



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

May 9, 2019

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, UNITS 2 AND 3 –  
INTEGRATED INSPECTION REPORT 05000277/2019001 AND  
05000278/2019001

Dear Mr. Hanson:

On March 31, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Peach Bottom Atomic Power Station, Units 2 and 3. On April 12, 2019, the NRC inspectors discussed the results of this inspection with Mr. Pat Navin, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented two findings of very low safety significance (Green) in this report. These findings involved violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violations or significance 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.

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.

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 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

*/RA/*

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

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

Enclosure:  
Inspection Report 05000277/2019001 and  
05000278/2019001

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SUBJECT: PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 –  
 INTEGRATED INSPECTION REPORT 05000277/2019001 AND  
 05000278/2019001 DATED MAY 9, 2019

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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: 05000277/2019001 and 05000278/2019001

Enterprise Identifier: I-2019-001-0037

Licensee: Exelon Generation Company, LLC

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

Location: Delta, Pennsylvania

Inspection Dates: January 1, 2019 to March 31, 2019

Inspectors: J. Heinly, Senior Resident Inspector  
B. Smith, Resident Inspector  
J. Ambrosini, Sr. Emergency Preparedness Inspector  
D. Beacon, Project Engineer  
T. Fish, Senior Operations Engineer  
T. Hedigan, Operations Engineer  
A. Turilin, Reactor Inspector

Approved By: Jonathan E. Greives, 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 a Quarterly inspection at Peach Bottom, 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. Findings and violations being considered in the NRC's assessment are summarized in the table below.

### List of Findings and Violations

Failure to Identify and Correct Vibration Induced Fretting Through Wall Wear of the High Pressure Coolant Injection (HPCI) Differential Pressure Sensing Line			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green NCV 05000278/2019001-01 Open/Closed	[P.5] - Operating Experience	71152
<p>The inspectors identified a self-revealing finding of very low safety significance (Green) and associated non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for Peach Bottom's (PB's) failure to establish measures to assure that a condition adverse to quality was adequately corrected. Specifically, misalignment and wear on the Unit 3, 1-inch HPCI pressure sensing line, which resulted in reactor coolant system (RCS) pressure boundary leakage, was not identified by the station during the 2015/2016 small bore piping and tubing inspections.</p>			

Failure of a Main Steam Isolation Valve to Fully Close			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000278/2019001-02 Open/Closed	None (NPP)	71153
<p>The inspectors identified a self-revealing NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," because Exelon did not correct a condition adverse to quality on the main steam isolation valves (MSIVs). Specifically, Exelon did not implement a vendor recommended modification to stabilize the internal poppet assembly of the inboard MSIVs and correct a flow induced vibration, which represented a condition adverse to quality. As a result, the flow induced vibration on the poppet created wear on the stem anti-rotation lug, which prevented the Unit 3 MSIV 80B from traveling full closed and performing its primary containment isolation function on October 1, 2018.</p>			

### Additional Tracking Items

Type	Issue number	Title	Report Section	Status
LER	05000278, 05000277/2018-002-01	LER 2018-002-01 for PB, Unit 3, RCS Pressure Boundary Leakage Resulting in	71153	Closed

		Technical Specification (TS) Required Shutdown.		
LER	05000278,05000277/2018-004-00	LER 2018-004-00 for PB, Unit 3, Failure of a MSIV to Fully Close.	71153	Closed

## PLANT STATUS

Unit 2 operated at or near rated thermal power for the entire inspection period.

Unit 3 operated at or near rated thermal power for the entire 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.

## REACTOR SAFETY

### 71111.01 - Adverse Weather Protection

#### Impending Severe Weather Sample (IP Section 03.03) (1 Sample)

The inspectors evaluated readiness for impending adverse weather conditions for a snow storm and freezing temperatures on January 18, 2019.

