

UNITED STATES NUCLEAR REGULATORY COMMISSION

REGION I 2100 RENAISSANCE BOULEVARD, SUITE 100 KING OF PRUSSIA, PENNSYLVANIA 19406-2713

February 5, 2020

Mr. Bryan C. Hanson 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 – INTEGRATED INSPECTION REPORT 05000333/2019004

Dear Mr. Hanson:

On December 31, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at James A. FitzPatrick Nuclear Power Plant. On January 23, 2020, the NRC inspectors discussed the results of this inspection with Mr. Joseph Pacher, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

Two findings of very low safety significance (Green) are documented in this report. One of these findings involved a violation of NRC requirements. One Severity Level IV violation without an associated finding is documented in this report. We are treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violations or the significance or severity of the violations 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 or a finding not associated with a regulatory requirement 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 <u>http://www.nrc.gov/reading-rm/adams.html</u> 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,

/**RA**/

Erin E. Carfang, Chief Reactor Projects Branch 1 Division of Reactor Projects

Docket No. 05000333 License No. DPR-59

Enclosure: As stated

cc w/ encl: Distribution via LISTSERV®

SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT – INTEGRATED INSPECTION REPORT 05000333/2019004 DATED FEBRUARY 5, 2020

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U.S. NUCLEAR REGULATORY COMMISSION Inspection Report

| Docket Number: | 05000333 |
|------------------------|--|
| License Number: | DPR-59 |
| Report Number: | 05000333/2019004 |
| Enterprise Identifier: | I-2019-004-0038 |
| Licensee: | Exelon Generation Company, LLC |
| Facility: | James A. FitzPatrick Nuclear Power Plant |
| Location: | Oswego, NY |
| Inspection Dates: | October 01, 2019 to December 31, 2019 |
| Inspectors: | E. Miller, Senior Resident Inspector D. Beacon, Resident Inspector J. Dolecki, Resident Inspector S. Ghrayeb, Project Engineer R. Rolph, Senior Health Physicist B. Sienel, Resident Inspector G. Stock, Senior Resident Inspector |
| Approved By: | Erin E. Carfang, Chief Reactor Projects Branch 1 Division of Reactor Projects |

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated 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 for more information.

List of Findings and Violations

| Inadequate Work Instructions result in 71T-3 Reserve Station Transformer Unavailability | | | | |
|---|---|-------------------|----------------|--|
| Cornerstone | Significance | Cross-Cutting | Report | |
| | | Aspect | Section | |
| Initiating Events | Green | None | 71111.18 | |
| | FIN 05000333/2019004-01 | | | |
| | Open/Closed | | | |
| The inspectors iden | tified a Green finding associated with EN-\ | VM-105, "Planning | ," Revision 6, | |
| when FitzPatrick failed to develop adequate work instructions associated with a receipt | | | | |
| internal inspection of the 71T-3 115-kilovolt reserve station transformer on August 25, 2010. | | | | |
| As a result, loose connections and extra hardware were not identified prior to placing the | | | | |
| transformer in service. The loose connection resulted in low energy discharge arcing, | | | | |
| elevated total dissolved combustible gas concentrations, and the need to remove the | | | | |
| transformer from service on October 3, 2019, for repair. | | | | |

| Inadequate Design Control Results in Loss of 'B' Battery Room Ventilation | | | |
|---|-------------------------|---------------|----------|
| Cornerstone | Significance | Cross-Cutting | Report |
| | | Aspect | Section |
| Mitigating | Green | [H.1] - | 71111.19 |
| Systems | NCV 05000333/2019004-02 | Resources | |
| | Open/Closed | | |

The inspectors identified a Green non-cited violation (NCV) of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion III, Design Control," because FitzPatrick failed to adequately translate the design associated with a modification to a battery room ventilation damper actuator. Specifically, FitzPatrick staff did not fully evaluate the electrical circuit associated with installation of the replacement damper actuator, resulting in a wiring error that caused a failure of the 'B' battery room ventilation system on August 31, 2019.

| Safety Relief Valve | Safety Relief Valve Lift Setpoint Exceeds Technical Specification Allowable Value | | | |
|---|---|---------------------|------------|--|
| Cornerstone | Significance | Cross-Cutting | Report | |
| | | Aspect | Section | |
| Not Applicable | NCV 05000333/2019004-03 | Not Applicable | 71153 | |
| | Open/Closed | | | |
| A self-revealed Sev | verity Level IV non-cited violation (NCV) of | Technical Specifica | ation (TS) | |
| 3.4.3, "Safety/Relief Valves (S/RVs)" (two examples) was identified when FitzPatrick was | | | | |
| notified that the as-found lift setpoint of SRVs was measured below the minimum allowable | | | | |
| value. Specifically, between 2017 and 2019, multiple pilot stage assemblies tested | | | | |
| experienced drift beyond the +/- 3 percent tolerance permitted by TS 3.4.3, resulting in | | | | |
| FitzPatrick issuing I | NRC License Event Reports (LERs) 05000 | 333/2017-004-00, | 0 | |
| 05000333/2017-004 | 4-01, and 050000333/2019-003-00. | | | |
| | | | | |

Additional Tracking Items

| Туре | Issue Number | Title | Report Section | Status |
|------|----------------------|--|----------------|--------|
| LER | 05000333/2019-003-00 | Safety Relief Valves Out of Tolerance | 71153 | Closed |
| LER | 05000333/2017-004-00 | Safety Relief Valves Out of Tolerance | 71153 | Closed |
| LER | 05000333/2017-004-01 | Safety Relief Valves Out of Tolerance | 71153 | Closed |

