UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

April 7, 2021

Mr. David P. Rhoades
Senior Vice President Exelon Generation Company, LLC
President and Chief Nuclear Officer, Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT – TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000333/2021010

Dear Mr. Rhoades:

On March 25, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at James A. FitzPatrick Nuclear Power Plant and discussed the results of this inspection with Mr. Pat Navin, Site Vice President 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 I; the Director, Office of Enforcement; and the NRC Resident Inspector at James A. FitzPatrick 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 I; and the NRC Resident Inspector at James A. FitzPatrick 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,

X /RA/

Signed by: Glenn T. Dentel

Glenn T. Dentel, Chief
Engineering Branch 2
Division of Reactor Safety

Docket No. 05000333
License No. DPR-59

Enclosure:
As stated

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SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT – TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000333/2021010 DATED APRIL 7, 2021

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Number:	05000333
License Number:	DPR-59
Report Number:	05000333/2021010
Enterprise Identifier:	I-2021-010-0008
Licensee:	Exelon Generation Company, LLC
Facility:	James A. FitzPatrick Nuclear Power Plant
Location:	Oswego, NY
Inspection Dates:	March 8, 2021 to March 25, 2021
Inspectors:	D. Kern, Senior Reactor Inspector, Team Lead C. Bickett, Senior Reactor Inspector E. Dipaolo, Senior Reactor Inspector
Approved By:	Glenn T. Dentel, Chief Engineering Branch 2 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 James A. FitzPatrick 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 Station a Continuous Fire Watch Compensatory Measure in the Diesel Generator Rooms While the Associated Automatic Pre-action Sprinkler Systems Were Out of Service for Planned Maintenance			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000333/2021010-01 Open/Closed	[H.13] - Consistent Process	71111.21N.05
The inspectors identified a Green non-cited violation of FitzPatrick Operating License Condition 2.C(3) because Exelon did not implement a continuous fire watch as required by the Technical Requirements Manual during planned maintenance to replace fire protection system valves.			

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.

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) (4 Samples)

The inspectors verified that components and/or systems will function as required to support the credited functions stated for each sample. Additional inspection considerations are located in the fire hazards analysis (FHA) or safe shutdown analysis (SSA).

(1) Fire Water Suppression System, Including Fire Water Pumps, Piping, Spray Nozzles, and Potential Consequence of Internal Flooding from the Fire Water System
(2) Fire Barrier Penetrations/Seals
(3) 'A' LPCI Inverter (71INV-3B) and Associated Components (e.g., MOVs) it Supplies
(4) Safety Relief Valve (SRV)/Automatic Depressurization System (ADS) Valves 02RV-71D/E/G/H

Fire Protection Program Administrative Controls (IP Section 03.02) (2 Samples)

The inspectors verified that the selected control or process is implemented in accordance with the licensee's current licensing basis. If applicable, ensured that the licensee's FPP contained adequate procedures to implement the selected administrative control. Verified that the selected administrative control met the requirements of all committed industry standards.

(1) Control of High Risk Fire Areas (control room (FZ-CR-1), relay room (FZ RR-1), west cable tunnel (FZ CT-1), cable spreading room (FZ CS-1))
(2) Control of Combustible Loading and Transient Combustible Material

Fire Protection Program Changes/Modifications (IP Section 03.03) (2 Samples)

The inspectors verified the following changes to the approved fire protection program do not constitute an adverse effect on the ability to safely shutdown.

(1) Major Fire Header Repairs, Including Isolation Valves 76FPS-55, 57, 58 Performed in July 2019
(2) JAF-ANAL-FPS-01183, Generic Evaluation 21.0, Assess Fiber Optic Cable Penetration as a 3-hour Fire Rated Penetration Seal