### 71111.04 - Equipment Alignment

#### Partial Walkdown (IP Section 02.01) (3 Samples)

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

- (1) Unit 3 standby liquid control on January 28, 2019
- (2) Unit 3 'A' core spray (CS) on February 11, 2019
- (3) Unit 3 HPCI on March 11 and 12, 2019

### 71111.05Q - Fire Protection

#### Quarterly Inspection (IP Section 03.01) (4 Samples)

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

- (1) Unit 2 motor generator set room on January 18, 2019
- (2) Cable spreading room on January 23, 2019
- (3) Unit 3 4 kV switchgear and station battery rooms on January 23, 2019
- (4) Unit 3 reactor building, elevation 135' on March 11, 2019

#### 71111.06 - Flood Protection Measures

##### Inspection Activities - Internal Flooding (IP Section 02.02a.) (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the:

- (1) High-pressure service water (HPSW)/emergency service water pump house on January 8, 2019

#### 71111.07A - Heat Sink Performance

##### Annual Review (IP Section 02.01) (1 Sample)

The inspectors evaluated readiness and performance of:

- (1) Unit 3 'D' residual heat removal (RHR) heat exchanger on January 24, 2019

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

##### Requalification Examination Results (IP Section 03.03) (1 Sample)

An in-office inspection of Pass/Fail results for PB licensed operator requalification examinations (operating test only) was conducted by one NRC region-based inspector on March 29, 2019.

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

##### Licensed Operator Requalification Program (IP Section 03.04) (1 Sample)

The inspectors reviewed and evaluated operator performance, evaluator performance, and simulator performance during requalification examinations administered the week of March 11, 2019.

#### 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 during a control rod exercise and position indication testing on January 13, 2019.

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

- (2) The inspectors observed and evaluated a licensed operator requalification training out of the box and critique on February 4, 2019.



#### 71111.12 - Maintenance Effectiveness

##### Routine Maintenance Effectiveness Inspection (IP Section 02.01) (2 Samples)

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

- (1) Unit 2 and Unit 3 emergency core cooling system flooding level switches on February 5, 2019
- (2) Unit 2 and Unit 3 reactor core isolation cooling (RCIC) systems on March 13, 2019

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

##### Risk Assessment and Management Sample (IP Section 03.01) (4 Samples)

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

- (1) Unit 3 RCIC logic system functional testing on January 17, 2019
- (2) Unit 3 'B' RHR system outage window on January 25, 2019
- (3) Unit 3 RCIC system outage on March 11, 2019
- (4) Unit 3 HPCI system outage on March 19, 2019

#### 71111.15 - Operability Determinations and Functionality Assessments

##### Sample Selection (IP Section 02.01) (5 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Unit 3 'A' CS on February 14, 2019
- (2) Unit 2 and Unit 3 E-2 emergency diesel generator on February 19, 2019
- (3) Unit 3 CS test line leakage on March 5, 2019
- (4) Unit 2 backup nitrogen system leak on March 8, 2019
- (5) Unit 2 automatic depressurization system (ADS) timer relay on March 12, 2019

#### 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 permanent modifications:

- (1) Alternate battery charger on March 1, 2019

#### 71111.19 - Post Maintenance Testing

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

The inspectors evaluated the following post-maintenance tests:

- (1) Unit 2 'D' HPSW on January 8, 2019
- (2) Unit 3 'C' HPSW on January 15, 2019
- (3) Unit 2 'A' CS outage on January 30, 2019
- (4) Unit 3 RCIC rotating element replacement on February 15, 2019
- (5) Unit 3 E-434 transfer breaker relay on February 26, 2019
- (6) Unit 2 HPCI valve maintenance on March 28, 2019

#### 71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

##### In Service Testing (IST) (IP Section 03.01) (1 Sample)

- (1) Unit 3 'A' RHR pump, valve, and flow comprehensive test on January 16, 2019

##### Surveillance Testing (IP Section 03.01) (4 Samples)

- (1) Unit 2 and Unit 3 deluge airflow test on January 8, 2019
- (2) Unit 3 RHR pedestal inspection on February 7, 2019
- (3) Unit 2 drywell pressure calibration on February 8, 2019
- (4) Unit 3 'B' CS excess flow check valve on February 20, 2019

#### 71114.02 - Alert and Notification System Testing

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

The inspectors evaluated Exelon's maintenance and testing of the PB alert and notification system on March 4 - 7 for the period of April 2017 through February 2019.

#### 71114.03 - Emergency Response Organization Staffing and Augmentation System

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

The inspectors evaluated the readiness of Exelon's Emergency Preparedness Organization on March 4 - 7.

#### 71114.04 - Emergency Action Level and Emergency Plan Changes

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

The inspectors evaluated the following submitted Emergency Action Level and Emergency Plan changes onsite on March 4 - 7.

