



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

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

February 5, 2021

Mr. David P. Rhoades  
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, UNITS 2 AND 3 –  
INTEGRATED INSPECTION REPORT 05000277/2020004 AND  
05000278/2020004 AND INDEPENDENT SPENT FUEL STORAGE  
INSTALLATION INSPECTION REPORT 07200029/2020401

Dear Mr. Rhoades:

On December 31, 2020, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Peach Bottom Atomic Power Station, Units 2 and 3. On January 15, 2021, the NRC inspectors discussed the results of this inspection with Mr. Matthew Herr, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

One finding of very low safety significance (Green) is documented in this report. This finding involved a violation of NRC requirements. We are treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violation or the significance or severity of the violation documented in this inspection report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement; and the NRC Resident Inspector at Peach Bottom Atomic Power Station, Unit 2 and 3.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; and the NRC Resident Inspector at Peach Bottom Atomic Power Station, Unit 2 and 3.

D. Rhoades

2

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

X /RA/

---

Signed by: Christopher Lally

Chris M. Lally, Acting Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

Docket Nos. 05000277, 05000278,  
and 07200029  
License Nos. DPR-44 and DPR-56

Enclosure:  
As stated

cc w/ encl: Distribution via LISTSERV®

SUBJECT: PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 –  
 INTEGRATED INSPECTION REPORT 05000277/2020004 AND  
 05000278/2020004 AND INDEPENDENT SPENT FUEL STORAGE  
 INSTALLATION INSPECTION REPORT 07200029/2020401 DATED  
 FEBRUARY 5, 2021

**DISTRIBUTION:**

DLew, RA (R1ORAMAIL Resource)  
 RLorson, DRA (R1ORAMAIL Resource)  
 DCollins, DRP (R1DRPMAIL Resource)  
 BPham, DRP (R1DRPMAIL Resource)  
 PKrohn, DRS (R1DRSMAIL Resource)  
 MFerdas, DRS (R1DRSMAIL Resource)  
 CLally, DRP  
 LCasey, DRP  
 ZCoffman, DRP  
 TCorcoran, DRP  
 EGarcia, DRP  
 SRutenkroger, DRP, SRI  
 PBoguszewski, DRP, RI  
 SSchmitt, DRP, AA  
 RSkokowski, RI OEDO  
 RidsNrrPMPeachBottom Resource  
 RidsNrrDorlLpl1 Resource  
 ROPreports Resource

DOCUMENT NAME: <https://usnrc.sharepoint.com/teams/Region-I-Branch-4/Shared Documents/Inspection Reports/Peach Bottom/2020/PBIR2020-004Final.docx>

**ADAMS ACCESSION NUMBER: ML21036A021**

<input checked="" type="checkbox"/> SUNSI Review		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available	
OFFICE	RI/DRP	RI/DRP	RI/DRP		
NAME	SRutenkroger	LCasey	CLally		
DATE	2/3/21	2/3/21	2/4/21		

OFFICIAL RECORD COPY

**U.S. NUCLEAR REGULATORY COMMISSION**  
**Inspection Report**

Docket Numbers: 05000277, 05000278, and 07200029

License Numbers: DPR-44 and DPR-56

Report Numbers: 05000277/2020004, 05000278/2020004, and 07200029/2020401

Enterprise Identifier: I-2020-004-0022  
I-2020-401-0009

Licensee: Exelon Generation Company, LLC

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

Location: Delta, PA 17314

Inspection Dates: October 1, 2020 to December 31, 2020

Inspectors: S. Rutenkroger, Senior Resident Inspector  
P. Boguszewski, Resident Inspector  
E. Andrews, Health Physicist  
J. Bream, Reactor Operations Engineer  
L. Casey, Senior Project Engineer  
P. Cataldo, Senior Reactor Inspector  
E. Dipaolo, Senior Reactor Inspector  
A. Turilin, Reactor Inspector

Approved By: Chris M. Lally, Acting Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

Enclosure

## SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Peach Bottom Atomic Power Station, Units 2 and 3, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

### List of Findings and Violations

Low-Pressure Coolant Injection Swing Bus and 480V Breaker Hoist Design Control			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000277,05000278/2020004-01 Open/Closed	[P.3] - Resolution	71152
The inspectors identified a Green non-cited violation (NCV) of Title 10 of the <i>Code of Federal Regulations</i> (10 CFR) Part 50, Appendix B, Criterion III, Design Control, because Exelon did not maintain safety-related equipment in a seismically analyzed condition. Specifically, on two occasions, Exelon personnel stored seismically unrestrained equipment in close proximity to safety-related components, challenging the seismic qualifications of the equipment.			

### Additional Tracking Items

None.

