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

February 13, 2019

EA-17-020

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: PEACH BOTTOM ATOMIC POWER STATION – INTEGRATED INSPECTION REPORT 05000277/2018004 AND 05000278/2018004 AND EXERCISE OF ENFORCEMENT DISCRETION

Dear Mr. Hanson:

On December 31, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Peach Bottom Atomic Power Station (Peach Bottom), Units 2 and 3. On January 11, 2019, the NRC inspectors discussed the results of this inspection with Mr. Pat Navin, Peach Bottom Site Vice President; Mr. Matthew Herr, Plant Manager; 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. Additionally, a violation of Exelon's site-specific licensing basis for tornado-generated missile protection was identified. Because this violation was identified during the discretion period covered by Enforcement Guidance Memorandum (EGM) 15-002, Revision 1, "Enforcement Discretion for Tornado Generated Missile Protection Non-Compliance," (ADAMS Accession No. ML16355A286) and because Exelon is implementing compensatory measures, the NRC is exercising enforcement discretion by not issuing an enforcement action and is allowing continued reactor operation.

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's 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 Title 10 of the *Code of Federal Regulations* (10 CFR), Part 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Jonathan E. Greives, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket Numbers: 50-277 and 50-278
License Numbers: DPR-44 and DPR-56

Enclosure:
Inspection Report 05000277/2018004
and 05000278/2018004

cc w/encl: Distribution via ListServ

SUBJECT: PEACH BOTTOM ATOMIC POWER STATION – INTEGRATED INSPECTION REPORT 05000277/2018004 AND 05000278/2018004 AND EXERCISE OF ENFORCEMENT DISCRETION DATED FEBRUARY 13, 2019

DISTRIBUTION: (via email)
DLew, RA (R1ORAMAIL Resource)
RLorson, DRA (R1ORAMAIL Resource)
DCollins, DRP (R1DRPMAIL Resource)
DPelton, DRP (R1DRPMAIL Resource)
JYerokun, DRS (R1DRSMAIL Resource)
BWelling, DRS (R1DRSMAIL Resource)
JGreives, DRP
GCroon, DRP
MRossi, DRP
JHeinly, DRP, SRI
DBeacon, DRP, RI
SSchmitt, AA
MMcCoppin, RI OEDO
RidsNrrPMPeachBottom Resource
RidsNrrDorlLpl1 Resource
ROPreports Resource

DOCUMENT NAME: \\nrc.gov\nrc\R1\Office\DRP\BRANCH4\Inspection Reports\Peach Bottom\2018\2018004\2018-004 final.docx
ADAMS ACCESSION NUMBER: **ML19045A281**

☑ SUNSI Review		☑ Non-Sensitive ☐ Sensitive		☑ Publicly Available ☐ Non-Publicly Available	
OFFICE	RI/DRP	RI/DRP	RI/ORA	RI/DRP	
NAME	JHeinly via email	GCroon	MMcLaughlin	JGreives	
DATE	2/13/19	2/13/19	2/8/19	2/13/19	

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Numbers:	50-277 and 50-278
License Numbers:	DPR-44 and DPR-56
Report Numbers:	05000277/2018004 and 05000278/2018004
Enterprise Identifier:	I-2018-004-0072
Licensee:	Exelon Generation Company, LLC
Facility:	Peach Bottom Atomic Power Station, Units 2 and 3
Location:	Delta, Pennsylvania
Inspection Dates:	October 1, 2018 to December 31, 2018
Inspectors:	J. Heinly, Senior Resident Inspector B. Smith, Resident Inspector D. Beacon, Acting Resident Inspector J. Cassata, Health Physicist J. DeBoer, Emergency Preparedness Inspector N. Floyd, Reactor Inspector
Approved By:	Jonathan E. Greives, Chief Reactor Projects Branch 4 Division of Reactor Projects

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring Exelon's performance at Peach Bottom Atomic Power Station, Units 2 and 3, by conducting the baseline inspections described in this report in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to https://www.nrc.gov/reactors/operating/oversight.html for more information. NRC-identified and self-revealed findings, violations, and additional items are summarized in the table below.

List of Findings and Violations

Installation of Condensate Pump Cables not in Accordance with Standard			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Event	Green FIN 05000278/2018-004-01 Opened/Closed	H.2 – Field Presence	71153
The inspectors identified a self-revealing Green finding because Exelon did not conduct cable replacement in accordance with E-1317, "Wire and Cable Notes and Details Power, Control, Instrument Cables," for the Unit 3 condensate pump transformers. Specifically, Exelon installed new power cables to the condensate pump transformers without proper waterproof protection which resulted in water being entrained in the cable conductors and caused premature cable failure on September 30, 2018. In addition, the condensate pump cable shielding was not grounded in accordance with E-1317, and resulted in a false fault indication which tripped a second condensate pump and resulted in a reactor SCRAM on September 30, 2018.			