- Evaluation 17-68, Exelon Nuclear Standardized Radiological Emergency Plan, EP-AA-1000, Revision 29

- Evaluation 17-73, Exelon Nuclear Radiological Emergency Plan Annex for PB, EP-AA-1007, Revision 33
- Evaluation 18-15, Emergency Action Levels for PB, EP-AA-1007, Addendum 3, Revision 6

This evaluation does not constitute NRC approval.

71114.05 - Maintenance of Emergency Preparedness

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

The inspectors evaluated the maintenance of the emergency preparedness program on March 4 - 7 for the period of April 2017 through February 2019.

**OTHER ACTIVITIES – BASELINE**

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

Alert & Notification System Reliability (IP Section 02.14) (1 Sample)

January 2018 to December 2018

Drill/Exercise Performance (IP Section 02.12) (1 Sample)

January 2018 to December 2018

ERO Drill Participation (IP Section 02.13) (1 Sample)

January 2018 to December 2018

IE01: Unplanned Scrams per 7000 Critical Hours Sample (IP Section 02.01) (2 Samples)

- (1) Unit 2 unplanned scrams from January 2018 to December 2018
- (2) Unit 3 unplanned scrams from January 2018 to December 2018

IE03: Unplanned Power Changes per 7000 Critical Hours Sample (IP Section 02.02) (2 Samples)

- (1) Unit 2 unplanned power changes from January 2018 to December 2018
- (2) Unit 3 unplanned power changes from January 2018 to December 2018

IE04: Unplanned Scrams with Complications (USwC) Sample (IP Section 02.03) (2 Samples)

- (1) Unit 2 unplanned scrams with complications from January 2018 to December 2018
- (2) Unit 3 unplanned scrams with complications from January 2018 to December 2018

71152 - Problem Identification and Resolution

Annual Follow-up of Selected Issues (IP Section 02.03) (2 Samples)

The inspectors reviewed the licensee’s implementation of its corrective action program (CAP) related to the following issues:

- (1) IR 04106233, Deficiencies in Implementation of Exelon Procedure ER-AA-520, "Instrument Performance Trending"
- (2) IR 04175898, RCS pressure boundary leakage on the HPCI steam supply instrument sensing line

71153 - Followup of Events and Notices of Enforcement Discretion

Event Report (IP Section 03.02) (2 Samples)

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

- (1) LER 05000278/2018-004-00, Failure of a MSIV to Fully Close (ADAMS Accession No. ML18334A035)

The circumstances surrounding this LER are documented in the Results section.

- (2) LER 05000278/2018-002-01, RCS Pressure Boundary Leakage Resulting in TS Required Shutdown (ADAMS Accession No. ML19010A037)

The circumstances surrounding this LER are documented in the Results section.

**INSPECTION RESULTS**

Observation	71152
<p>The NRC inspectors reviewed corrective actions taken associated with a deficiency in the implementation of Exelon procedure ER-AA-520, “Instrument Performance Trending,” that was previously identified by the NRC in February 2018 and documented in PB’s CAP under issue report (IR) 04106233. ER-AA-520 is an Exelon corporate procedure that requires PB to identify and assess repeated occurrences of instruments with out-of-tolerance (OOT) conditions found during preventative maintenance and testing. Furthermore, the procedure requires OOT conditions to document ‘OOT’ in the title of the IR to allow for future procedurally required trending of the conditions. The deficiency identified at PB was that some IRs did not contain OOT in their title and were not identified for assessment as ER-AA-520 requires.</p> <p>In August 2018, PB implemented two corrective actions to address the deficiency. The first was to perform a review of their CAP from 2014 through 2018 to identify and assess OOT conditions that were previously missed. PB identified a significant population of IRs that required evaluation under ER-AA-520 and performed the evaluations. As a result, multiple trend IRs were generated for resolution. Upon reviewing the evaluations that were performed, the inspectors noted that the guidance provided by ER-AA-520, specifically step 4.4.5, was not implemented consistently. The inspectors found that the extent of review and the threshold for generating trend IRs varied between individuals performing portions of the review. This issue has been entered into the CAP under IR 04234488 and revision of ER-AA-520 is being</p>	

considered by Exelon. The inspectors note that no other issues of concern related to the evaluations performed were identified.