## **PLANT STATUS**

Unit 2 began the inspection period at 83 percent of rated thermal power (RTP) in end of cycle coastdown. The unit was down powered on October 18, 2020, and taken offline for a scheduled refueling outage on October 19, 2020. The unit was returned to operation on November 15, 2020, reaching RTP on November 18, 2020. On December 19, 2020, the unit was down powered to 31 percent in single loop operation when the 'B' reactor recirculation pump tripped due to an issue with the adjustable speed drive power supply system. After replacing the controller components, the pump was placed back in service, restoring two loop operation, and the unit was returned to RTP on December 21, 2020. The unit remained at or near RTP for the remainder of the inspection period.

Unit 3 began the inspection period at RTP. On October 13, 2020, the '3C' reactor feedwater pump tripped, and the unit was down powered to 55 percent. The pump was returned to service, and the unit was returned to RTP the same day. On December 18, 2020, the unit was down powered to 73 percent for a control rod pattern adjustment and turbine valve testing and was returned to RTP on December 21, 2020, after resolving a failure of control valve number 1 to indicate closed when tested. 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 licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards. Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the coronavirus (COVID-19), resident and regional inspectors were directed to begin telework and to remotely access licensee information using available technology. During this time the resident inspectors performed periodic site visits each week, increasing the amount of time on site as local COVID-19 conditions permitted. As part of their onsite activities, resident inspectors conducted plant status activities as described in IMC 2515, Appendix D, observed risk significant activities, and completed on site portions of IPs. In addition, resident and regional baseline inspections were evaluated to determine if all or portion of the objectives and requirements stated in the IP could be performed remotely. If the inspections could be performed remotely, they were conducted per the applicable IP. In some cases, portions of an IP were completed remotely and on site. The inspections documented below met the objectives and requirements for completion of the IP.

## **REACTOR SAFETY**

### 71111.04 - Equipment Alignment

#### Partial Walkdown Sample (IP Section 03.01) (3 Samples)

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

- (1) Unit 2 reactor core isolation cooling (RCIC) system during planned high-pressure coolant injection (HPCI) system testing on October 5, 2020
- (2) Unit 2 shutdown cooling shortly after it was placed in service for the refueling outage on October 19, 2020
- (3) E-1 emergency diesel generator (EDG) while Unit 2 'A' residual heat removal (RHR) was in service for shutdown cooling on November 10, 2020

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

- (1) The inspectors evaluated system configurations during a complete walkdown of the Unit 2 RCIC system. The inspectors inspected the normally inaccessible portions of the Unit 2 RCIC system on October 10, 2020, during the refueling outage, and inspected the normally accessible portions of the system during the week of November 16, 2020.

### 71111.05 - Fire Protection

#### Fire Area Walkdown and Inspection Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated the implementation of the fire protection program by conducting a walkdown and performing a review to verify program compliance, equipment functionality, material condition, and operational readiness of the following fire areas:

- (1) PF-78W, Unit 2 turbine building moisture separator area on October 21, 2020
- (2) PF-3, Unit 2 'B' and 'D' RHR walkdown during heat exchanger bottom head welding on October 15, 2020
- (3) PF-23, North isolation valve room on October 24, 2020
- (4) PF-19, South isolation valve room on October 24, 2020

### 71111.06 - Flood Protection Measures

#### Inspection Activities - Internal Flooding (IP Section 03.01) (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the:

- (1) Unit 2 HPCI pump room

#### Cable Degradation (IP Section 03.02) (1 Sample)

The inspectors evaluated cable submergence protection in:

- (1) Manholes (MHs) MH-062, MH-091A, and MH-016A

## 71111.08G - Inservice Inspection Activities (BWR)

### BWR Inservice Inspection Activities Sample - Nondestructive Examination and Welding Activities (IP Section 03.01) (1 Sample)

- (1) The inspectors verified that the reactor coolant system boundary, reactor vessel internals, risk-significant piping system boundaries, and containment boundary are appropriately monitored for degradation, and that repairs and replacements were appropriately fabricated, examined, and accepted by reviewing the following activities from October 19 to December 14, 2020:

