



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

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

April 28, 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 05000277/2021001 AND
05000278/2021001

Dear Mr. Rhoades:

On March 31, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Peach Bottom Atomic Power Station, Units 2 and 3. On April 16, 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. One Severity Level IV violation without an associated finding is documented in this report. We are treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy.

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

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

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

Enclosure:
As stated

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SUBJECT: PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 –
 INTEGRATED INSPECTION REPORT 05000277/2021001 AND
 05000278/2021001 DATED APRIL 28, 2021

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

Docket Numbers: 05000277 and 05000278

License Numbers: DPR-44 and DPR-56

Report Numbers: 05000277/2021001 and 05000278/2021001

Enterprise Identifier: I-2021-001-0083

Licensee: Exelon Generation Company, LLC

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

Location: Delta, PA 17314

Inspection Dates: January 1, 2021 to March 31, 2021

Inspectors: S. Rutenkroger, Senior Resident Inspector
P. Boguszewski, Resident Inspector
J. Brand, Reactor Inspector
N. Mentzer, Reactor Inspector
J. Rady, Emergency Preparedness Inspector

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

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

High-Pressure Service Water Valve Failed to Open			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000277/2021001-01 Open/Closed	[H.12] - Avoid Complacency	71111.15
A self-revealing Green non-cited violation (NCV) of Title 10 of the <i>Code of Federal Regulations</i> (10 CFR) Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," because Exelon did not accomplish work in accordance with instructions during maintenance and staging activities. Specifically, during planned work staging, Exelon personnel did not effectively prevent contact with plant equipment which resulted in unplanned unavailability of high-pressure service water (HPSW) to the 'D' residual heat removal (RHR) heat exchanger.			

Degraded Condition Due to Reactor Pressure Vessel Instrument Nozzle Leakage			
Cornerstone	Severity	Cross-Cutting Aspect	Report Section
Not Applicable	Severity Level IV NCV 05000277/2021001-02 Open/Closed	Not Applicable	71153
A Severity Level IV NCV of Peach Bottom Atomic Power Station, Unit 2, Technical Specification (TS) 3.4.4, "Reactor Coolant System (RCS) Operational Leakage," was self-revealed when leakage was identified from the 'N16A' 2 inch reactor pressure vessel (RPV) instrument nozzle during a RPV pressure test on October 29, 2020. Specifically, RCS pressure boundary leakage reasonably began on an unknown date that was more than 36 hours before the shutdown for the refueling outage on October 21, 2020.			

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
LER	05000277/2020-002-00	Licensee Event Report (LER) 2020-002-00 for Peach Bottom Atomic Power Station, Unit 2, Degraded Condition due to RPV Instrument Nozzle Leakage	71153	Closed

PLANT STATUS

Unit 2 began the inspection period at rated thermal power (RTP). On March 5, 2021, the unit was down powered to 75 percent for a planned control rod pattern adjustment, turbine valve testing, and general unit maintenance. The unit was returned to RTP the following day. The unit remained at or near RTP for the remainder of the inspection period.

Unit 3 began the inspection period at RTP. On February 25, 2021, the '3C' reactor feedwater pump tripped, and the unit was down powered to 60 percent. New control cabling for the pump was installed and re-routed, the pump was returned to service, and the unit was returned to RTP on February 27, 2021. 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 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

71111.01 - Adverse Weather Protection

Seasonal Extreme Weather Sample (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated readiness for seasonal extreme weather conditions prior to the onset of seasonal cold temperatures for the following systems: emergency diesel generators (EDGs), HPSW, and emergency service water (ESW) during the week of January 10, 2021

Impending Severe Weather Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated the adequacy of the overall preparations to protect risk-significant systems from potential severe weather given a winter storm warning from January 26, 2021 to February 2, 2021

71111.04 - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (5 Samples)

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

- (1) Unit 2 'A' RHR while 'B' RHR was inoperable due to a failed surveillance test on January 14, 2021
- (2) Unit 2 'A' standby liquid control during 'E-2' EDG maintenance on February 5, 2021
- (3) Unit common, 'A' ESW during 'B' ESW maintenance on February 23, 2021
- (4) Unit 3 'B' core spray during 'C' core spray maintenance on March 26, 2021
- (5) Unit common, 'E-4' EDG during 'E-2' EDG maintenance on March 24, 2021

