



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
2443 WARRENVILLE RD. SUITE 210
LISLE, IL 60532-4352

October 15, 2015

EA-14-168

Mr. Anthony Vitale
Vice President, Operations
Entergy Nuclear Operations, Inc.
Palisades Nuclear Plant
27780 Blue Star Memorial Highway
Covert, MI 49043-9530

SUBJECT: PALISADES NUCLEAR PLANT; NRC SUPPLEMENTAL (95001) INSPECTION
REPORT 05000255/2015011 AND ASSESSMENT FOLLOW-UP LETTER

Dear Mr. Vitale:

As a result of our continuous review of plant performance, the U.S. Nuclear Regulatory Commission (NRC) updated its assessment of Palisades Nuclear Plant. The NRC's evaluation consisted of a review of performance indicators and inspection results. This letter informs you of the NRC's assessment of your facility. This letter supplements, but does not supersede, the mid-cycle letter issued on September 1, 2015.

On September 3, 2015, the NRC completed a supplemental inspection at your Palisades Nuclear Plant. The enclosed report documents the inspection results which were discussed on September 3, 2015, with you and members of your staff.

The NRC performed this supplemental inspection consistent with the NRC Action Matrix due to a White performance issue in the Occupational Radiation Safety Cornerstone. Specifically, on February 23, 2015, the NRC issued its Final Significance Determination and a Notice of Violation (NRC Inspection Report 05000255/2015007) for a White finding associated with the compromised ability to assess dose while utilizing effective dose equivalent for external exposure (EDEX) for the control rod drive mechanism housing replacement work, between February 6 and March 8, 2014. The NRC staff was informed on July 20, 2015, of your staff's readiness for this inspection.

This supplemental inspection utilized NRC Inspection Procedure (IP) 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," and was conducted to provide assurance that: (1) the root and contributing causes of the White performance issue were understood; (2) the extent of condition and extent of cause were identified; and (3) your corrective actions were sufficient to address the root causes and contributing causes and to prevent recurrence.

The inspection was an examination of activities conducted under your license as they relate to safety and to compliance with the Commission's Rules and Regulations and with the conditions of your license. Within these areas, the inspection focused on your staff's evaluation of the White performance issue and consisted of a selective review of procedures, documents and representative records, and interviews of personnel.

Your staff's evaluation identified that the root cause of the issue was a lack of processes to systematically incorporate the requirements contained in Regulatory Guides (RGs) into fleet and station processes. As a result, the requirements of RG 8.40, "Methods for Measuring Effective Dose Equivalent from External Exposure," were not incorporated into EN-RP-204, "Special Monitoring Requirements." Based on the results of this inspection, no findings associated with your staff's evaluation of this performance issue were identified. The inspector determined that your root cause evaluation for the White finding was conducted using systematic techniques and adequately identified the root and contributory causes for the specific performance issue.

Corrective actions were developed to address the identified cause and contributors, which included a revision to the Operating Experience review process to include a formal written review of new or revised RGs, improvements to the As-Low-As-Reasonably-Achievable personnel training on the use of EDEX, and a revision to the implementing procedure to include all requirements for the use of EDEX. We concluded that your corrective actions were adequate to address the causes that were identified in your evaluation so as to prevent recurrence.

After reviewing Palisades Nuclear Plant performance in addressing the White finding that was the subject of this inspection report, the NRC concluded your actions met the objectives of this IP 95001 inspection. Therefore, in accordance with Inspection Manual Chapter (IMC) 0305, "Operating Reactor Assessment Program," the White finding will only be considered in assessing plant performance for a total of four quarters. As a result, the NRC determined the performance at Palisades Nuclear Plant to be in the Licensee Response Column of the Reactor Operating Program Action Matrix as of October 1, 2015.

On September 18, 2015, a Regulatory Performance Meeting was conducted. During the meeting Palisades management discussed the underlying causes as well as the corrective actions implemented to address this White finding.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Billy C. Dickson, Chief
Health Physics and Incident Response Branch
Division of Reactor Safety

Docket No. 50-255
License No. DPR-20

Enclosure:
IR 05000255/2015011
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No.: 50-255
License No.: DRP-20

Report No.: 05000255/2015011

Licensee: Entergy Nuclear Operations, Inc.

