



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

February 14, 2018

Mr. Bryan C. Hanson  
Senior Vice President, Exelon Generation Company, LLC  
President and Chief Nuclear Officer, Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

**SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT – INTEGRATED  
INSPECTION REPORT 05000333/2017004 AND INDEPENDENT SPENT FUEL  
STORAGE INSTALLATION INSPECTION REPORT 07200012/2017001**

Dear Mr. Hanson:

On December 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the James A. FitzPatrick Nuclear Power Plant (FitzPatrick). On January 23, 2018, 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.

NRC inspectors documented two findings of very low safety significance (Green) in this report. These findings involved violations of NRC requirements. Additionally, the inspectors documented a licensee-identified violation which was determined to be of very low safety significance in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violations or significance of the NCVs, 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 FitzPatrick. In addition, 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 FitzPatrick.

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 the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

*/RA/*

Anthony Dimitriadis, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

Docket No. 50-333  
License No. DPR-59

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Inspection Report 05000333/2017004  
w/Attachment: Supplementary Information

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SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT – INTEGRATED  
INSPECTION REPORT 05000333/2017004 AND INDEPENDENT SPENT FUEL  
STORAGE INSTALLATION INSPECTION REPORT 07200012/2017001 dated  
February 14, 2018

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**U.S. NUCLEAR REGULATORY COMMISSION**

REGION I

Docket No. 50-333

License No. DPR-59

Report No. 05000333/2017004 and 07200012/2017001

Licensee: Exelon Generation Company, LLC

Facility: James A. FitzPatrick Nuclear Power Plant

Location: Scriba, NY

Dates: October 1, 2017, through December 31, 2017

Inspectors: K. Kolaczyk, Senior Resident Inspector  
B. Sienel, Resident Inspector  
E. Carfang, Senior Resident Inspector  
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Approved By: Anthony Dimitriadis, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

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## SUMMARY

Inspection Report 05000333/2017004 and 07200012/2017001; 10/01/2017 – 12/31/2017; James A. FitzPatrick Nuclear Power Plant (FitzPatrick); Maintenance Effectiveness, Follow-Up of Events and Notices of Enforcement Discretion.

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. The inspectors documented two non-cited violations (NCVs) and one licensee-identified violation, all which were of very low safety significance (Green). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process", dated October 28, 2016. Cross-cutting aspects are determined using IMC 0310, "Aspects Within Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

### Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green NCV of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion III, "Design Control," because Exelon did not verify the adequacy of the low pressure coolant injection (LPCI) motor operated valve (MOV) independent power supply (IPS) with respect to the 419 volt direct current (VDC) battery sizing calculation. Specifically, non-conservative design inputs were used for the safety-related battery sizing calculation which reduced the battery capacity margin. On November 22, 2017, Exelon performed an operability determination for the identified issue and determined that the batteries had sufficient capacity. This issue was entered into the corrective action program (CAP) as issue report (IR) 4079452.

The performance deficiency was determined to be more than minor because it was associated with the Design Control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, based on the quantity and magnitude of the errors, there was reasonable doubt that the LPCI MOV batteries would have adequate capacity under all design conditions. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 2 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the finding was of very low safety significance (Green) because it was a design deficiency confirmed not to result in a loss of operability. This finding does not have a cross-cutting aspect because the calculation was last revised in 2003 so the finding is not indicative of current performance. (Section 1R12)

- Green. A self-revealing NCV of very low safety significance (Green) of Technical Specification (TS) 5.4, "Procedures," was identified for a procedural error which resulted in the inadvertent isolation of the high pressure coolant injection (HPCI) system. Specifically, on April 4, 2017, an instrumentation and controls (I&C) technician did not correctly perform procedure ISP-175B1, "Reactor and Containment Cooling Instrument Functional Test/Calibration," which caused the HPCI system to isolate. Exelon's immediate response to the event included stopping the surveillance test, and developing and implementing a plan to restore the HPCI system to an operable status. The HPCI system was subsequently

restored to service approximately five hours after the inadvertent isolation. Additional corrective actions included increased observations of peer checks and validation of I&C activities. This issue was entered into the CAP as IR 03993791.

This performance deficiency is more than minor because it is associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to correctly implement procedure ISP-175B1 caused an isolation of the HPCI system and rendered it unavailable to respond to an initiating event. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 2 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined that this finding required a detailed risk evaluation since the HPCI isolation resulted in a loss of safety function. Using the Standardized Plant Assessment Risk Model (SPAR), the Region I senior reactor analyst (SRA) determined this finding was of low safety significance (Green). The inspectors determined that this finding had a cross-cutting aspect in the area of Human Performance, Avoid Complacency, because the I&C technician did not correctly implement error reduction tools and verify that the direct current voltage source was installed on the correct trip unit prior to performing the surveillance procedure. [H.12] (Section 4OA5)

### **Other Findings**

A violation of very low safety significance that was identified by Exelon was reviewed by the inspectors. Corrective actions taken or planned by Exelon have been entered into Exelon's CAP. This violation and corrective action tracking number are listed in Section 4OA7 of this report.

## REPORT DETAILS

### Summary of Plant Status

FitzPatrick began the inspection period at 100 percent power. On November 3, 2017, operators performed a planned power reduction to approximately 52 percent to perform power suppression testing for a reactor fuel leak and a subsequent control pattern adjustment. Power was restored to 100 percent on November 10, 2017. Operators performed a downpower to approximately 86 percent on December 19, 2017, to perform additional suppression testing and restored power to 100 percent the same day. The unit remained at or near 100 percent power for the remainder of the inspection period.

### 1. REACTOR SAFETY

#### **Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

#### 1R01 Adverse Weather Protection (71111.01 – 1 sample)

##### Readiness for Seasonal Extreme Weather Conditions

##### a. Inspection Scope

The inspectors reviewed Exelon's readiness for the onset of seasonal cold temperatures. The review focused on the standby gas treatment room and auxiliary boiler room. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), TSs, control room logs, and the CAP to determine what temperatures or other seasonal weather could challenge these systems, and to ensure Exelon personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including Exelon's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during cold weather conditions. Documents reviewed for each section of this inspection report are listed in the Attachment.

##### b. Findings

No findings were identified.

#### 1R04 Equipment Alignment

##### Partial System Walkdown (71111.04 – 1 sample)

##### a. Inspection Scope

The inspectors performed a partial walkdown of the 'C' emergency diesel generator (EDG) during planned maintenance on October 10, 2017. The inspectors selected this system based on its risk-significance relative to the reactor safety cornerstones at the time it was inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, TSs, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted the system's performance of its intended safety functions. The inspectors performed field walkdowns



of accessible portions of the system to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether Exelon staff had properly identified equipment issues and entered them into the CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 5 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that Exelon controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out of service, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Cable spreading room, fire area/zone VII/CS-1, on October 5, 2017
- Safety-related pump rooms, fire areas/zones XII/SP-1 and XIII/SP-2, on October 5, 2017
- Standby gas filter room, fire area/zone XX/SG-1, on October 6, 2017
- Reactor building 326' elevation, fire area/zone IX/RB-1A on October 10, 2017
- Reactor building 344' elevation, fire area/zone IX/RB-1A, on October 12, 2017

b. Findings

No findings were identified.

