



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION I
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November 2, 2017

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

**SUBJECT: PEACH BOTTOM ATOMIC POWER STATION – INTEGRATED INSPECTION
REPORT 05000277/2017003 AND 05000278/2017003**

Dear Mr. Hanson:

On September 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Peach Bottom Atomic Power Station, Units 2 and 3. On October 17, 2017, the NRC inspectors discussed the results of this inspection with Mr. Pat Navin, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented one finding of very low safety significance (Green) in this report. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy. Further, NRC inspectors documented a licensee-identified violation which was determined to be of very low safety significance (Severity Level IV) in this report.

If you contest the violation or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the 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 Peach Bottom.

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's Public Document Room in accordance with 10 *Code of Federal Regulations* (CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Daniel L. Schroeder, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket Nos. 50-277 and 50-278
License Nos. DPR-44 and DPR-56

B. Hanson

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Enclosure:

Inspection Report 05000277/2017003

and 05000278/2017003

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 ADAMS ACCESSION NUMBER: ML17306A079

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U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.: 50-277 and 50-278

License Nos.: DPR-44 and DPR-56

Report No.: 05000277/2017003 and 05000278/2017003

Licensee: Exelon Generation Company, LLC

Facility: Peach Bottom Atomic Power Station, Units 2 and 3

Location: Delta, Pennsylvania

Dates: July 1, 2017 through September 30, 2017

Inspectors: J. Heinly, Senior Resident Inspector
B. Smith, Resident Inspector
C. Bickett, Senior Reactor Inspector
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Approved By: Daniel L. Schroeder, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Enclosure

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SUMMARY

Inspection Report 05000277/2017003 and 05000278/2017003; 07/01/2017 – 09/30/2017; Peach Bottom Atomic Power Station (PB), Units 2 and 3; Operability Evaluations.

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by four region-based inspectors. The inspectors identified one finding, which was 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 (SDP)," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within Cross-Cutting Areas," dated December 4, 2014. All violations of the Nuclear Regulatory Commission (NRC) requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated August 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. A self-revealing NCV of Technical Specification (TS) 5.4.1, "Procedures," of very low safety significance (Green) was identified for Exelon not implementing procedural instructions for the replacement of the HS-3-40H-3AV060 switch block associated with the 3AV060 high pressure service water (HPSW) ventilation fan. Exelon did not ensure that electrical connections were free of loose wire strands per their procedural standard E-1317, Wire and Cable Notes and Details, Power, Control, and Instrumentation, Revision 55, and from the vendor manual instructions. As a result, on July 10, 2017, the 3AV060 HPSW ventilation fan failed its surveillance test (ST) and rendered one subsystem of Unit 3 HPSW inoperable. Exelon entered this issue into their corrective action program (CAP) as issue reports (IR) 4030367 and 4044444, straightened out the remaining loose strands, and specified additional electrical panels for an extent of condition (EOC) review.

This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and affected the cornerstone's objective to ensure the reliability, availability, and capability of systems to respond to initiating events to prevent undesirable consequences (i.e. core damage). By not implementing the E-1317 procedural instructions, the 3AV060 fan failed and affected the reliability of one HPSW subsystem. The inspectors evaluated the finding in accordance with Exhibit 2 of IMC 0609, Appendix A, "SDP for Findings At-Power" and determined the finding was of very low safety significance (Green) because it did not represent a loss of system function or represent an actual loss of function of at least a single train for longer than its TS allowed outage time. The inspectors determined no cross-cutting aspect applied because the PD occurred in 2010 and was not indicative of current performance. (Section 1R15)

Other Findings

A Severity Level IV violation was identified by Exelon has been reviewed by the inspectors. Corrective actions taken and planned by Exelon have been entered into Exelon's CAP. This violation and corrective action tracking numbers are listed in 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 2 began the inspection period at 100 percent rated thermal power (RTP). On September 12, 2017, operators performed a downpower to 82 percent RTP to remove the '2B' reactor feed pump (RFP) from service due to control valve oscillations. Following repairs, operators returned the '2B' RFP to service and the unit was returned to 100 percent RTP on September 13, 2017. The unit remained at 100 percent RTP except for brief periods to support planned testing and control rod pattern adjustments.

Unit 3 began the inspection period at 100 percent RTP and remained at 100 percent RTP except for brief periods to support planned testing and control rod pattern adjustments. The unit then began end-of-cycle coastdown for refueling outage 3R21 on August 18, 2017, and ended the inspection period at 86 percent RTP.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment

Partial System Walkdowns (71111.04Q – 4 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 3 high-pressure coolant injection (HPCI) system while the reactor core isolation cooling (RCIC) system was inoperable for electrical troubleshooting on August 29, 2017
- Unit 2 and Unit 3 E-1, E-3, and E-4 emergency diesel generators (EDG) while E-2 EDG was inoperable for bolt replacements on the exhaust manifold on August 30, 2017
- Unit 3 'B' core spray (CS) system during E-1 EDG overhaul on September 14, 2017
- Unit 3 'B' residual heat removal (RHR) system during Unit 3 'A' RHR system outage on September 28, 2017

The inspectors selected these systems based on their risk-significance relative to the Reactor Safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the updated final safety analysis report (UFSAR), TS, work orders (WOs), IRs, 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 also performed field walkdowns of accessible portions of the systems 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 (71111.05 – 5 samples)

.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 4 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 (OOS), degraded or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Unit 2 torus room (PF-5C) on August 11, 2017
- Unit 3 torus room (PF-13C) on August 11, 2017
- Unit 2 and Unit 3 EDG building (PF-132) on August 30, 2017
- Unit 2 'B' and 'D' CS rooms (PF-5D) on September 14, 2017

b. Findings

No findings were identified.