PLANT STATUS

FitzPatrick began the inspection period at rated thermal power. On October 19, 2019, operators reduced reactor power to 70 percent to perform scram time testing, main steam isolation valve testing, turbine valve testing, and control rod hydraulic control unit maintenance. The unit was returned to rated thermal power the same day. FitzPatrick remained at or near rated thermal power for the remainder 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 Sample (IP Section 03.02) (1 Sample)

(1) The inspectors evaluated readiness for seasonal extreme weather conditions prior to the onset of seasonal cold temperatures on November 5, 2019

71111.04Q - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (2 Samples)

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

- (1) 'A' standby liquid control system on October 10, 2019
- (2) Reactor core isolation cooling system on November 7, 2019

71111.04S - Equipment Alignment

Complete Walkdown Sample (IP Section 03.02) (1 Sample)

(1) The inspectors evaluated system configuration during a complete walkdown of the instrument air system on December 14, 2019

71111.05Q - Fire Protection

Quarterly Inspection (IP Section 03.01) (4 Samples)

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

- (1) Reactor building, 344' elevation, fire area/zone IX/RB-1A on October 15, 2019
- (2) Switchgear room east, 272' elevation, fire area/zone II/SW-2 on October 18, 2019
- (3) Switchgear room west, 272' elevation, fire area/zone 1C/SW-1 on October 18, 2019
- (4) Battery room complex, 272', 282' fire area/zone XVI/BR-5 on November 6, 2019

71111.06 - Flood Protection Measures

Inspection Activities - Internal Flooding (IP Section 02.02a.) (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the:

(1) East and west crescent (reactor building) water intrusion due to manhole-1 (MH-1) sump pump failure on October 21, 2019

Inspection Activities - Underground Cables (IP Section 02.02c.) (1 Sample)

The inspectors evaluated cable submergence protection in:

(1) Underground cable inspection of MH-1 due to sump pump failure on October 25, 2019

71111.11Q - Licensed Operator Regualification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (1 Sample)

(1) The inspectors observed operators downpower to 70 percent to perform main steam isolation valve and main turbine control valve surveillance testing, and control rod scram time surveillance testing on October 19, 2019

Licensed Operator Requalification Training/Examinations (IP Section 03.02) (1 Sample)

(1) The inspectors observed a simulator evaluation that involved a failure of a feedwater pump and reactor recirculation pump, and a loss of offsite power on November 8, 2019

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness Inspection (IP Section 02.01) (1 Sample)

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

(1) Instrument air system on October 4, 2019

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (3 Samples)

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

- (1) Elevated risk during 71T-3 transformer planned maintenance on October 4, 2019
- (2) Planned maintenance associated with the 'B' reactor recirculation motor generator scoop tube control circuit on October 18, 2019
- (3) Elevated risk during electro-hydraulic control power supply planned maintenance on November 5, 2019

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 02.02) (3 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) 'B' low pressure coolant injection battery inverter following capacitor failure on October 16, 2019
- (2) 'D' residual heat removal pump 4.16-kilovolt breaker following identification of loose parts on October 25, 2019
- (3) 'B' core spray system following low torus water level alarm on December 17, 2019

71111.18 - Plant Modifications

<u>Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02)</u> (2 Samples)

The inspectors evaluated the following temporary or permanent modifications:

- (1) Engineering Change Package 9000012703, "Replace Reserve Station Service Transformers," on October 3, 2019
- (2) Engineering Change Package 629654, "Evaluation for Not Performing Full Inverter Performance Testing for 71INV-3B," on October 16, 2019

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (5 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) 71T-3 115-kilovolt reserve station transformer following repair of loose connections on October 8, 2019
- (2) 'B' drywell continuous atmospheric monitor following a radioactive source check failure and subsequent restart on October 8, 2019
- (3) Hydraulic control unit 30-47 scram solenoid pilot valve replacement on October 18, 2019

- (4) 71T-2 115-kilovolt reserve station transformer following preventive maintenance on October 24, 2019
- (5) 76P-4, east diesel fire pump following immersion heater repair on October 25, 2019

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Tests (other) (IP Section 03.01) (3 Samples)

- (1) 'A' and 'C' emergency diesel generators during review of Technical Specification 3.8.1 emergency license amendment submittal on October 3, 2019
- (2) 'B' and 'D' emergency diesel generators during review of Technical Specification 3.8.1 emergency license amendment submittal on October 3, 2019
- (3) 'A' residual heat removal system during review of Technical Specification 3.8.1 emergency license amendment submittal on October 3, 2019

Inservice Testing (IP Section 03.01) (2 Samples)

- (1) Reactor core isolation cooling system during review of Technical Specification 3.8.1 emergency license amendment submittal on October 3, 2019
- (2) High pressure coolant injection system during review of Technical Specification 3.8.1 emergency license amendment submittal on October 3, 2019

RCS Leakage Detection Testing (IP Section 03.01) (1 Sample)

(1) RP-JF-03.01, Drywell Continuous Atmospheric Monitoring System on October 23, 2019

RADIATION SAFETY

71124.01 - Radiological Hazard Assessment and Exposure Controls

Radiological Hazard Assessment (IP Section 02.01) (1 Sample)

The inspectors evaluated radiological hazards assessments and controls.