.2 Fire Brigade Drill (71111.05A – 1 sample)

a. Inspection Scope

The inspectors observed an unannounced fire brigade drill conducted on December 19, 2017, that involved a simulated fire in the east cable tunnel, elevation 258'. The inspectors evaluated the readiness of the plant fire brigade to fight fires and verified that Exelon personnel identified deficiencies, openly discussed them in a self-critical manner at the debrief, and took appropriate corrective actions as required. The inspectors evaluated the following specific attributes of the drill:

- Proper wearing of turnout gear and self-contained breathing apparatus
- Proper use and layout of portable fire extinguishers

- Employment of appropriate fire-fighting techniques
- Sufficient fire-fighting equipment brought to the scene
- Effectiveness of command and control
- Search for victims and propagation of the fire into other plant areas
- Smoke removal operations
- Utilization of pre-planned strategies
- Adherence to the pre-planned drill scenario
- Drill objectives met

The inspectors also evaluated the fire brigade's actions to determine whether these actions were in accordance with Exelon's firefighting strategies.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to identify internal flooding susceptibilities for the site. The inspectors' review focused on the emergency service water (ESW) pumps located in the greenhouse on October 2, 2017. The inspectors verified the adequacy of equipment seals located below the flood line, floor and water penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, control circuits, and temporary or removable flood barriers. The inspectors also assessed the adequacy of operator actions that Exelon had identified as necessary to cope with flooding in this area and reviewed the CAP to determine if Exelon was identifying and correcting problems associated with both flood mitigation features and site procedures for responding to flooding.

b. Findings

No findings were identified.

1R08 Inservice Inspection (71111.08 – 1 sample)

(Closed) Unresolved Item (URI) 05000333/2017-001-01: Drywell Moisture Barrier Description in License Renewal Application

a. Inspection Scope

The inspectors reviewed URI 2017-001, Drywell Moisture Barrier Description in License Renewal Application, which was discussed in NRC Inspection Report 05000333/2017001 (ML17128A109). The URI documented a discrepancy identified by the NRC inspectors between the license renewal application and the actual plant configuration. Specifically, the NRC inspectors identified that the license renewal

application stated that a moisture barrier was installed between the containment steel liner and the drywell concrete floor. However, inspectors walked down the area and determined a moisture barrier was not installed. The URI stated:

While evaluating drywell containment examination records, the inspectors reviewed FitzPatrick license renewal documents related to the drywell and identified an issue for which more information is needed to determine whether there is a performance deficiency. Specifically, the inspectors noted that NUREG-1905, "Safety Evaluation Report Related to the License Renewal of James A. FitzPatrick Nuclear Power Plant," (ML081510826) referenced a drywell floor moisture barrier in Section 3.5.2.1.1. However, during a drywell walkdown, the inspectors noted that no moisture barrier existed on the drywell floor between the drywell liner and the concrete floor. The inspectors further noted that Section 3.5.2.2.1.4 of the initial license renewal application (ML062160494) submitted in July 2006, described a moisture barrier that was to be inspected as part of the IWE Program and Structures Monitoring Program, and that in Amendment 9 to the license renewal application (ML071060390), an audit question discussed the moisture barrier condition.

The inspectors reviewed Exelon's evaluation and corrective actions to address the questions identified in the URI. Specifically, the inspectors reviewed condition reports (CRs) that documented the identification, evaluation, and corrective actions taken to address the discrepancy; interviewed engineers; reviewed correspondence between Exelon and the NRC that corrected the discrepancies (ML 17192A449); and reviewed license renewal documents. The inspectors' reviews were focused on assessing the questions raised in the URI.

b. Findings and Observations

No findings were identified.

The inspectors determined that Exelon staff performed an extent of condition review of license renewal documents submitted to the NRC to identify whether there were additional errors in the documents. The review identified several documents that described the moisture barrier, but did not identify any other discrepancies. Following identification and review of the issue, Exelon submitted a letter to the NRC dated July 17, 2017, correcting the errors and indicating a moisture barrier did not exist (ML17192A449). The inspectors reviewed the actions taken by Exelon staff to identify and correct any other potential errors in the submitted documents. The inspectors also independently reviewed license renewal documents and found no additional errors. Finally, the inspectors reviewed the drawings, licensee inspection reports, and the UFSAR, and concluded that a moisture barrier had never been installed at the drywell floor and was not required for the design of the plant.

The inspectors determined a violation of 10 CFR 54.13, "Completeness and Accuracy of Information," had occurred. Title 10 CFR 54.13 states, in part, that information provided to the Commission by an applicant for a renewed license must be complete and

accurate in all material respects. The inspectors concluded that information submitted by Exelon in license renewal documents was not accurate because it described a moisture barrier between the containment steel liner and the drywell concrete floor and their actions to manage the effects of aging on the barrier, but a barrier was not installed per the plant design. However, following the inspectors' review of the revised information, the inspectors determined that no additional regulatory actions were required because the moisture barrier was not a component required for the design of the plant nor was it a regulatory requirement. Specifically, the incorrect information did not result in a specific NRC-imposed condition or action (or lack thereof), and this did not change upon submittal of the correct information. Although this issue was required to be corrected, it constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section 2 of the NRC Enforcement Policy, because it had insignificant safety or regulatory impact. This URI is closed.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance  
(71111.11Q – 2 samples)

.1 Quarterly Review of Licensed Operator Regualification Testing and Training

a. Inspection Scope

The inspectors observed a licensed operator regualification challenge scenario on November 13, 2017. The scenario involved a number of hypothetical component failures including a trip of the 'A' control rod drive pump, the loss of both recirculating water pumps, and a failure of all control rods to fully insert upon initiation of a manual scram signal by control room operators. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the TS action statements entered by the control room supervisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

The inspectors observed control room operators during a reactor downpower to 60 percent on November 3, 2017, in preparation for power suppression testing. The inspectors observed crew briefings, reactivity manipulations using control rods and recirculating water flow, and main turbine valve testing. Additionally, the inspectors observed crew performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 3 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structure, system, and/or component (SSC) performance and reliability. The inspectors reviewed CAP documents, work orders (WOs), and maintenance rule basis documents to ensure that Exelon was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by Exelon was reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that Exelon was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- LPCI MOV IPS 419 VDC batteries on October 27, 2017
- Reactor water recirculation pressure boundary leakage on October 30, 2017
- Diesel generator ventilation system tornado structural integrity evaluation on November 30, 2017

b. Findings

Introduction. The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” because Exelon did not verify the adequacy of the LPCI MOV IPS with respect to the 419 VDC battery sizing calculation. Specifically, non-conservative design inputs were used for the safety-related battery sizing calculation which reduced the battery capacity margin.