.2 Fire Protection – Drill Observation (71111.05A – 1 sample)

a. Inspection Scope

The inspectors observed a fire brigade drill scenario conducted on September 22, 2017, that involved a simulated fire in the Unit 2 reactor building 195' elevation ventilation fan room. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that the fire brigade instructors identified deficiencies, openly discussed them in a self-critical manner at the debrief, and took appropriate corrective actions (CAs) as required. The inspectors evaluated the following specific attributes of the drill:

- Proper use of turnout gear and self-contained breathing apparatus
- Proper use and layout of fire hoses
- 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 fire-fighting 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 EDG building on August 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. It assessed the adequacy of operator actions that Exelon had identified as necessary to cope with flooding in this area and also 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.

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

.1 Quarterly Review of Licensed Operator Regualification Testing and Training (1 sample)

a. Inspection Scope

The inspectors observed licensed operator out-of-the-box simulator training on September 11, 2017, which involved a loss of all reactor pressure vessel (RPV) instrumentation requiring flooding of the RPV. The inspectors evaluated operator performance in the control room simulator during the training 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 classifications made by the shift manager and the TS action statements entered by the shift technical advisor. 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
(1 sample)

a. Inspection Scope

The inspectors observed and reviewed the licensed operator performance from the main control room during the activities listed below. The inspectors observed use of and compliance with procedures, crew communications, interpretation, diagnosis, and understanding of plant alarms, use of human error prevention techniques, documentation of activities, and management oversight of the evolution to verify that the crew was following procedures and plant expectations for conduct of operations.

- Unit 3 removal of the '3A' and '3C' 5th stage feedwater heaters on July 22, 2017 and Unit 2 troubleshooting of the 'B' feed water pump turbine on September 13, 2017

The inspectors observed control room briefings and power changes. Additionally, the inspectors observed power changes 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 – 2 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structures, systems, and components (SSCs) performance and reliability. The inspectors reviewed system health reports, CAP documents, maintenance WOs, and maintenance rule (MR) basis documents to ensure that Exelon was identifying and properly evaluating performance problems within the scope of the MR. For each sample selected, the inspectors verified that the SSC was properly scoped into the MR in accordance with 10 *Code of Federal Regulations* (CFR) 50.65 and verified that the (a)(2) performance criteria established by the Exelon staff 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) status. Additionally, the inspectors ensured that Exelon staff was identifying and addressing common cause failures that occurred within and across MR system boundaries.

- Unit 3 drywell chillers on July 24 through 28, 2017
- Unit 2 and Unit 3 Appendix R emergency lighting on September 11 through 15, 2017

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 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 to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Unit 2 and Unit 3 E-3 EDG exhaust manifold bolt replacement on July 26, 2017
- Unit 2 and Unit 3 'B' standby gas planned maintenance on August 7, 2017
- Unit 3 HPSW/RHR cross-tie pipe leak on August 15, 2017
- Unit 2 and Unit 3 station blackout (SBO) line tripped on August 17, 2017
- Unit 2 and Unit 3 E-1 EDG overhaul on September 11, 2017

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 6 samples)

a. Inspection Scope

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

- Unit 3 HPCI pressure control valve leaking on July 17, 2017
- Unit 3 HPSW cross-tie pipe unexpectedly contained water on August 15, 2017
- Unit 2 and Unit 3 HPSW ventilation fan 'X1' wire not connected on August 18, 2017
- Unit 3 maximum fraction of limiting power density higher than expected on August 25, 2017
- Unit 3 'K' safety relief valve electrical ground in the bellows alarm detection circuit on September 5, 2017
- Unit 3 HPCI water intrusion into oil reservoir on September 19, 2017

The inspectors evaluated the technical adequacy of the ODs 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, including compliance with in-service testing requirements. Where compensatory measures were required to maintain operability, such as in the case of operator workarounds, the inspectors determined whether the measures in place would function as intended and were properly controlled by Exelon.

b. Findings

Introduction. A self-revealing NCV of TS 5.4.1, "Procedures," of very low safety significance (Green) was identified for Exelon not implementing procedural instructions for the replacement of the HS-3-40H-3AV060 switch block associated with the 3AV060 HPSW ventilation fan. Specifically, Exelon did not ensure that electrical connections were free of loose wire strands per their procedural standard E-1317, "Wire and Cable Notes and Details Power, Control, and Instrumentation", Revision 55 and from the vendor manual E-5-167 instructions. As a result on July 10, 2017, the 3AV060 HPSW ventilation fan failed its surveillance test and rendered one subsystem of Unit 3 HPSW inoperable.