#### 03.01.a - Nondestructive Examination and Welding Activities.

1. Ultrasonic Examination of CH-MB, Reactor Pressure Vessel (RPV) Closure Head Meridian Weld at 60 degrees Az. (PEA-2-008900)
2. Ultrasonic Examination of 3-I-19R, Nozzle N9 to Cap (ISI-UT-010)
3. Ultrasonic Examination of CH-C-1, RPV Closure Head Dollar Plate Weld 0 - 360 degrees (PEA-2-008600)
4. Ultrasonic Examination of CH-C-2, RPV Closure Head to Flange Weld (PEA-2-008700)
5. Magnetic Particle Examination of CH-C-2, RPV Closure Head to Flange Weld (ISI-MT-001)
6. Visual Examination (GV) of 4.1.3.7, Drywell Interior Moisture Barrier (4.2.1.4.AF and 4.2.1.4.AF2)
7. Visual Examination (GV) of 4.5.2.1 thru 4.5.2.16, Accessible Torus Shell Inside Surface Above the Water Line (4.5.2)
8. Visual Examination (GV) of the Drywell Airgap Drains (4.8.5)
9. Visual Examination (GV) of 4.1.3.1, Drywell walls below 135' (4.2.1.3)
10. Visual Examination (GV) of 4.1.3.1 and 4.1.3.4, N1 Equipment Hatch Penetration at Elevation 140' at 315 deg Az. and associated bolting (4.2.2.4)
11. Visual Examination (GV) of 4.1.3.1, Accessible Containment Surfaces of the Drywell Walls between 157' and 186' elevation (4.2.3.3)
12. Visual Examination (GV) of 4.1.3.1, Accessible Containment Surfaces of the Drywell Walls between 186' and 210'-4" elevation (4.2.4.3)
13. Repair/Replacement Activity
  - a. Repair activity associated with the repair of RPV N-16A nozzle due to a leak discovered during a VT-2 exam (CR 4380514, Relief Request I5R-14)

## 71111.11Q - Licensed Operator Requalification Program and Licensed Operator Performance

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

- (1) The inspectors observed and evaluated licensed operator performance in the control room after a trip of the Unit 3 'C' reactor feed pump on October 13, 2020, and during the Unit 2 reactor pressure vessel leakage pressure test on November 14, 2020



### 71111.12 - Maintenance Effectiveness

#### Maintenance Effectiveness (IP Section 03.01) (1 Sample)

The inspectors evaluated the effectiveness of maintenance to ensure the following structures, systems, and components (SSCs) remain capable of performing their intended function:

- (1) Unit 2 main steam isolation valves (MSIVs) from December 17, 2020 to December 21, 2020

### 71111.13 - Maintenance Risk Assessments and Emergent Work Control

#### Risk Assessment and Management Sample (IP Section 03.01) (2 Samples)

The inspectors evaluated the accuracy and completeness of risk assessments for the following planned and emergent work activities to ensure configuration changes and appropriate work controls were addressed:

- (1) Unit 2 'B' RHR inoperability due to a failed surveillance test on October 6, 2020
- (2) Unit 2 planned loss-of-coolant accident/loss of offsite power testing on October 28, 2020

### 71111.15 - Operability Determinations and Functionality Assessments

#### Operability Determination or Functionality Assessment (IP Section 03.01) (6 Samples)

The inspectors evaluated the licensee's justifications and actions associated with the following operability determinations and functionality assessments:

- (1) Unit 3 'K' erratic safety/relief valve steam line temperature readings on October 1, 2020
- (2) Unit 2 control rod '30-19' was slow to settle on October 18, 2020
- (3) Unit 2 reactor feedwater pump '2B' discharge check valve had seat cracking on October 21, 2020
- (4) Unit 2 station battery '2A' rail insulators were degraded on October 23, 2020
- (5) Unit 2 operability of RPS and primary containment isolation system (PCIS) with 'N16A' nozzle instrumentation out of service on November 3, 2020
- (6) Unit 3 scram discharge volume level transmitter flange damage on December 22, 2020

### 71111.18 - Plant Modifications

#### Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (1 Sample)

The inspectors evaluated the following temporary or permanent modifications:

- (1) Unit 2 instrument line nozzle 'N16A' replacement with a weld pad and half nozzle on November 14, 2020

### 71111.19 - Post-Maintenance Testing

#### Post-Maintenance Test Sample (IP Section 03.01) (6 Samples)

The inspectors evaluated the following post-maintenance test activities to verify system operability and functionality:

- (1) Unit 2 'E224-R-B' motor control unit maintenance on October 27, 2020
- (2) Unit 2 'B' low pressure coolant injection (LPCI) swing bus testing following outage preventative maintenance on October 28, 2020
- (3) Unit 2 'B' outboard MSIV post-maintenance testing following the installation of a poppet stabilization modification on November 2, 2020
- (4) Unit 2 'D' outboard MSIV post-maintenance leakage testing following maintenance on November 2, 2020
- (5) Unit 2 HPCI maintenance on November 15, 2020
- (6) Unit 2 instrument line nozzle 'N16A' weld repair and replacement activities on November 14, 2020

### 71111.20 - Refueling and Other Outage Activities

#### Refueling/Other Outage Sample (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated Unit 2 Refueling Outage activities from October 19, 2020 to November 15, 2020

### 71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

#### Surveillance Tests (other) (IP Section 03.01) (2 Samples)

- (1) Unit 3 'A' RHR pump, valve, and flow surveillance test on November 30, 2020
- (2) Functional test of the Unit 2 torus to reactor building vacuum breakers on December 3, 2020

### Containment Isolation Valve Testing (IP Section 03.01) (1 Sample)

- (1) Local leak rate testing results of containment isolation valve, feedwater long path recirculation isolation valve on December 11, 2020