Description. The inspectors reviewed JAF-CALC-ELEC-01857, “419 VDC LPCI Power System 3A and 3B Sizing,” which established the adequacy of the LPCI 419 VDC batteries to supply power to the LPCI MOVs. The battery sizing calculation concluded that the batteries had a 21.6 percent design margin. The inspectors identified that the sizing calculation contained two non-conservative design inputs which resulted in a significant reduction in the battery capacity margin. The non-conservative inputs were: (1) using an incorrect battery capacity curve from the manufacturer, and (2) neglecting to account for the inter-tier voltage drop in the battery. The sizing calculation was dated November 2, 1994, with a minor revision done on February 25, 2003.

The battery vendor updated the battery capacity curves in July 1995. Although Exelon updated the battery curves in the battery vendor manual, they neglected to update the sizing calculation. The new vendor curves reduce the sizing margin by approximately 22 percent.

The minor revision to the sizing calculation in 2003 accounted for the voltage drop from the batteries to the IPSs, which convert the direct current (DC) power to alternating

current power for the MOVs. The minor revision determined that the voltage drop from the batteries to the IPSs was 1.5V. Neither the original sizing calculation nor the minor revision accounted for the inter-tier voltage drop. The inter-tier voltage drop is caused from the battery current flowing through cables that connect groups (or tiers) of battery cells. According to JAF-CALC-ELEC-01860, "LPCI Battery Performance Test End Volt Cutoff," the total inter-tier resistance for battery 3A is 3179 micro-Ohms and for battery 3B is 5182 micro-Ohms. These resistances correspond to voltage drops of 2.9V for battery 3A and 4.8V for battery 3B for total voltage drops of 4.4V and 6.3V. The original calculation was sized with 3V of margin, so the voltage drop non-conservatism results in a subsequent worst-case sizing margin decrease of approximately 4 percent.

The result of these errors was that there was reasonable doubt that the battery capacity would have been adequate under all design conditions. Since the battery sizing calculation was the basis for the acceptance criteria of the battery service and performance tests, there would not have been indications of inadequate capacity during testing. Preliminary evaluations performed by Exelon during the inspection revealed that, although the errors resulted in the battery sizing margin being negative, there was adequate capacity based on recent capacity testing and the batteries' ages. Exelon entered this issue into its CAP as IR 4079452. The inspectors reviewed Exelon's basis for operability and independently evaluated battery operability. The inspectors similarly concluded that the issues identified did not render any of the batteries inoperable, based on the magnitude of the errors and currently available aging margin.

Analysis. The inspectors determined that Exelon's failure to ensure that adequate design control measures existed to verify the adequacy of the design capacity for the LPCI MOV IPS batteries was a performance deficiency that was reasonably within Exelon's ability to foresee and correct and should have been prevented. The performance deficiency was determined to be more than minor because it was associated with the Design Control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, based on the quantity and magnitude of the errors, there was reasonable doubt that the LPCI MOV batteries would have adequate capacity under all design conditions. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 2 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the finding was of very low safety significance (Green) because it was a design deficiency confirmed not to result in a loss of operability. This finding does not have a cross-cutting aspect because the calculation was last revised in 2003 so the finding is not indicative of current performance.

Enforcement. 10 CFR Part 50, Appendix B, Criterion III, "Design Control," states, in part, that "design control measures shall provide for verifying or checking the adequacy of design." Contrary to the above, as of November 30, 2017, Exelon's design control measures had not verified the adequacy of the design regarding the LPCI MOV battery sizing calculation. Specifically, non-conservative design inputs were used for the safety-related LPCI MOV battery sizing calculation. Upon identification, Exelon verified that the batteries were operable while they de-rate the battery life or find other available margin. Because this violation was of very low safety significance (Green) and has been

entered into Exelon's CAP (IR 4079452), this violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy.

**(NCV 05000333/2017004-01, Inadequate Design Control for Battery Sizing Calculation)**

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 3 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Exelon performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that Exelon personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When Exelon performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst as needed to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Planned 'C' EDG maintenance during the week of October 9, 2017
- Planned 'A' ESW maintenance, independent spent fuel storage installation (ISFSI) campaign heavy lifts, and heavy rains and area flood warnings the week of October 30, 2017
- Planned HPCI preventive maintenance on December 12, 2017

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 4 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions based on the risk significance of the associated components and systems:

- Control room emergency ventilation system 70MOD-110B(OP) recirculation motor operated damper motor indicates dual position when in purge on October 20, 2017
- Cable tunnel unit cooler 67E-14 upper coil appears to have a leak on October 23, 2017
- IR 4078735 concerning continued operability of one train of control room emergency ventilation air supply when the 'B' exhaust fan failed to start during post-maintenance testing activities on the 'A' train on November 29, 2017
- Operator workarounds with open corrective actions for deficiencies listed on the
- December 12, 2017 plan of the day status sheet

The inspectors evaluated the technical adequacy of the operability determinations to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TSs and UFSAR to Exelon's evaluations to determine whether the components or systems were operable. The inspectors confirmed, where appropriate, compliance with bounding limitations associated with the evaluations. Where compensatory measures were required to maintain operability, such as in the case of operator workarounds, the inspectors evaluated whether the measures in place would function as intended and were properly controlled by Exelon.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 4 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to determine whether procedures and test activities adequately tested the safety functions that may have been affected by the maintenance activity, whether the acceptance criteria in the procedure were consistent with the information in the applicable licensing basis and/or design basis documents, and whether the test results were properly reviewed and accepted and problems were appropriately documented. The inspectors also performed walk-downs the affected job site, observed the pre-job brief and post-job critique where possible, confirmed work site cleanliness was maintained, and witnessed the test or reviewed test data to verify quality control hold points were performed and checked, and that results adequately demonstrated restoration of the affected safety functions.

- WO 82655954 to replace the 'D' EDG engine driven fuel pump and coupling on September 29, 2017
- WO 82630905 to calibrate the 'C' EDG loss of field relay on October 13, 2017
- WO 04708179 to replace 'D' diesel generator lubricating oil immersion heater on November 6, 2017
- WO 82494681 to clean the ESW piping to the west switchgear area room cooler on November 6, 2017

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 4 samples)

a. Inspection Scope

The inspectors observed the performance of surveillance tests and/or reviewed test data of selected risk-significant structures, systems, and components to assess whether test results satisfied TSs, the UFSAR, and Exelon procedure requirements. The inspectors



verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied.

Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- ISP-107A, RPS [reactor protection system] Drywell Pressure Instrument Response Time Test (ATTS), on November 1, 2017
- SP-01.06, Gaseous Effluent Sampling and Analysis, on November 2, 2017
- ISP-106A, MSIV [main steam isolation valve] Closure High Steam Line Flow Response Time Test (ATTS), on November 7, 2017
- ST-9QA, EDG 'A' and 'C' Full Load Test (8 Hour Run) on November 8, 2017

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04 – 1 sample)

a. Inspection Scope

Exelon implemented various changes to the FitzPatrick emergency action levels (EALs), emergency plan, and implementing procedures. Exelon had determined that, in accordance with 10 CFR 50.54(q)(3), any change made to the EALs, emergency plan, and its lower-tier implementing procedures, had not resulted in any reduction in effectiveness of the plan, and that the revised plan continued to meet the standards in 50.47(b) and the requirements of 10 CFR Part 50, Appendix E.

The inspectors performed an in-office review of all EAL and emergency plan changes submitted by Exelon as required by 10 CFR 50.54(q)(5), including the changes to lower-tier emergency plan implementing procedures, to evaluate for any potential reductions in effectiveness of the emergency plan. This review by the inspectors was not documented in an NRC safety evaluation report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety. The requirements in 10 CFR 50.54(q) were used as reference criteria.

b. Findings

No findings were identified.

#### 4. OTHER ACTIVITIES

##### 4OA1 Performance Indicator Verification (71151 – 5 samples)

###### Mitigating Systems Performance Index

###### a. Inspection Scope

The inspectors reviewed FitzPatrick's submittal of the mitigating systems performance index for the following systems for the period of October 1, 2016, through September 30, 2017:

- Emergency Alternating Current Power System
- High Pressure Injection System
- Heat Removal System
- Residual Heat Removal System
- Cooling Water Systems

To determine the accuracy of the performance indicator data reported during this period, the inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, and discussed specific questions with the responsible system engineer. The inspectors also reviewed FitzPatrick operator narrative logs, CRs, IRs, NRC integrated inspection reports, and the FitzPatrick mitigating systems performance index basis document to validate the accuracy of the submittals.

###### b. Findings

No findings were identified.

##### 4OA2 Problem Identification and Resolution (71152 – 4 samples)

###### .1 Routine Review of Problem Identification and Resolution Activities

###### a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify Exelon entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended IR screening meetings. The inspectors also confirmed, on a sampling basis, that, as applicable, for identified defects and non-conformances, Exelon performed an evaluation in accordance with 10 CFR Part 21.

###### b. Findings

No findings were identified.

## .2 Semi-Annual Trend Review

### a. Inspection Scope

The inspectors performed a semi-annual review of site issues to identify trends that might indicate the existence of more significant safety concerns. As part of this review, the inspectors included repetitive or closely-related issues documented by Exelon in trend reports, site performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or CAP backlogs. The inspectors also reviewed Exelon's CAP database for the period of July 2017 to October 2017 to assess IRs written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRCs daily CR review (Section 40A2.1). The inspectors reviewed Exelon's trending information to verify that Exelon personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

### b. Findings and Observations

No findings were identified.

The inspectors evaluated a sample of issues and events that occurred over the course of the third and fourth quarters of 2017 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 CAP or through department review. Adverse trends and corrective action plans to reverse the trends were documented in the site performance improvement integrated matrix. The inspectors did not identify any trends that the FitzPatrick station had not captured in the performance improvement integrated matrix.

## .3 Annual Sample: Abnormal Trends for 'A' Main Steam Line Flow

### a. Inspection Scope

The inspectors performed an in-depth review of Exelon's evaluation and corrective actions to address abnormal trends for the 'A' main steam line flow instrument. The inspectors reviewed CRs that documented the identification, evaluation, and corrective actions taken to address the issues. In addition to reviewing of these documents, the inspectors interviewed the responsible system engineer to determine whether the scope of the corrective actions addressed all identified deficiencies. Specifically, the inspectors reviewed actions completed by Exelon staff to diagnose and replace steam line flow instrument components.

The inspectors assessed Exelon's evaluation, extent of condition review, and corrective actions, and the prioritization and timeliness of actions to evaluate whether the actions taken by Exelon were appropriate. The inspectors evaluated whether the corrective actions, which included replacing the 'A' main steam line flow instrument transmitter and proportional amplifier, addressed the identified issues. The inspectors also evaluated whether the main steam line flow instruments were being tested in accordance with approved procedures. The inspectors reviewed the assessments of the failures,

including operability determinations and equipment failure evaluations, to determine if Exelon was using the available processes at the correct thresholds.

b. Findings and Observations

No findings were identified.

The inspectors determined that Exelon's evaluations and extent of condition reviews were thorough and the causes were appropriately identified. The inspectors also determined that the corrective actions were reasonable and addressed the deficiencies and corrected the identified issues.

The inspectors reviewed the instrument trend data which the control room operators had used to identify the 'A' main steam line flow instrument trending low in February 2015. The inspectors reviewed the adequacy of the calculation that Exelon performed which demonstrated that the worst-case instrument drift could not impact any safety systems or cause a plant trip. The inspectors also reviewed the operational decision making index, which established monitoring criteria for the instrument until it could be repaired. The inspectors reviewed the troubleshooting and calibration of the instrument components which identified the instrument transmitter was faulty. The replacement of the transmitter corrected the issue.

However, in November 2016, the control room operators identified the 'A' main steam line instrument beginning to drift high. Again, operability was verified, and Exelon implemented a monitoring program until the next outage to fully troubleshoot and repair the instrument. In February 2017, Exelon performed calibration checks of all loops and determined that the proportional amplifier for the 'A' main steam line was faulty. The faulty proportional amplifier was replaced and the system has since operated properly. The inspectors reviewed the troubleshooting documentation and the electrical system diagram to verify the repair was adequate and the extent of condition review was appropriate. The inspectors also confirmed that the November 2016 instrument error was unrelated to the February 2015 instrument error. Specifically, the indications were different, the failed component was different, and the intervening maintenance was unlikely to have caused the subsequent failure.

.4 Annual Sample: Unplanned Elevated Risk Associated With Isolation of Normal and Emergency Service Water to Unit Coolers

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's apparent cause evaluation and corrective actions associated with CR-2016-0838 for the removal of both emergency and normal service water to the crescent area unit coolers during an 'A' ESW system flush. This condition resulted in an unevaluated elevated risk condition from February 29, 2016, to March 1, 2016.

The inspectors assessed Exelon's problem identification threshold, cause analyses, extent of condition reviews, and the prioritization and timeliness of Exelon's corrective actions to determine whether Exelon was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the

requirements of FitzPatrick's CAP and 10 CFR Part 50, Appendix B. In addition, the inspectors performed field walkdowns and interviewed work control staff to assess the effectiveness of the implemented corrective actions.

b. Findings and Observations

One licensee-identified violation was identified and is discussed in Section 4OA7 of this report.

Exelon identified two probable causes for the unplanned elevated (Orange) risk entry on February 29, 2016, and March 1, 2016. The first causal factor was the risk management program (EOOS) did not fully incorporate necessary equipment into the risk model. EOOS is used by operators and work planning staff to ensure the risk of specific plant configurations is understood and appropriately compensated for when necessary. The second causal factor was related to the lack of training for key risk planning staff (senior reactor operators and work week managers) on the impact of removing normal service water.