During independent review of the CAP, the NRC inspectors identified three examples of OOT instrumentation that were not captured during Exelon's August 2018 CAP review and consequently were not assessed under ER-AA-520. Most significantly, a jet pump flow transmitter, FT-2-2-3-63B, was found OOT in 2014, as documented in IR 02405750. Upon examining prior performance, the inspectors found that the instrument was OOT in 2006, as documented in an associated surveillance test's completion notes. The 2014 IR was not initially captured in the ER-AA-520 process and did not get captured during the CAP review performed in August of 2018. Therefore, no assessment of the instrument's past performance was completed by Exelon and the repeated occurrence (2006 and 2014) was not identified or addressed. Subsequently, in October 2018, the flow transmitter was found OOT a third time, as documented in IR 04187046. The inspectors determined that the failure to identify and correct a condition adverse to quality was a performance deficiency and violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action." However, this issue was considered minor because the jet pump maintained operability for its technical specification 3.4.2 function. PB has included the three identified examples in the CAP under IR 04234488 to assess the approach used to identify OOT occurrences and to ensure that the identified examples are appropriately addressed.

The second corrective action taken in August 2018 was to provide guidance via a briefing sheet to the personnel responsible for writing IRs related to OOT instruments. This guidance focused on including appropriate wording in the titles of IRs to ensure they are readily identifiable during performance of ER-AA-520. Inspectors performed an independent review of CAP items that were generated after August 2018 to assess the effectiveness of this corrective action and found that Exelon was generally effective at titling IRs. However, inspectors identified three IRs written after the implementation of the briefing sheet that did not reflect the guidance provided, which could have left those IRs vulnerable to exclusion from future ER-AA-520 reviews. The inspectors noted, however, that the majority of IRs generated were written following the guidance. These three examples have also been included in IR 04234488 to ensure that they are appropriately addressed at PB and to further inform the potential corporate revision of ER-AA-520 and its implementation at PB.

Failure to Identify and Correct Vibration Induced Fretting Through Wall Wear of the HPCI Differential Pressure Sensing Line			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green NCV 05000278/2019001-01 Open/Closed	[P.5] - Operating Experience	71152
The inspectors identified a self-revealing finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for PB's failure to establish measures to assure that a condition adverse to quality was adequately corrected. Specifically, misalignment and wear on the Unit 3, 1-inch HPCI pressure sensing line, which resulted in RCS pressure boundary leakage, was not identified by the station during the 2015/2016 small bore piping and tubing inspections.			
<u>Description:</u> On September 22, 2018, PB staff identified a leak on the Unit 3 HPCI differential pressure high side 1-inch sensing line piping and determined that this condition constituted a			

violation of the Unit 3 TS Limiting Condition for Operation (LCO) 3.4.4, "RCS Operational Leakage," which requires there be no pressure boundary leakage. PB staff entered the leak into the CAP as IR 04175898 and performed an evaluation to identify the cause of the leakage and specify corrective actions.

PB staff discovered the sensing line to be misaligned in its support guide and attributed the cause of the sensing line failure to fretting (rubbing wear). Vibration and thermal expansion caused the support guide to rub against the misaligned sensing line, eventually causing a through wall leak. The cause for the misalignment is currently under investigation by PB staff. PB staff identified other areas with wear indications during the extent of condition (EOC) inspections in other system. The identified areas were repaired.

PB staff corrected the condition adverse to quality by replacing and modifying the small bore piping. The modifications consisted of wrapping a piece of stainless steel sheet metal ("shim") tightly around the replaced pipe to act as a sacrificial shim. Additionally, PB initiated actions to monitor the shims installed in Unit 2 and Unit 3 for wear and degradation in the upcoming outages. PB has scheduled actions for the next refueling outage to determine which of the potential causes led to the pipe misalignment. The actions consist of inspections of nearby clamp anchors.

The inspectors reviewed PB's causal evaluation and noted that it described gaps in the performance of the small bore piping and tubing inspections conducted in the fall 2015 refuel outage. Specifically, PB staff determined they did not conduct Just-In-Time (JIT) training, did not sufficiently document the inspections to ensure all of the piping/tubing was inspected, and did not generate IRs for areas that could not be inspected.