(1) The inspectors reviewed the following:

Radiological Surveys

- 369' reactor building
- 'A' reactor water cleanup pump room
- 'B' reactor water cleanup pump room
- 326' reactor building

Risk Significant Radiological Work Activities

- Dewatering of an independent spent fuel storage installation canister
- Reactor building refuel floor

Air Sample Survey Records

• The inspectors verified the operation of the AMS-4 on the refuel floor

Instructions to Workers (IP Section 02.02) (1 Sample)

The inspectors evaluated instructions to workers including radiation work permits used to access high radiation areas.

(1) The inspectors reviewed the following:

Radiation Work Packages

- JF-1-18-00541, Drywell Reactor Water Cleanup
- JF-1-18-00506, Drywell Scaffold Activities
- JF-1-18-00510, Drywell Safety Relief Valves
- JF-1-18-00516, Drywell Reactor Water Recirculation Pump
- JF-1-18-00901, Refuel Floor Reactor Disassembly and Reassembly Activities

Electronic Alarming Dosimeter Alarms

• No alarms occurred during the period of this inspection

Labeling of Containers

• The inspectors observed the labeling of bags in the radiation waste processing area

Contamination and Radioactive Material Control (IP Section 02.03) (1 Sample)

The inspectors evaluated licensee processes for monitoring and controlling contamination and radioactive material.

(1) The inspectors verified the following sealed sources are accounted for and are intact:
 Source #S-008 and Source #S-009

Radiological Hazards Control and Work Coverage (IP Section 02.04) (1 Sample)

The inspectors evaluated in-plant radiological conditions during facility walkdowns and observation of radiological work activities.

- (1) The inspectors also reviewed the following radiological work package for areas with airborne radioactivity:
 - No work packages within airborne areas were available for review during this inspection

Radiation Worker Performance and Radiation Protection Technician Proficiency (IP Section 02.06) (1 Sample)

(1) The inspectors evaluated radiation worker performance and radiation protection technician proficiency

71124.02 - Occupational ALARA Planning and Controls

Implementation of ALARA and Radiological Work Controls (IP Section 02.03) (1 Sample)

The inspectors reviewed as low as reasonably achievable (ALARA) practices and radiological work controls

- (1) The inspectors reviewed the following activities:
 - JF-1-18-00510, Drywell Safety Relief Valves
 - JF-1-18-00516, Drywell Reactor Water Recirculation Pump

71124.04 - Occupational Dose Assessment

External Dosimetry (IP Section 02.02) (1 Sample)

(1) The inspectors evaluated the external dosimetry program implementation

Internal Dosimetry (IP Section 02.03) (1 Sample)

The inspectors evaluated the internal dosimetry program implementation

(1) The inspectors reviewed the following:

Whole Body Counts

• No whole body counts were available to determine internal deposition since the last inspection

In-Vitro Internal Monitoring

• None were available during this inspection

Dose Assessments Performed Using Air Sampling and Derived Air Concentration-Hour Monitoring

• None were available during this inspection

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

OR01: Occupational Exposure Control Effectiveness Sample (IP Section 02.15) (1 Sample)

(1) September 1, 2018 through August 31, 2019

71152 - Problem Identification and Resolution

Semiannual Trend Review (IP Section 02.02) (1 Sample)

(1) The inspectors evaluated a sample of condition reports generated over the course of the second, third and fourth quarters of 2019 to determine whether issues were appropriately considered as emerging or adverse trends. The inspectors verified that these issues were addressed within the scope of the corrective action program or through department review.

71153 - Followup of Events and Notices of Enforcement Discretion

Event Report (IP Section 03.02) (3 Samples)

The inspectors evaluated the following LERs:

- (1) LER 05000333/2017-004-00, Safety Relief Valves Out of Tolerance (ADAMS accession number: ML18089A040). The previous LER submittal was reviewed in Inspection Report 05000333/2018004. The inspectors reviewed the updated LER submittal. The circumstances surrounding this LER are documented in the Inspection Results section of this report. This LER is Closed.
- (2) LER 05000333/2017-004-01, Safety Relief Valves Out of Tolerance (ADAMS accession number: ML18089A040). The inspectors reviewed the updated LER submittal. The previous LER submittal was reviewed in Inspection Report 05000333/2018004. The circumstances surrounding this LER are documented in the Inspection Results section of this report. This LER is Closed.
- (3) LER 05000333/2019-003-00, Safety Relief Valves Out of Tolerance (ADAMS accession number: ML19263B250). The circumstances surrounding this LER are documented in the Inspection Results section of this report. This LER is Closed.

INSPECTION RESULTS

| Inadequate Work Instructions result in 71T-3 Reserve Station Transformer Unavailability | | | |
|---|---|---------------------|----------|
| Cornerstone | Significance | Cross-Cutting | Report |
| | | Aspect | Section |
| Initiating Events | Green | None | 71111.18 |
| | FIN 05000333/2019004-01 | | |
| | Open/Closed | | |
| The inspectors identified a Green finding associated with EN-WM-105, "Planning," | | | |
| Revision 6, when FitzPatrick failed to develop adequate work instructions associated with a | | | |
| receipt internal insp | pection of the 71T-3 115-kilovolt reserve s | station transformer | on |

August 25, 2010. As a result, loose connections and extra hardware were not identified prior to placing the transformer in service. The loose connection resulted in low energy discharge arcing, elevated total dissolved combustible gas concentrations, and the need to remove the transformer from service on October 3, 2019 for repair.

