



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, ILLINOIS 60532-4352

December 1, 2021

Mr. Rod Penfield
Site Vice President
Energy Harbor Nuclear Corp.
Perry Nuclear Power Plant
10 Center Road,
Perry, OH 44081

**SUBJECT: PERRY NUCLEAR POWER PLANT – TRIENNIAL FIRE PROTECTION
INSPECTION REPORT 05000440/2021010**

Dear Mr. Penfield:

On October 21, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Perry Nuclear Power Plant and discussed the results of this inspection with Mr. D. Reeves, Site Engineering Director and other members of your staff. The results of this inspection are documented in the enclosed report.

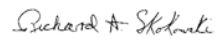
One finding of very low safety significance (Green) is documented in this report. This finding involved a violation of NRC requirements. We are treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violation or the significance or severity of the violation 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 Perry Nuclear Power Plant.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; and the NRC Resident Inspector at Perry Nuclear Power 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 Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,



Signed by Skokowski, Richard
on 12/01/21

Richard A. Skokowski, Chief
Engineering Branch 3
Division of Reactor Safety

Docket No. 05000440
License No. NPF-58

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV®

Letter to Rod Penfield from Richard A. Skokowski dated December 1, 2021.

SUBJECT: PERRY NUCLEAR POWER PLANT – TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000440/2021010

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Number: 05000440

License Number: NPF-58

Report Number: 05000440/2021010

Enterprise Identifier: I-2021-010-0056

Licensee: Energy Harbor Nuclear Corp.

Facility: Perry Nuclear Power Plant

Location: Perry, OH

Inspection Dates: September 13, 2021 to October 21, 2021

Inspectors: A. Dahbur, Senior Reactor Inspector (Lead)
I. Hafeez, Reactor Inspector
J. Gilliam, Senior Reactor Inspector

Approved By: Richard A. Skokowski, Chief
Engineering Branch 3
Division of Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a triennial fire protection inspection at Perry Nuclear Power 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.

List of Findings and Violations

Failure to Provide Adequate Guidance to Mitigate Spurious Operation of Breaker EH1115			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000440/2021010-01 Open/Closed	[H.3] - Change Management	71111.21N.05
The inspectors identified a finding of very low safety significance (Green), and an associated non-cited violation (NCV) of Technical Specifications (TS) Section 5.4.1.a for the licensee's failure to have adequate procedural guidance in their fire response procedure. Specifically, Procedure IOI-0011, "Shutdown from Outside Control Room," Revision 39, did not prioritize isolation of the Control Room circuits for breaker EH1115 and it did not include instructions for operating the circuit breaker without control power.			

Additional Tracking Items

None.

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 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. Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the coronavirus (COVID-19), inspectors were directed to begin telework. In addition, regional baseline inspections were evaluated to determine if all or a portion of the objectives and requirements stated in the IP could be performed remotely. If the inspections could be performed remotely, they were conducted per the applicable IP. In some cases, portions of an IP were completed remotely and on site. The inspections documented below met the objectives and requirements for completion of the IP.

REACTOR SAFETY

71111.21N.05 - Fire Protection Team Inspection (FPTI)

Structures, Systems, and Components (SSCs) Credited for Fire Prevention, Detection, Suppression, or Post-Fire Safe Shutdown Review (IP Section 03.01) (3 Samples)

The inspectors verified that the following systems credited in the approved fire protection program could perform their licensing basis function:

- (1) Operating Procedure ONI-C61 "Evacuation of the Control Room,"
Operating Procedure IOI-0011 "Shutdown from Outside Control Room."
- (2) Post-Fire Safe Shutdown Analysis including Multiple Spurious Operation Scenarios.
- (3) Wet Pipe Water Suppression System at Elevation 599' (FZ OCC-2C) above
Suspended Ceiling.

Fire Protection Program Administrative Controls (IP Section 03.02) (1 Sample)

The inspectors verified that the following fire protection program administrative controls were implemented in accordance with the current licensing basis:

- (1) Combustible Control Program.

Fire Protection Program Changes/Modifications (IP Section 03.03) (1 Sample)

The inspectors reviewed the following changes to ensure that they did not constitute an adverse effect on the ability to safely shutdown post-fire and to verify that fire protection program documents and procedures affected by the changes were updated.

- (1) License Amendment associated with abandon in place the general area heat detection system in the drywell.

