplement 1; Pressure and Temperature Limit Curves; Revision 6
- GOP-11; Refueling Operations and Fuel Handling; Revision 50
- GOP-3; Mode 3 ≥ 525°F to Mode 2; Revision 33
- GOP-5; Power Escalation in Mode 1; Revision 45
- GOP-9; Mode 3 ≥ 525°F to Mode 4 or Mode 5; Revision 37
- Outage Risk Assessment for 1R26; Revisions 0 and 1
- RFL-D-16; Reactor Vessel Closure Head Removal; Revision 20
- SOP-1A; Primary Coolant System; Revision 33
- SOP-1C; Primary Coolant System – Heatup; Revision 24
- WI-PCS-M-06; NSSS Walkdown; Revision 5

71111.22—Surveillance Testing

- BCT-2000 Battery Load Test Report; 10/24/2018
- CR-PLP-2018-03292; During Performance of QO-34 Coltrol Rod Exercising CRD-40 Temperature Rose; 07/16/2018
- CR-PLP-2018-04653; Primary Cooling System Leakrate Completed 10/11/2018 Required Entry into Action level 3 per Admin 4.19; 10/11/2018
- CR-PLP-2018-04684; Unidentified Leak Rate >0.150 GPM Required Entry into AOP-23; 10/13/2018
- E-17; Safety Injection Actuation; Sheet 4; Revision 17
- Admin. 4.19; PCS Leak Rate Monitoring Program; Revision 6
- RE-83B; Service Test – Battery No ED-02; Revision 30
- RT-8D; Engineered Safeguards System – Right Channel; Revision 39
- SOP-23; Primary Coolant Leak; Revision 2
- WO 52777692; RE-83B – Service Battery No. ED-02; 10/24/2018
- WO 52779131; RT-8D – Engineered Safeguards System Right Channel; 11/10/2018
- WO 52780656; RO-32 – Containment Building Penetrations – LLRT (Main); 12/21/2018

71114.04—Emergency Action Level and Emergency Plan Changes

- 10 CFR 50.54(Q)(3) Evaluation – EAL Basis Revision 8 Evaluation; 05/23/2018
- 10 CFR 50.54(Q)(3) Evaluation – Site Emergency Plan Supplement I - EAL Wall Charts, Revision 4 Evaluation; 05/24/2018
- 10 CFR 50.54(Q)(3) Evaluation – Site Emergency Plan, Revision 29, and On-Shift Staffing Analysis, Revision 4 Evaluation; 08/01/2017
- 10 CFR 50.54(Q)(3) Screening – EAL Basis Revision 8 Screen; 05/23/2018
- 10 CFR 50.54(Q)(3) Screening – Site Emergency Plan Supplement I - EAL Wall Charts, Revision 4 Screen; 05/23/2018
- 10 CFR 50.54(Q)(3) Screening – Site Emergency Plan, Revision 29, and On-Shift Staffing Analysis, Revision 4 Screen; 08/01/2017
- 10 CFR 50.54(Q)(3) Screening – Site Emergency Plan, Revision 30 Screen; 03/01/2018
- 10 CFR50.54(Q) Training Documentation - Exemption Approval Form for D. Malone; 02/24/2012
- 10 CFR50.54(Q) Training Documentation Records (Sample)
- CR-PLP-2017-04821; Older Revision of Administrative Procedure 10.41 used to Process Site Emergency Plan, Revision 29; 10/24/2017
- CR-PLP-2018-01396; Atmospheric Dispersion Constant Impact on EAL Classification; 03/22/2018

- CR-PLP-2018-02123; EN-EP Series of Procedures which Implement Portions of the NRC Approved Palisades Site Emergency Plan (SEP) are not Designated "Quality Related"; 05/03/2018
- EAL Basis; Emergency Action Level Technical Bases; Revisions 7 and 8
- EN-EP-305 Attachment 9.4; 10CFR50.54(q) Training Documentation for K. Howard; 11/15/2017
- EN-EP-305 Attachment 9.4; 10CFR50.54(q) Training Documentation for S. McKinney; 03/15/2018
- EN-EP-305 Attachment 9.4; 10CFR50.54(q) Training Documentation for W. Cable; 04/10/2017
- EN-EP-305; Emergency Planning 10CFR50.54(q) Review Program; Revision 6
- SEP; Palisades Nuclear Plant Site Emergency Plan; Revisions 28, 29, and 30
- Site Emergency Plan Supplement I - EAL Wall Charts, Revisions 3 and 4