The inspectors validated that discrepancies between equipment modeled in the probabilistic risk assessment and equipment not included in the EOOS risk program were rectified. The inspectors sampled updates for the 125 VDC, instrument air, control rod drive, and service water systems to verify updates were made, and the appropriate impact statement included in the EOOS program. The inspectors interviewed the manager responsible for training individuals on EOOS and reviewed work planning packages to verify procedural changes. Time-critical operator action documentation was also reviewed, which ultimately led to a final risk determination of a risk value of  $3.88E-5$  per reactor year versus the original threshold of  $5.45E-5$  per reactor year. The value of  $3.88E-5$  per reactor year is within the original range of risk (Yellow) identified by the licensee on March 1, 2016.

As part of Exelon's extent of condition, two additional occurrences of the ESW chemical flush were identified in April 2015 and March 28, 2011. During these ESW chemical flushes, risk was identified as  $3.56E-6$  per reactor year, with a duration of 91 hours. This licensee-identified violation is documented in Section 4OA7.

In conclusion, inspectors determined that Exelon took appropriate corrective actions to address the EOOS program deficiencies and training gaps.

.5 Annual Sample: Evaluation of Corrective Actions to Repair Electric Bay Unit Cooler Leaks and Technical Requirements Manual Usage

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's evaluations and corrective actions related to electric bay unit cooler leaks in 2016 and 2017, and Exelon staff implementation of the FitzPatrick Technical Requirements Manual sections applicable to the performance of these coolers. Additionally, the inspectors reviewed an apparent cause evaluation under CR-JAF-2016-05133 related to periodic service water leaks from cooler tubes and changes made by Exelon staff to their internal guidance related to the Technical Requirements Manual under CR-JAF-2016-5224.

The inspectors performed a walkdown of the electric bay and cable tunnel unit coolers to observe the operation and physical condition of the equipment, and interviewed engineering personnel to gain an understanding of the planned and implemented corrective actions related to the CRs listed. The inspectors further reviewed associated documentation including functionality reviews for cooler performance in the presence of leaks. The inspectors compared the actions taken to the requirements of Exelon's CAP and 10 CFR Part 50, Appendix B.

b. Findings and Observations

No findings were identified.

The FitzPatrick plant design includes two electric bay coolers which remove heat from the electrical bay areas via forced air cooling units with either normal or ESW flow through the cooling coils. The inspectors determined that Exelon identified a leak from the east electric bay cooler (67UC-16B) in December 2016. Exelon staff opened and examined the unit cooler and identified two leaking tubes and noted evidence of tube material erosion on several inlet tube ends. As a result, Exelon staff installed mechanical plugs to remove the two leaking tubes from service and installed additional plugs in other tubes identified as degraded. Prior to returning the cooler to service on December 23, 2017, Exelon staff evaluated the thermal and structural capability of the cooler with the 29 additional tubes plugged under CR-JAF-2016-05140.

Subsequently, Exelon evaluated the problem via an equipment-apparent cause evaluation which was completed under CR-JAF-2016-05133. The inspectors reviewed the operational history of the electric bay unit coolers from approximately 2016 to the end of the inspection period, discussed it with the cognizant system engineer, and reviewed the equipment-apparent cause evaluation. The inspectors determined tube erosion-corrosion was identified by Exelon staff as the direct cause of the cooler leaks. Exelon appropriately identified the apparent cause of this problem to be from increased service water flows resulting from several historical system modifications that made this wear more likely. Exelon also identified a contributing cause that involved an inadequate preventive maintenance frequency that did not sufficiently trend the tube conditions.

The inspectors determined that Exelon staff appropriately addressed the extent of the problem by including in their evaluation both electric bay coolers and the cable tunnel coolers, which are of similar design and operation. The inspectors determined design margin was restored to the east electric bay cooler (67UC-16B) via replacement in March 2017. Subsequently, the inspectors determined the west electric bay cooler (67UC-16A) was replaced in December 2017 (under WO 80464492). Exelon staff tracked further actions to examine the cable tunnel coolers with plans to repair or replace based on the results. Finally, the inspectors determined that Exelon completed actions to measure cooler tube service water flowrates as a prerequisite to determining if modifications should be pursued to minimize the potential for tube material loss due to erosion-corrosion. At the time of the inspection, Exelon staff were considering several options and were tracking these activities in their corrective action process. The inspectors concluded Exelon's evaluation was of sufficient technical detail to identify the apparent causes of the electric bay cooler leaks in December 2016 and to develop interim and longer-term corrective actions that addressed the causes commensurate with their safety significance.

The inspectors further determined that under CR-JAF-2016-05224, Exelon staff documented retraction of an internal historical memo that identified TS 3.0.3 should be entered if one electric bay cooler could not be returned to service after 7 days. Exelon staff determined the memo was predicated on an assumption that an operability determination could not be completed. This memo guidance was determined by Exelon staff to be overly conservative because the Technical Requirements Manual statements and operability determination process provided sufficient guidance for this potential condition. The inspectors did not identify any issue of concern with this corrective action.

#### 4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 2 samples)

(Closed) Licensee Event Report (LER) 05000333/2017-003-00: Inadvertent Isolation of the High Pressure Coolant Injection System

The inspectors reviewed Exelon's actions associated with LER 05000333/2017-003-00 which reported an inadvertent isolation of the HPCI system that occurred on April 4, 2017, during a planned surveillance test of instrumentation associated with the low pressure emergency core cooling systems. The inspectors identified one NCV while reviewing this LER. This LER is closed.

Introduction. A self-revealing NCV of very low safety significance (Green) of TS 5.4, "Procedures," was identified for a procedural error which resulted in the inadvertent isolation of the HPCI system. Specifically, procedure ISP-175B1, "Reactor and Containment Cooling Instrument Functional Test/Calibration," was not correctly performed, which caused the HPCI system to isolate.

Description. On April 4, 2017, an I&C technician inadvertently isolated the HPCI system while performing surveillance procedure ISP-175B1, which tests various instrumentation associated with the low pressure emergency core cooling systems. Step 9.4.5 of ISP-175B1 required installation of a DC voltage source on 02-3MTU-252B, Reactor Pressure Interlock Containment Spray Pump/Residual Heat Removal/Residual Heat Removal Shutdown Cooling Master Trip Unit. However, an I&C technician mistakenly connected the DC voltage source to the adjacent trip unit 23MTU-217B, HPCI Area Temp High Master Trip Unit, which caused the HPCI system to isolate. The error was immediately identified by control room operators with the unexpected receipt of control room annunciators. Exelon's immediate response to the event included stopping the surveillance test, and developing and implementing a plan to restore the HPCI system to an operable status. The HPCI system was subsequently restored to service approximately five hours after the inadvertent isolation. Exelon entered this issue into the CAP as IR 03993791.