## **RADIATION SAFETY**

### 71124.01 - Radiological Hazard Assessment and Exposure Controls

#### Radiological Hazard Assessment (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated how the licensee identifies the magnitude and extent of radiation levels and the concentrations and quantities of radioactive materials and how the licensee assesses radiological hazards

#### Instructions to Workers (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated radiological protection-related instructions to plant workers

#### Contamination and Radioactive Material Control (IP Section 03.03) (2 Samples)

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

- (1) Observed licensee surveys of potentially contaminated material leaving the radiologically controlled area
- (2) Observed workers exiting the radiologically controlled area during the Unit 2 Refueling Outage

#### Radiological Hazards Control and Work Coverage (IP Section 03.04) (4 Samples)

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

- (1) Observed Unit 2 reactor cavity decontamination
- (2) Observed hydraulic control unit maintenance
- (3) Observed worker briefings for entry into high radiation areas and contaminated areas
- (4) Reviewed radiological surveys and documentation associated with control rod drive exchange

#### High Radiation Area and Very High Radiation Area Controls (IP Section 03.05) (3 Samples)

The inspectors evaluated licensee controls of the following High Radiation Areas and Very High Radiation Areas:

- (1) Unit 2 drywell entrance
- (2) Unit 3 '3A' steam jet air ejector room
- (3) Unit 2 traversing incore probe room

#### Radiation Worker Performance and Radiation Protection Technician Proficiency (IP Section 03.06) (1 Sample)

- (1) The inspectors evaluated radiation worker and radiation protection technician performance as it pertains to radiation protection requirements

### **SAFEGUARDS**

#### 71130.09 - Security Plan Changes

The inspectors evaluated the security plan changes through completion of the following procedure elements:

#### Review Security Plan Changes (IP Section 02.01) (1 Sample)

The inspectors evaluated the security plan changes through completion of the following procedure elements:

- (1) Since the last NRC inspection of this program area, Security Plan Revisions 20 and 21 were implemented based on your determination, in accordance with 10 CFR 50.54(p)(2), that the changes resulted in no decrease in safeguards effectiveness of the security plan, and that the revised security plan continues to meet the requirements of 10 CFR 73.55(b). The inspectors conducted a review of the security plan changes to evaluate for potential decrease in safeguards effectiveness of the security plan. However, this review does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety.

## **OTHER ACTIVITIES – BASELINE**

### 71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

#### MS05: Safety System Functional Failures (SSFFs) Sample (IP Section 02.04) (2 Samples)

- (1) Unit 2 October 1, 2019 to September 30, 2020
- (2) Unit 3 October 1, 2019 to September 30, 2020

#### MS06: Emergency AC Power Systems (IP Section 02.05) (2 Samples)

- (1) Unit 2 October 1, 2019 to September 30, 2020
- (2) Unit 3 October 1, 2019 to September 30, 2020

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

- (1) Occupational Exposure Control Effectiveness for the period of October 1, 2019 to September 30, 2020

#### PR01: Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual Radiological Effluent Occurrences (RETS/ODCM) Radiological Effluent Occurrences Sample (IP Section 02.16) (1 Sample)

- (1) Radiological Effluent TS/ODCM Radiological Effluent Occurrences for the period of October 1, 2019 to September 30, 2020

### 71152 - Problem Identification and Resolution

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

- (1) The inspectors reviewed the licensee's corrective action program (CAP) for potential adverse trends in third and fourth quarters of 2020 that might be indicative of a more significant safety issue

### Annual Follow-up of Selected Issues (IP Section 02.03) (3 Samples)

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

- (1) E-1 EDG cable failure due to water treeing and cable monitoring program testing delays to determine if the corrective actions to implement the cable monitoring program were timely, comprehensive, and adequate
- (2) Review of Selected Non-Compliances with the Peach Bottom Atomic Power Station Cyber Security Plan
- (3) High-pressure service water (HPSW) system raw water piping corrosion, wall-thinning, and through-wall leak conditions

### 71153 - Followup of Events and Notices of Enforcement Discretion

#### Event Followup (IP Section 03.01) (1 Sample)

- (1) The inspectors followed up on a reactor coolant system leak from the Unit 2 instrument line nozzle 'N16' identified during the reactor pressure vessel pressure test on October 29, 2020

#### Personnel Performance (IP Section 03.03) (2 Samples)

- (1) The inspectors followed up on the trip of the Unit 3 'C' reactor feedwater pump and subsequent recirculation pump runback and unit downpower on October 13, 2020
- (2) The inspectors followed up on a Unit 2 'B' reactor recirculation pump trip on December 20, 2020

## **OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL**

### 81311 - Physical Security Requirements for Independent Spent Fuel Storage Installations

The inspectors assessed the adequacy of Exelon's Independent Spent Fuel Storage Installation (ISFSI) co-located at Peach Bottom Atomic Power Station.