Description. The safety objective of the Unit 3 HPSW system is to provide a reliable supply of cooling water for the Unit 3 RHR system under post-accident conditions. Unit 3 HPSW consists of four 4500 gpm pumps installed in parallel in the pump structure with its normal water supply to the suction of the pumps from the Conowingo pond. Within the pump structure, two emergency ventilation supply and exhaust fans maintain suitable temperatures for safety-related equipment protection during post-accident conditions. Furthermore, the Unit 3 Technical Requirements Manual (TRM) 3.11 requires that two pump structure ventilation subsystems be operable. In the event that one pump structure ventilation subsystem is inoperable, the TRM requires that the station immediately comply with TS section 3.7.1, Condition A, and declare one HPSW subsystem inoperable.

On July 10, 2017, during the quarterly ST-O-033-300-2, Revision 42, "Unit 3 ESW, Valve, Unit Cooler, and Emergency Cooling Tower Fan Functional In-Service Test," the 3AV060 fan switch was taken to start, but the fan did not start. Upon further investigation in the 30C139 electrical panel, Exelon identified that wire 'X1' was disconnected rendering the 3AV060 fan inoperable. Exelon generated IR 4030367 in the CAP and entered TS 3.7.1, declaring the 'A' HPSW subsystem inoperable. Exelon subsequently re-landed the wire within one hour, successfully completed the surveillance, and exited the TS 3.7.1 action statement. Previously, the 3AV060 ventilation fan operated successfully on April 14, 2017, during the prior quarterly surveillance.

The inspectors discussed IR 4030367 with Exelon's I&C technicians as to the cause of the disconnected 'X1' wire and the need for an EOC review. In response to the inspectors' questions, Exelon generated IR 4044444 on August 22, 2017, and identified that IR 4030367 did not have sufficient detail concerning the cause of the disconnected 'X1' wire nor had the station conducted an appropriate extent of condition review for the disconnected 'X1' wire. In IR 4044444, Exelon noted that some of the strands from the wire were loose and not captured under the terminal clamp such that adequate clamping force was not provided. In 2010, the switch block associated with the 3AV060 fan, HS-3-40H-3AV060, had been replaced under WO C0234066 following a previous failure of the 3AV060 fan.

Exelon standard E-1317, "Wire & Cable Notes and Details for Power, Control and Instrumentation," Revision 55, states in section 3.3.1 that, "All cables shall be terminated with ring tongue compression terminals except as noted." In the exceptions section it states that, "vendor supplied terminal lugs/connectors may be used provided the manufacturer's instructions are followed." Exelon's vendor manual, E-5-167, for these type of connections instructs to "tighten all binding screws snugly. To avoid trouble do not leave loose strands of wire." However following the failure of the fan to start, Exelon identified many loose wire strands that had not been captured under the terminal clamp for the 'X1' wire connection. Exelon entered this issue into their CAP as IR 4030367 and IR 4044444, straightened out the remaining loose strands, and specified additional electrical panels for an EOC review.

Analysis. Exelon's failure to implement their E-1317 procedural instructions for the replacement of the HS-3-40H-3AV060 switch block was a PD that was within their ability to foresee and correct and should have been prevented. The finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and affected the cornerstone's objective to ensure the reliability, availability, and capability of systems to respond to initiating events to prevent undesirable consequences (i.e., core damage). By not implementing their E-1317 procedural instructions, the 3AV060 fan failed and adversely affected the reliability of one HPSW subsystem. The inspectors evaluated the finding in accordance with Exhibit 2 of IMC 0609, Appendix A, "SDP for Findings At-Power," and determined the finding was of very low safety significance (Green) because it did not represent a loss of system function or represent an actual loss of function of at least a single train for longer than its TS allowed outage time. The inspectors determined no cross-cutting aspect applied because the PD occurred in 2010 and was not indicative of current performance.

Enforcement. TS 5.4.1, "Procedures," states, in part, that written procedures shall be implemented for the applicable procedures recommended in Regulatory Guide (RG) 1.33, Appendix A, November 1972. RG 1.33 section I.1 specifies procedures and instructions shall be preplanned and followed for performing maintenance which can affect the performance of safety-related equipment. Contrary to the above requirement, Exelon did not follow the procedural instructions in E-1317 for ensuring that the replacement of switch block HS-3-40H-3AV060 was installed properly. Because this finding was of very low safety significance and was entered into Exelon's CAP as IRs 4030367 and 4044444, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000278/2017003-01, Instructions Not Followed for Replacement of HPSW Ventilation Switch Block)**

1R18 Plant Modifications (71111.18 – 1 sample)

Permanent Modifications

a. Inspection Scope

The inspectors reviewed the station seismic monitoring system replacement modification on August 3, 2017, to determine whether the modification affected the safety function of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing results, and conducted field walkdowns of the modification to verify that the permanent modification did not degrade the design bases, licensing bases, and performance capability of the affected system.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 6 samples)a. Inspection Scope

The inspectors reviewed the post-maintenance tests (PMTs) for the maintenance activities listed below to verify that procedures and test activities tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with the information in the applicable licensing basis and/or design basis documents, and that the test results were properly reviewed and accepted and problems were appropriately documented. The inspectors also walked down 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 point were performed and checked, and that results adequately demonstrated restoration of the affected safety functions.