Additional Tracking Items

Type	Issue number	Title	Report Section	Status
LER	05000277/2017-001-01	Emergency Diesel Generator (EDG) Exhaust Stacks Nonconforming Design for Tornado Missile Protection	71153	Closed
LER	05000278/2018-003-00	Automatic Reactor Scram Due to Loss of Two Condensate Pumps	71153	Closed

TABLE OF CONTENTS

PLANT STATUS

Unit 2 began the inspection period at rated thermal power (RTP). On October 15, 2018, the unit was shut down to perform a refuel outage. The unit was returned to RTP on November 1, 2018, and remained at or near RTP for the remainder of the inspection period.

Unit 3 began the inspection period shutdown due to an automatic reactor scram on September 30, 2018. On October 9, 2018, the unit was returned to RTP. The unit remained at or near RTP for the remainder of the inspection period.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed plant status activities described in IMC 2515, Appendix D, "Plant Status," and conducted routine reviews using IP 71152, "Problem Identification, and Resolution." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess Exelon's performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Cold Weather Seasonal (1 Sample)

The inspectors evaluated preparations for seasonal winter weather conditions on November 15, 2018.

71111.04 - Equipment Alignment

Partial Walkdowns (4 Samples)

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

(1) Unit 2 'B' loop of shutdown cooling inservice on October 15, 2018
(2) Unit 2 'B' emergency service water on October 17, 2018
(3) Unit 2 high-pressure coolant injection (HPCI) following restoration on October 29, 2018
(4) Unit 2 125 VDC batteries & battery chargers during reactor core isolation cooling (RCIC) out of service on November 28, 2018

Complete Walkdown (1 Sample)

The inspectors evaluated system configurations during a complete walkdown of the Unit 2 automatic depressurization system on October 28, 2018.

71111.05A/Q - Fire Protection Annual/Quarterly

Quarterly Inspection (6 Samples)

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

(1) Unit 2 drywell on October 19, 2018
(2) Unit 2 outboard main steam isolation valve (MSIV) room on October 20, 2018
(3) Unit 2 torus room on October 20, 2018
(4) Unit 2 and 3 circulating water pump structure on November 5, 2018
(5) Unit 3 reactor building, elevation 195' on December 18, 2018
(6) Unit 3 'B/D' residual heat removal (RHR) system room on December 21, 2018

71111.08 – Inservice Inspection Activities (1 Sample)

The inspectors evaluated Exelon's non-destructive examination and welding activities at Peach Bottom Unit 2 by reviewing the following activities and programs from October 17 to October 24, 2018:

(1) Volumetric Examinations
   a) Manual encoded phased array ultrasonic testing of N1A recirc inlet nozzle to safe end weld, 2-AS-1. This review involved a previous outage indication that was analytically evaluated and accepted.
   b) Manual ultrasonic testing of RHR system valve to elbow weld, 10-2DC18-23.
   c) Automated ultrasonic testing of jet pump diffuser welds, JP-9 and -17. This review pertained to examinations performed in accordance with BWRVIP-41, "BWR Jet Pump Assembly Inspection and Flaw Evaluation Guidelines."
   d) Radiography testing of main steam end cap weld, W-1. This review involved welding activities associated with a pressure boundary risk significant system.

(2) Surface Examinations
   a) Magnetic particle testing of main steam end cap weld, W-1. This review involved welding activities associated with a pressure boundary risk significant system.

(3) The inspectors reviewed the welding activities associated with the modification of a branched connection upsteam of valve MO-2469 in the main steam system.

71111.11 - Licensed Operator Requalification Program and Licensed Operator Performance

Operator Requalification (1 Sample)

The inspectors observed and evaluated the simulator scenario involving an external event and numerous mitigating equipment challenges on November 26, 2018.

Operator Performance (1 Sample)

The inspectors observed the shutdown of the Unit 3 forced outage on September 30 through October 9, 2018. The inspectors evaluated the startup from the Unit 2 refueling outage on October 14, 2018.

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness (1 Sample)

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

(1) Unit 3 condensate system on November 26 through November 30, 2018

Quality Control (1 Sample)

The inspectors evaluated maintenance and quality control activities associated with the following equipment performance issue:

(1) Unit 2 and 3 emergency cooling tower level instruments 2(3) 804 ('A/B') on November 19 through November 21, 2018

71111.13 - Maintenance Risk Assessments and Emergent Work Control (5 Samples)

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

(1) Unit 2 yellow risk for low water inventory before floodup on October 16, 2018
(2) Unit 2 yellow risk after vessel floodup on October 19, 2018
(3) Unit 3 CB-15 and '3B' RHR out of service on November 18, 2018
(4) Unit 2 and Unit 3 yellow risk during E-2 and E-3 EDG cardox testing on November 14, 2018
(5) Unit 2 yellow risk with CB-215 being open on November 19, 2018

71111.15 - Operability Determinations and Functionality Assessments (6 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

(1) Unit 3 MSIV 'B' & 'C' inboard anti-rotation rub on October 4, 2018 through October 8, 2018
(2) Unit 3 high pressure service water (HPSW) 89 valve torque switch on October 8 through October 9, 2018
(3) Unit 2 group II deficient logic system functional test on October 9, 2018
(4) Unit 2 anchor darling valves on October 16 through October 19, 2018
(5) Unit 2 RCIC on December 13, 2018
(6) Unit 2 and 3 operator work around on December 27, 2018