#### Physical Security Requirements for Independent Spent Fuel Storage Installations (1 Sample)

- (1) The inspectors completed one sample in accordance with Section 02.01 for a general license ISFSI licensed under 10 CFR 72.210 of Subpart K

## **INSPECTION RESULTS**

Low-Pressure Coolant Injection Swing Bus and 480V Breaker Hoist Design Control			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000277,05000278/2020004-01 Open/Closed	[P.3] - Resolution	71152
The inspectors identified a Green non-cited violation (NCV) of Title 10 of the <i>Code of Federal Regulations</i> (10 CFR) Part 50, Appendix B, Criterion III, Design Control, because Exelon did not maintain safety-related equipment in a seismically analyzed condition. Specifically, on two			

occasions, Exelon personnel stored seismically unrestrained equipment in close proximity to safety-related components, challenging the seismic qualifications of the equipment.

Description: The NRC inspectors identified two examples of design control violations. The first example affects the RHR system and a primary containment isolation valve (PCIV). The second example affects the safety-related 480V power distribution system.

The LPCI mode of RHR provides water to the reactor vessel via the recirculation system discharge piping to cool the fuel in the event of a loss of coolant accident. There are two LPCI subsystems per unit, each consisting of two motor driven pumps, piping, and valves to transfer water from the suppression pool to the reactor vessel via the corresponding recirculation loop. The two LPCI pumps and associated motor operated valves in each LPCI subsystem are powered from separate 4 kV emergency buses. Both pumps in a LPCI subsystem inject water into the reactor vessel through a common inboard injection valve and depend on the closure of the recirculation pump discharge valve following a LPCI signal. Therefore, each LPCI subsystems' common inboard injection valve and recirculation pump discharge valve is powered from one of the two 4 kV emergency buses associated with that subsystem (normal source) and has the capability for automatic transfer to the second 4 kV emergency bus associated with that LPCI subsystem via the corresponding LPCI subsystem LPCI swing bus. The ability to provide power to the inboard injection valve and the recirculation pump discharge valve from either 4 kV emergency bus associated with the LPCI subsystem ensures that the single failure of a diesel generator (DG) will not result in the failure of both LPCI pumps in one subsystem. Although the LPCI swing bus is not required to meet single failure criteria for the other modes of RHR, some additional RHR modes, such as shutdown cooling, require repositioning the RHR inboard injection valve or recirculation pump discharge valve.

The function of the PCIVs is to limit fission product release during and following postulated Design Basis Accidents (DBAs) to within limits. PCIVs ensure that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a DBA.

On September 23, 2020, the inspectors discovered a large standing radiation shield stored next the Unit 3 'B' LPCI swing bus and a nearby PCIV. Upon discovery, the licensee stated that the placement had been analyzed but was unable to locate the analysis. After further review, Exelon determined that the shield was not permitted to be stored in its current location, as in a seismic event, the shield would likely tip, possibly impacting the Unit 3 'B' LPCI swing bus and a nearby nitrogen header supply PCIV.

The second example affects the AC electrical power distribution system. This system ensures the availability of AC electrical power for systems required to shutdown the reactor and maintain it in a safe condition after an operational transient or design basis event. On October 25, 2020, the NRC inspectors identified that a non-seismically supported breaker hoist was stored in an unapproved location next to a safety-related 480V load center. This exact issue was previously identified by the NRC Design Basis Assurance (DBA) inspection team in July 2020 and resulted in an NCV, 2020011-003. After the DBA inspection documented the issue and Exelon performed corrective actions, the NRC resident inspectors discovered the breaker hoist had been moved back to the unapproved storage location. After the DBA inspection team's inspection finding, Exelon determined that when subject to design basis seismic forces, the breaker hoists would experience forces large enough to cause them to overturn. The station determined that based on this analysis, a new restraint design would

need to be developed and implemented to prevent tipping during expected seismic forces.

Corrective Actions: Exelon immediately relocated the rolling shield and breaker hoist to locations away from safety-related equipment and documented the issue in their CAP.

Corrective Action References: IRs 04371568 and 04379330

Performance Assessment:

Performance Deficiency: The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion III, Design Control, because Exelon did not maintain safety-related equipment in a seismically analyzed condition. Specifically, on two occasions, Exelon personnel stored seismically unrestrained equipment in close proximity to safety-related components, challenging the seismic qualifications of the equipment.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Design Control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the inspectors identified two instances where the site seismic analyses associated with safety-related equipment was not consistent with installed plant configuration, and these variations adversely affected the availability, reliability, and capability of safety-related systems.

In the first example, Exelon's engineering evaluation of the rolling shield found that the shield would have fallen over if it had been subjected to design basis seismic forces adversely affecting the availability, reliability, and capability of a low-pressure injection swing bus and a PCIV. Specifically, taking into account the weight of the shield and the force it would have produced upon impact, the impacted equipment would have been rendered inoperable if impacted. This issue is also similar to example 4.a in IMC 0612, Appendix E, "Examples of Minor Issues," in that, the engineering evaluation confirmed that the affected safety-related equipment would be subject to seismic induced forces that had not been considered in the original analysis and increased the probability of failure during accident mitigation.