- Unit 2 and Unit 3 emergency cooling tower valve replacement PMT on July 13, 2017
- Unit 2 reactor protection system (RPS) level switch LIS-2-3-99C replacement PMT on August 2, 2017
- Unit 2 and Unit 3 standby gas treatment valve replacement PMT on August 7, 2017
- Unit 3 RCIC M-series relay contact replacements and PMT on August 14, 2017
- Unit 2 and Unit 3 E-1 EDG cam shaft replacement and engine overhaul PMT on September 18, 2017
- Unit 3 'C' RHR system outage PMT on September 28, 2017

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 4 samples)a. Inspection Scope

The inspectors observed performance of surveillance tests (STs) and/or reviewed test data of selected risk-significant SSCs 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 STs:

- Unit 3 control rod settle time testing on July 5, 2017
- Unit 2 jet pump core flow verification on July 18, 2017
- Unit 2 'A' standby liquid control (SBLC) test on September 18, 2017
- Unit 3 HPCI pump, valve, and flow test (IST) on September 20, 2017

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness1EP6 Drill Evaluation (71114.06 – 1 sample)Emergency Preparedness Drill/Simulator Evaluation/Observationa. Inspection Scope

The inspectors evaluated the shift manager\emergency director's emergency preparedness (EP) implementation during a licensed operator out-of-the-box simulator training on September 11, 2017, which involved a loss of all RPV instrumentation requiring flooding of the RPV. The inspectors observed emergency response operations in the simulator to determine whether event classifications and notifications were performed in accordance with approved procedures. The inspectors also attended the control room simulator drill critique to compare inspector observations with those identified by Exelon staff in order to evaluate whether Exelon staff were properly identifying emergency preparedness weaknesses and entering them into the CAP.

b. Findings

No findings were identified.

2. RADIATION SAFETY**Cornerstone: Public Radiation Safety**2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (71124.08 - 6 samples)a. Inspection Scope

The inspectors verified the effectiveness of Exelon's programs for processing, handling, storage, and transportation of radioactive material. The inspectors used the requirements of 49 CFR 170-177, 10 CFR 20, 61, and 71, applicable industry standards, RGs, and procedures required by TS as criteria for determining compliance.

Inspection Planning

The inspectors conducted an in-office review of the solid radioactive waste system description in the UFSAR, the process control program, and the recent radiological effluent release report for information on the types, amounts, and processing of radioactive waste disposed. The inspectors reviewed the scope of quality assurance audits performed for this area since the last inspection.

Radioactive Material Storage (1 sample)

The inspectors observed radioactive waste container storage areas and verified the postings and controls and that Exelon had established a process for monitoring the impact of long-term storage of the waste.

Radioactive Waste System Walkdown (1 sample)

The inspectors walked down the following:

- Accessible portions of liquid and solid radioactive waste processing systems to verify current system alignment and material condition
- Abandoned in place radioactive waste processing equipment to review the controls in place to ensure protection of personnel
- Changes made to the radioactive waste processing systems since the last inspection
- Processes for mixing and transferring radioactive waste resin and/or sludge discharges into shipping/disposal containers
- Current methods and procedures for dewatering waste

Waste Characterization and Classification (1 sample)

The inspectors identified radioactive waste streams and reviewed radiochemical sample analysis results to support radioactive waste characterization. The inspectors reviewed the use of scaling factors and calculations to account for difficult-to-measure radionuclides.

Shipment Preparation (1 sample)

The inspectors reviewed the records of shipment packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and licensee verification of shipment readiness.

Shipping Records (1 sample)

The inspectors reviewed selected non-excepted package shipment records.

Problem Identification and Resolution (1 sample)

The inspectors assessed whether problems associated with radioactive waste processing, handling, storage, and transportation, were identified at an appropriate threshold and properly addressed in Exelon's CAP.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA2 Problem Identification and Resolution (71152 – 1 sample)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure (IP) 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that Exelon entered issues into the CAP at an appropriate threshold, gave adequate attention to timely CAs, 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 Annual Sample: 10 CFR 50 Appendix R Switchgear Cubicle Wiring Discrepancy

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's evaluation and corrective actions related to a wiring discrepancy in switchgear cubicles, as documented in issue reports 02465711, 02472724, 02486367, and 02486371. Specifically, during an extent of condition review resulting from another issue, Exelon identified four switchgear cubicles that contained 14-gauge wiring instead of 8-gauge wiring, as specified in station design documents.

The inspectors assessed Exelon's implemented and planned corrective actions to evaluate whether Exelon staff appropriately identified, characterized, prioritized, and corrected problems associated with this issue. The inspectors compared the actions taken to the requirements in Exelon procedure PI-AA-125, "Corrective Action Program Procedure," and the Peach Bottom Fire Protection Program. The inspectors also reviewed associated documents, conducted interviews with station personnel, and completed field walkdowns to gain an understanding of the implemented and planned corrective actions associated with this issue.

b. Findings and Observations

No findings were identified.