INSPECTION RESULTS

Failure to Provide Adequate Guidance to Mitigate Spurious Operation of Breaker EH1115			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000440/2021010-01 Open/Closed	[H.3] - Change Management	71111.21N.05
<p>The inspectors identified a finding of very low safety significance (Green), and an associated non-cited violation (NCV) of Technical Specifications (TS) Section 5.4.1.a for the licensee's failure to have adequate procedural guidance in their fire response procedure. Specifically, Procedure IOI-0011, "Shutdown from Outside Control Room," Revision 39, did not prioritize isolation of the Control Room circuits for breaker EH1115 and it did not include instructions for operating the circuit breaker without control power.</p>			
<p><u>Description:</u></p> <p>The licensee performed a detailed review of Perry's susceptibility to the effects of postulated Multiple Spurious Operations (MSOs) and identified a potential vulnerability in isolating equipment from a Control Room fire. Particularly, in the event of a Control Room fire, the licensee identified a vulnerability of the alternate preferred source breaker (EH1115) closing due to MSO of control circuits which were routed to the Control Room. A spurious/unplanned closure of the alternate preferred source breaker (EH1115) could cause a temporary loss of the Division 1 Diesel Generator and consequently bus EH11 and all Division 1 Safety Related loads. If the Emergency Diesel Generator (EDG) was connected to bus EH 11 following a loss of offsite power (LOOP) (the expected response) and breaker EH1115 were to close, the Division 1 Diesel Generator could trip and require operations to manually trip breaker EH1115 to allow the Diesel to be re-aligned to bus EH11.</p> <p>The licensee implemented Engineering Change Package (ECP) 12-0229 which provided a method for isolating control circuitries that were routed to the Control Room associated with the closing coil for breaker EH1115 during a Control Room fire. The modification did not alter the control logic for breaker EH1115 when the IR22-S51 placed in Remote (Control Room). The modification isolated the circuits that are routed to the Control Room when control of the Division 1 EDG changed from the Control Room to Local using Switch 1R22-S51 at panel 1H51-P055A. As a result, operators will not be able to close EH1115 using switch S28 located in the Main Control Room once control of the Division 1 EDG has been transferred to the local Diesel Panel. However, operators could trip the breaker from the Control Room using S28, as this modification did not affect the control logic for the trip coil. The modification noted that if breaker EH1115 was closed during manipulation of switch 1R22-S51, the breaker would remain in the closed position until operators locally trip the breaker at the switchgear because removing control power to the closing coil of the breaker does not cause the breaker to open. The modification did not change the control logic nor isolated the circuits routed to the Control Room associated with the trip coil.</p> <p>In March of 2018, as a result of the modification, the licensee revised Procedure IOI-0011 "Shutdown from Outside Control Room," and added Step 4.3 in Attachment 20, "Control Room Isolation," to verify breaker EH1115 was open prior to aligning the EDG to the safety related bus. The inspectors reviewed Procedure IOI-0011 and noticed that Step 4.8.1 of Attachment 20, directed operators to place the Diesel Generator control transfer switch to LOCAL at EDG Control Panel 1H51-P055A. The inspectors recognized that the procedure</p>			

failed to ensure breaker EH1115 was open after the operators transfer the control switch to LOCAL. Specifically, if breaker EH1115 spuriously closed after the licensee verified the breaker was open in Step 4.3 and before placing the transfer switch to local in Step 4.8.1, the operators may not be able to align EDG-1 to its safety bus which could affect safe shutdown. In addition, because control power to the trip coil was not modified and could be lost in the event of a fire in the Control Room, operators would not be able to trip the breaker from the switchgear using the trip push button. The inspectors concluded that the procedure did not include specific guidance on mechanical means of operating the breaker.

Corrective Actions: The licensee entered the inspectors' issues into their corrective action program and recommended revising Procedure IOI-0011.

Corrective Action References: CR-2021-07492 "Procedure Deficiencies"

Performance Assessment:

Performance Deficiency: The inspectors determined that the licensee's failure to adequately revise the safe shutdown procedure after implementing ECP 12-0229 was contrary to TS Section 5.4.1.a, and a performance deficiency. Specifically, in the event of a Control Room fire, Procedure IOI-0011 failed to prioritize isolation of the Control Room circuits for breaker EH1115 and it did not include instructions for operating the circuit breaker without control power to ensure proper alignment of the EDG to the safety bus.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Procedure Quality attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, a fire in the Control Room could damage circuits for breaker EH-1115 causing a potential spurious closing of the breaker and affecting the operation of the EDG breaker EH-11 from outside the Control Room. The lack of adequate procedural guidance to prioritize isolation of the Control Room circuits for breaker EH1115 and lack of instructions for operating the circuit breaker without control power could potentially impair the operation of the EDG breaker EH-11 and affect shutdown of the plant.