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (6 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-132, diesel generator building general area on January 6, 2021
- (2) PF-27, Unit 3 north isolation valve room on February 24, 2021
- (3) PF-31, Unit 3 south isolation valve room on February 24, 2021
- (4) PF-132, diesel generator building general area on February 17, 2021
- (5) PF-1, Unit 2 'A' RHR on March 11, 2021
- (6) PF-13C, Unit 3 reactor building torus room on March 16, 2021

Fire Brigade Drill Performance Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated the onsite fire brigade training and performance during an unannounced fire drill on March 4, 2021

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 3 torus room during the week of March 22, 2021

71111.11Q - Licensed Operator Regualification Program and Licensed Operator Performance

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

- (1) The inspectors observed and evaluated licensed operator performance in the main control room during a power reduction to 55 percent for Unit 3 'C' reactor feed pump repairs on February 26, 2021

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

- (1) The inspectors observed and evaluated licensed operator regualification training in the simulator on January 25, 2021

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (2 Samples)

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 common, 'E-2' EDG as of February 13, 2021
- (2) Unit 2 instrument air system during the week of March 15, 2021

Quality Control (IP Section 03.02) (1 Sample)

The inspectors evaluated the effectiveness of maintenance and quality control activities to ensure the following SSC remains capable of performing its intended function:

- (1) Unit common, 'E-1' EDG maintenance overhaul from January 31 to February 5, 2021

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (4 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 common, 'E-2' EDG planned maintenance on January 27, 2021
- (2) Unit 2 'D' HPSW planned valve replacement on February 11, 2021
- (3) Unit 2 'C' RHR planned maintenance on March 3, 2021
- (4) Unit 2 'A' and 'C' RHR planned relay testing on March 17, 2021

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (7 Samples)

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

- (1) Unit 2 high-pressure coolant injection (HPCI) leak from the pressure sensing line to the cooling water header pressure control valve on December 29, 2020
- (2) Unit 2 low-pressure coolant injection (LPCI) max light did not illuminate, and separately the LPCI min light did not extinguish, within the band required by procedure on January 13 and 15, 2021
- (3) Unit common, review of multiple switch failures for potential common cause failure mode on January 17, 2021
- (4) Unit 2 'D' HPSW outlet valve for the 'B' loop RHR heat exchanger did not open on February 5, 2021
- (5) Unit common, FLEX diesel generators staged without heaters energized during the week of February 8, 2021
- (6) Unit 2 'A' station batteries during battery cell replacements on February 22, 2021
- (7) Unit 3 reactor core isolation cooling (RCIC) low lube oil cooling water pressure on March 2, 2021

71111.19 - Post-Maintenance Testing

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

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

- (1) Unit 3 wide range neutron monitor period recorder 'NR-03-07-049B' testing after replacement on January 20, 2021
- (2) Unit 2 'B' RHR control valve 'CV-2-10-2677B' limit switch testing after LPCI max light issues and maintenance on January 22, 2021
- (3) Unit common, 'E-2' EDG testing after the two-year maintenance overhaul on February 10, 2021
- (4) Unit common, EDGs CARDOX fire suppression system leak testing after valve replacements on February 17, 2021
- (5) Unit 2 drywell purge valve 'AO-2-07B-2520' leak testing after installation of a nitrogen bottle modification on February 17 and February 18, 2021

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

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

- (1) Unit 3 'A' and 'C' LPCI pump start time delay relay calibration on January 5, 2021
- (2) Unit 3 'A' RHR pump, valve, flow, and unit cooler test on March 1, 2021
- (3) Unit 3 RCIC pump, valve, and flow test on March 2, 2021

Inservice Testing (IP Section 03.01) (3 Samples)

- (1) Unit 3 'B' RHR pump, valve, flow, and unit cooler test on January 15, 2021
- (2) Unit 3 'C' RHR room unit cooler test on January 19, 2021
- (3) Unit common 'E-2' EDG simulated Unit 3 emergency core cooling system signal auto start test on February 24, 2021