INSPECTION RESULTS

<table>
<tr><td colspan="4">Failure to Station a Continuous Fire Watch Compensatory Measure in the Diesel Generator Rooms While the Associated Automatic Pre-action Sprinkler Systems Were Out of Service for Planned Maintenance</td></tr>
<tr><td>Cornerstone</td><td>Significance</td><td>Cross-Cutting Aspect</td><td>Report Section</td></tr>
<tr><td>Mitigating Systems</td><td>Green
NCV 05000333/2021010-01
Open/Closed</td><td>[H.13] - Consistent Process</td><td>71111.21N.05</td></tr>
<tr><td colspan="4">The inspectors identified a Green non-cited violation of FitzPatrick Operating License Condition 2.C(3) because Exelon did not implement a continuous fire watch as required by the Technical Requirements Manual during planned maintenance to replace fire protection system valves.</td></tr>
<tr><td colspan="4">Description: In July 2019, Exelon removed portions of FitzPatrick's fire protection system from service in order to support replacement of fire protection system valves 76FPS-55, -57, and -58. This included removing fire pumps 76P-1, -2, and -3 from service as well as securing multiple sprinkler systems, hose stations, and hydrants throughout the station.

Removal of sprinkler systems from service requires the station to implement Technical Requirements for Operation (TRO) 3.7.I, "Water Spray and Sprinkler System," in the Technical Requirements Manual. Operations entered this TRO action statement on July 9, 2019, at 1945 and stationed hourly fire watches in multiple areas as compensatory measures, including the north and south diesel generator rooms as well as the 272' elevation of the reactor building. To further mitigate risk, the station established a backup fire water suppression system via city water; worked the maintenance around the clock to minimize unavailability time; removed transient combustibles; ensured no hot work was performed during the maintenance; and ensured that backup diesel driven fire pump 76P-4 could be restored during an emergency. Operations exited the TRO action statement on July 11, 2019 at 1426.

The inspectors reviewed Exelon's compensatory measures for this maintenance and compared them to the requirements listed in the Technical Requirements Manual. TRO 3.7.I states that sprinkler systems listed in Table T3.7.I-1 shall be functional. If one or more sprinkler systems are non-functional, the station is required to:

· Establish a continuous fire watch within one hour or
· Ensure backup fire suppression is available, verify early warning fire detection is operable, and establish an hourly fire watch patrol, all within one hour, and restore the sprinkler system to functional within 14 days.

Table T3.7.I-1 includes the sprinkler systems for the north and south emergency diesel generator rooms and water curtain #2, which is located on the 272' elevation of the reactor building. This table also states that early warning fire detection for these areas is "N/A". The Technical Requirements Manual further explains that early warning fire detection devices initiate alarms only and do not result in fire system actuation. The inspectors noted that this statement, as well as the requirements in TRO 3.7.I, are directly supported by Nuclear Safety Evaluation JAF-NSE-00-033, dated 01/19/2001.

The inspectors completed a walkdown of the diesel generator rooms and water curtain #2</td></tr>
</table>

(reactor building 272' elevation) to determine what detection capability was available in those areas. The inspectors observed that early warning fire detection (smoke detectors) was available at water curtain #2. However, early warning fire detection was not available in the north and south emergency diesel generator rooms. The only detection system available was heat detection, which normally actuates the automatic pre-action sprinklers in the emergency diesel generator rooms, and thus did not satisfy the requirements of TRO 3.7.I for early warning detection. As such, the inspectors concluded that a continuous fire watch was appropriate for the north and south diesel generator rooms instead of the hourly fire watch that Exelon had implemented.

Corrective Actions: The Shift Operations Superintendent reviewed this issue with all operating crew Shift Managers. All Shift Managers notified their crews that if a water spray or sprinkler system became non-functional and the Early Warning Fire Detection was marked N/A in TRM 3.7.I, then a continuous fire watch was required. Exelon entered this issue into the corrective action program to determine and remediate the cause.

Corrective Action References: Issue reports 4408812 and 4410988

Performance Assessment:

Performance Deficiency: Exelon's failure to follow the Technical Requirements Manual and station a continuous fire watch in the north and south diesel generator rooms while the associated automatic pre-action sprinkler systems were out of service was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Protection Against External Factors 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, during this maintenance, Exelon stationed a fire watch in the north and south emergency diesel generator rooms at a frequency less than that stated in the Technical Requirements Manual (i.e., hourly vs. required continuous). A fire watch at a reduced frequency, lack of early warning fire detection, and out-of-service automatic pre-action sprinkler systems due to maintenance would have delayed suppression of a fire in this area.