Exelon's review of this incident determined that the I&C technician involved did not correctly implement error reduction tools and verify that the DC voltage source was installed on the correct trip unit prior to performing the surveillance procedure step. The inspectors reviewed the corrective actions that were documented in IR 03993791 and determined that Exelon's conclusions and follow-up corrective actions were appropriate.

Analysis. The inspectors determined that the failure to correctly implement procedure ISP-175B1 and install the DC voltage source on the correct master trip unit as specified in Step 9.4.5 was a performance deficiency within Exelon's ability to foresee and correct

and should have been prevented. This performance deficiency was more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability of system that respond to initiating events to prevent undesirable consequences. Specifically, the failure to correctively implement procedure ISP-175B1 caused an isolation of the HPCI system and rendered it unavailable to respond to an initiating event.

In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 2 of IMC 0609, Appendix A, "The SDP for Findings At-Power," issued June 19, 2012, the inspectors determined that this finding required a detailed risk assessment by a regional SRA since the HPCI isolation resulted in a loss of safety function. The SRA assumed that the HPCI system was inoperable for 5 hours and that no other risk significant equipment was unavailable. Using SAPHIRE 8 Version 8.1.6 and the FitzPatrick SPAR, model version 8.50 dated February 28, 2017, the SRA ran the above scenario and determined the increase in risk of an event leading to core damage (core damage frequency) to be 1.2E-8 events per year. The dominant risk sequence was a transient with a loss of condenser heat sink and a failure to depressurize. This corresponds to very low risk significance (Green).

The inspectors determined this finding had a cross-cutting aspect in the area of Human Performance, Avoid Complacency, because the I&C technician did not correctly implement error reduction tools and verify that the DC voltage source was installed on the correct trip unit prior to performing the surveillance procedure step [H.12].

Enforcement. TS 5.4, "Procedures," requires, in part, that written procedures be maintained as recommended in NRC Regulatory Guide 1.33, "Quality Assurance Program Requirements," Revision 2, Appendix A, November 1972. Regulatory Guide 1.33, Appendix A, Section H includes the requirement for implementing surveillance procedures for emergency core cooling system tests. Contrary to the above, on April 4, 2017, procedure ISP-175B1, "Reactor and Containment Cooling Instrument Functional Test/Calibration," was not adequately implemented, resulting in an isolation of HPCI. Corrective actions included restoring HPCI to an operable status, increased observations of peer checks, and validation of I&C activities. Because this finding was of very low safety significance (Green) and has been entered into the CAP as IR 03993791, this violation is being treated as an NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy. **(NCV 05000333/2017004-02, Human Error Resulting in Unplanned HPCI Isolation)**

#### 4OA5 Other Activities

##### Operation of an ISFSI at Operating Plants (60855, 60855.1 - 1 sample)

##### a. Inspection Scope

On October 2–6, 2017, the inspectors observed and evaluated Exelon's loading of multi-purpose canister (MPC)-410, the first of five canisters scheduled to be loaded during Exelon's ISFSI dry cask campaign. The inspectors also reviewed Exelon's activities related to long-term operation and monitoring of their ISFSI. The inspectors verified compliance with the certificate of compliance, TSs, regulations, and Exelon procedures.



The inspectors observed cask processing operations to include welding of the lid to the MPC, non-destructive examination of welds, hydrostatic testing, vacuum drying of the MPC, and helium backfill. During performance of these activities, the inspectors evaluated whether procedure use, communication, and coordination of ISFSI activities met established standards and requirements. The inspectors attended Exelon briefings to assess their ability to identify critical steps of the evolution, potential failure scenarios, and human performance tools to prevent errors. The inspectors reviewed loading and monitoring procedures and evaluated Exelon's adherence to these procedures.

The inspectors reviewed Exelon's program associated with fuel characterization and selection for storage. The inspectors reviewed cask fuel selection packages to determine whether Exelon was loading fuel in accordance with the certificate of compliance and TS. The inspectors confirmed that Exelon did not plan to load any damaged fuel assemblies during this campaign. The inspectors reviewed recordings made of the fuel assemblies loaded into MPC-810 to ensure the loading was in accordance with FitzPatrick's loading plan.

The inspectors reviewed radiation protection procedures and radiation work permits associated with the ISFSI loading campaign. The inspectors observed radiation protection technicians as they provided job coverage for the cask loading workers. The inspectors also reviewed the as low as reasonably achievable (ALARA) goal for the cask loading to determine the adequacy of Exelon's radiological controls, to ensure that radiation worker doses were ALARA, and that project dose goals could be achieved. The inspectors reviewed survey data maps and radiological records from the dry storage cask storage loading to confirm that radiation survey levels measured were within limits specified by the TS and consistent with values specified in the final safety analysis report.

The inspectors performed tours of the heavy haul path and ISFSI pad to assess the material condition of the path, pad, and the loaded Holtec International Storage Modules (HI-STORMs). The inspectors also verified that transient combustibles were not being stored on the haul path, ISFSI pad, or in the vicinity of the HI-STORMs. The inspectors checked the operations rover patrol daily logs and verified Exelon was appropriately performing daily HI-STORM vent surveillances in accordance with TS requirements. The annual environmental reports were reviewed to verify that areas around the ISFSI site boundary were within limits specified in 10 CFR Part 20 and 10 CFR 72.104. The inspectors reviewed selected 10 CFR 72.48 screenings to verify that Exelon had appropriately considered the conditions under which they may make changes without prior NRC approval. The inspectors also reviewed CAP CRs, audit reports, and self-assessments that were generated since Exelon's last loading campaign to ensure that issues were being properly identified, prioritized, and evaluated commensurate with their safety significance.

b. Findings

No findings were identified.

#### 4OA6 Meetings, Including Exit

On January 23, 2018, the inspectors presented the inspection results to Mr. Joseph Pacher, Site Vice President, and other members of the Exelon staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

#### 4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by Exelon and is a violation of NRC requirements, which meets the criteria of the NRC Enforcement Policy for being dispositioned as a NCV.

- 10 CFR 50.65(a)(4) states, in part, that before performing maintenance activities (including but not limited to surveillance, post-maintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. The scope of the assessment may be limited to structures, systems, and components that a risk-informed evaluation process has shown to be significant to public health and safety. Contrary to the above, on March 28, 2011, and April 16, 2015, before performing maintenance activities on the electric bay unit coolers, as discussed in Section 4OA2.4, Exelon did not assess and manage the increase in risk that resulted from the maintenance activities. This issue was documented in Condition Report JAF-2016-0838. In accordance with IMC 0609.04, "Initial Characterization of Findings," and IMC 0609 Appendix K, Flowchart 2, "Assessment of RMAs." The inspectors determined that the violation was of very low safety significance (Green) because the incremental core damage probability was less than  $1E-5$ , with three risk management actions taken during the maintenance activities.