71114.02 - Alert and Notification System Testing

Inspection Review (IP Section 02.01-02.04) (1 Sample)

- (1) The inspectors evaluated Exelon's maintenance and testing of the Peach Bottom Atomic Power Station Alert and Notification System on February 8–11, 2021, for the period of March 2019 through January 2021

71114.03 - Emergency Response Organization Staffing and Augmentation System

Inspection Review (IP Section 02.01-02.02) (1 Sample)

- (1) The inspectors evaluated the readiness of Exelon's Emergency Preparedness organization on February 8–11, 2021

71114.04 - Emergency Action Level and Emergency Plan Changes

Inspection Review (IP Section 02.01-02.03) (1 Sample)

- (1) The inspectors evaluated the following submitted Emergency Action Level and Emergency Plan changes onsite on February 8–11, 2021:
 - Evaluation 18-86, EP-AA-1007, "Exelon Nuclear Radiological Emergency Plan Annex for Peach Bottom Atomic Power Station," Revision 34
 - Evaluation 19-60, EP-AA-1007 Addendum 1, "Peach Bottom Atomic Power Station On-Shift Staffing Technical Basis," Revision 2
 - Evaluation 19-66, EP-AA-1007, "Exelon Nuclear Radiological Emergency Plan Annex for Peach Bottom Atomic Power Station," Revision 35

This evaluation does not constitute NRC approval.

71114.05 - Maintenance of Emergency Preparedness

Inspection Review (IP Section 02.01 - 02.11) (1 Sample)

- (1) The inspectors evaluated the maintenance of the Emergency Preparedness Program on February 8–11, 2021, for the period of March 2019 through January 2021

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

EP01: Drill/Exercise Performance (IP Section 03.12) (1 Sample)

- (1) Unit common for the period October 1, 2020 - December 31, 2020

IE01: Unplanned Scrams per 7000 Critical Hours Sample (IP Section 03.01) (2 Samples)

- (1) Unit 2 for the period January 1, 2020 to December 31, 2020

- (2) Unit 3 for the period January 1, 2020 to December 31, 2020

EP02: ERO Drill Participation (IP Section 03.13) (1 Sample)

- (1) Unit common for the period October 1, 2020 - December 31, 2020

IE03: Unplanned Power Changes per 7000 Critical Hours Sample (IP Section 03.02) (2 Samples)

- (1) Unit 2 for the period January 1, 2020 to December 31, 2020
- (2) Unit 3 for the period January 1, 2020 to December 31, 2020

EP03: Alert & Notification System Reliability (IP Section 03.14) (1 Sample)

- (1) Unit common for the period October 1, 2020 - December 31, 2020

IE04: Unplanned Scrams with Complications (USwC) Sample (IP Section 03.03) (2 Samples)

- (1) Unit 2 for the period January 1, 2020 to December 31, 2020
- (2) Unit 3 for the period January 1, 2020 to December 31, 2020

71152 - Problem Identification and Resolution

Annual Follow-up of Selected Issues (IP Section 02.03) (1 Sample)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issues:

- (1) 10 CFR Part 21, Battery Charger Oscillator Card Short to Ground

71153 - Followup of Events and Notices of Enforcement Discretion

Event Report (IP Section 03.02) (1 Sample)

The inspectors evaluated the following licensee event report (LER):

- (1) LER 05000277/2020-002-00, Degraded Condition Due to RPV Instrument Nozzle Leak (ADAMS Accession No. ML20357B113)

The inspection conclusions associated with this LER are documented in this report under Inspection Results Section.