In March 2014, the station discovered broken wires during an inspection of the E23 (1606) breaker cubicle (see NRC NCV 05000277, 278/2014004-01). The function of these wires is to connect 125VDC control power to the associated 10 CFR 50 Appendix R transfer/isolation switch when the switch is taken to the “emergency” position. Use of these transfer/isolation switches is credited in Peach Bottom’s Fire Protection Program as Shutdown Method D, which would be utilized for a fire in the main control room, the cable spreading room, the computer room, or the emergency shutdown panel area.

As a result of the apparent cause evaluation associated with this issue, Exelon determined that the following repairs would be completed in breaker cubicles that were part of the extent of condition for this issue:

- Provide proper and effective strain relief for the affected wires
- Move the wires from the hinge side of the terminal strip to the opposite side
- Replace the wire with one that contains a higher strand count and is better suited to handle fatigue stress

The inspectors noted two deficiencies during their review of Exelon’s corrective action program documentation for this issue:

Cancellation of Extent of Condition Repairs for Cubicle E22 (1607)

The extent of condition repairs discussed above for breaker cubicle E22 (1607) for the 2B high pressure service water pump were cancelled with the following closure remarks: “This work order is not needed. The [10 CFR 50] Appendix R [modification] doesn’t apply to this cubicle. The [action request] was created by mistake.” Exelon determined that cancellation of the work order for the specified reason was inappropriate because the switches in this cubicle are used for alternative shutdown per document NE-296, “Fire Protection Specification for Post-Fire Safe Shutdown Program Requirements.” Exelon documented this issue in the corrective action program as issue report 04053708 on September 19, 2017 for further evaluation. Additionally, based on inspectors’ questions, the station conducted a walkdown of this breaker cubicle.

Based on the results of the evaluation and walkdown, Exelon concluded that it was appropriate to cancel this work order, but the justification used was less than adequate. Exelon determined that no repairs were needed since the configuration of the terminal strip was different, in that, there was more space between the terminal block and the door hinge, which eliminated the tight radius bend that wires in other cubicles experienced when the door was closed. Additionally, the station determined that the wire loop inside the cubicle was properly secured. Exelon also noted that the cause of this issue was indeterminate, as the individual who had cancelled the work was no longer with the company, and no other documentation was available to provide justification for the closure.

The inspectors determined that the station did not appropriately implement Section 4.7.1 of Exelon procedure PI-AA-125 for closure of the issue report and associated action request implementing the extent of condition repairs on breaker cubicle E22 (1607). This section states, in part, that in order to downgrade or cancel a “corrective action” assignment type, Management Review Committee review and approval is required. This section also notes that closure documentation should be “stand alone” and be clear enough to identify the corrective action, as intended, was completed satisfactorily.

The inspectors determined that Exelon's subsequent evaluation of this issue, as documented in issue report 04053708, was reasonable, and noted that the evaluation was approved by the station's Management Review Committee. The inspectors screened this issue in accordance with NRC Inspection Manual Chapter 0612, Appendix B, "Issue Screening," and determined that the issue was of minor significance because the repairs were ultimately not required, and the condition of the breaker cubicle was acceptable as-is.

Untimely Corrective Actions for Wiring Discrepancies

During implementation of the extent of condition repairs discussed above, Exelon identified four breaker cubicles where the installed wiring was actually 14-gauge instead of the 8-gauge wiring that was specified in design documentation. Exelon conducted a technical evaluation of the condition, as documented in issue report 02465711-02, and noted that a deficiency did exist, in that, this 14-gauge wire was not protected from damage during fault current situations because the upstream protective device was sized for 8-gauge wire. The station further concluded that based on the configuration and length of the affected cable, the function of the breaker, and the presence of a battery ground detection system, "it is acceptable to operate the system as identified with the 14 [gauge] wire (temporarily) until the next [technical specification action] (TSA)/outage when the necessary work and planning can be completed prior to entering the TSA/outage."

The inspectors reviewed the technical evaluation and determined that Exelon's conclusions were reasonable. However, though Exelon had discovered the condition in March 2015, the inspectors noted that in some cases, the work to correct this condition was scheduled almost 10 years after discovery, in order to coincide with previously scheduled bus outages. Additionally, the inspectors determined that the station did not revisit the associated technical evaluation prior to extending this work to ensure that the assumptions documented in the evaluation were still appropriate for the work schedule. Exelon entered this issue into their corrective action program as issue report 04064032.