<u>Description</u>: The 71T-3 115-kilovolt reserve station transformer is one of two transformers that supply alternating current (AC) power to the station during startup and shutdown. It also supplies power to the 10500 4.16-kilovolt bus during loss or degradation of the normal AC power supply from the main generator.

On September 26, 2019, FitzPatrick staff identified the 71T-3 transformer combustible gas concentration monitor in alarm. Subsequently, a monitoring plan was established along with contingency plans to replace or repair the transformer. On October 3, 2019, 71T-3 transformer combustible gas concentrations reached administrative limits established by the FitzPatrick staff. Operators then removed the transformer from service to begin inspections. On October 5, 2019, FitzPatrick staff identified a loose connection inside 71T-3 transformer at the on-line load tap changer. The staff also identified extra hexagonal nuts and extra lock washers that were determined to not be causal to the gassing, however were unexpected conditions that needed correction.

The inspectors reviewed FitzPatrick's modification to replace the 71T-3 reserve station transformer in 2012, as captured in Engineering Change 9000012703, "Replace Reserve Station Transformers," Revision 1. FitzPatrick carried out replacement and installation using Work Order 212936. The inspectors' review of the work order identified in task 26 step 4.9 that an internal inspection of the transformer was performed and signed as completed on August 26, 2010.

The inspectors determined the instructions to perform the internal inspection were not adequate. Procedure EN-WM-105, "Planning," Revision 6 step 5.2[4], "Develop Work Instructions," states in part under section (a) to "use the global planning macro to ensure standard text development for those packages requiring step text. See Attachment 9.1 for Global Macro Work Instructions development, expectations and guidelines."

Section 5.2[4](f) states in part, "compliance packages require step instructions using place-keeping and verifications. The Global Planning Macro shall be used to develop work instructions." Work Order 212936 was a "Compliance" work package. Attachment 9.1, "Global Macro Work Instructions" step 4.0, "Work Plan Details" states in part, "instructions should provide logical step progression and format throughout the written instructions to minimize confusion in the field." Step 4.4 states, "use approved plant procedures and technical manuals...where possible when writing instructions." The inspectors identified Entergy fleet guidance existed in EN-EE-G-001, "Large Power Transformer Inspection Guidelines," Revision 0, that provided steps to support internal inspections to make certain they are tight and there are no missing nuts and washers." Also, step 5.3.11 states to "check the bottom of the tank for loose debris or parts." The inspectors determined that the incorporation of this guidance documents steps for internal inspection during receipt of the 71T-3 transformer was reasonably within the ability for FitzPatrick staff to have incorporated and allowed the staff to adequately identify the loose connections and extra hardware.

Corrective Actions: Following tightening of the loose connections and removal of extra hardware, FitzPatrick staff successfully performed post maintenance testing and returned 71T-3 transformer to service on October 7, 2019. As part of corrective actions, Exelon also

performed an internal inspection of the 71T-2 reserve station transformer. Exelon did not identify any loose connections.

Corrective Action References: IR # 04283131 Performance Assessment:

Performance Deficiency: The inspectors determined that the failure to develop adequate work instructions associated with an internal inspection of the 71T-3 115-kilovolt reserve station transformer on August 25, 2010 was contrary to EN-WM-105, "Planning," Revision 6.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Procedure Quality attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The inspectors determined that this finding involved the partial loss of a support system that contributes to the likelihood of, or cause an initiating event (AC offsite power supply component), but did not affect mitigation equipment. Therefore, the inspectors determined the finding to be of very low safety significance (Green).

Cross-Cutting Aspect: None. The inspectors determined that the finding did not have an associated cross-cutting aspect because the performance deficiency occurred more than 3 years ago and was not indicative of current plant performance.

<u>Enforcement</u>: Inspectors did not identify a violation of regulatory requirements associated with this finding.

| Inadequate Desigr | Inadequate Design Control Results in Loss of 'B' Battery Room Ventilation | | | | |
|-------------------|---|---------------|----------|--|--|
| Cornerstone | Significance | Cross-Cutting | Report | | |
| | | Aspect | Section | | |
| Mitigating | Green | [H.1] - | 71111.19 | | |
| Systems | NCV 05000333/2019004-02 | Resources | | | |
| - | Open/Closed | | | | |

The inspectors identified a Green non-cited violation (NCV) of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion III, "Design Control," because FitzPatrick failed to adequately translate the design associated with a modification to a battery room ventilation damper actuator. Specifically, FitzPatrick staff did not fully evaluate the electrical circuit associated with installation of the replacement damper actuator, resulting in a wiring error that caused a failure of the 'B' battery room ventilation system on August 31, 2019. Description: On June 25, 2019, FitzPatrick staff completed a modification, Engineering Change 627077, to 'B' battery room ventilation damper actuator 72MOD-100B. The modification was the first of two, intended to replace the obsolete analog actuators with digital actuators to provide more precise control. The battery room heating, ventilation, and air conditioning (HVAC) system consists of two redundant subsystems. One subsystem serves one battery and battery charger room, and the second subsystem serves the other battery and battery charger room. The functions of the battery room HVAC system are to supply outside filtered air, to provide environmental heating and cooling to maintain the temperature below 110°F, and to prevent hydrogen accumulation during an accident condition.

On August 31, 2019, FitzPatrick operators identified the 'B' battery room ventilation damper 72MOD-100B to be in the closed position and not functioning properly to allow outside air into the room for cooling. Operators declared the 'B' station battery ventilation system non-functional and took compensatory measures in accordance with OP-59A, "Battery Room Ventilation," Revision 16. Compensatory measures included blocking open fire doors to the rooms and cross-tying the 'A' and 'B' battery room ventilation systems.