71111.18 - Plant Modifications (3 Samples)

The inspectors evaluated the following permanent modification:

(1) Unit 2 and 3 river intake ice booms on November 5, 2018
(2) Unit 2 digital feedwater modification on November 12 through November 16, 2018
(3) Unit 2 and 3 containment isolation valve replacement on November 27, 2018

71111.19 - Post-Maintenance Testing (7 Samples)

The inspectors evaluated post-maintenance testing for the following maintenance/repair activities:

(1) Unit 3 'B/C' MSIV on October 7, 2018
(2) Unit 2 HPSW 89D valve torque switch on October 7, 2018
(3) Unit 2 RCIC major overhaul on October 12, 2018
(4) Unit 2 RHR drywell spray valves on October 24 and October 26, 2018
(5) Unit 2 and 3 'A' emergency service water booster pump on November 13 and 14, 2018
(6) Unit 2 and 3 E-2 diesel on December 13 through 17, 2018
(7) Unit 2 'C' HPSW on December 19 and December 20, 2018

71111.20 - Refueling and Outage Activities (2 Samples)

(1) The inspectors evaluated the Unit 3 forced outage from September 30, 2018 through October 9, 2018.
(2) The inspectors evaluated the Unit 2 refueling outage P2R22 activities from October 15, 2018 through October 29, 2018.

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Routine (3 Samples)

(1) Unit 2 'A/C' battery discharge test on October 17, 2018
(2) Unit 2 containment isolation valve 2511 on October 18, 2018
(3) Unit 2 'A/B' low-pressure coolant injection relay calibration functional test on December 20, 2018

Inservice (1 Sample)

(1) Unit 2 standby liquid control inservice testing on October 19, 2018

71114.04 – Emergency Action Level and Emergency Plan Changes (1 Sample)

The inspectors verified that the changes made to the Emergency Plan were done in accordance with 10 CFR 50.54(q)(3), and any change made to the Emergency Action Levels, Emergency Plan, and its lower-tier implementing procedures, had not resulted in any reduction in effectiveness of the Plan. This evaluation does not constitute NRC approval.

71114.06 - Drill Evaluation

Drill/Training Evolution (1 Sample)

The inspectors observed and evaluated the simulator scenario and emergency classification and notifications involving an external event and reactor SCRAM on November 26, 2018.

RADIATION SAFETY

71124.01 - Radiological Hazard Assessment and Exposure Controls

Instructions to Workers (1 Sample)

The inspectors reviewed high radiation area work permit controls and use, reviewed electronic alarming dosimeter alarms and setpoints, observed worker briefings on radiological conditions, and observed containers of radioactive materials and assessed whether the containers were labeled and controlled in accordance with requirements.

Radiological Hazards Control and Work Coverage (1 Sample)

The inspectors evaluated in-plant radiological conditions and performed independent radiation measurements during facility walkdowns and observation of radiological work activities. The inspectors assessed whether posted surveys; radiation work permits; worker radiological briefings and radiation protection job coverage; the use of continuous air monitoring, air sampling and engineering controls; and dosimetry monitoring were consistent with the present conditions. The inspectors examined the control of highly activated or contaminated materials stored within the spent fuel pool and the posting and physical controls for selected high radiation areas, locked high radiation areas, and very high radiation areas.

High Radiation Area and Very High Radiation Area Controls (1 Sample)

The inspectors reviewed the procedures and controls for high radiation areas, very high radiation areas, and radiological transient areas in the plant.

71124.02 - Occupational As Low As Reasonably Achievable (ALARA) Planning and Controls

Verification of Dose Estimates and Exposure Tracking Systems (1 Sample)

The inspectors reviewed the current annual collective dose estimate, basis methodology, and measures to track, trend, and reduce occupational doses for ongoing work activities. The inspectors evaluated the adjustment of exposure estimates, or re-planning of work. The inspectors reviewed post-job ALARA evaluations.

Implementation of ALARA and Radiological Controls (1 Sample)

The inspectors reviewed radiological work controls and ALARA practices during the observation of in-plant work activities. The inspectors verified use of shielding, contamination controls, airborne controls, radiation work permit controls, and other work controls were consistent with ALARA plans. The inspectors ensured that work-in-progress reviews were performed in a timely manner and adjustments made to the ALARA estimates when appropriate. The inspectors reviewed the results achieved against the intended ALARA estimates to confirm adequate implementation and oversight of radiological work controls.

71124.03 – In-Plant Airborne Radioactivity Control and Mitigation

Engineering Controls (1 Sample)

The inspectors evaluated the airborne controls and monitoring. The inspectors observed temporary ventilation system setups and portable airborne radioactivity monitoring systems and verified the licensee's established alarm setpoints for evaluating levels of airborne for both beta and alpha emitting radionuclides.