Facility: Palisades Nuclear Plant

Location: Covert, MI

Dates: August 31, 2015, through September 3, 2015

Inspector: V. Myers, Senior Health Physicist, DRS

Approved by: B. C. Dickson, Chief
Division of Reactor Safety
Health Physics & Incident Response Branch

Enclosure

SUMMARY

Inspection Report (IR) 05000255/2015011; 08/31/2015 – 09/03/2015; Palisades Nuclear Plant; Supplemental Inspection - Inspection Procedure (IP) 95001.

A senior health physicist performed this inspection. No findings were identified during this inspection. The U.S. Nuclear Regulatory Commission's (NRC) program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

Cornerstone: Occupational Radiation Safety

The NRC staff performed this supplemental inspection in accordance with IP 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," to assess the licensee's evaluation associated with the compromised ability to assess dose while utilizing effective dose equivalent for external exposure (EDEx) for the control rod drive mechanism (CRDM) housing replacement work, which was conducted between February 6 and March 8, 2014. The NRC staff previously characterized this issue as having low to moderate safety significance (White), as documented in NRC IR 05000255/20015007. During this supplemental inspection, the inspector determined that the licensee performed a comprehensive evaluation of the specific performance issue and that comprehensive corrective actions addressed each of the root and contributing causes. The licensee identified one root cause in that Entergy processes did not have a requirement to systematically incorporate requirements contained in Regulatory Guides (RGs) into fleet and station processes. This resulted in the requirements of RG 8.40, "Methods for Measuring Effective Dose Equivalent from External Exposure," not being incorporated into fleet processes, ultimately resulting in regulatory requirements not being known by personnel implementing the EDEx process. Two contributing causes were identified as ineffective radiation protection field oversight and failure to validate assumptions.

Given the licensee's acceptable performance in evaluating and correcting the issues associated with the failure to perform EDEx appropriately, the White finding associated with this issue will only be considered in assessing plant performance for a total of four quarters in accordance with the guidance in Inspection Manual Chapter 0305, "Operating Reactor Assessment Program." As a result, the NRC determined the performance at Palisades Nuclear Plant to be in the Licensee Response Column of the Reactor Oversight Process (ROP) Action Matrix as of October 1, 2015.

Findings

No findings were identified.

REPORT DETAILS

4. OTHER ACTIVITIES

4OA4 Supplemental Inspection (95001)

.01 Inspection Scope

The U.S. Nuclear Regulatory Commission (NRC) staff performed this supplemental inspection in accordance with Inspection Procedure (IP) 95001 to assess the licensee's evaluation of a White finding, which affected the occupational radiation safety cornerstone in the radiation safety strategic performance area. The inspection objectives were to:

- provide assurance that the root and contributing causes of risk-significant issues were understood;
- provide assurance that the extent of condition and extent of cause of risk-significant issues were identified; and
- provide assurance that the licensee's corrective actions for risk-significant issues were or will be sufficient to address the root and contributing causes and to preclude repetition.

The licensee entered the Regulatory Response Column of the NRC's ROP Action Matrix in the fourth quarter of 2014 as a result of one inspection finding of low to moderate safety significance (White). The finding was associated with the compromised ability to assess dose while utilizing effective dose equivalent for external exposure (EDE_x) during Control Rod Drive Mechanism (CRDM) housing replacement work. A preliminary White finding and associated Apparent Violation (AV) 05000255/2014010-01, was issued in inspection report 05000255/2014010. A final White finding, based on the results of radiological risk in accordance with the occupational radiation safety significance determination process (SDP), was issued with a Notice of Violation (NOV) by letter dated February 23, 2015.

The licensee staff informed the NRC staff on July 20, 2015, that they were ready for the supplemental inspection. In preparation for the inspection, the licensee performed a root cause evaluation (RCE), CR-PLP-2014-04683, Revision 2, to identify the root and contributing causes of the White finding and to determine the organizational attributes that resulted in the White finding. The licensee also addressed safety culture in the RCE.