In the second example, the initial engineering evaluation associated with the breaker hoist determined that the breaker hoists were susceptible to tipping during expected seismic forces, adversely affecting the availability, reliability, and capability of the safety-related 480V load center. The station determined that based on this analysis, a new restraint design would need to be developed and implemented to prevent tipping during expected seismic forces. This issue is similar to example 3.a in IMC 0612, Appendix E, "Examples of Minor Issues," in that, there was a reasonable doubt with respect to the seismic qualifications of the breaker hoists, which affected the assurance of availability and reliability of safety-related equipment.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." For both examples, the inspectors assessed the significance of the finding using IMC 0609 Appendix A, Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined that this finding was a deficiency affecting the design or qualification of mitigating SSCs, where the SSCs maintained their operability or functionality. Therefore, the inspectors determined the finding to be of very low safety significance (Green).

Cross-Cutting Aspect: P.3 - Resolution: The organization takes effective corrective actions to address issues in a timely manner commensurate with their safety significance. On July 2020, the NRC DBA inspection team documented a violation for the storage of breaker hoists located near 480V safety-related switchgear cabinets, which were not seismically analyzed or maintained in accordance with established engineering seismic analyses. Exelon did not implement effective corrective actions and, as a result, the inspectors identified two additional instances of unrestrained equipment, which challenged the seismic qualifications of safety-related equipment.

Enforcement:

Violation: 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that design changes, including field changes, shall be subject to design control measures commensurate with the original design and be approved by the responsible organization.

Contrary to the above, a non-seismically restrained portable shield was stored near the Unit 3 'B' LPCI swing bus and nitrogen 'A' supply header to drywell PCIV. Additionally, a breaker hoist stored near the E-424 480V load center was not restrained to prevent tipping. In both instances, the affected safety-related equipment would be subject to seismic induced forces that had not been considered in the original analysis and would have increased the probability of failure during accident mitigation.

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

Observation: Semi-Annual Trend

71152

The inspectors conducted a semi-annual trend review by evaluating sample issues that occurred in the third and fourth quarter of 2020. During the evaluation, the inspectors verified the issues identified were addressed within the scope of the CAP. The inspectors reviewed health reports and related databases for trends and considered prior issues while performing routine walkdowns and attending the plan of the day meetings. No notable adverse performance trends or substantive repetitive equipment failures were identified during this time. However, during the fourth quarter, the inspectors identified an issue where Exelon placed a non-seismically supported breaker hoist next to a safety-related piece of equipment, which was previously identified by the NRC Design Basis Assurance Inspection team earlier in the year (Inspection Report 05000277/2020011 and 05000278/2020011, ML20252A081). The inspectors also identified a non-seismically supported portable lead shielding placed next to safety-related equipment. These issues were determined to be two examples of one Finding documented in this inspection report (Green NCV 2020011-003). However, following the identification of these issues, the inspectors did not identify further examples to indicate development of an adverse trend.

In addition, other than the non-isolable leakage identified from the weld of the 'N16A' instrument line nozzle during the reactor pressure vessel pressure testing (Licensee Event Report 2-20-002, ML20357B113) no significant safety-related equipment failures were identified during this time. The inspectors reviewed scram solenoid pilot valve buzzing, hydraulic control unit pressure alarms, and pump vibration trending issues. For the selected samples, the inspectors determined that the issues were appropriately evaluated by Exelon staff for potential trends at a low threshold, and resolved within the scope of the CAP. Based on the overall results of the semi-annual trend review, the inspectors determined that Exelon had identified adverse trends at Peach Bottom before they could become more significant



safety problems. The inspectors continue to monitor the CAP and maintenance effectiveness during routine inspection activities.
---

Observation: E-1 EDG Cable Failure Due to Water Treeing and Cable Monitoring Program Testing Delays	71152
<p>The inspectors reviewed the corrective actions taken for the delays in the implementation of the cable monitoring program as described in AR 04252679 that contributed to the E-1 EDG cable failure on May 29, 2019. The inspectors evaluated the current implementation of the cable monitoring program by reviewing the medium and low voltage cable program action plan items described in AR 0428277 and AR 04282788. The inspectors also reviewed CAP documentation of subsequent cable failures in AR 04241082 and AR 04376239. The inspectors reviewed ER-AA-300-150, Revision 7, "Cable Condition Monitoring Program," to assess the licensee's categorization and ranking of the cables in the cable monitoring program and assessed the prioritization and timeliness of the licensee's corrective actions.</p> <p>As a result of the review, inspectors concluded that the licensee has planned and completed adequate corrective actions to restore compliance with the cable monitoring program.</p>	