Use of Respiratory Protection Devices (1 Sample)

The inspectors evaluated the respiratory protection program. The inspectors reviewed the licensee's ALARA reviews and the storage, selection, and use of respiratory protection devices and verified that air used in supplied air devices meets or exceeds "Grade D" quality. The inspectors also reviewed the qualifications of several individuals to ensure the individuals were qualified to use respiratory protections devices.

Self-Contained Breathing Apparatus for Emergency Use (1 Sample)

The inspectors evaluated the self-contained breathing apparatus program. The inspectors verified that personnel who are required to use self-contained breathing apparatus were trained and qualified and that the control rooms were stocked with an adequate variety of respirator face pieces.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification (12 Samples)

The inspectors verified mitigating system performance indicator (MSPI) submittals listed below for the period from October 1, 2017 through September 30, 2018:

(1) Unit 2 and Unit 3 MSPI – Safety System Functional Failures (MS05)
(2) Unit 2 and Unit 3 MSPI – Emergency AC Power Systems (MS06)
(3) Unit 2 and Unit 3 MSPI – HPCI Systems (MS07)
(4) Unit 2 and Unit 3 MSPI – Reactor Core Removal Systems (MS08)
(5) Unit 2 and Unit 3 MSPI – RHR (MS09)
(6) Unit 2 and Unit 3 MPSI – Cooling Water Systems (MS10)

Occupational Exposure Control Effectiveness (1 Sample)

The inspectors reviewed licensee submittals for the occupational radiological occurrences PI for the fourth quarter 2017 through the third quarter of 2018.

Radioactive Effluent Technical Specifications (TSs)/ Offsite Dose Calculation Manual (ODCM)/ Radiological Effluent Occurrences (1 Sample)

The inspectors reviewed licensee submittals for the radiological effluent TS/ODCM radiological effluent occurrence PI for the fourth quarter 2017 through the third quarter of 2018.

71152 - Problem Identification and Resolution

Semi-Annual Trend Review (1 Sample)

The inspectors reviewed Exelon's corrective action program (CAP) for trends that might be indicative of a more significant safety issue.

Annual Follow-up Selected Issues (2 Samples)

The inspectors reviewed Exelon's implementation of its CAP related to the following issues:

(1) Unit 2 and 3 external flood seal on December 7, 2018
(2) Unit 2 and 3 instrument nitrogen moisture content on December 13, 2018

71153 - Follow-up of Events and Notices of Enforcement Discretion

Events (1 Sample)

The inspectors evaluated operator response to the following event:

(1) Unit 3 SCRAM on September 30, 2018

Licensee Event Reports (2 Samples)

The inspectors evaluated the following licensee event reports (LERs) which can be accessed at https://lersearch.inl.gov/LERSearchCriteria.aspx:

(1) LER 05000277; 278/2017-001-01, EDG Exhaust Stacks Nonconforming Design for Tornado Missile Protection (ADAMS Accession No. ML19010A038)

(2) LER 05000278/2018-003-00, Automatic Reactor Scram Due to Loss of Two Condensate Pumps (ADAMS Accession No. ML18333A304)

INSPECTION RESULTS

Installation of Condensate Pump Cables Not in Accordance with Standard			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Event	Green FIN 05000278/2018-004-01 Opened/Closed	H.2 – Field Presence	71153
Introduction: The inspectors identified a self-revealing Green finding because Exelon did not conduct cable replacement in accordance with E-1317, "Wire and Cable Notes and Details Power, Control, Instrument Cables," for the Unit 3 condensate pump transformers. Specifically, in October 2017, Exelon installed new power cables to the condensate pump transformers without proper waterproof protection which resulted in water being entrained in the cable conductors and caused premature cable failure on September 30, 2018. In addition, the condensate pump cable shielding was not grounded in accordance with E-1317 and resulted in a false fault indication which tripped a second condensate pump and resulted in a Reactor SCRAM on September 30, 2018.			

Description: Peach Bottom has three condensate pumps per unit and each condensate has its own dedicated power supply transformer. The condensate pumps' function is to provide pressurized condensate water to the feedwater pumps to support maintaining normal water level in the reactor pressure vessel during normal power operations. The pumps are non-safety-related and only needed for power generation.

In October 2017, Peach Bottom replaced the Unit 3 'B' and 'C' condensate pump transformers and associated power cables. The new cables were run through the existing conduits, which traverses underground between the turbine building and the transformer. During installation, Exelon personnel identified ground water in the existing conduits and took steps to remove the water from the conduit. The installation of the cables proceeded despite some water remaining present in the conduits.

On September 30, 2018, Unit 3 experienced a trip of the 'B' and 'C' condensate pumps which resulted in a low water level SCRAM of the unit. Safety systems responded appropriately and the unit was safely shut down. Exelon entered the SCRAM into their CAP under IR 4178845 and performed a root cause evaluation to determine the cause of the trip of the 'B' and 'C' condensate pumps. Exelon's investigation identified that specification E-1317, Sheet 16, states "…pulling end of all cables in underground duct or conduit … shall be sealed waterproof…" Contrary to this standard, Exelon did not waterproof the cable ends when they were pulled through the underground conduits. This resulted in water entering the conductors and causing a premature failure of the 'B' condensate motor cable.