The inspector reviewed the licensee's RCE in addition to other evaluations conducted in support and as a result of the RCE. The inspector reviewed corrective actions that were taken or planned to address the identified causes. The inspector also held discussions with licensee personnel to ensure that the root and contributing causes and the contribution of safety culture components were understood and corrective actions taken or planned were appropriate to address the causes and preclude repetition.

.02 Evaluation of the Inspection Requirements

02.01 Problem Identification

- a. IP 95001 requires that the inspection staff determine that the licensee's evaluation of the issue documents who identified the issue (i.e., licensee-identified, self-revealing, or NRC-identified) and the conditions under which the issue was identified.

The issue related to improper use of EDEX during the CRDM housing replacement work was identified by an NRC health physics inspector during a routine baseline inspection. The licensee's RCE identifies that the issue was discovered by an NRC inspector in various records, including the licensee's RCE.

- b. IP 95001 requires that the inspection staff determine that the licensee's evaluation of the issue documents how long the issue existed and prior opportunities for identification.

The licensee's RCE documented that the CRDM housing replacement work with the use of EDEX was conducted from February 6, 2014, through March 8, 2014. The RCE also indicated that the issue went unrecognized by the licensee because procedure EN-RP-204, "Special Monitoring Requirements", failed to implement all requirements which resulted in a lack of knowledge related to the regulatory requirements of using EDEX.

- c. IP 95001 requires that the inspection staff determine that the licensee's evaluation documents the plant-specific risk consequences, as applicable, and compliance concerns associated with the issue.

A plant-specific probabilistic risk assessment is not applicable to this issue. However, the licensee did re-evaluate the EDEX using an NRC-approved method. This re-evaluation resulted in several individuals having unknowingly exceeded the licensee's administrative dose limit of 2 Rem but did not result in exceeding any federal dose limits. In accordance with procedure EN-RP-110-04, "Radiation Protection Risk Assessment Process," the licensee assigned a high safety significance because individuals were assigned an additional dose of greater than 500 mrem, which creates a high probability workers have exceeded another utilities' administrative dose guidance unknowingly and a less probable outcome that workers unknowingly exceeded a federal dose limit.

- d. Findings

No findings were identified.

02.02 Root Cause, Extent of Condition, and Extent of Cause Evaluation

- a. IP 95001 requires that the inspection staff determine that the licensee evaluated the issue using a systematic methodology to identify the root and contributing causes.

The licensee analyzed the issue to determine the root and contributing causes using procedure EN-LI-118, "Cause Evaluation Process," Revision 21, and other implementing procedures. The licensee utilized Barrier Analysis and the Organizational and Programmatic analysis techniques in accordance with these procedures. The inspector determined that the licensee evaluated the issue using a systematic methodology to identify root and contributing causes.

- b. IP 95001 requires that the inspection staff determine that the licensee's RCE was conducted to a level of detail commensurate with the significance of the issue.

The inspector concluded that the root cause evaluation had identified and assessed the potential contributors to the White finding in sufficient detail to identify appropriate corrective actions.

- c. IP 95001 requires that the inspection staff determine that the licensee's RCE included a consideration of prior occurrences of the issue and knowledge of Operating Experience (OE).

The RCE included a review of the licensee's corrective actions database. Although several previous condition reports were reviewed for similarities to this issue, none were determined to be similar. The RCE also included a review of external OE. This review identified one similar issue at another facility in which a non-cited violation was briefed for the inappropriate use of EDEX which resulted from regulatory requirements not being incorporated into processes. Although this OE was documented in an external database, it was never distributed to other licensees to be reviewed through their OE process and, therefore, was not considered a missed opportunity. The inspector concluded that the licensee's RCE appropriately considered both internal and external OE.

- d. IP 95001 requires that the inspection staff determine that the licensee's RCE addresses the extent of condition and extent of cause of the issue.

The licensee's evaluation considered the extent of condition associated with the misuse of EDEX and determined that the issue had the potential to exist in other jobs where EDEX was performed. The licensee also determined other non-EDEX dose assessments (e.g., extremity and internal) could also have been affected.