Troubleshooting by FitzPatrick maintenance staff under Work Order 04776901 on September 3, 2019, identified a latent wiring error that occurred during modification installation as the cause of the damper failure. Inspector review of the June 26, 2019, post maintenance testing identified that FitzPatrick staff failed to enter this issue into their corrective action program. After bringing this to the station's attention, FitzPatrick staff entered the issue into the corrective action program and performed a work group evaluation cause investigation. The investigation confirmed that the wiring error led to the failure of the damper and an additional damper to function properly.

In addition, FitzPatrick staff did not identify the amount of resistance in the circuit prior to selecting the wiring configuration. This resulted in a low impedance and insufficient voltage to control two of the three dampers in the 'B' battery room ventilation system. The investigation determined that a contributing cause to the wiring error was associated with a lack of experience on the part of the preparer and reviewer, which was not initially recognized as a potential error trap. An electrical or instrument controls staff member review may have helped identify the error prior to implementation. Procedure CC-AA-102, "Design Input and Configuration Change Impact Screening," Revision 33, Section 4.1.23, states to "consider the functional and physical system interface requirements." Contrary to this requirement, FitzPatrick staff did not adequately assess functional and physical system interface requirements.

The inspectors also identified the post maintenance test performed on June 25, 2019, was not adequate to identify the wiring error. On June 26, 2019, operations staff performed ST-19AB, "Battery Room B Ventilation Equipment Operability Test," Revision 0. Specifically, Section 8.5 states, "NOTE: Due to the small amount of flow through 72MOD-100B during winter months this slightly open damper may appear to be closed." Although operators identified the dampers visually appeared to be passing flow as allowed by the procedure, the circuit was not tested using the temperature control device, which would confirm proper damper operation in response to changes in temperature.

Corrective Actions: FitzPatrick staff completed an assessment of the modification error and revised the wiring to compensate for the amount of resistance in the circuit. Station leadership communicated to the staff the causes and actions going forward to ensure proper engagement from all levels of the organization during future design changes. The station also updated procedure ST-19AB, "Battery Room B Ventilation Equipment Operability Test," to ensure that the battery room ventilation dampers are tested using the temperature control device to ensure the electrical circuit responds properly during surveillance testing.

Corrective Action References: IR 04275996 and IR 04284016

Performance Assessment:

Performance Deficiency: The inspectors determined that the failure to adequately translate the design associated with a modification of a battery room ventilation damper actuator was contrary to 10 CFR Part 50, Appendix B, Criterion III, "Design Control."

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Design Control 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, failure to assess the resistance of the circuit prior to modification installation on June 25, 2019, resulted in improper wiring instructions for the 'B' battery room air supply damper actuator, which resulted in a loss of system function on August 31, 2019.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The finding was determined to be a deficiency affecting the design or qualification of mitigating structures, systems and components (SSC) and failed to maintain its functionality. The finding represents a loss of system function, and therefore requires a detailed risk evaluation. Additional review determined the risk associated with this finding to be Green because operators demonstrated an ability to respond and provide additional ventilation within 30 minutes, as demonstrated through validated time-critical operator actions. This compensatory action will restore functionality, as demonstrated on August 31, 2019 when the 72MOD-100B failed close.

Cross-Cutting Aspect: H.1 - Resources: Leaders ensure that personnel, equipment, procedures, and other resources are available and adequate to support nuclear safety. The inspectors determined that the finding had a cross-cutting aspect of Resources within the cross-cutting area of Human Performance because FitzPatrick staff failed to provide the proper staff involvement with review of the modification to ensure a thorough circuit evaluation was performed.

Enforcement:

Violation: The inspectors identified a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. These measures shall include provisions to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled.

Contrary to the above, on June 25, 2019, Exelon personnel failed to adequately translate the design associated with a modification to battery room ventilation damper actuator 72MOD-100B. As a result, the improper wiring instructions for the 'B' battery room supply damper actuator caused low impedance in the circuit and loss of functionality that occurred on August 31, 2019.

Enforcement Action: This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy.

| Observation: Semiannual Trend Review 71152 | |
|---|------|
| The inspectors evaluated a sample of issues and events that occurred over the second, the | ird, |
| and fourth quarters. The evaluation did not reveal any new trends that could indicate a mo | ore |
| significant safety issue. The inspectors determined that, in most cases, the issues were | |
| appropriately evaluated by Exelon staff for potential trends at a low threshold and resolved | ł |
| within the scope of the corrective action program. FitzPatrick identified a new trend | |
| associated with equipment reliability as documented in IR 04301960. During the period of | ſ |
| review, Exelon experienced multiple instrument air compressor failures, an unplanned | |
| change in reactor power when the 'B' reactor recirculation motor generator speed control | |
| circuit failed, multiple failures of the 'A' and 'B' drywell continuous atmospheric monitors, a | n |
| unexpected ground on the 'A' reactor recirculation motor generator set, and an unexpected | d |
| closure and re-opening of all main turbine combined intermediate valves. In addition | |
| to FitzPatrick addressing the issues individually through the corrective action program, | |
| IR 04301960 has been established to perform a two-year review and evaluate for commor | ۱ |
| causes. | |