The inspectors determined that this issue was a violation of Peach Bottom Unit 2 Operating License Condition 2.C(4) which states, in part, that Exelon shall implement and maintain in effect all provisions of the approved fire protection program. Peach Bottom Fire Protection Program document Section 3.1.2, Item 11.8, "Corrective Action," states that measures should be established to assure that conditions adverse to fire protection are promptly identified, reported and corrected. The inspectors screened this issue in accordance with NRC Inspection Manual Chapter 0612, Appendix B, "Issue Screening," and determined that this issue was of minor significance, and therefore not subject to enforcement action in accordance with the NRC's Enforcement Policy. Specifically, the inspectors noted that there has not been any failures related to this non-conformance since implementation of the modification in 1985. Additionally, the technical evaluation provided reasonable assurance that this non-conformance would have minimal impact on the station's ability to achieve fire safe shutdown. Finally, the station has proceduralized steps to manually operate the associated breaker in the event control power is not available.

4OA6 Meetings, Including Exit

Quarterly Resident Exit Meeting Summary

On October 17, 2017, the inspectors presented the inspection results to Mr. Pat Navin, Site Vice President, and other members of Exelon's 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 Severity Level IV was identified by Exelon and is a violation of NRC requirements which meet the criteria of the NRC Enforcement Policy for being dispositioned as a NCV.

10 CFR 55.25 states, in part, that if an operator develops a permanent physical or mental condition that causes the operator to fail to meet the requirements of 10 CFR 55.21, the facility licensee shall notify the Commission within 30 days of learning of the diagnosis, in accordance with 10 CFR 50.74(c), which states, that the regional administrator shall be notified if a licensed operator develops a permanent disability or illness. Contrary to these requirements, as the result of Exelon's medical examination audit completed September 26, 2017, Exelon identified a change in a licensed operator's medical condition that was not communicated to the NRC within the required 30 days. The results of the medical examination audit were documented in IR 4054146 and subsequent notifications were made to the NRC.

This violation is subject to traditional enforcement because of the potential impact upon the regulatory process for issuing restrictions to operators' licenses. The inspectors determined that this issue meets the criteria for a Severity Level IV violation using example 6.4.d.1(a) from the NRC Enforcement Policy because no incorrect regulatory decision was made as the result of the failure of the licensee to report within 30 days. This is of very low safety significance because after NRC review of the subsequent notifications, no changes to license restrictions were required.

ATTACHMENT: SUPPLEMENTARY INFORMATION

**SUPPLEMENTARY INFORMATION
KEY POINTS OF CONTACT**

Exelon Generation Company Personnel

P. Navin, Site Vice President
 M. Herr, Plant Manager
 N. Alexakos, Emergency Preparedness Manager
 J. Armstrong, Regulatory Assurance Manager
 D. Baracco, Radiation Protection Manager
 D. Dullum, Regulatory Assurance Engineer
 S. Griffith, Manager Site Security
 D. Henry, Engineering Director
 B. Holmes, Radiation Protection Manager
 D. Hornberger, Chemistry/Radwaste
 P. Kester, Senior Design Engineer
 B. Miller, Fire Protection Engineer
 M. Rector, Engineering Response Team Manager
 M. Retzer, Senior Manager Systems Engineering
 R. Riley, Radwaste Shipper
 D. Turek, Operations Director
 M. Weidman, Work Management Director
 T. Wickle, Senior Design Manager

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

05000278/2017003-01	NCV	Instructions Not Followed for Replacement of HPSW Ventilation Switch Block (Section 1R15)
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LIST OF DOCUMENTS REVIEWED

* -- Indicates NRC-identified

Section 1R04: Equipment Alignment

Procedures

COL 10.1.A-3B, RHR system Setup for Automatic Operation Loop B, Revision 27
 COL 14.1.A-2B, CS System Loop B, Revision 11
 COL 23.1.A-3, HPCI System, Revision 24
 COL 52A.1.A-2, E-2 DG Normal Standby, Revision 15
 SO 52A.1.A, DG Lineup for Automatic Start, Revision 14

Drawings

6280-M-361, Sheet 4, RHR System, Revision 74
 6280-M-365, Sheet 1, P&ID Diagram HPCI System, Revision 63

Section 1R05: Fire Protection

Procedures

CC-AA-211, Fire Protection Program, Revision 6
FF-01, Fire Brigade, Revision 23
OP-AA-201-001, Fire Marshall Tours, Revision 6
OP-AA-201-003, Fire Drill Performance, Revision 16
OP-AA-201-008, Pre-Fire Plant Manual, Revision 3
OP-AA-201-009, Control of Transient Combustible Material, Revision 19
PF-5C, Unit 2 RX Bldg. Torus Room Elevation 91'-6", Revision 5
PF-5D, Unit 2 RX Bldg. '2B' and '2D' CS Room Elevation 91'-6", Revision 3
PF-13C, Unit 3 RX Bldg. Torus Room Elevation 91'-6", Revision 5
PF-132, DG Building, General Area – Elevation 127'-0", Revision 9
PF-132A DG Building General Area (Upper Level), Revision 4
RT-F-101-922-2, Fire Drill, Revision 3

IRs

*4041067 *4041746 *4041879 *4041251

Miscellaneous

Fire Drill Scenario 2017-19
PB Fire Protection Program, Revision 21

Section 1R06: Flood Protection Measures

ARs

00505423

Drawings

C-51, Underground Piping South Area, Revision 37
M-543, Plumbing & Drainage DG Building Floor Plan, Revision 3