Significance: The inspectors assessed the significance of the finding using Appendix F, "Fire Protection and Post - Fire Safe Shutdown SDP." The inspectors determined that this issue was associated with the "Fixed Fire Protection Systems" category because the fire watches were posted as a compensatory measure for a fixed fire protection system outage. The inspectors determined that a Phase 2 assessment would be required since the finding could not be assigned a low degradation rating and the deficiency (reduced frequency fire watch) adversely affected the ability of the system to protect equipment important to safe shutdown. Additionally, FitzPatrick does not have an approved fire probabilistic risk assessment available to screen the issue in accordance with Step 1.5.

For the Phase 2 assessment, the inspectors conducted a bounding risk quantification using the following inputs and assumptions:

· Duration factor of 42.75 hours, which is based on the time that the station was in the

TRO 3.7.I action statement. This is conservative given that there was an hourly fire watch in place for the duration of the maintenance.

- Fire ignition frequencies for the diesel generator rooms as listed in JF-PRA-021.06, "Fire Ignition Frequency Notebook," Revision 1
- Bounding values of 1.0 for adjustment factor, severity factor, and non-suppression probability
- Conditional core damage probability of 0.01 since high pressure coolant injection and reactor core isolation cooling were available.
- All four diesel rooms were included in the calculation, which is conservative since only one fire at a time is normally postulated.

Based on the above, the inspectors determined that the change in core damage frequency is conservatively 5.33E-07, which is of very low safety significance (i.e., Green).

Cross-Cutting Aspect: H.13 - Consistent Process: Individuals use a consistent, systematic approach to make decisions. Risk insights are incorporated as appropriate. This finding had a cross-cutting aspect in the area of Human Performance – Consistent Process because Exelon did not use a consistent, systematic approach to make decisions. Specifically, given the scope of the work and the impact on the availability of the fire protection system, Exelon did not implement a consistent approach to ensure that adequate compensatory measures were implemented for this infrequently performed maintenance evolution [H.13].

Enforcement:

Violation: FitzPatrick Operating License Condition 2.C(3) requires, in part, that Exelon shall implement and maintain in effect provisions of the approved fire protection program as described in the Final Safety Analysis Report for the facility. FitzPatrick Final Safety Analysis Report Section 9.8.5, "Fire Protection Program," states, in part, that the Technical Requirements Manual (TRM) will be used to implement the FitzPatrick Fire Protection Program.

Technical Requirement for Operation 3.7.I of the TRM, "Water Spray and Sprinkler System," states that sprinkler systems listed in Table T3.7.I-1 shall be functional. If one or more sprinkler systems are non-functional, the station is required to either:

- Establish a continuous fire watch within one hour or
- Ensure backup fire suppression is available, verify early warning fire detection is operable, and establish an hourly fire watch patrol, all within one hour, and restore the sprinkler system to functional within 14 days

Because early warning fire detection was not available for the north and south diesel generator rooms, a continuous fire watch was required for these areas. Contrary to this, from July 9, 2019 at 1945 to July 11, 2019 at 1426, Exelon established an hourly fire watch for the north and south emergency diesel generator rooms during replacement of fire water system valves 76FPS-55, -57, and -58.