Based on the overall results of the semiannual trend review, the inspectors determined that Exelon had generally identified adverse trends at FitzPatrick before they could become more significant safety problems. The inspectors independently evaluated the deficiencies noted above for significance in accordance with the guidance in IMC 0612, Appendix B, "Issue Screening," and Appendix E, "Examples of Minor Issues." The inspectors identified one violation of TS 3.4.5 Condition C that was of minor significance and, therefore, is not subject to enforcement action in accordance with the NRC's Enforcement Policy. This minor violation was associated with FitzPatrick staff failing to adequately implement Condition C to monitor drywell atmosphere with both 'A' and 'B' drywell continuous atmospheric monitors while they were out of service for a total of 63 hours from October 6, 2019, to October 8, 2019. The inspectors identified that RP-JF-03.01, "Drywell Continuous Atmospheric Monitoring," Revision 40, was not properly implemented by FitzPatrick staff to obtain samples that provided meaningful data to effectively monitor the drywell for leakage. The station did not obtain particulate samples; rather isotopic radionuclide data was gathered from a gaseous sample. This prevented implementation of the drywell leakage adverse condition monitoring plan, as the data was not comparable. This issue was determined to be minor because although the actions were not properly implemented to support meeting Condition C, the 30-day limiting condition for operation was not exceeded and the drywell floor drain system remained operable, providing FitzPatrick staff with an additional means to monitor drywell leakage. Exelon has entered this issue into its corrective action program as IR 04295162 and IR 4295136.

| Safety Relief Valve Lift Setpoint Exceeds Technical Specification Allowable Value | | | |
|---|--|-------------------|-----------|
| Cornerstone | Severity | Cross-Cutting | Report |
| | | Aspect | Section |
| Not | Severity Level IV | Not | 71153 |
| Applicable | NCV 05000333/2019004-03 | Applicable | |
| | Open/Closed | | |
| A self-revealed | Severity Level IV non-cited violation (NCV) of T | echnical Specific | cation |
| (TS) 3.4.3, "Safety/Relief Valves (SRVs)" (two examples) was identified when FitzPatrick was | | | |
| notified that the as-found lift setpoint of safety relief valves was measured below the minimum | | | |
| allowable value. Specifically, between 2017 and 2019, multiple pilot stage assemblies tested | | | |
| experienced dri | ift beyond the +/- 3 percent tolerance permitted I | oy TS 3.4.3, resu | Ilting in |

FitzPatrick issuing NRC LERs 05000333/2017-004-00, 05000333/2017-004-01, and 050000333/2019-003-00.

<u>Description</u>: On July 29, 2019, FitzPatrick staff received results indicating the as-found setpoint tests for main steam SRV pilot stage assemblies had exceeded the lift setting tolerance prescribed in technical specifications. Each pilot assembly is a subcomponent of a 2-stage Target Rock SRV. Specifically, eight of the 11 pilot stage assemblies tested experienced drift beyond the +/- 3 percent tolerance permitted by TS 3.4.3. FitzPatrick staff concluded that the cause of the setpoint drift was attributed to corrosion bonding between the pilot disc and seating surfaces. This condition was reported to the NRC in accordance with 10 CFR 50.73(a)(2)(i)(B) and (a)(2)(v)(D) as any operation or condition which was prohibited by the plant's technical specifications, and any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident, respectively (LER 2019-003-00).

The SRV corrosion bonding issue has been reported to the NRC by a number of plant operators. Staff in the NRC Office of Nuclear Reactor Regulation have met with the Boiling Water Reactor Owners Group (BWROG) and other stakeholders to gain a better understanding of the industry initiatives to address this issue (reference ADAMS Accession No. ML18267A016, ML19239A280, and ML19323E051).

Previously, in NRC Inspection Report 05000333/2018004, the NRC reviewed LER 2017-004-00 and supplemental LER 2017-004-01 that documented a similar SRV setpoint drift issue for ten of the 11 SRV pilot stage assemblies. Those two LERs remained open at that time because, although the NRC did not identify a performance deficiency, the NRC considered developing formal guidance to disposition continued SRV setpoint test failures that were caused by the known corrosion bonding phenomenon.

Based on review of the LER, the safety significance was very low because the safety function of the SRVs was not compromised. In addition, at FitzPatrick, the electric lift system provided a redundant means to actuate the SRVs in the event they would have been needed. Further, the BWROG was continuing its efforts with the industry to develop both a licensing change to align this issue with its low safety significance and was also pursuing additional technical changes (e.g., pilot disc coating application methods) to abate corrosion bonding issues. Most importantly, FitzPatrick completed appropriate corrective actions during its September 2018 refueling outage by installing a modified 3-stage Target Rock SRV that is intended to address pilot valve corrosion bonding. Based on this information and applying a risk-informed approach to this issue, both instances (November 2017 and July 2019) are evaluated in this report.

Corrective Actions: FitzPatrick replaced all 11 SRVs with redesigned 3-stage SRVs, which are expected to not be vulnerable to pilot valve corrosion bonding.

Corrective Action References: IR 04077124, 4082823, and 04267818

<u>Performance Assessment</u>: The NRC determined this violation was not reasonably foreseeable and preventable by the licensee and therefore is not a performance deficiency. <u>Enforcement</u>: Because no performance deficiency, and therefore no finding, was identified, it is necessary to address the violation using traditional enforcement, in accordance with Section 2.2.4 of the NRC Enforcement Policy.