Furthermore, Exelon identified that the zero-sequence current transformer (CT) on the 'B' and 'C' condensate cables were not installed in accordance with E-1317. A CT is installed for each condensate pump and its function is to sense a power cable fault and initiate a trip of the breaker to isolate the fault. In this case, the CT was terminated in such a way that resulted in the 'C' condensate pump CT sensing the fault on the 'B' condensate pump cable as a fault on its own cable, and initiated an unnecessary 'C' condensate pump trip.

Exelon's root cause evaluation determined that supervision in the field did not adequately enforce the E-1317 specification standards during installation and that the work order (WO) package had not provided enough specificity for adequate installation.

Corrective Actions: Exelon performed immediate corrective actions to replace the condensate pump transformer cables on the 'B' and 'C' transformers and rewire the CT. In addition, they revised the WO to ensure the installation standards were adequate for future installations. An extent of condition review was performed and/or WOs were established to investigate and replace similar cables and CTs that may have been installed incorrectly.

Corrective Action Reference: IR 4178845

Performance Assessment:

Performance Deficiency: The inspectors identified that the failure to perform cable installations in accordance with E-1317 was a performance deficiency that was within Exelon's ability to foresee and correct. Specifically, Exelon installed new power cables to the condensate pump transformers without proper waterproof protection which entrained water in the conductor and caused premature cable failure on September 30, 2018. In addition, the 'C' condensate pump zero-sequence current transformer was not installed in accordance with E-1317 and resulted in a false fault indication which tripped a second condensate pump and resulted in a reactor SCRAM on September 30, 2018.

Screening: The finding was more than minor because it was associated with the equipment performance attribute of the Initiating Events cornerstone and adversely impacted the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during power operations. Specifically, the incorrect cable installation process resulted in the trip of the Unit 3 'B' and 'C' condensate pumps and a reactor SCRAM.

Significance: The inspectors evaluated the significance of this finding using IMC 0609, Appendix A, "The Significance Determination Process for Findings at Power," Exhibit 1 – Initiating Events Screening Questions. The inspectors determined that the finding was of very low safety significance, because it caused a reactor trip but did not cause a loss of mitigation equipment. Specifically, though it caused a reactor trip, it did not cause a loss of reactor feedwater.

Cross-Cutting Aspect: The inspectors determined this finding had a cross-cutting aspect in the area of Human Performance, Field Presence, because Exelon's leaders in the field did not reinforce compliance with installation standards which resulted in the cables and zero-sequence current transformer being installed incorrectly. [H.2]

Enforcement: This finding does not involve enforcement action because no violation of regulatory requirements was identified. Because the finding does not involve a violation of regulatory requirements and has very low safety significance, it is identified as a finding. The disposition of this violation closes LER 05000278/2018-003-00.

Exercise of Enforcement Discretion	Enforcement Action (EA)-17-020: EDG Exhaust Stacks Nonconforming Design for Tornado Missile Protection, Revision 1	71153

Description: On November 1, 2018, it was determined that Peach Bottom's RCIC system and the RHR suppression pool cooling system did not conform with the licensing basis for protection against tornado-generated missiles. Power and instrumentation cabling for RCIC and RHR were identified in rooms adjacent to the Unit 2 and Unit 3 reactor buildings which were not tornado missile protected.

As a result of the non-conforming condition, on November 1, 2018, the RCIC system and the RHR suppression pool cooling system were declared inoperable for both units. Compensatory measures were put in place and, in accordance with NRC guidance contained in Enforcement Guidance Memorandum (EGM) 15-002, the RCIC and RHR systems were returned to an operable but non-conforming status.

Corrective Actions: Exelon took immediate compensatory measures which included verifying that procedures are in place, equipment was appropriately staged, and training is current for performing actions in response to a tornado to preserve RCIC and RHR operability.

Corrective Action Reference: IR 3961028

Enforcement:

10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure that the applicable regulatory requirements and the design basis for structures, systems, and components are correctly translated into specifications, drawing, procedures, and instructions.

Contrary to the above, since as early as 1986 Exelon failed to correctly translate the design basis for protection against tornado-generated missiles into their specifications and procedures. Specifically, Exelon did not adequately protect Unit 2 and Unit 3's RCIC and RHR suppression pool cooling systems from tornado-generated missiles. A risk evaluation was performed, and the issue was determined to be of very low safety significance (Green). Because this violation was identified during the discretion period covered by EGM 15-002, Revision 1, "Enforcement Discretion for Tornado Generated Missile Protection Non-Compliance," (ADAMS Accession No. ML16355A286) and because Exelon has implemented compensatory measures, the NRC is exercising enforcement discretion, is not issuing enforcement action, and is allowing continued reactor operation.

The disposition of this violation closes LER 05000277; 278/2017-001-01.

Observations	71152

Inaccessible External Flood Seal Inspections

In 2012, Exelon performed the required post-Fukushima walkdowns in accordance with Nuclear Energy Institute (NEI) 12-07, "Guidelines for Performing Verification Walkdowns of Plant Flood Protection Features," to confirm the condition of the external flood barrier system. Exelon evaluated the accessibility of the external flood seals using the definition and guidelines in NEI 12-07. As a result, Exelon determined that a population of 186 seals were inaccessible due to configuration or operational constraints and documented a technical justification for reasonable confidence that the seals existed and no inspections were required.