INSPECTION RESULTS

High-Pressure Service Water Valve Failed to Open			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000277/2021001-01 Open/Closed	[H.12] - Avoid Complacency	71111.15
<p>A self-revealing Green non-cited violation (NCV) of Title 10 of the <i>Code of Federal Regulations</i> (10 CFR) Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," because Exelon did not accomplish work in accordance with instructions during maintenance and staging activities. Specifically, during planned work staging, Exelon personnel did not effectively prevent contact with plant equipment which resulted in unplanned unavailability of high-pressure service water (HPSW) to the 'D' residual heat removal (RHR) heat exchanger.</p> <p><u>Description:</u> The safety objective of the Unit 2 HPSW system is to provide a reliable supply of cooling water for the Unit 2 RHR system under post-accident conditions. Unit 2 HPSW consists of four 4500 gpm pumps installed in parallel in the pump structure with its normal water supply to the suction of the pumps from the Conowingo pond. The 'D' loop of HPSW provides cooling water to the 'D' RHR heat exchanger. On February 6, 2021, during surveillance testing, the outlet valve did not open when the control switch was taken to the open position. Operators attempted to open the outlet valve a second time, and the valve did not stroke and no change in position indication was observed at the power supply breaker.</p> <p>Maintenance personnel then performed troubleshooting of the valve. Technicians determined the amphenol connector back-shell was cross-threaded and associated control circuitry was unexpectedly open. The technicians disconnected and re-installed the amphenol connector which restored the control circuit, and the valve stroked satisfactorily. Subsequent investigation determined that the cable conduit attached to the amphenol connector was previously disturbed in a manner that exerted force on the amphenol connection.</p> <p>Exelon determined that the connection was most likely disturbed during a work staging activity on February 5 or 6, 2021. In particular, valve rigging was installed above and in the immediate proximity of the valve for a planned valve replacement the following week. In addition, the conduit appeared to have been disturbed because the protective jacket was pulled out of the junction box, such as from being stepped upon or pushed against. Therefore, Exelon concluded that the most likely apparent cause was a human performance error event during the mobilization and preparation field activities.</p> <p>The inspectors reviewed the maintenance and performance history of the outlet valve and considered the operating environment, proximity and spacing of equipment, and the orientation of the control wiring conduit and amphenol connector. The inspectors concluded that Exelon's determination that the most likely cause was an event on February 5 that disturbed the connection was appropriate. However, the inspectors determined that the condition of the amphenol connector back-shell being not installed completely, and apparently cross-threaded, was most likely due to a pre-existing contributing cause to the event.</p>			

In particular, the inspectors noted that no damage was identified with the amphenol connector or its threads, including the back-shell, and the lock-wire was found intact and undisturbed. The inspectors further questioned the as-found conditions which revealed that the back-shell was threaded down further upon re-installation relative to the as-found condition. Therefore, during the last valve maintenance in 2014, the back-shell was most likely not installed correctly and not fully threaded in place, potentially cross-threaded, which was a failure to implement the work instructions correctly. Then, on February 5, the conduit was likely disturbed which pulled the inserted plug up to the back-shell, stressed the back-shell and threads, and disengaged the amphenol pin connection.

Although this non-qualified condition likely existed since 2014, the inspectors determined the most probable safety impact was limited to February 5 and the ability of the valve to function was not compromised until then. This determination was made, in part, on there being no malfunction for a seven year period, the configuration of the conduit to amphenol connection likely applying a holding force to the connection, the horizontal orientation of the amphenol connector, and the mild operating environment, including vibration, being judged unlikely to introduce a pulling force on the plug under design accident conditions, and unlikely to challenge the pin connection. Therefore, the most probable cause of the valve failing to open was a human performance error event in which the work instructions for mobilizing and staging equipment in the field, including the rigging for the outlet valve replacement, were not accomplished as intended by disturbing the cable conduit and amphenol connector. Finally, the human performance error prevention tools contained in Exelon's procedure HU-AA-101, "Human Performance Tools and Verification Practices," if performed correctly, would have prevented contact with the cable conduit and prevented the failure.

Corrective Actions: Exelon disassembled and reinstalled the amphenol connector which restored the circuit continuity and restored the valve's functionality on February 7, 2021, which was approximately two days from February 5, out of a seven-day allowed outage time. Then, in the following week, the valve operator and wiring were replaced during planned maintenance.