The licensee's evaluation also considered the extent of cause associated with the misuse of EDEX. This evaluation determined that the lack of process to incorporate RGs into processes could affect areas other than radiation protection. The licensee also determined that the lack of a formal process to incorporate RGs into licensee processes and procedures could also mean there was a lack of process to incorporate other OE type documents.

The inspector concluded that the licensee's RCE addressed the extent of condition and the extent of cause of the issue.

- e. IP 95001 requires that the inspection staff determine that the licensee's root cause, extent of condition, and extent of cause evaluations appropriately considered the safety culture components described in Inspection Manual Chapter 0305.

The licensee's RCE considered the safety culture components. The licensee determined that the root cause was related to the resources and change management areas while the contributing causes were related to field presence and complacency. The inspector concluded that the current safety culture aspects associated with this issue were appropriately considered in the licensee's RCE and included consideration of whether a weakness in any safety culture component was a root cause or a significant contributing cause of the issue.

f. Findings

No findings were identified.

02.03 Corrective Actions

- a. IP 95001 requires that the inspection staff determine that: (1) the licensee specified appropriate corrective actions for each root and/or contributing cause, or (2) an evaluation that states no actions are necessary is adequate.

Corrective actions were developed to address the root and contributing causes to prevent recurrence of the performance issue. Corrective actions, as documented in the root cause evaluation, included:

- A revision to EN-OE-100, "Operating Experience Program" to require a written evaluation of new or revised RGs.
- A review of radiation protection, emergency preparedness, and security procedures against current applicable RGs.
- A review of the OE screening process to determine if other types of OE (other than RGs) were not being included.
- Training on EDEX and tungsten vests for radiation protection (RP) personnel.

The inspector determined that the proposed corrective actions were appropriate and addressed each root and contributing cause.

- b. IP 95001 requires that the inspection staff determine that the licensee prioritized corrective actions with consideration of risk significance and regulatory compliance.

Upon notification of the violation, the licensee suspended use of EDEX. As part of their near term corrective actions, the licensee recalculated doses to the involved individuals. The licensee also recalculated doses for those individuals identified in the extent of condition review. At the time of the inspection, most long-term corrective actions had been completed with the exception of completing the review of radiation protection, emergency preparedness, and security procedures against applicable RGs, which was expected to be completed by the end of 2015.

The inspector considered the prioritization of the established corrective actions to be appropriate.

- c. IP 95001 requires that the inspection staff determine that the licensee established a schedule for implementing and completing the corrective actions.

The licensee established adequate schedules for the completion of the specified corrective actions. The majority of the corrective actions had been completed prior to

this inspection, and the remaining corrective actions were on schedule for completion. The inspector reviewed the completed corrective actions and concluded that they had been generally implemented in a timely and effective manner. The inspector did not identify any concerns with the scheduling or completion of corrective actions.

- d. IP 95001 requires that the inspection staff determine whether the licensee developed quantitative and/or qualitative measures of success for determining the effectiveness of the corrective actions to preclude repetition.

The licensee developed means to validate the effectiveness of the corrective actions for the performance deficiency. These means include performing a review of RWPs that use EDEX as well as observing RP technician briefing and radiation worker practices when EDEX is used in conjunction with tungsten vests. This review was to be performed in conjunction with the next maintenance outage as this is when EDEX is typically utilized. The effectiveness review plan also established a review of all RGs issued after the revision to EN-OE-100 to ensure the formal written evaluation was completed as directed. This review was scheduled to be completed 6 months after the revision to EN-OE-100.

The inspector determined that quantitative and qualitative measures of success had been developed for determining the effectiveness of the corrective actions to preclude repetition.

- e. IP 95001 requires that the inspection staff determine whether the licensee's planned or taken corrective actions adequately addressed a Notice of Violation (NOV) that was the basis for the supplemental inspection, if applicable.

The NRC issued an NOV to the licensee on February 23, 2015. The licensee provided the NRC a written response to the NOV on March 25, 2015. The licensee's response described: (1) corrective steps which have been taken and the results achieved; (2) corrective steps which will be taken; (3) the date when full compliance will be achieved; and (4) the reasons for the violation. During this inspection, the inspector confirmed that the licensee's RCE and planned and taken corrective actions addressed the NOV. The licensee indicated that full compliance would be restored with the completion of Revision 8 to EN-RP-204 which was implemented on June 4, 2015.