Observation: High-Pressure Service Water System Degradation	71152
<p>The inspectors reviewed corrective action documents, dating back to 2015, which described HPSW piping degradation and licensee actions to address these conditions. In particular, the inspectors noted that for conditions such as through-wall leaks and wall thinning, Peach Bottom personnel completed non-destructive examinations and appropriately evaluated the conditions for operability (i.e., capability to perform specified safety functions in accordance with technical specifications) and applicable regulatory (i.e., 10 CFR 50.55a and License Renewal Commitments under Appendix R of the PBAPS UFSAR) or piping code compliance (i.e., original USAS/ANS B31.1 construction code, ASME Section XI repair/replacement requirements, or ASME code cases, such as N-513-3 and N-513-4.)</p> <p>The inspectors verified that the overall management of piping degradation associated with the HPSW and emergency service water (ESW) systems was consistent with the licensee's raw water integrity program under procedure ER-AA-5400-1001, "Raw Water Piping Integrity Management Guide," Revision 11. The inspectors determined the licensee identified the causes of the degradation to involve microbiologically-induced corrosion (MIC) and turbulent flow-induced corrosion on the raw water systems at PBAPS. The inspectors observed the licensee had replaced pipe sections, and planned further corrective actions to increase pipe design margin by decreasing the required system design pressure via pump and valve modifications as described in NRC approval of PBAPS Unit 2 and Unit 3 License Amendments No. 327 and 330 (ML19182A006, dated August 28, 2019, respectively).</p> <p>The inspectors observed that systematic replacement of components that were contributing to turbulent flow-induced corrosion, will most likely reduce, but not eliminate, the detrimental effects on the HPSW and ESW systems.</p> <p>The NRC inspectors determined that, based on a sampling of corrective action documents, the licensee's management of raw water piping associated with the high-pressure and ESW systems, as it pertains to degradation mechanisms of corrosion, wall-thinning, and through-wall leaks were appropriately identified, assessed and resolved within the CAP.</p>	

Observation: Review of Selected Non-Compliances with the Peach Bottom Atomic Power Station Cyber Security Plan	71152
<p>During the Peach Bottom Atomic Power Station, Units 2 and 3, cyber security inspection completed in May 2019, four non-compliances with the station's Cyber Security Plan were identified as documented in NRC Inspection Report 05000277/2019403 and 05000278/2019403 (ML19154A110). Two NRC-identified and two licensee-identified NCVs were documented. One NRC-identified NCV was applicable to an Exelon corporate-wide practice. The actions to address this NCV were sufficiently reviewed during cyber security inspections at other Exelon sites.</p> <p>The scope of this inspection evaluated Exelon's initial, interim, and long-term corrective actions and extent of condition related to the three NCVs that were attributed to Peach Bottom specific implementation of the Cyber Security Plan. These issues were documented in the Exelon CAP as IRs 04259069, 04327691, and 04327692. The inspectors reviewed the cause analyses, technical evaluations performed, and the corrective actions taken and planned. The inspectors assessed Exelon's problem identification threshold, prioritization of the issues, apparent cause analyses, use of operating experience, and timeliness of corrective actions.</p> <p>As a result of the review, the inspectors concluded that Exelon appropriately evaluated the issues, performed thorough extent of condition reviews, performed thorough reviews of operating experience, and completed timely and appropriate corrective actions. The inspectors concluded that Exelon appropriately addressed the issues to restore compliance with the Peach Bottom Cyber Security Plan.</p>	

## EXIT MEETINGS AND DEBRIEFS

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

- On January 15, 2021, the inspectors presented the integrated inspection results to Mr. Matthew Herr, Site Vice President, and other members of the licensee staff.
- On December 17, 2020, the inspectors presented the High Pressure Service Water System inspection results to Mr. Matthew Rector and other members of the licensee staff.
- On December 14, 2020, the inspectors presented the inspection results of the Problem Identification and Resolution Annual Follow-up of Selected Issues Associated with Non-compliances with the Peach Bottom Atomic Power Station Cyber Security Plan to Mr. Matthew Herr, Site Vice President, and other members of the licensee staff.
- On November 4, 2020, the inspectors presented the In-Service Inspection results to Mr. Matthew Herr, Site Vice President, and other members of the licensee staff.
- On October 30, 2020, the inspectors presented the Radiological Hazard Assessment and Exposure Controls inspection results to Mr. Matthew Herr, Site Vice President, and other members of the licensee staff.

## DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.06	Corrective Action Documents	IR 4359805		
		IR 4359805		
		IR 4372429		
	Procedures	AO 20A.1	Temporary Removal and Installation of Flood Barriers in the Reactor Building Drainage System	Revision 18
		RT-W-020-930-2	Survey for Flood Barriers in Reactor Building Drainage System	Revision 6
	Work Orders	WR 1471851		
		WR 1475634		
		WR 1480787		
		WR 4881847		
71111.08G	Corrective Action Documents	04379124	P2R23 ISI CNF-002 - Moisture Barrier Damage	10/24/2020
		04379541	P2R23SU: ISI CNF-004 - Additional Moisture Barrier Damage	10/26/2020
		04380514	Unit-2 Instrument Nozzle During Leak Test N-16A	10/29/2020
	Engineering Changes	0000632907	Half Nozzle Repair of RPV Nozzle N-16A	Revision 0
	Miscellaneous	20-113	ASME Section XI Repair/Replacement Plan	11/04/2020
	NDE Reports	4.8.5	Drywell Airgap Drains	10/28/29020
		4.2.1.3	Drywall walls below 135'	10/28/2020
		4.2.1.4.AF	Drywell Interior Moisture Barrier	10/29/2020
		4.2.1.4.AF2	Drywell Interior Moisture Barrier	10/29/2020
		4.2.2.4	N1 Equipment Hatch Penetration at Elevation 140' at 315 deg Az. and associated bolting	10/28/2020
		4.2.3.3	Accessible Containment Surfaces of the Drywell Walls between 157' and 186' elevation	10/27/2020
		4.2.4.3	Accessible Containment Surfaces of the Drywell Walls between 186' and 210'-4" elevation	10/27/2020
		4.5.2	Accessible Torus Shell Inside Surface Above the Water Line	10/30/2020
		ISI-MT-001	RPV Closure Head to Flange Weld	10/24/2020
		ISI-UT-010	Nozzle N9 to Cap	10/27/2020

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		PEA-2-008600	CH-C-1 RPV Closure Head Dollar Plate Weld 0 - 360 degrees	11/03/2020
		PEA-2-008700	RPV Closure Head to Flange Weld	11/03/2020
		PEA-2-008900	CH-MB, Top Head Meridian Weld at 60 degrees Az.	11/03/2020
	Work Orders	04997289	ISI-07 DW119 Drywell Moisture Barrier Inspection	10/26/2020
		05003055	ISI-04 Fuel Floor RPV Top Head Auto UT CH-MB	10/23/2020
		05003055	ISI-04 Fuel Floor RPV Top Head NDE CH-C-2 MT and UT	10/23/2020
		05003055	ISI-04 Fuel Floor RPV Top Head NDE CH-C-1	10/23/2020
		05004057	ISI-04 DW135 Noz N9 and IRS and Weld 3-I-19R	10/23/2020
		05005444	ISI-07 CISI Drywell/Reactor BDG Containment Exam, Torus NDE VT Exterior 91' 6" and Catwalk	10/26/2020
71111.15	Corrective Action Documents	IR 4377851		
		IR 4378845		
		IR 4379202		
71111.19	Procedures	ST-O-023-200-2	HPCI Flow Rate at Less Than or Equal to 175 PSIG	Revision 21
71124.01	ALARA Plans	PB-2-20-00513	DW: Control Rod Drive Exchange	1
	Corrective Action Documents	IR 4300191		
71130.09	Miscellaneous		Peach Bottom Atomic Power Station Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Plan	Revision 20
			Peach Bottom Atomic Power Station Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Plan	Revision 21
	Procedures	SY-PB-101-501	Site Protective Strategy	Revision 8
		SY-PB-101-503	Physical Protection Measures for the Independent Spent Fuel Storage Installation	Revision 3
71151	Corrective Action Documents	4256366		
		4349262		
71152	Calibration Records	4249279		
	Corrective Action Documents	1541900-2	Technical Evaluation for PBAPS Raw Water Corrosion Rate & Remaining Life Basis	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		2494904		
		2523505		
		2568856		
		2734068		
		3969672		
		4176155		
		4225404		
		4228807		
		4232165		
		4234974		
		4236637		
		4240265		
		4240877		
		4249279		
		4259069		
		4327691		
		4327692		
		4346624		
		4359573		
		IR 04379330		
	Miscellaneous	NOSA-PEA-20-11 (AR 4379505)	Cyber Security Program Audit Report	11/25/2020
		PBAPS UFSAR	Appendix R - Second License Renewal UFSAR Supplement	Revision 28
	Procedures	ER-AA-330-009	ASME Section XI Repair/Replacement Program	Revision 17
		PI-AA-120	Issue Identification and Screen Process	Revision 11
		PI-AA-125	Corrective Action Program (CAP) Procedure	Revision 7
		SO.10.1.B-3	Residual Heat Removal System Shutdown Cooling Mode Manual Start	Revision 54
		ST-O-010-405-3	LPCI System Valves Swing Bus B Functional Test	Revision 6
		SY-AA-101-106	Control and Classification of Safeguards Information	Revision 21
81311	Procedures	SY-AA-101-112-1004	Protected Area Search Processes	Revision 4
		SY-PB-101-116-	Security Patrols	Revision 15

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		1001		
		SY-PB-101-116-1001-F-07	Owner Controlled Area and ISFSI Patrol	Revision 121
		SY-PB-101-122-1001	Performance of Security System Tests	Revision 6a54