### **ATTACHMENT: SUPPLEMENTARY INFORMATION**

**SUPPLEMENTARY INFORMATION****KEY POINTS OF CONTACT**Licensee Personnel

J. Pacher, Site Vice President  
 T. Peter, Plant Manager  
 C. Adner, Director, Site Operations  
 H. Borick, Senior Operations Instructor  
 W. Drews, Manager, Site Regulatory Assurance  
 J. Jones, Manager, Emergency Preparedness  
 A. King, Radiation Protection Supervisor  
 D. Loope, Radiation Protection Manager  
 T. Redfearn, Manager, Security  
 B. Sanders, Chemistry Supervisor  
 A. Smith, Director, Training  
 A. Sterio, Director, Site Engineering

**LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED**Closed

05000333/2017-001-01	URI	Drywell Moisture Barrier Description in License Renewal Application (Section 1R08)
05000333/2017-003-00	LER	Inadvertent Isolation of the High Pressure Coolant Injection System (Section 4OA3)

Opened/Closed

05000333/2017004-01	NCV	Inadequate Design Control for Battery Sizing Calculation (Section 1R12)
05000333/2017004-02	NCV	Human Error Resulting in Unplanned HPCI Isolation (Section 4OA3)

## LIST OF DOCUMENTS REVIEWED

### **Section 1R01: Adverse Weather Protection**

#### Procedures

AP-12.04, Seasonal Readiness Preparations, Revision 26

WC-AA-107, Seasonal Readiness, Revision 18

#### Issue Report

04031460

#### Work Order

82716033

### **Section 1R04: Equipment Alignment**

#### Procedure

ST-9R, EDG System Quick-Start Operability Test and Offsite Circuit Verification, Revision 8

### **Section 1R05: Fire Protection**

#### Procedures

OP-AA-201-003, Fire Drill Performance, Revision 16

OP-AA-201-003, Fire Drill Performance, Revision 18

PFP-PWR01, East Cable Tunnel, Elevation 258, Revision 3

PFP-PWR11, Building Cable Spreading Room Elevation 272, Revision 3

PFP-PWR22, Standby Gas Filter Room, Elevation 272, Revision 6

PFP-PWR26, Reactor Building/Elevation 326 Fire Area/Zone IX/RB-1A, Revision 14

PFP-PWR27, Reactor Building/Elevation 344 Fire Area 9/ Fire Zone RB-1A

PFP-PWR33, Pump Rooms (Screenwell), Elevation 255, Revision 2

#### Miscellaneous

JAF-RPT-04-00478, JAF Fire Hazards Analysis, Revision 3

### **Section 1R06: Flood Protection Measures**

#### Procedure

FM-36A Flow Diagram Circulating Water System 36, Revision 44

#### Miscellaneous

James A. FitzPatrick Individual Plant Examination, Revision 1

### **Section 1R08: Inservice Inspection Activities**

#### Condition Reports

JAF-2017-0906

JAF-2010-05936

#### Action Request

03992520

Miscellaneous

ML062160491, Transmittal of James A. Fitzpatrick License Renewal Application  
ML062160553, James A. Fitzpatrick License Renewal Application, Appendix A, Updated Final Safety Analysis Report Supplement  
ML062160556, James A. Fitzpatrick License Renewal Application, Cover Page through Chapter 4  
ML17192A449, Errors Identified in Response Provided to NRG during License Renewal Application Process  
EN-DC-150 R12, Attachment 9.4, Reinforced Concrete Inspection Checklist – Drywell Floor, dated January 17, 2017

Drawings

11825-FC-20M, Sht. 1, Reactor Building Fdn Dets. - Drywell Support, Revision 2  
11825-FC-20R, Sht. 3, Reactor Building Fdn Dets. - Drywell Supports, Revision 3  
11825-FC-21A, Sht. 1, Reactor Building Reactor Supports and Fdn. Dets. in Drywell, Revision 5  
11825-FM-1G, Sht. 7, Mach. Loc. – Reactor Bldg., Revision 11

Work Orders

00196185-01  
00406689-01

**Section 1R11: Licensed Operator Regualification Program**

Procedures

OP-65, Startup and Shutdown Procedure, Revision 121  
ST-1E, Main Turbine Stop Valve Limit Switch Channel Functional Test, Revision 22  
ST-1L, Main Turbine Control Valve Instrument Channel and Valve Operability Check, Revision 36

**Section 1R12: Maintenance Effectiveness**

Issue Reports

3993289	4038078	4072571*	4074229*
4077089*	4077273*	4079452*	

\*identified as a result of the inspection

Condition Reports

JAF-2009-03840  
JAF-2016-00245

Work Orders

4637832-01  
4666830-01  
52342720  
52394378  
52733098

Calculations

JAF-CALC-ELEC-01857, 419VDC LPCI Power System 3A and 3B Sizing, Revision 0A

JAF-CALC-ELEC-01860, LPCI Battery Performance Test End Volt Cutoff, Revision 1  
JAF-RPT-ELEC-02302, Maintenance Rule Basis Document System 71-DC, Revision 6

Miscellaneous

JAF-RPT-MISC-02272, Maintenance Rule Basis Document for Plant Level Performance, Revision 8  
JAF-RPT-RWR-02656, Maintenance Rule Basis Document System 02-2 Reactor Water Recirculation System, Revision 9  
JENG-17-0006, (a)(1) Evaluation of the Reactor Water Recirculation System 02-2, May 15, 2017  
MP-057.06, Battery Maintenance, Revision 51

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

Procedure

OP-AA-108-117, Protected Equipment Program, Revision 5

**Section 1R15: Operability Determinations and Functionality Assessments**

Procedures

OP-55B, Control Room Ventilation and Cooling, Revision 36  
OP-62, Pipe and Cable Tunnels Ventilation Systems, Revision 14  
ST-18, Main Control Room Emergency Fan and Operability Test, Revision 32

Issue Reports

04078735  
04078737  
04064990

Condition Reports

3992600	3992608	3992613	3992524
3992547			

Work Order

82644734

**Section 1R19: Post-Maintenance Testing**

Procedures

RT-02.01, Chemical Flush, Revision 9  
ST-8Q, Testing of the Emergency Service Water System, Revision 49  
ST-9BA, 'A' and 'C' EDG Full Load Test and ESW Pump Operability Test, completed October 13, 2017  
ST-9BB, 'B' and 'D' EDG Full Load Test and ESW Pump Operability Test, completed September 29, 2017

Issue Report

04061338

Work Orders

04708179

82630905  
82655954

Miscellaneous

SEP-SW-JAF-001, NRC Generic Letter 89-13 Service Water Program, Revision 0

**Section 1R22: Surveillance Testing**

Procedure

SP-01.06, Gaseous Effluent Sampling and Analysis, Revision 18

Issue Report

04072267

Work Request

01371281

**Section 1EP4: Emergency Action Level and Emergency Plan Changes**

EAP-1.1, Offsite Notifications, Revision 74  
EAP-1.1, Offsite Notifications, Revision 75  
EAP-4B, Detailed Dose Assessment, Revision 2  
EAP-17, Emergency Organization Staffing, Revision 126  
IAP-2, Classification of Emergency Conditions, Revision 34A  
IAP-2, Classification of Emergency Conditions, Revision 35  
IAP-2, Figure IAP-2.1, Emergency Action Level Matrix, Revision 10A  
IAP-2, Classification of Emergency Conditions, Revision 36