Significance: The inspectors assessed the significance of the finding using Appendix F, "Fire Protection and Post - Fire Safe Shutdown SDP." The inspectors determined that the finding impacted the ability to achieve safe shutdown and assigned the finding to the category of 1.4.8 Main Control Room Fire using Table 1 in IMC 0609, Appendix F, Attachment 1, "Part 1: Fire Protection SDP [Significance Determination Process] Phase 1 Worksheet," dated May 03, 2018. The inspectors answered "Yes" to Question 1.4.8-A, "the finding involves the malfunction (either a spurious operation due to a hot short or the failure to operate due to fire damage) of two or more components located in the main control board (MCB) (MCB includes any panels in the horseshoe area or within the line of sight of the operators), is all of the internal cabinet wiring in the MCB qualified (such as per Institute of Electrical and Electronics Engineers (IEEE) - 383) and are the components located at least 8.2 feet (2.5 meters) apart?" All MCB cables were qualified to IEEE-383 and in addition, per Perry's Individual Plant Examination of External Events (IPEEE) only one fire scenario in Control Room panel 1H13P870 can cause a LOOP. Cables that can cause spurious operation/closer on breaker EH1115 were in panel 1H13P877 and not in 1H13P870. Therefore, the inspectors determined that the finding screened as having very low safety significance (Green) because there was no credible fire scenario that can affect offsite power and EDG operation.

Cross-Cutting Aspect: H.3 - Change Management: Leaders use a systematic process for evaluating and implementing change so that nuclear safety remains the overriding priority. Specifically, in 2018 when the licensee added the step to verify EH1115 was open in Procedure IOI-0011, they failed to correctly implement the modification and recognize that control power to open the breaker may not be available due to fire induced failure and additional instructions to mechanically open the breaker were needed.

Enforcement:

Violation: Technical Specifications Section 5.4.1.a requires, in part, that “written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978.” NRC Regulatory Guide 1.33, Appendix A, Section 6 addresses “Procedures for Combating Emergencies and Other Significant Events,” and Section 6.v, addresses “Plant Fires.” Procedure IOI-0011, “Shutdown from Outside Control Room,” Revision 39, was the implementing procedure for responding to a fire event in the Control Room.

Contrary to the above, from 2012 through October 07, 2021, the licensee failed to maintain a written fire response Procedure IOI-0011 to be able to safely shutdown in the event of a Control Room fire as required per TS Section 5.4.1.a. Specifically, the licensee failed to correctly update Attachment 20 in Procedure IOI-0011 when they implemented ECP 12-0229. The procedure did not prioritize isolation of the Control Room circuits for breaker EH1115 and it did not include instructions for operating the circuit breaker without control power.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On October 21, 2021, the inspectors presented the triennial fire protection inspection results to Mr. D. Reeves, Site Engineering Director and other members of the licensee staff.
- On October 1, 2021, the inspectors presented the Interim Exit inspection results to Mr. R. Penfield, Site Vice President and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.21N.05	Calculations	SSC-001, Att. 1	Safe Shutdown Capability Report	5
	Corrective Action Documents	CR 2019-00241	Wall Depiction Error on Drawing 023-0011-00000	01/10/2019
		CR 2019-01202	Several Appendix R and BTP 9.5-1 Fire Barriers Not Properly Depicted on Drawings and/or Not Included in PTI-P54-P0054	02/08/2019
		CR G202-2010-766215	Control Room Fire Induced MSO Potential Vulnerability	04/30/2010
	Corrective Action Documents Resulting from Inspection	CR 2021-07492	Procedure Deficiencies	10/07/2021
	Drawings	023-0007-00000	Fire Protection Evaluation-Control Complex Plan - Elevation 599'-0"	M
		208-0006	4.16KV Switchgear Internals	G
		221-0024-00000	Electrical Plant Security and Fire Protection Conduit Layout Reactor Plant Auxiliary Plan EL 599'-0"	J
		4549-70A-001-41-5A	Control Complex Sprinklers EL 599'-0" - 38E Series Head	4
		70A-0001-00040-4A	Control Complex Sprinklers EL 599'-0" - Piping Plan Above 599-0	4
		70A-0001-00040A-3	Control Complex Sprinklers EL 599'-0" - Reflected Ceiling Plan Below Susp. Ceiling 599-0	3
	Engineering Changes	19-0114-000	Re-establish PNPP's Compliance with the Requirements of NRC Branch Technical Position (BTP) 9.5-1	0
		ECP 12-0229-000	Reconfigure the Control Logic for Breaker EH1115	1
	Procedures	FPI-OCC	Pre-Fire Plan Instruction Control Complex	12
		IOI-0011	Shutdown from Outside Control Room	39
		ONI-P54	Fire	27
		PAP-1910	Fire Protection Program	40
		PTI-P54-P0053R	1M38 AND 1M47 System Fire Damper Visual Inspection	2
	Work Orders	200774384	PTI-P54P0036 (18M) Diesel Fire Pump Flow Data and	04/28/2020

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Control Panel Functional Test	
		200813232	Motor Driven Fire Pump Flow Data and Control Panel Functional Test(18M)	08/02/2021
		PTI-P54-P0009	Quarterly Fire Alarm Test	16