Procedures

Internal Hazards DBD No. P-T-09, Revision 11
SE-4 Flood Procedure, Revision 41

Miscellaneous

MR System Basis Document, PB, System 52/52A-G/40F, EDGs, dated August 1, 2017
PBs Alarm Response Card

Section 1R11: Licensed Operator Regualification Program

Procedures

GP-5-2, Power Operations, Revision 5

Miscellaneous

NEI 99-02, Regulatory Assessment PI Guideline, Revision 7
PB3C21-17.0, Reactivity Maneuver Plan, Revision 7/4/17
PSEG-2018R, LORT Scenario, Revision 1

Section 1R12: Maintenance Effectiveness

Procedures

SO 44A.2.A-3, Removing a Drywell Chiller from Service
SO 44A.6.A-3, Placing an Additional Drywell Chiller in Service
SO 44A.7.F-3, Response to a Drywell Chiller Trouble Alarm
SO 44A.8.A-3 Drywell Chilled Water System Routine Inspection, Revision 16

IRs

4036429
4034288
4021846

Work Requests

1358023
1357305

Miscellaneous

Drywell Ventilation MR Basis Document, System Health Report, and Performance History Documents
MREP Meeting Minutes on Function 37-1 ELUs Exclusion from the MR

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

ER-AA-600, Risk Management, Revision 7
ER-AA-600-1042, On-Line Risk Management, Revision 10
OP-AA-108-117, Protected Equipment Program, Revision 4
OP-AA-108-117-1000, PB Protected Equipment Program, Revision 3
OP-AA-201-012-1001, Operations On-line Fire Risk Management, Revision 1
OP-PB-108-101-1002, PB Protected Equipment Tracking Sheet, Attachment A
WC-AA-101, On-Line Work Control Process, Revision 26
WC-AA-101-1006, On-Line Risk Management and Assessment, Revision 2
WC-AA-104, Integrated Risk Management, Revision 23

Miscellaneous

P3R21 Paragon Shutdown Safety Overview
P3R21 Shutdown Safety Profile
Protective Equipment Tracking Sheets

1R15: Operability Determinations and Functionality Assessments

Procedures

CC-AA-309-101, Engineering Technical Evaluations, Revision 15
ER-AA-200, Preventive Maintenance Program, Revision 2
HU-AA-1212, Technical Task/Rigor Assessment, Pre-job Brief, Independent Third Party Review, and Post-job Review, Revision 7
MA-AA-716-100, Attachment 1, Maintenance Alterations Log, Revision 10
MA-AA-716-100-F-1, Maintenance Alterations Log, Revision 0
OP-AA-108-111, Adverse Conditioning Monitoring and Contingency Plan, Revision 10
ST-O-023-300-3, HPCI Pump, Valve, Flow and Unit Cooler Functional and In-service Test Without Vibration Data Collection, Revision 12

Drawings

6280-M-365, Sheet 1, HPCI System, Revision 63

6280-M-366, Sheet 1, HPCI Pump Turbine Details, Revision 57

E-202, Electrical Schematic Diagram Intake Structure Ventilation System, Revision 22

E-1317, Wire and Cable Notes and Details Power, Control, and Instrumentation, Revision 55

WO

0234066

0240071

4306865

4688304

WR

1283394

1359912

IRs

4030367 *4044444 *4052562 *4052566 4054022 4033575

4050431 4047489 4075403 3966085 4045515 1523656

4041821

Miscellaneous

ACMP for PB3 High Core Thermal Limit (MFLPD)

BWROG-TP-14-016, HPCI Steam Admission Valve Leakage, Revision 0

Technical Evaluation for U3 71K Safety Relief Valve Bellows Pressure Leak Monitor
Circuit Ground

Vendor Manual E-5-167 Instructions CR2940 Push Button and Signal Station

Section 1R18: Plant ModificationsProcedures

WC-AA-101, On-Line Work Control Process Revision 27

IRs

4049250

Miscellaneous

EC556261, Seismic Monitoring System Replacement, Revision 0

Section 1R19: Post-Maintenance TestingProcedures

MA-AA-716-012, PMT, Revision 23

RT-O-052-251-2, E-1 DG Inspection Post-Maintenance Functional Test, Revision 32

ST-I-60F-100-2, RPS Logic System Functional Test, Revision 10

ST-O-010-406-3, RHR Loop A Backup Power Supply Transfer Test, Revision 1

ST-O-013-301-2, RCIC Pump, Valve, Flow, and Unit Cooler Functional and In-Service Test,
Revision 48

ST-O-033-300-2, ESW Valve Unit Cooler and ECT Fans Functional Inservice Test, Revision 42

ARs

A1522766

WOs

4181947	4181947	4231284	4243305
4279032	4295177	4298707	4601445
4609778			

WRs

1264825
1363466

IRs

4032455	4033110	4033375	4050985	4050989
4051006	4051042	4051076	4051097	4051322
4051323	4051324	4051386	4051390	4051655
4051748	4051827	4052685	4052691	4052816
4052819	4052823	4052844	4052849	4052931
4053452	4053511			