In 2018, Exelon performed a review of the inaccessible seals and developed methods to access the seals and perform inspections. The project was planned to be performed one building at a time as funding allowed. On August 16, 2018, Exelon performed inspections of electrical conduit junction boxes located in the EDG building and identified an unsealed 4" electrical conduit penetration. Exelon's design basis external flood height is 132' and the unsealed penetration was at elevation 127' and communicated directly with the external flood water. This degraded condition could allow external flood water intrusion into the E-1 diesel bay. The degraded condition was entered into the CAP under IR 4164952 and the conduit was immediately filled with sealant material to restore the flood barrier. An extent of condition review was performed in each diesel bay and one 4" conduit in each bay was found unsealed. The degraded penetrations were immediately sealed. Exelon performed a cause evaluation and determined that the unsealed penetrations were a result of a modification in the 1990s that did not consider its impact on flood seals. Exelon's review did not identify any further extent of condition vulnerabilities related to this modification.

The inspectors reviewed the degraded seal conditions, cause evaluation, and the immediate corrective actions. The inspectors validated that the sealant material applied was capable of withstanding the forces developed by the flood waters and would remain in-tact. In addition, the inspectors reviewed the licensee's original evaluation on the inaccessibility of the EDG room flood seals and determined that the seals were accessible and should have been inspected during the post-Fukushima walkdowns in 2012. Furthermore, it was identified that a total population of 108 inaccessible floods seals on site were incorrectly evaluated for accessibility and needed to be inspected. Exelon performed an expedited review of this population of seals and did not identify any required flood seals that were missing. The inspectors reviewed the extent of condition population and performed risk informed

inspections of flood seal inspections. The inspectors did not identify any significant issues with the flood seal inspections that were performed.

The inspectors reviewed the as-found unsealed penetration condition and the potential challenge to the operability and availability of the EDGs. The inspectors reviewed the site original design basis flood analysis along with the updated post-Fukushima flooding reanalysis to determine the impact on the EDGs. The inspectors determined that the sites original external flood design basis of 132' was conservative and the post-Fukushima flooding hazard reanalysis determined the actual stillwater flood height would remain below the penetration elevation. Exelon's external flood reanalysis was performed using analytical methods acceptable by the NRC and was qualified for use as an alternative analytical method in support of an operability determination. The inspectors review determined that the reanalyzed flood height was below the height of any equipment that could impact the EDG operability or availability and it would remain operable despite the missing flood seals. Therefore, the inspectors did not identify any performance deficiencies more than minor.

Observations	71152

Unit 2 Instrument Nitrogen Moisture Content

The inspectors reviewed Exelon's corrective actions for an adverse trend in instrument nitrogen quality documented in IRs 04056044 and 04175504. Specifically, it was identified that the Unit 2 instrument nitrogen system repeatedly failed biennial testing acceptance criteria for moisture content. Upon each occurrence, corrective actions were taken to replace the desiccant and verify that the moisture content was left below the acceptance criteria. Exelon appropriately entered the identified trend into their CAP and developed actions to monitor and evaluate it. Upon evaluation, it was identified that the relevant industry standard, ANSI/ISA-7.0.01-1996, "*Quality Standard for Instrument Air*," does not specify moisture content as an element of instrument air quality for use in pneumatic instruments. Additionally, the performance history of instrumentation supplied by the instrument nitrogen system over the last 15 years was reviewed, and no evidence was discovered to suggest that the variable moisture content experienced during that time period contributed to adverse performance of the instrumentation. Therefore, Exelon determined that moisture content can be considered a best practice not required by the standard or station operating experience.

Nonetheless, Exelon developed a tool for trending and potential incorporation into the instrument nitrogen system's Performance Monitoring Plan. Additionally, in light of potential extended operation under subsequent license renewal, Exelon planned to further evaluate the underlying issue of moisture in the instrument nitrogen system to determine if further corrective action, beyond replacing the desiccant when needed, is warranted. Extent of condition reviews have been performed and no similar trend has been observed on the other instrument nitrogen systems at the site. The inspectors walked down the system, observed its operation, and reviewed the industry standard and recent preventative maintenance test results. The inspectors determined that Exelon's completed and proposed actions were reasonable and no additional issues of concern were identified.

Observations	71152

Semi-Annual Trend Review

The inspectors evaluated a sample of issues and events that occurred over the course of the third and fourth quarters of 2018 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.