Corrective Action References: IR 4400698 and IR 4400876

Performance Assessment:

Performance Deficiency: The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawing," because Exelon did not accomplish work in accordance with instructions during maintenance and staging activities. Specifically, during a planned work staging activity, Exelon personnel did not effectively prevent contact with plant equipment which resulted in unplanned unavailability of HPSW to the 'D' RHR heat exchanger.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Configuration 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 impact on the cable conduit to the amphenol connector resulted in the unplanned unavailability of the HPSW system to the 'D' RHR heat exchanger.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Using IMC 0609, Appendix A, Exhibit 2, the inspectors determined that this finding was of very low safety

significance (Green). Specifically, the finding did not represent a loss of probabilistic risk assessment (PRA) system or function and did not represent the loss of the PRA function of one train of a multi-train system for greater than its TS allowed outage time. Therefore, the inspectors determined the finding to be of very low safety significance (Green).

Cross-Cutting Aspect: H.12 - Avoid Complacency: Individuals recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Individuals implement appropriate error reduction tools. On February 5, 2021, Exelon personnel did not properly implement human error reduction tools such that adverse contact impacted the control wiring connecting to the operator of the HPSW outlet valve to the 'D' RHR heat exchanger.

Enforcement:

Violation: 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that work which can affect safety-related equipment be accomplished in accordance with instructions appropriate to the circumstances.

Contrary to the above, on February 5 or 6, 2021, work was not accomplished in accordance with instructions appropriate to the circumstances. Specifically, during preparation and field mobilization work activities for the valve, the valve was intended to be maintained operable according to the work instructions, but this was not accomplished in accordance with the instructions due to a human error event which disturbed the equipment.

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

Observation: Battery Charger Oscillator Card Short to Ground	71152
<p>The inspectors reviewed Condition Reports 04338712 and 04364596 which document Exelon's evaluation, extent of condition reviews, and corrective actions associated with a Part 21 notification issued by United Controls International (UCI) on June 25, 2020. This Part 21 is specific to Peach Bottom Atomic Power Station. The inspectors focused on Exelon's planned and/or implemented corrective actions to ensure they were commensurate with the safety significance of the problem. The notification documents a manufacturing and modification error involving ABB/Thomas & Betts/Cyberex P/N: 93-41-119385 Time Delay Oscillator Printed Circuit Boards supplied to Exelon Nuclear Peach Bottom Station by UCI on May 8, 2009. Specifically, the error was determined to involve insufficient electrical clearances between the board's mounting holes and the mounting washers to the energized traces such that when the subject boards are installed, the mounting flat washers may come in contact with the conductive traces resulting in short circuit to the mounting chassis.</p> <p>Exelon engineers identified this degraded condition on April 21, 2020, during installation of one of the available battery charger oscillator circuit boards onto a safety-related station battery charger. The original board was reinstalled, and the battery ground fault condition cleared. Exelon's evaluation determined the cause of the failure was due to manufacturing and modification errors that occurred in 2008 when the boards were returned to UCI for inspection and repairs to address a short to ground condition identified in 2008 during installation of a similar board in a non-safety-related battery charger (IR 0767543). In 2008, staff at the Peach Bottom plant identified the ground was caused by metal to metal contact of the mounting washer to the trace metal on the back of the board. Their investigation also identified that some similar boards had mounting holes that were too small and needed to be</p>	

enlarged and that the trace metal on the back of the boards needed to be cut to prevent the hard ground/short circuit. Peach Bottom staff worked with the supplier to implement these two actions and the refurbished circuit boards were supplied back to Peach Bottom on May 8, 2009. The problem reoccurred in April 21, 2020, resulting in a Part 21 notification.

The inspectors reviewed the Part 21 notification and associated documentation, interviewed station personnel, reviewed implemented corrective actions, and independently inspected several of the boards currently in stock to verify adequate electrical clearances exist between the mounting holes and the traces that would be energized. The inspectors concluded the issue that resulted in the Part 21 notification was evaluated sufficiently to identify the causes and develop effective corrective actions, and that the extent of condition review was adequate to identify affected boards. Corrective actions included removal of the affected boards, visual inspection and testing of similar circuit boards in stock, removal of all affected boards from stock and returning them to the manufacturer for detailed inspections of electrical clearances between mounting holes and energized traces, and testing of the boards at Peach Bottom with ground detection. Additionally, the inspectors determined there were no common mode failure concerns associated with this issue, because only one of the susceptible boards supplied in 2008 is currently installed in a non-safety-related battery charger and there is sufficient redundancy and design separation between the safety-related battery chargers such that a ground in one of the two chargers would not affect the second charger. Additionally, this board has operated properly since installation. Regarding actions taken in 2008 for this problem, the inspectors concluded that Peach Bottom staff implementing their corrective action program missed opportunities to work out with their vendor appropriate testing acceptance protocols for these circuit board cards to correct this problem, which was appropriately addressed in their corrective action program in 2020.