- f. Findings

No findings were identified.

4OA6 Management Meetings

Exit Meeting Summary

On September 3, 2015, the inspector presented the inspection results to Mr. A. Vitale, Site Vice President, and other members of his staff who acknowledged the results of the inspection. The inspector confirmed that proprietary information was not provided or examined during this inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

A. Vitale, Site Vice President
D. Nestle, Radiation Protection Manager
M. Ginzel, Radiation Protection
J. Hardy, Regulatory Assurance Manager

U. S. Nuclear Regulatory Commission

R. Pedersen, US NRC Headquarters

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Discussed

None

Closed

05000255/2014010-01	VIO	Failure to Monitor The Highest Exposed Part Of The Compartment When Using EDEX
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LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety, but rather, that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

- CR-PLP-2014-04683 RCE; EDEX Dose Reevaluation; Revision 2
- CR-PLP-2014-04683 Corrective Action Closure Documentation; Various Dates
- CR-PLP-2014-4349; Common Cause Analysis; September 10, 2014
- EN-LI-102; Corrective Action Program; Revision 24
- EN-LI-104; Self-Assessment and Benchmark Process; Revision 11
- EN-LI-118; Cause Evaluation Process; Revision 21
- EN-RP-204; Special Monitoring Requirements; Revision 5
- EN-RP-204; Special Monitoring Requirements; Revision 6
- EN-RP-204; Special Monitoring Requirements; Revision 8
- EN-RP-201; Dosimetry Administration; Revision 4
- EN-RP-203; Dose Assessment; Revision 7
- EN-OE-100; Operating Experience Program; Revision 24
- O2C-PAL-2015-0143; Oversight Observation Checklist; May 5, 2015
- RG 8.40; Methods For Measuring Effective Dose Equivalent From External Exposure; July, 2010
- NRC Form 5; Occupational Dose Record For A Monitoring Period; Various Individuals for 2014
- 2015 Pursuing Excellence Plan; September 2, 2015

Your staff's evaluation identified that the root cause of the issue was a lack of processes to systematically incorporate the requirements contained in Regulatory Guides (RGs) into fleet and station processes. As a result, the requirements of RG 8.40, "Methods for Measuring Effective Dose Equivalent from External Exposure," were not incorporated into EN-RP-204, "Special Monitoring Requirements." Based on the results of this inspection, no findings associated with your staff's evaluation of this performance issue were identified. The inspector determined that your root cause evaluation for the White finding was conducted using systematic techniques and adequately identified the root and contributory causes for the specific performance issue.

Corrective actions were developed to address the identified cause and contributors, which included a revision to the Operating Experience review process to include a formal written review of new or revised RGs, improvements to the As-Low-As-Reasonably-Achievable personnel training on the use of EDEX, and a revision to the implementing procedure to include all requirements for the use of EDEX. We concluded that your corrective actions were adequate to address the causes that were identified in your evaluation so as to prevent recurrence.

After reviewing Palisades Nuclear Plant performance in addressing the White finding that was the subject of this inspection report, the NRC concluded your actions met the objectives of this IP 95001 inspection. Therefore, in accordance with Inspection Manual Chapter (IMC) 0305, "Operating Reactor Assessment Program," the White finding will only be considered in assessing plant performance for a total of four quarters. As a result, the NRC determined the performance at Palisades Nuclear Plant to be in the Licensee Response Column of the Reactor Operating Program Action Matrix as of October 1, 2015.

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Sincerely,
/RA/
 Billy C. Dickson, Chief
 Health Physics and Incident Response Branch
 Division of Reactor Safety

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Letter to Mr. Anthony Vitale from Mr. Billy C. Dickson dated October 15, 2015

SUBJECT: PALISADES NUCLEAR PLANT; NRC SUPPLEMENTAL (95001) INSPECTION
REPORT 05000255/2015011 AND ASSESSMENT FOLLOW-UP LETTER

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