Exelon identified an adverse trend in equipment reliability during the first two quarters of 2018 and the trend continued through the remainder of 2018. A relatively high number of equipment performance challenges had occurred at Peach Bottom associated with adjustable speed drives, E-3 diesel, Unit 3 RCIC, external flood seals, condensate pump cables, and MSIVs. An analysis of common issues was performed to evaluate the cause of this adverse trend. Exelon identified that Peach Bottom has declined in the technical rigor applied to decision making which has directly impacted equipment performance issues. These results were documented in IR 4155200. The station developed performance improvement plans and focused briefings to site personnel to reinforce technical decision making standards. In addition, the station performed evaluations of risk significant equipment issues that are currently outstanding to confirm actions to mitigate and eliminate the issues. The inspectors reviewed the IRs and determined that Exelon had performed an adequate evaluation and the corrective actions were commensurate with the safety significance of the adverse trend. Furthermore, the station is performing a root cause evaluation in response to an NRC White finding (IR 4195110, NRC Inspection Report 05000277/2018003 and 05000278/2018003) that will result in additional corrective actions. Currently, the inspectors did not identify any issues of concern. However, additional inspection and assessment of the licensee's actions to address this trend will be reviewed in 2019.

Generally, the station's implementation of the CAP has been effective in promptly identifying and correcting issues. In addition, the station is generally effective in identifying their own weaknesses and taking corrective actions to address the issues. Notwithstanding this, the inspectors have identified a recent trend in the effectiveness of the CAP in resolving equipment related issues in a timely and effective manner. The inspectors noted examples of conditions adverse to quality in the CAP not being addressed in a timely manner (containment atmosphere control/containment atmosphere dilution primary containment isolation valves, '2B' battery charger, E-3 EDG dashpot oil leak, spent fuel pool level indication). The station has recognized the adverse trend in CAP effectiveness and documented the concern in IR 4209875. The evaluation and corrective actions have not been completed and the residents will continue to monitor the licensee's performance closely in this area.

No additional issues of concern were identified.

Licensee Identified Non-Cited Violation Severity Level IV	71152

This violation of very low safety significant was identified by the licensee and has been entered into the licensee's CAP and is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Violation: Peach Bottom Atomic Power Station, Unit No. 2 Renewed License No. DPR-44, Condition 2.C.5.b.3 and Peach Bottom Atomic Power Station, Unit No. 3 Renewed License No. DPR-56, Condition 2.C.5.b.3 requires, in part, that no disbursements or payments from the [decommissioning] trust shall be made by the trustee until the trustee has first given the NRC 30 days' notice of the payment.

Contrary to the above, on occasions between 2001 and 2015, disbursements from the Peach Bottom Atomic Power Station decommissioning trust were made by the trustee and the trustee had not first given the NRC 30 days' notice of the payment. Specifically, in 2001, 2012, and 2015, PSEG directed the Bank of New York Mellon (the trustee of the

decommissioning trust for Peach Bottom Atomic Power Station) to disburse payments equaling $145,548.34 for Unit 2 and $145,548.34 for Unit 3 for decommissioning cost estimates. However, PSEG failed to notify the NRC of these disbursements until October 19, 2018.

Significance/Severity: This issue is considered within the traditional enforcement process because the failure to inform the NRC prior to disbursing decommissioning funds impacts the ability of the NRC to perform its regulatory oversight function. As noted in Section 2.2.4 of the NRC Enforcement Policy, such violations are dispositioned using traditional enforcement.

The inspectors evaluated the violation in accordance with the NRC Enforcement Policy and determined that it is appropriately characterized at Severity Level IV (SL IV) because it is similar to the SL IV example violation 6.9.d.7, describing a licensee's failure to provide or make a 15-day or 30-day written report or notification that does not impact the regulatory response by the NRC. For this Peach Bottom issue, the inspectors determined that the disbursements were made for acceptable decommissioning expenses and would not have necessitated further inquiry or caused the NRC to object to the payments.

Corrective Action Reference: IR 4202344

EXIT MEETINGS AND DEBRIEFS

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

- On January 11, 2019, the inspectors presented the quarterly resident inspector inspection results to Mr. Pat Navin, Site Vice President, Mr. Matthew Herr, Plant Manager, and other members of the Exelon staff.

THIRD PARTY REVIEWS

Inspectors reviewed Institute of Nuclear Power Operations report that was issued during the inspection period.

DOCUMENTS REVIEWED

71111.01

Procedures
RT-O-040-620-2, Outbuilding HVAC and Outer Screen Inspection for Winter Operation, Revision 26
RT-O-040-630-2, Unit 2 Condensate Storage Tank, Revision 16
RT-O-040-630-2, Winterizing Procedure, Revision 16
WC-AA-107, Plant System Readiness Review, Revision 18
WC-AA-107, Attachment 7, Seasonal Critique Template, Revision 19

IRs
4196081 4197085

Miscellaneous
Engineering Change 624973, Installation of Ice Booms in River to Protect Outer Screen Structure from Ice and Debris
IP-ENG-001 Form 3, Installation of Ice Booms in River to Protect Outer Screen Structure from Ice and Debris, Revision 0

71111.04

Procedures
ST-O-013-350-2, RCIC Valve Alignment Verification, Revision 5

IRs
4328401-01

Drawings
6280-M-351, Sheet 1, Nuclear Boiler, Revision 80
6280-M-351, Sheet 2, Nuclear Boiler, Revision 71
6280-M-359, Sheet 1, RCIC System, Revision 50
6280-M-360, Sheet 1, RCIC Pump Turbine Details, Revision 56