In review of the corrective actions described, the inspectors determined that PB staff had an opportunity to identify the misaligned piping prior to it resulting in an RCS leak. This required proper implementation of actions in IR 02483369, which instructed sites to conduct hand over hand at arm's length inspections to the extent practical. The inspectors determined that the location of the leak was readily observable. Specifically, the leak was not in a difficult area to access and did not require any special equipment set up such as a scaffolding or fall protection harness.

#### Performance Assessment:

Performance Deficiency: Failure to establish measures to assure a condition adverse to quality was identified and corrected in accordance with 10 CFR Part 50, Appendix B, Criterion XVI, was a performance deficiency that was within PB's ability to foresee and correct and should have been prevented. Specifically, IR 02483369 actions were not implemented as instructed to identify the condition prior to the leak.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Equipment Performance attribute of the Initiating Events cornerstone. Specifically, it adversely affected the cornerstone objective to limit the likelihood of plant events that upset plant stability and challenge critical safety functions because it resulted in an unisolable reactor coolant pressure boundary leak.

Significance: The inspectors assessed the significance of the finding using Appendix A, "Significance Determination of Reactor Inspection Findings for At - Power Situations." The inspectors determined the finding was of very low safety significance (Green) because the

leakage would not have exceeded the RCS leak rate for a small loss-of-coolant accident (LOCA) and it did not affect other systems used to mitigate a LOCA.

Cross-cutting Aspect: P.5 - Operating Experience: The organization systematically and effectively collects, evaluates, and implements relevant internal and external operating experience in a timely manner. Specifically, PB staff did not implement actions in IR 02483369, to address operating experience as intended.

Enforcement:

Violation: 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. Contrary to this requirement, during a 2015 refuel outage Exelon failed to perform corrective actions of IR 02483369 to identify and correct a condition adverse to quality which resulted in RCS pressure boundary leakage on September 20, 2018.

Additionally, TS 3.4.4, "RCS Operational Leakage," prohibits pressure boundary leakage in Mode 1. Contrary to this, PB operated in Mode 1 from September 20, 2018, through September 22, 2018, with reactor coolant pressure boundary leakage. PB's immediate corrective actions included correcting the condition adverse to quality by replacing and modifying the leaking sensing line. PB entered the issue in to the CAP as IR 04175898. The disposition of this violation closes LER 05000278/2018-003-00.

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

Failure of a MSIV to Fully Close			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000278/2019001-02 Open/Closed	None (NPP)	71153
<p>The inspectors identified a self-revealing NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," because Exelon did not correct a condition adverse to quality on the MSIV. Specifically, Exelon did not implement a vendor recommended modification to stabilize the internal poppet assembly of the inboard main steam isolation valves and correct a flow induced vibration, which represented a condition adverse to quality. As a result, the flow induced vibration on the poppet created wear on the stem anti-rotation lug which prevented the Unit 3 MSIV 80B from traveling full closed and performing its primary containment isolation function on October 1, 2018.</p>			
<p><u>Description:</u> PB has four main steam lines per unit and each main steam line has redundant (inboard/outboard) primary containment isolation valves. The MSIVs have a safety function to close to isolate primary containment and to preserve reactor coolant on a loss of the condenser heat sink. The MSIV's internals include a main poppet assembly that is full open on its backseat during normal power operations.</p> <p>PB Unit 3 experienced a reactor SCRAM on September 30, 2018, following the loss of two condensate pumps. On October 1, 2018, in preparation to enter Mode 4, the operators attempted to close all eight MSIVs and identified that the inboard 3B MSIV (AO-3-01A-80B)</p>			

would not travel to the full closed position evidenced by a split indication in the control room. However, the redundant outboard MSIV did travel full closed, providing containment isolation for that penetration. Troubleshooting in the field determined that the valve had stopped approximately 1-inch short of full closure. The station immediately removed the valve from service and disassembled the valve to determine the cause of failure. Upon disassembly, the valve was found to have significant wear on the anti-rotation lug due to flow induced vibration of the valve poppet. The vibration wore a notch in the lug and the anti-rotation device became caught on the notch and prevented full travel of the poppet. This condition was entered into the CAP under IR 4178993. The stem and poppet cap guide were replaced and a modification was performed to stabilize the poppet to prevent recurrence. The valve was successfully tested and returned to service on October 8, 2018.