Severity: This issue is assigned a Severity Level IV violation based on its similarity to example 6.1.d.1 in the Enforcement Policy, "a failure to comply with a technical specification

action requirement demonstrates misapplication of the conventions in technical specifications Section 1.0, 'Use and Application', or the allowances for LCO and surveillance requirement applicabilities in technical specifications Section 3.0." The inspectors also reviewed the NRC Enforcement Policy, Section 2.2.1, "Factors Affecting Assessment of Violations," which states, in part, that in determining the appropriate enforcement response to a violation, the NRC considers, whenever possible, risk information in assessing the safety or security significance of violations and assigning severity levels. The inspectors determined the issue to be of very low safety significance because the safety function of the SRVs was not compromised and the redundant electric lift system (redundant SRV actuation system) was available. As a result, the inspectors determined that the violation is appropriately characterized as Severity Level IV.

Violation: Technical Specification 3.4.3 requires the safety function of nine SRVs be operable. Surveillance Requirement 3.4.3.1 requires FitzPatrick to verify the safety function lift setpoint of the required SRVs is 1145 ± 34.3 psig. Contrary to the above, on two occasions (November 2017 and July 2019), a number of SRVs lifted outside the allowable tolerance (10 in November 2017 and eight in July 2019) and those SRVs were assumed to have been inoperable at some point in the operating cycle (less than nine SRVs were operable in both operating cycles).

Enforcement Action: This violation is being treated as an NCV, 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 January 23, 2020, the inspectors presented the integrated inspection results to Mr. Joseph Pacher, Site Vice President, and other members of the licensee staff.
- On October 10, 2019, the inspectors presented the Radiolgical Safety inspection results to Mr. Joseph Pacher, Site Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

| Inspection Procedure | Туре | Designation | Description or Title | Revision or Date |
|-------------------------|--------------------------------|----------------|---|---------------------|
| 71111.01 | Corrective Action | 04283881 | | |
| | Documents | 04296745 | | |
| | Procedures | WC-AA-107 | Seasonal Readiness | 22 |
| | | WC-JF-107-1000 | Seasonal Readiness T&RM for JAF | 3 |
| | Work Orders | 04858366 | | |
| 71111.04Q | Corrective Action | 04295471 | | |
| | Documents | | | |
| | Resulting from | | | |
| | Inspection | | | |
| | Drawings | FM-21A | Flow Diagram Standby Liquid Control System 11 | 37 |
| | 0 | FM-22A | Flow Diagram Reactor Core Isolation Cooling System 13 | 57 |
| | Procedures | OP-17 | Standby Liquid Control System | 52 |
| 71111.04S | Drawings | FM-27B | Flow Diagram Control Rod Drive System 03 | 34 |
| | | FM-39A | Flow Diagram Breathing, Instrument & Service Air System 39 | 50 |
| | | FM-39C | Flow Diagram Instrument Air Reactor Bldg. & Drywell System 39 | 33 |
| | | FM-39D | Instrument Air Reactor Building System 39 | 12 |
| 71111.05Q | Corrective Action Documents | 04287157 | | |
| | Fire Plans | PFP-PWR04 | Battery Room Complex, 272', 282 Fire Area/Zone III/BR-1, BR-2, IV/BR-3, BR-4, XVI/BR-5 | 02 |
| | | PFP-PWR27 | Reactor Building - East / Elev. 344', Fire Area/Zone IX/RB1-A | 4 |
| | | PFP-PWR29 | Switchgear Room-East / Elev. 272' Fire Area / Zone II/SW-2 | 02 |
| | | PFP-PWR30 | Switchgear Room-West / Elev. 272' Fire Area/ Zone IC/SW-1 | 02 |
| 71111.06 | Corrective Action Documents | 04289195 | | |
| | Procedures | ER-AA-300-150 | Cable Condition Monitoring Program | 5 |
| 71111.11Q | Procedures | RAP-7.4.01 | Control Rod Scram Time Evaluation | 30 |
| | | ST-1I | Main Steam Isolation Valve Limit Switch Channel Functional | 1 |

| Inspection | Туре | Designation | Description or Title | Revision or |
|------------|-------------------|----------------------------|--|-------------|
| Procedure | | | | Date |
| | | | Test | |
| | | ST-1L | Main Turbine Control Valve Instrument Channel and Valve | 37 |
| | | | Operability Check | |
| 71111.12 | Corrective Action | 04289047 | | |
| | Documents | | | |
| | Miscellaneous | JF-MRULE-003 | Maintenance Rule Risk Significance Determination PRA | 0 |
| | Procedures | ER-AA-310-1002 | Maintenance Rule Functions Safety Significance Classification | 3 |
| 71111.13 | Corrective Action | 04283005 | | |
| | Documents | 04283131 | | |
| | | 04283960 | | |
| | | 04285089 | | |
| | | 04285094 | | |
| | | 04294135 | | |
| | | 05282040 | | |
| | Procedures | OP-27 | Recirculation System | 84 |
| | Work Orders | 04963642 | | |
| | | 04976158 | | |
| 71111.15 | Corrective Action | 04287157 | | |
| | Documents | 04288401 | | |
| | | 04290066 | | |
| | | 04290155 | | |
| | Procedures | MP-054.01 | 4.16 KV Magne-Blast Breaker | 33 |
| | | MP-054.03 | 4.16 KV Magne-Blast Breaker Overhaul | 08 |
| | | OP-AA-108-115 | Operability Determinations (CM-1) | 22 |
| 71111.18 | Corrective Action | 04287157 | | |
| | Documents | | | |
| | Engineering | 9000012703 | Replace Reserve Station Service Transformers | |
| | Changes | 629654 | Evaluation for Not Performing Full Inverter Performance | |
| | | | Testing for 71INV-3B | |
| | Miscellaneous | Purchase Order 10256320 | | 004 |