Section 1R22: Surveillance TestingProcedures

RT-R-003-961-3, CRD Friction Monitoring – Settle and Full Stroke Insertion Testing, Revision 8
ST-O-011-301-2, Standby Liquid Control Pump A Functional Test for IST
ST-O-023-300-3, HPCI Pump, Valve, Flow and Unit Cooler Functional and In-service Test
Without Vibration Data Collection, Revision 12
ST-I-002-250-2, Core Flow Verification, Revision 5
ST-O-02F-560-2, Daily Jet Pump Operability, Revision 18

Miscellaneous

SC 11-05, Failure to Include Seismic Input in Channel-Control Blade Interference Customer
Guidance, Revision 2

Section 1EP6: Drill EvaluationMiscellaneous

NEI 99-02, Regulatory Assessment PI Guideline, Revision 7
PSEG-2018R, LORT Scenario, Revision 1

Section 2RS8: Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and TransportationProcedures:

CY-PB-130-516, Resin Analysis, Revision 1
RP-AA-602, Packaging of Radioactive Material Shipments, Revision 20
RP-AA-602-1001, Packaging of Radioactive Materials/Waste Shipments, Revision 17
RP-AA-603, Inspection and Loading of Radioactive Material Shipments, Revision 10
RP-PB-605-1001, PB 10 CFR 61 Program, Revision 3
RT-H-099-931-2, Rad Pro Shipping QA Review for 10 CFR 20, App G, Revision 2
RW-AA-100, Process Control Program for Radioactive Wastes, Revision 11
RW-AA-605, 10 CFR 61 Program, Revision 7

Quality Assurance

Check-In Self-Assessment, Radwaste, August 2015

10 CFR Part 61 Scaling Factors:

Teledyne Brown Engineering Reports of Analysis for Dry Active Waste, Unit 2 Spent Fuel Pool,
Unit 3 Spent Fuel Pool, Radwaste Resin, Oil Samples, RWCU Elements, and
RWCU Filters

IRs:

02673186	02718219	03985906
02694231	02727434	03992177
02700574	03978900	04016356

Training:

HAZSEC-A1, DOT Security Awareness and Transportation Security Plan, Rev 0
NRWSHP1000, DOT/79-19 Training for Support of Radioactive and Asbestos Shipments

Shipments:

16-0019
16-0020
16-0011
17-0020
17-0021

Section 40A2: Problem Identification and ResolutionIRs

01662555	01690543	01690548	01690524	01690527	01690529
01690533	01690535	01690536	01690537	01690543	01690545
01690548	01690550	01690553	01690555	02465711	02472724
02486367	02486371	04053708			

Drawings

E-193, Sheet 2, Electrical Schematic Diagram Emergency Auxiliary Switchgear Diesel
Generator 4160V Circuit Breaker, Revision 33
E-1317, Wire and Cable – Notes & Details, Power, Control, and Instrumentation, Revision 55
6280-E7-142-1, Medium Voltage Metalclad Switchgear Connection Diagram, Revision 7

Procedures

AO 54.2, 4KV Breaker Manual Operation, Revision 0
CC-AA-309-101, Engineering Technical Evaluations, Revision 15
SE-10, Alternative Shutdown, Revision 21
SE-10, Plant Shutdown from the Alternative Shutdown Panels – Bases, Revision 29
SE-10, Attachment 6, 4KV Alternative Shutdown Panel Setup and Transfer of 125V
Battery Charger 2BD003 to Alternate Power Source
PI-AA-125, Corrective Action Program Procedure, Revision 5
WC-AA-106, Work Screening and Processing, Revision 17
CC-AA-309-101, Engineering Technical Evaluations, Revision 15

Surveillance Tests

ST-O-054-752-2, E22 4KV Bus Undervoltage Relays and LOCA LOOP Functional Test and
E22 and E224 Alternative Shutdown Control Functional Test, Revision 27, completed
10/31/2016

Miscellaneous

LER 2-14-001, Unanalyzed Condition due to Broken Wires in Breakers Used for Appendix R
 Post-Fire Safe Shutdown
 Peach Bottom Atomic Power Station Fire Protection Program, Revision 19

LIST OF ACRONYMS

CA	corrective action
CAP	corrective action program
CFR	<i>Code of Federal Regulations</i>
CR	condition report
CS	core spray
DG	diesel generator
EDG	emergency diesel generator
ESW	emergency service water
HPCI	high pressure coolant injection
HPSW	high pressure service water
IMC	inspection manual chapter
IP	inspection procedure
IR	issue report
MR	maintenance rule
NCV	non-cited violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OD	operability determinations
OOS	out of service
PARS	publicly available records
PB	Peach Bottom Atomic Power Station
PD	performance deficiency
PI	performance indicator
PMT	post-maintenance testing
RCIC	reactor core isolation cooling
RFP	reactor feed pump
RG	regulatory guide
RHR	residual heat removal
RPV	reactor pressure vessel
RTP	rated thermal power
SDP	significance determination process
SSC	structure, system, and component
ST	surveillance test
TRM	technical requirements manual
TS	technical specification
UFSAR	Updated Final Safety Analysis Report
WOs	work orders