71124.01—Radiological Hazard Assessment and Exposure Controls

- 'A' and 'B' Steam Generator Primary Platform Surveys; Various Dates
- Containment Cavity Surveys; Various Dates
- Reactor Head Radiological Surveys; 11/15/2018
- Airborne Radioactivity Calculation Form; Various Dates
- EN-RP-131; Air Sampling; Revision 16
- EN-RP-122; Alpha Monitoring; Revision 9
- EN-RP-141-01; Job Coverage Using Remote Monitoring Technology; Revision 7
- CR-PLP-2018-03839; Posted Locked High Radiation Area Found Open; 08/22/2018
- CR-PLP-2018-05349; Platform Workers Not Dressed In Accordance With RWP; 10/31/2018

71124.02—Occupational As Low As Reasonably Achievable Planning and Controls

- RWP 20180449 and Associated ALARA Files; Refuel Project: Reactor Head Inspection: Volumetric (UT) Inspection Activities and Setup for Emergent Reactor Head Repairs; Revision 1
- RWP 20180454 and Associated ALARA Files; S/G Primary Side Activities; Revision 0
- RWP 20180433 and Associated ALARA Files; Refuel Project: Disassembly Of The Reactor Head and Associated Activities; Revision 0

71124.03—In-Plant Airborne Radioactivity Control and Mitigation

- Airgas Certificate of Analysis for Grade D Air; 10/29/2018
- Maxair Qualification Records; Various Dates
- FPF-GET-RPT; Respiratory Protection Practical Factor Guide; Revision 25
- CR-PLP-2018-05967; Variable Radioactive Airborne Activity with Values were Measured at Various Locations at the Spent Fuel Pool; 11/13/2018

71151—Performance Indicator Verification

- Performance Indicator Derivation Report for the Last 2 Quarters of 2017 and the First 2 Quarters of 2018
- NRC Indicator Occupational Exposure Control Effectiveness (OR01) Submittal Package; 10/1/2018-09/30/2018
- NRC Indicator Reactor Coolant System Specific Activity (BI01) Submittal Package; 10/1/2018-09/30/2018

- NRC Indicator RETS/ODCM Radiological Effluent Occurrence (PR01) Submittal Package; 10/1/2018-09/30/2018
- NEI 99-02; Regulatory Assessment Performance Indicator Guideline; Revision 7
- Mitigating Systems Performance Indicator; Emergency AC Power (EDG MSO6) November 2017; 01/11/2018
- Mitigating Systems Performance Indicator; Emergency AC Power (EDG MSO6) February 2018; 04/16/2018
- Mitigating Systems Performance Indicator; Emergency AC Power (EDG MSO6) August 2018; 10/19/2018
- Mitigating Systems Performance Indicator; Cooling Water Support (MS10 CWS-1) October 2017; 01/18/2018
- Mitigating Systems Performance Indicator; Cooling Water Support (MS10 CWS-2) October 2017; 01/08/2018
- Mitigating Systems Performance Indicator; Cooling Water Support (MS10 CWS-1) September 2018; 10/10/2018
- Mitigating Systems Performance Indicator; Cooling Water Support (MS10 CWS-2) September 2018; 10/10/2018

71152—Problem Identification and Resolution

- EC 75056; Palisades Cycle 27 Reload Core Design Evaluation; Revision 0
- CR-PLP-2017-03984; Potential Fuel Failure Confirmed bythe Fuel Integrity Monitoring Committee; 08/25/2017
- CR-PLP-2017-03864; Weekly Trending of PCS Radiochemistry Gas Samples; 08/17/2017
- CR-PLP-2018-06054; Assembly Shows Indication of a Failure; 11/15/2018
- EN-NF-102; Corporate Fuel Reliability; Revision 5
- EN-NL-121; Trending and Performance Review Process; Revision 25
- Palisades EOC26 Vacuum Sipping On Site Report; 12/03/2018
- Palisades Performance Improvement August 2018 Report; Revision 0
- LO-PLPLO-2017-00056; Self-Assessment on Outage FME Performance; 06/29/2018
- Trend Codes; Revision 6

92702—Followup on Corrective Actions for Violations and Deviations

- CR-PLP-2016-02518; Confirmatory Order (CO) EA-15-039 Issued to Palisades; 06/01/2016
- Letter to Mr. Anthony Vitale from the NRC; Confirmatory Order Related to NRC Report No. 05000255/2015013; and Investigation Report 3-2012-021; Palisades Nuclear Plant; dated 05/16/2016
- EN-TQ-201-05; SAT-Evaluation Phase; Revision 4
- PL-TRN16-2690 CA-0004; LM-0317 Attendance Roster; 01/12/2017
- TQF-201-EV03A; Post Training – Incumbent; Revision 2
- TQF-201-EV04A; Post Training Interview – Supervisor; Revision 1
- TQF-201-EV05A; Post Training Interview – Peer; Revision 1