Degraded Condition Due to Reactor Pressure Vessel Instrument Nozzle Leakage			
Cornerstone	Severity	Cross-Cutting Aspect	Report Section
Not Applicable	Severity Level IV NCV 05000277/2021001-02 Open/Closed	Not Applicable	71153
A Severity Level IV NCV of Peach Bottom Atomic Power Station, Unit 2, Technical Specification (TS) 3.4.4, "Reactor Coolant System (RCS) Operational Leakage," was self-revealed when leakage was identified from the 'N16A' 2 inch reactor pressure vessel (RPV) instrument nozzle during a RPV pressure test on October 29, 2020. Specifically, RCS pressure boundary leakage reasonably began on an unknown date that was more than 36 hours before the shutdown for the refueling outage on October 21, 2020.			
<u>Description:</u> On October 29, 2020, while Peach Bottom Atomic Power Station, Unit 2, was in cold shutdown for a refueling outage during a RPV pressure test, a through-wall leak was identified from the 'N16A' 2 inch RPV instrument nozzle. A visual examination detected active leakage in the form of slight weeping at the nozzle's interface with the RPV. The condition was reported in event notification 54971, as required by 10 CFR 50.72(b)(3)(ii)(A), because it represented a degradation of a principal safety barrier.			
Exelon evaluated the flaw and determined the RCS pressure boundary leakage was most likely caused by intergranular stress corrosion cracking (IGSCC) in which a single radial-axial oriented IGSCC flaw initiated in the J-groove weld and then propagated through the J-groove weld until it reached a depth where a leak path in the annulus between the nozzle and reactor vessel penetration existed. Exelon's corrective actions included a half nozzle repair, a post-			

leakage test, and an extent of condition review.

The inspectors reviewed the LER, Exelon's root cause evaluation of the event, and performed visual inspection of the leak conditions and determined that RCS pressure boundary leakage reasonably began on an unknown date that was more than 36 hours before the shutdown for the refueling outage on October 21, 2020.

Corrective Actions: A nozzle repair was completed on November 11, 2020. The repair method involved installing a weld pad and then installing a half nozzle to the weld pad, making the nozzle resistant to IGSCC. The original partial penetration attachment weld and a remnant of the original nozzle remained in place. A failure assessment and flaw evaluation were completed prior to startup to demonstrate the acceptability of leaving the original partial penetration attachment weld, with a maximum postulated flaw, in place for one operating cycle. Exelon submitted Relief Request 15R-14 for this, which was granted. Exelon plans to submit a separate Relief Request to allow continued use of the nozzle repair for the life of the plant.

Corrective Action References: IR 4380514

Performance Assessment: The NRC determined this violation was not reasonably foreseeable and preventable by the licensee and therefore is not a performance deficiency.

Enforcement:

Severity: The inspectors informed the significance of the pressure boundary leakage, and determined that had the condition represented a performance deficiency, it would be very low safety significance (Green) because it would not result in exceeding the RCS leak rate for a small loss of coolant accident, and would not have likely affected other systems used to mitigate a loss of coolant accident. Therefore, this violation is being characterized as Severity Level IV.

Violation: Peach Bottom Atomic Power Station, Unit 2, TS 3.4.4, "RCS Operational Leakage," requires, in part, that RCS operational leakage be limited to no pressure boundary leakage, and if pressure boundary leakage exists that the unit be in Mode 3 within 12 hours and Mode 4 in 36 hours. Contrary to the above, on an unknown date more than 36 hours prior to the unit being in Mode 3 and Mode 4 on October 21, 2020, RCS pressure boundary leakage existed.

The disposition of this violation closes LER 05000277-2020-002-00.