71111.08 – Inservice Inspection Activities

Procedures
GEH-PDI-UT-1, PDI Generic Procedure for the Ultrasonic Examination of Ferritic Welds, Revision 12
GEH-UT-543, Procedure for Automated Ultrasonic Examination of Jet Pump Assembly Welds, Revision 5
SI-UT-217, Procedure for the Encoded Phased Array Ultrasonic Examination of Dissimilar Metal Welds, Revision 1
SI-UT-217-TS01, Phased Array Dissimilar Metal Weld Technique Sheet, Revision 0
WPS 1-1-GTSM-PWHT, Welding Procedure Specification for Manual GTAW and SMAW of P No.1 Base Metals, Revision 2

IRs (*initiated in response to inspection)
4184351 4184460 4184788 4186505

Drawings
GB-10-MI-202-3-C, ISI Iso RHR Discharge 2CP35 to Heat Exchanger 2CE24, Revision 1

WOs
4746115

Miscellaneous
A-18-003, Field Weld Checklist for W-1 on MO-2-01A-2469, dated October 23, 2018
BOP-MT-18-086, MT Examination Report for W-1 on MO-2-01A-2469, dated October 23, 2018
ER-PB-330-1001, Peach Bottom Units 2 & 3 ISI Program Plan Fourth Ten-Year Inspection Interval, Revision 0
RT Examination Report for W-1 on MO-2-01A-2469, dated October 25, 2018
Submittal of the In-Service Inspection (ISI) Owner's Activity Report (OAR) for the 21st Refueling Outage for Unit 2, dated February 9, 2017
UT-18-013, UT Examination Report for 10-2DC18-23, dated October 23, 2018
VE-18-015, UT Examination Report for 2-AS-1, dated October 21, 2018

71111.13

Procedures
AO 53.2-0, Equipment Checks After a Thunderstorm or High Wind Event, Revision 11

IRs
4171519

Miscellaneous
PBAPS UFSAR, Chapter 06, Revision 26
PEA-24641, Failure Analysis of Valve, Check, 1” FNPT, 2000PSI, 316SS Construction

71111.15

IRs
4013582 4037803 4190682

Miscellaneous
EC 623295, Peach Bottom Tornado Missile Vulnerabilities
PBAPS Current Licensing Basis for Tornado Events to Support Technical Evaluation 623295, Attachment 1
PBAPS UFSAR, Appendix C, Revision 26
PEA-3-2018-0379, ODM-U3 MSIV EOC Inspection, Revision 0

71111.18

Procedures
ST/LLRT 20.01A.02, MSIV Local Leak Rate Test, Revision 14

IRs
4178993 4187918 4187920 4194514 4196643

71111.19

Procedures
ER-AA-380, Primary Containment Leak Rate Testing Program, Revision 11
ST-O-007-410-2, PCIS Valves Cold Shutdown Inservice Test, Revision 32
ST/LLRT 20.06.01, 'A' Feedwater LLRT, Revision 12
ST/LLRT 20.06.03, 'B' Feedwater LLRT, Revision 14

Assignment Report
2738860

IRs
4186375 4188083

71111.22

Procedures
ST-O-011-405-2, Standby Liquid Control System 'B' LOOP Injection Test, Revision 14

71114.04

Procedures
EP-AA-110-200, Dose Assessment, Revision 10
EP-AA-110-200-F-04, JAF/NMP Evaluation of Possible Lake Breeze Events, Revision B
EP-AA-110-200-F-21, JAF/NMP Meteorological Data Acquisition, Revision B
EP-AA-110-201, On-Shift Dose Assessment, Revision 5
EP-AA-110-201-F-13, NMP Unit 1 Rapid Release Path Board, Revision B
EP-AA-110-201-F-14, NMP Unit 2 Rapid Release Path Board, Revision B
EP-AA-110-201-F-17, Manual Summing of Dose Assessment Results, Revision A

Miscellaneous
Evaluation 18-19, URI Procedures and Supporting Forms
Evaluation 18-30, EP-AA-110-200-F-13 - Peach Bottom Detailed Assessment Release Path Board - Revision B

71124.01

IRs
4151004 4151784 4154290

71124.02

IRs
4180496 4142855

71151

IRs
4084790 4157087 4163939

Miscellaneous
Occupational Exposure Control Effectiveness (OR01) and
RETS/ODCM Radiological Effluent Occurrence (PR01)

71152

Procedures
SE-4 Flood Procedure, Revision 42

IRs

0822268	1402625	4155200	4164952	4165876
4166599	4166603	4167622	4168339	4169926
4169935	4169942	4170250	4170501	4172328
4172411	4192902	4192905	4193331	4193333
4193352	4201141			

Miscellaneous
DBD No. P-S-07, Diesel Generator and Auxiliary Systems, Revision 18
Enclosure 1 – Decision Documentation for Reactive Inspection (Deterministic and Risk Criteria Analyzed)
PBAPS UFSAR, Chapter 02, Revision 26

71153

IRs

4178845	4187194	4196558