Exelon performed an equipment cause evaluation (ECAPE) and determined that PB had not adequately applied operating experience to address a known industry issue with the MSIVs. Specifically, PB had not implemented a vendor recommended modification to stabilize the poppet assembly and eliminate the flow induced vibration, which represented a condition adverse to quality. The vendor recommended the modification through a General Electric service information letter (GE-SIL 473) in 1988. However, PB did not install the modification in 1988 and Exelon could not identify the basis for that decision. Exelon now determined that the modification was required to be installed in order to stabilize the poppet assembly and eliminate the condition adverse to quality. An EOC review was performed and identified that the condition adverse to quality was only applicable to inboard MSIVs. PB identified six applicable MSIVs that did not have the stabilization modification installed currently. Diagnostic testing was performed on the remaining Unit 3 MSIVs during the forced shutdown and determined that the 80C MSIV required disassembly and repair. Test data for the remaining MSIVs was reviewed, which indicated that there was no substantial wear present and the valves remained operable. The inspectors reviewed Exelon's operability determination and did not identify any additional issues of concern.

Corrective Actions: Exelon disassembled the Unit 3 80B and 80C MSIVs, repaired the anti-rotation assembly, and performed the poppet stabilization modification. The valves were post-maintenance tested and returned to service on October 8, 2018. An EOC review determined that the poppet stabilization modification was required on the Unit 2 80A/B/C and Unit 3 80A/D inboard MSIVs. The Unit 2 valves were modified during the Fall 2018 refuel outage and the Unit 3 valves are scheduled to be modified during the 2019 refuel outage.

Corrective Action Reference: IR 4178993

Performance Assessment:

Performance Deficiency: The inspectors determined that the failure to correct a condition adverse to quality on the MSIVs was a performance deficiency that was within Exelon's ability to foresee and correct.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the RCS Equipment and Barrier Performance attribute of the Barrier Integrity cornerstone. The performance deficiency adversely affected the cornerstone's objective to provide reasonable assurance that the containment design barrier protect the public from radionuclide releases caused by accidents or events. Specifically, the 3B MSIV failed to perform its primary containment isolation function as a result of not performing the corrective actions.



Significance: The inspectors evaluated the significance of this finding using IMC 0609, Appendix A, "The Significance Determination Process for Findings at Power," Exhibit 3-Barrier Integrity Screening Questions. The inspectors determined this finding was of very low safety significance (Green) because the finding did not result in an actual open pathway in the physical integrity of the reactor containment or involve an actual reduction in the function of hydrogen igniters in the reactor containment.

Cross-cutting Aspect: Not Present Performance (NPP). No cross-cutting aspect was assigned to this finding because the inspectors determined the finding did not reflect present licensee performance. The performance deficiency was associated with a decision made greater than three years ago and is not indicative of current plant performance.

Enforcement:

Violation: 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires that measures shall be established to ensure conditions adverse to quality are promptly identified and corrected. Contrary to this requirement, from 1988 until 2018, Exelon did not ensure conditions adverse to quality associated with primary containment isolation valves were promptly corrected commensurate with their safety significance. Specifically, Exelon did not perform vendor recommended modifications to address flow induced vibrations, which resulted in the Unit 3 'B' inboard MSIV failing to close on October 1, 2018.

The inspectors noted this violation is also associated with a violation of TS 3.6.1.3, "Primary Containment Isolation Valves," which requires each primary containment isolation valve to be operable during Modes 1, 2, and 3. With one primary containment isolation valve inoperable, TS 3.6.1.3 Condition D requires leakage limits to be restored to within limits in 8 hours, or be in Mode 3 in 12 hours, and Mode 4 in 36 hours. Contrary to this, the Unit 2 'B' MSIV was inoperable from its last successful stroke on September 23, 2018, until October 1, 2018, which exceeded its allowed outage time. Exelon reported this condition in accordance with 10 CFR 50.73(a)(2)(i)(B), a condition prohibited by TSs, in LER 05000278/2018004-00. The disposition of this violation closes LER 05000278/2018004-00.

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 12, 2019, the inspectors presented the quarterly resident inspector inspection results to Mr. Pat Navin, Site Vice President, and other members of the licensee staff.
- On March 7, 2019, the inspectors presented the EP Program inspection results to Mr. Pat Navin, Site Vice President, and other members of the licensee staff.
- On March 1, 2019, the inspectors presented the HPCI pressure sensing line leak inspection results to Mr. Matthew Herr, Plant Manager, and other members of the licensee staff.