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

EXIT MEETINGS AND DEBRIEFS

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

- On April 16, 2021, the inspectors presented the integrated inspection results to Mr. Matthew Herr, Site Vice President, and other members of the licensee staff.
- On February 11, 2021, the inspectors presented the Emergency Preparedness Program inspection results to Mr. Dave Henry, Plant Manager and other members of the licensee staff.
- On March 10, 2021, the inspectors presented the Problem Identification and Resolution Sample, Part 21, Battery Charger Oscillator Card Short to Ground inspection results to Mr. Ryan Stiltner, Site Engineering Director and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.01	Corrective Action Documents	04388255 04394312		
	Procedures	RT-O-040-630-2	Winterizing Procedure	Revision 16
71111.04	Corrective Action Documents Resulting from Inspection	IR 4411488		
71111.05	Procedures	CC-AA-211	Fire Protection Program	Revision 9
		OP-AA-201-007	Fire Protection System Impairment Control	Revision 0
		OP-AA-201-009	Control of Transient Combustible Material	Revision 25
		OP-AA-201-012-1001	Operations On-line Fire Risk Management	Revision 4
		PF-132	Diesel Generator Building, General Area, Elevation 127'-0"	Revision 9
71111.12	Corrective Action Documents	Issue Reports (IRs) 4374949 4380174 4380183 4389490 4397504 4397775 4398057 4397997 4398001 4399074 4399081 4399270 4399351 4399950 4402021		
71111.15	Corrective Action Documents	IR 4393071		
		IR 4400698		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		IRs 4395836 4396360		
		IRs 4399671 4286215		
		IRs 4406032 4406048		
	Procedures	ST-O-010-307-2	'B' RHR Loop, Pump, Valve, Flow, and Unit Cooler Functional and Inservice Comprehensive Test	Revision 17
		ST-O-032-301-2	HPSW Pump, Valve, and Flow Functional and Inservice Test	Revision 38
	Work Orders	WO 05082136 WR 01485131		
WO 4882738				
71111.19	Procedures	ST-I-37G-392-2	E-2 Diesel Generator Cardox System Simulated Actuation and Air Flow Test	Revision 0
		ST-I-37G-394-2	E-4 Diesel Generator Cardox System Simulated Actuation and Air Flow Test	Revision 10
	Work Orders	WO 04303155		
		WO 04648426		
		WO 05079121		
	71111.22	Corrective Action Documents	IR 4396187	
Procedures		RT-I-033-631-3	RHR Cooler ESW Heat Transfer Test	Revision 14
		S13K-10-TDR-A1C2	Calibration Functional Check of Low-Pressure Coolant Injection Pump Start Time Delay Relays	Revision 8
		ST-O-010-306-3	'B' RHR Loop Pump, Valve, Flow, and Unit Cooler Functional and Inservice Test	Revision 48
		ST-O-052-152-3	'E-2' DG Simulated Unit 3 ECCS Signal Auto Start with Off-Site Power Available and Full Load Test	Revision 14
Work Orders		WO 04944974		
		WO 4866766		
		WO 5089892		
71114.02	Miscellaneous	Design Report	Peach Bottom Atomic Power Station Public Alert and Notification System Design Report	Revision 1
71114.03	Miscellaneous	EP-AA-1000	Exelon Nuclear Standardized Radiological Emergency Plan	Revision 33

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		EP-AA-1007	Exelon Nuclear Radiological Emergency Plan Annex for Peach Bottom Atomic Power Station	Revision 35
		EP-AA-1007 Addendum 1	Peach Bottom Atomic Power Station On-Shift Staffing Technical Basis	Revision 2
71114.04	Corrective Action Documents Resulting from Inspection	04401709		
	Procedures	EP-AA-120-1001	10 CFR 50.54(q) Change Evaluation	Revision 11
71114.05	Corrective Action Documents Resulting from Inspection	04401349		
		04401467		
		04401565		
	Procedures	EP-AA-121-F-07	Peach Bottom Equipment Matrix	Revision 9
71152	Corrective Action Documents	01465239		
		04338712		
		04364596		
	Miscellaneous	10 CFR Part 21	Notification for ABB/Thomas & Betts / Cyberex P/N: 93-41-119385 Time Delay Oscillator Printer Circuit Boards	June 25, 2020