| Inspection | Туре | Designation | Description or Title | Revision or |
|------------|-------------------|---------------|---|-------------|
| Procedure | | | | Date |
| | | Vendor Manual | Operating Instructions Uninterruptable Power Supply (UPS) | |
| | | G953-0002 | With Main Bypass | |
| | Procedures | CC-AA-204 | Control of Vendor Equipment Manuals | 12 |
| | Work Orders | 4969067 | | |
| 71111.19 | Corrective Action | 04047763 | | |
| | Documents | 04180515 | | |
| | | 04193687 | | |
| | | 04283131 | | |
| | | 04285331 | | |
| | | 04285365 | | |
| | | 04285367 | | |
| | | 04286746 | | |
| | | 04288521 | | |
| | | 04976158 | | |
| | Corrective Action | 04295136 | | |
| | Documents | 04295162 | | |
| | Resulting from | | | |
| | Inspection | | | |
| 71111.19 | Procedures | FPP-3.57 | East Diesel Fire Pump 76P-4 Operational Check | 4 |
| | | MP-003.12 | HCU Scram Inlet & Outlet Valve Maintenance (03AOV-126 and 127) | 17 |
| | | RP-JF-03 01 | Drywell Continuous Atmospheric Monitoring System | 40 |
| | Work Orders | 04897035 | | |
| | | 04967529 | | |
| | | 04970930 | | |
| 71111.22 | Corrective Action | 04047763 | | |
| | Documents | 04180515 | | |
| | | 04193687 | | |
| | | 04280066 | | |
| | | 04286746 | | |
| | Corrective Action | 04162122 | | 1 |
| | Documents | 04162128 | | 1 |
| | Resulting from | 04207510 | | |

| Inspection | Туре | Designation | Description or Title | Revision or |
|------------|------------|----------------|---|-------------|
| Procedure | | | | Date |
| | Inspection | 04269716 | | |
| | • | 04272368 | | |
| | Procedures | CA-01.02 | Drywell and Torus Atmosphere Sampling and Analysis | 12 |
| | | MST-071.12 | 125 VDC Station Battery and Charger Weekly Surveillance | |
| | | | Test | |
| | | OP-AA-108-111 | Adverse Condition Monitoring and Contingency Planning | 13 |
| | | RP-JF-03.01 | Drywell Continuous Atmospheric Monitoring System | 40 |
| | | ST-24A | RCIC Flow Rate and Inservice Test (IST) | 49 |
| | | ST-24D | RCIC Automatic Isolation Logic System Functional and | 27 |
| | | | Simulated Automatic Actuation Test | |
| | | ST-24E | RCIC Logic System Functional and Simulated Automatic | 37 |
| | | | Actuation Test | |
| | | ST-24J | RCIC Flow Rate and Inservice Test (IST) | 49 |
| | | ST-4B | HPCI Monthly Operability Test | 61 |
| | | ST-4E | HPCI and SGT Logic System Functional and Simulated | 55 |
| | | | Automatic Actuation Test | |
| | | ST-4F | HPCI Automatic Isolation Logic System Functional and | 29 |
| | | | Simulated Automatic Actuation Test | |
| | | ST-4N | HPCI Quick Start and Flow Rate IST | 70 |
| | | ST-9AB | EDG A and C Full Load Test and ESW Pump Operability | 17 |
| | | | Test | |
| | | ST-9BB | EDG B and D Full Load Test and ESW Pump Operability | 15 |
| | | | Test | |
| | | ST-9CA | EDG A and C Load Sequencing Test and 4KV Emergency | 5 |
| | | | Power System Voltage Relays Instrument Functional Test | |
| | | ST-9CB | EDG B and D Load Sequencing Test and 4kV Emergency | 3 |
| | | | Power System Voltage Relays Instrument Functional Test | |
| | | ST-9QB | EDG B and D Full Load Test (8 Hour Run) | 12 |
| 71124.01 | Procedures | NISP-RP-004 | Radiological Posting and Labeling | Revision 1 |
| | | RP-AA-376-1001 | Radiological Posting and Labeling Program | Revision 1 |
| | Radiation | 2019-022715 | 'B' Reactor Water Clean-up Pump Room | 09/17/2019 |
| | Surveys | 2019-036440 | 'A' Reactor Water Clean-up Pump Room | 03/04/2019 |
| | | 2019-041874 | 326' Reactor Building | 04/18/2019 |

| Inspection | Туре | Designation | Description or Title | Revision or |
|------------|------------|-------------|---|-------------|
| Procedure | | | | Date |
| | | 2019-043871 | 'B' Reactor Water Clean-up Pump Room | 05/10/2019 |
| | | 2019-045436 | 'A' Reactor Water Clean-up Pump Room | 06/04/2019 |
| | | 2019-048752 | 369' Reactor Building | 07/24/2019 |
| | | 2019-049240 | 326' Reactor Building | 08/01/2019 |
| | | 2019-050079 | 369' Reactor Building | 08/14/2019 |
| 71124.02 | Procedures | RP-AA-400 | ALARA Program | Revision 16 |
| 71124.04 | Procedures | RP-AA-800 | Control, Inventory, and Leak Testing of Radioactive Sources | Revision 9 |