## **DOCUMENTS REVIEWED**

### **71111.04**

#### Procedures

COL 23.1.A-3, HPCI System, Revision 24

RT-O-032-310-2, HPSW Oil Cooler Heat Transfer Capability Test, Revision 13

SO 23.1.A-3, HPCI System Setup for Automatic or Manual Operation, Revision 24

ST-O-014-355-3, CS LOOP 'B' Valve Alignment and Filled and Vented Verification, Revision 5

#### Drawings

6280-M-359, RCIC System, Sheet 2, Revision 48

6280-M-360, RCIC Pump Turbine Details, Sheet 2, Revision 54

6280-M-362, CS Cooling System, Sheet 2, Revision 62

6280-M-365, HPCI System, Sheet 2, Revision 66

### **71111.05**

#### Procedures

ER-AA-2001, Plant Health Issue Ranking Process, Attachment 3, Revision 24

PF-4C, Radwaste Building, Unit 2 Recirculation Pump MG Set Room, Revision 10

PF-117, Unit 3 Turbine Building, Emergency Battery SWGR Rooms, Revision 10

#### IRs

4220504

### **71111.07**

#### Procedures

ER-AA-340-1002, Service Water Heat Exchanger Inspection Guide, Revision 8

MA-AA-716-012, Heat Exchangers Test Matrix, Revision 23

#### IRs

4212926

### **71111.13**

#### Procedures

OP-PB-108-117-1000, PB Protected Equipment Tracking Sheet, Attachment 1

### **71111.15**

#### Procedures

SO 16A.8.A-2, Backup Instrument Nitrogen to ADS System Routine Inspection, Revision 5

#### IRs

4185486

4226158

4227299

**71111.18**

Procedures  
EC 622606

**71111.19**

Procedures  
M-013-003, RCIC Pump Maintenance, Revision 3  
M-032-013, HPSW Pump Motor Maintenance, Revision 8  
MA-AA-716-012, Pumps Post-Maintenance Test Matrix, Attachment 1, Revision 23

IRs  
0204981      4209149      4228978      4229709      4230046      4230316  
4230340      4230349      4230355      4230457      4230489      4230745

**71111.22**

Procedures  
IC-C-11-00701, Calibration of ITT Barton Differential Pressure Indicating Switches, Revision 12  
RT-M-010-900-3, RHR Pump Pedestal Inspection, Revision 0  
ST-M-037-354-2, Standby Gas Treatment Filter Train B Deluge System Airflow Test, Revision 1

IRs  
1030553      4086363

**71114.02 Alert and Notification System Evaluation**

Procedures  
EP-AA-1007, Exelon Nuclear Radiological Emergency Annex for PB, Revision 33  
PB Public Alert and Notification System Design Report, Revision 1, February 2017  
EP-MA-121-1002, Alert and Notification System (ANS) Program, Revision 14  
EP-MA-121-1003, Alert and Notification System (ANS) Monitoring, Troubleshooting, and Testing Program, Revision 8  
EP-MA-121-1004, Alert and Notification System (ANS) Maintenance Program, Revision 11

IRs  
4164673      4200556

**71114.03 Emergency Response Organization Staffing and Augmentation System**

Procedures  
EP-AA-1007, Addendum 1, PB On-Shift Staffing Technical Basis, Revision 1

**71114.04 Emergency Action Level and Emergency Plan Changes**

Procedures  
EP-AA-120-1001, 10 CFR 50.54(q) Change Evaluation, Revision 10

**71114.05 Maintenance of Emergency Preparedness**

Procedures

EP-AA-111, Emergency Classification and Protective Action Recommendations, Revision 21

EP-AA-122-100, Drill and Exercise Planning and Scheduling, Revision 9

EP-AA-122-100-F-18, Health Physics (HP) Drill Checklist, Revision A

IRs

4000399      4123279      4125698      4218285      \*4226996

**71152**

Procedures

PI-AA-115, Operating Experience Program, Revision 4

PI-AA-115-1004, Processing of NER and ICES Reports, Revision 6

IRs

2483369      4175355      4175404      4175898      4176097

4193409      4194100      4194147      4222758

Work Orders

4833343

**71153**

IRs

4178993