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 March 25, 2021, the inspectors presented the triennial fire protection inspection results to Mr. Pat Navin, 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	ABB Impell Calculation 0090-00066-C-001	Combustible Loading Calculation for FAF	2
		JAF-CALC-20-00001	71T-4 Transformer Deluge System Hydraulic Calculation	0
		JAF-CALC-FPS-02013	Hydraulic Calculations for Fire Suppression Systems	1
	Corrective Action Documents	04012033		
		04287157		
		04287360		
		04289713		
		04301012		
		04380970		
		1517272		
		4135970		
		4136026		
		4265259		
		4314078		
		4371707		
		4374533		
		4374542		
		4374547		
		CR-JAF-2010-07457		
	Corrective Action Documents Resulting from Inspection	04407575		
		04407694		
		04407934		
		04408205		
		04411483		
		04411487		
		04411491		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		4408812		
		4409411		
		4410988		
	Drawings	FB-48A	Flow Diagram Fire Protection Water Piping System 76	34
		FB-49A	Sheet 1, Flow Diagram - Fire Protection Water Piping System 76	43
	Engineering Changes	EC 621773	Replace Existing GE Alterrex AVR with Digital ABB Unitrol Model	10/05/2020
	Engineering Evaluations	0090-00066-C-003	JAF Fire Suppression Effects Analysis for JAFNPP	4
		JAF-ANAL-FPS-00742	Miscellaneous Floor Penetrations in the Safety Related and Diesel Fire Pump Rooms	12/15/2012
		JAF-ANAL-FPS-01183	Assessment of a 3-Hour Fire Rated Silicone RTV Foam or Silicone Elastomer Penetration Seal Remain Functional	09/14/2018
		JAF-NSE-00-033	Revise AP-01.04 to Include Additional Early Warning Fire Detection Systems and the HPCI Foam System	0
		JAF-RPT-04-00478	JAF Fire Hazards Analysis	3
		MDE-137-0585	Analysis to Extend Operator Action Time for Alternate Shutdown Panels in Support of FitzPatrick Compliance to Appendix R	2
	Miscellaneous		Time Critical Action - Operator Response Time Validation	12/06/2018
			JAF Exelon Clearance 1C24-3 - Tagout 76-021- -FPS - 55/57/58	
			Operations Shift Log	02/05/2021
			James A. FitzPatrick Technical Requirements Manual	83
			Operations Shift Log	06/18/2019
			Operations Shift Log	07/11/2019
			NRC Review of Fire Protection Safety Evaluation Supplementary Items	10/03/1980
		DBD-076 TAB 1	Design Basis Document for Fire Protection, 076 System, Water Supply and Distribution	4
		JAF-RPT-04-00478	JAF Fire Hazards Analysis	3

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		JAF-SCN-19-04	Fire Engine Inspection 50.59 Screening	0
		JPN-79-72	Power Authority of the State of New York Fire Protection System Safety Evaluation Report Supplemental Submittal	11/17/1979
		JPS-79-12	Fire Detection System Criteria and Guidelines James A. FitzPatrick Nuclear Power Plant	03/05/1979
		MST-076.01	Diesel Fire Pump Engine, 76P-1 (ENG)	10/30/2020
		NCV 2016007-02	Failure to Adequately Evaluate a Procedure Change Impacting a PRA-Credited Time Critical Operator Action	
		NUREG 1905	Safety Evaluation Report Related to the License Renewal of James A. FitzPatrick Nuclear Plant	April 2008
		OPEX Evaluation 4059504	NRC Information Notice 2017-06, Battery and Battery Charger Short-Circuit Current Contributions to a Fault on Direct Current Distribution System	
		PMRQ 00345733	Inspect Fire System Sprinkler Heads and Piping	
		ST-22K	Manual Safety Relief Valve Operation System Test (completed test)	9/27/2020
		Vendor Manual C742-0081	Cummins Diesel Operation and Maintenance Manual	4
	Procedures	AOP-28	Operation During Plant Fires	28
		AOP-43	Plant Shutdown from Outside the Control Room	43
		AOP-51	Unexpected Fire Pump Start	10
		CC-AA-211	Fire Protection Program	8
		ER-AA-600-1069	High Risk Fire Area Identification	4
		IS-E-03	Opening and Sealing of Electrical Penetrations	20
		IS-M-04	Opening and Sealing of Non-Electrical Penetration Sleeves	15
		MST-076.11	Fire Barrier Penetration Functional Integrity Surveillance Test	21
		OP-33	Fire Protection	62
		OP-AA-201-007	Fire Protection System Impairment Control	0
		OP-AA-201-009	Control of Transient Combustible Material	25
		OP-JF-102-106	Operator Response Time Program at JAF	5
	Work Orders	4705086		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		4824402		
		4855725		
		4878469		
		5124467		
		5126011		