**Section 4OA1: Performance Indicator Verification**

Procedures

EN-LI-114, Regulatory Performance Indicator Process, Revision 7  
LS-AA-2001, Collecting and Reporting of NRC Performance Indicator Data, Revision 14  
LS-AA-2200, Mitigating System Performance Index Data Acquisition and Reporting, Revision 5

Issue Reports

04079996  
04080016

Miscellaneous

JAF-RPT-05-00047, Mitigating System Performance Index (MSPI) Basis Document, Revision 5

**Section 4OA2: Problem Identification and Resolution**

Procedures

PI-AA-1001, Performance Improvement Integrated Matrix, Revision 0  
PI-AA-101-1001, Performance Monitoring and Analysis Manual, Revision 0  
PI-AA-120, Issue Identification and Screening Process, Revision 7  
PI-AA-125, Corrective Action Program (CAP) Procedure, Revision 6

Condition Reports

JAF-2015-00575  
JAF-2016-04871  
JAF-2016-05006  
JAF-2016-05243

Drawing

1.75-72, Elementary Diagram Feedwater Control System, Revision 14

Work Order

52606334-01

Miscellaneous

Fleet Assessment Report, August 2017  
Fleet Assessment Mid-Cycle Assessment Report, June 12-23, 2017  
Performance Improvement Action Plan Development, July 2017  
Plan of the Day Meeting Package, December 21, 2017

**Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion**

Procedures

OP-AA-101-113-1004, Guidelines for the Morning Plant Status Call, Revision 37  
ISP-175B1, Reactor and Containment Cooling Instrument Functional Test/Calibration,  
Revision 20

Issue Report

03993791

**Section 4OA5: Other Activities**

Procedures

EN-MA-125, Revision 21, Troubleshooting Control of Maintenance Activities  
EN-RP-110-04, Revision 3, Radiation Protection Risk Assessment Process  
EN-RP-110-05, Revision 1, ALARA Planning and Controls  
EN-RP-204, Revision 11, Special Monitoring Requirements  
EN-RP-317, Revision 0, Central Calibration Facility  
EN-RP-319-01, Revision 0, Calibration of Portable Neutron Meters  
GQP 9.2, Revision 9, High Temperature Liquid Penetrant Examination and Acceptance  
Standards for Welds, Base Materials and Cladding (50\*-350\*F)  
GQP 9.6, Revision 15, Visual Examination of Welds  
H2-NON-002, Revision 9, Hydrogen Monitoring for Holtec Canisters  
MA-AA-716-008-1808, Revision 13, Refuel Floor FME Plan  
MP-019.04, Rev 5, HI-STORM Receiving, Handling, and Storage  
MP-019.06, Revisions 23, 23A, 24, and 25, MPC Loading and Sealing and Associated  
Troubleshooting Plans  
MP-019.07, Revision 25, MPC Transfer and HI-STORM Movement  
MP-019.13, Vertical Cask Transporter, Revision 2  
NF-AA-622, Revision 3, Fuel Selection and Documentation for Cask Loading  
NF-AA-622-1000, Revision 5, Fuel Characterization for Dry Storage  
OP-51A, Revision 50, Reactor Building Ventilation and Cooling System  
PI-CNSTR-OP-EXE-H-01, Revision 17, Closure Welding of Holtec Multi-Purpose Canister



RP-INST-02.07, Revision 6, Neutron Survey Instruments  
 RP-OPS 03.05, Revision 19, Refuel Floor and Drywell Radiological Controls

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03994767	04042028	04047122	04058378
04058456	04058752	04058913	04058919
04059125	04059155	04059536	

Work Order

80470867

Miscellaneous

A704-11-880 Issue D GV160 Vacuum Pump Instruction Manual  
 ALARA Plan for RWP 20170022  
 Certificate of Compliance No. 1014, Amendment No. 8, Revision 1  
 James A. FitzPatrick Nuclear Power Plant 2016 Annual Radiological Environmental Operating Report  
 Operations Manual for ALICAT Precision Gas Mass Flow Meters  
 RWP 20130022  
 RWP Closeout and Post Job ALARA Review  
 Self-Assessment AR3998256  
 Surveys JAF-1310-0224, JAF-1311-0190, JAF-1608-0131, JAF-1608-0132, JAF-1608-0133, JAF-1608-0134, JAF-1608-0137, JAF-1609-0098, ISFSI-000005, ISFSI-000004, ISFSI-000002, ISFSI-000011, ISFSI-000014, ISFSI-000015, ISFSI-000016, ISFSI-000007, ISFSI-000005, ISFSI-000017  
 72.48 Screening for MP-19.16, Revision 1; ISFSI Equipment Handling and Storage Abnormal Conditions, MP19.15, Revision 6; HI-STORM Overpack Annual Inspection, MP-19.10, Revision 5; Dry Cask Storage Special Lifting Devices, MP-19.07, Revision 4; MPC Transfer and HI-STORM Movement, MP-19.06, Revision 22; MPC Loading and Sealing

**Section 40A7: Licensee-Identified Violations**

Procedure

EN-LI-102, Corrective Action Program, Revision 28

Condition Reports

JAF-2016-0838  
 JAF-2016-4372  
 JAF-2016-1656

Miscellaneous

JAF-CALC-16-00001, Crescent Area Heatup with No Unit Coolers, Revision 0  
 JAF-LO-2016-009  
 QDR No. 02.02, General Electric 8000 Series AC Motor Control Centers, Revision 3  
 QDR No. 4.01, General Electric 4kV Series 5K6339XC Motors, October 2001

**LIST OF ACRONYMS**

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ALARA	as low as is reasonably achievable
CAP	corrective action program
CR	condition report
DC	direct current
EAL	emergency action level
EDG	emergency diesel generator
ESW	emergency service water
HI-STORM	Holtec International Storage Module
HPCI	high pressure coolant injection
I&C	instrumentation and control
IMC	Inspection Manual Chapter
IPS	independent power supply
IR	issue report
ISFSI	independent spent fuel storage installation
LER	licensee event report
LPCI	low pressure coolant injection
MOV	motor operated valve
MPC	multi-purpose canister
NCV	non-cited violation
NRC	Nuclear Regulatory Commission
SPAR	Standardized Plant Assessment Risk Model
SRA	senior reactor analyst
SSC	structure, system, and component
TS	technical specification
UFSAR	Updated Final Safety Analysis Report
URI	unresolved item
VDC	volts direct current
WO	work order