



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

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

September 22, 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 – BIENNIAL  
PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION REPORT  
05000277/2021012 AND 05000278/2021012

Dear Mr. Rhoades:

On August 12, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed a problem identification and resolution inspection at your Peach Bottom Atomic Power Station, Units 2 and 3 and discussed the results of this inspection with Mr. David Henry and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC inspection team reviewed the station's corrective action program and the station's implementation of the program to evaluate its effectiveness in identifying, prioritizing, evaluating, and correcting problems, and to confirm that the station was complying with NRC regulations and licensee standards for corrective action programs. Based on the samples reviewed, the team determined that your staff's performance in each of these areas adequately supported nuclear safety.

The team also evaluated the station's processes for use of industry and NRC operating experience information and the effectiveness of the station's audits and self-assessments. Based on the samples reviewed, the team determined that your staff's performance in each of these areas adequately supported nuclear safety.

Finally the team reviewed the station's programs to establish and maintain a safety conscious work environment, and interviewed station personnel to evaluate the effectiveness of these programs. Based on the team's observations and the results of these interviews the team found no evidence of challenges to your organization's safety-conscious work environment. Your employees appeared willing to raise nuclear safety concerns through at least one of the several means available.

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, 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,

Jonathan E. Greives, Chief  
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 – BIENNIAL  
 PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION REPORT  
 05000277/2021012 AND 05000278/2021012 DATED SEPTEMBER 22, 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: 05000277/2021012 and 05000278/2021012

Enterprise Identifier: I-2021-012-0029

Licensee: Exelon Generation Company, LLC

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

Location: Delta, PA 17314

Inspection Dates: July 26, 2021 to August 12, 2021

Inspectors: L. Casey, Senior Project Engineer  
N. Floyd, Senior Reactor Inspector  
S. Rutenkroger, Senior Resident Inspector  
N. Warnek, Senior Allegations Coordinator

Approved By: Jonathan E. Greives, Chief  
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 a biennial problem identification and resolution 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

Failure to Correct Erosion of Structural Backfill Material in the Pipe Trench			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000277,05000278/2021012-01 Open/Closed	[P.2] - Evaluation	71152B
The inspectors identified a Green finding and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for Exelon's failure to adequately correct a condition adverse to quality associated with the erosion of structural backfill material in the pipe trench on the west side of the site. Specifically, continued erosion of backfill and settlement of the buried safety-related piping can lead to increased loading on the piping not intended by the design.			

### Additional Tracking Items

None.

## 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), inspectors were directed to begin telework. In addition, regional baseline inspections were evaluated to determine if all or a 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.

## OTHER ACTIVITIES – BASELINE

### 71152B - Problem Identification and Resolution

#### Biennial Team Inspection (IP Section 02.04) (1 Sample)

- (1) The inspectors performed a biennial assessment of the licensee's corrective action program, use of operating experience, self-assessments and audits, and safety conscious work environment.
  - Corrective Action Program Effectiveness: The inspectors assessed the corrective action program's effectiveness in identifying, prioritizing, evaluating, and correcting problems. The inspectors also conducted a five-year review on cable degradation, piping and hanger issues, emergency diesel generators, and FLEX equipment.
  - Operating Experience, Self-Assessments and Audits: The inspectors assessed the effectiveness of the station's processes for use of operating experience, audits and self-assessments.
  - Safety Conscious Work Environment: The inspectors assessed the effectiveness of the station's programs to establish and maintain a safety conscious work environment.

## INSPECTION RESULTS

Assessment	71152B
Problem Identification: The team determined that, in general, the licensee identified issues and entered them into the corrective action program at a low threshold.	

However, the team identified one minor performance deficiency regarding the licensee not initiating an issue report (IR) for a breach of foreign material exclusion (FME) controls when fiberglass fibers were identified on the contacts of a switch.

**Problem Prioritization and Evaluation:** Based on the samples reviewed, the team determined that, in general, the licensee appropriately prioritized and evaluated issues commensurate with the safety significance of the identified problem. The licensee appropriately screened IRs for operability and reportability, categorized IRs by significance, and assigned actions to the appropriate department for evaluation and resolution.

However, the team identified one Green finding with an associated non-cited violation and one minor performance deficiency. The Green finding was due to the licensee's failure to correct the erosion of structural backfill in the pipe trench due to not properly recognizing the condition when prioritizing and evaluating issues caused by the erosion. The minor performance deficiency was due to the licensee's failure to appropriately evaluate issues with the suppression chamber to reactor building pressure gauges in that sticking affected both indication and actuation signals.

**Corrective Actions:** The team determined that the overall corrective action program performance related to resolving problems was effective. In most cases, the licensee implemented corrective actions to resolve problems in a timely manner.

However, the team identified two minor performance deficiencies in the area of corrective actions. First, the team identified that the licensee did not establish and implement a corrective action to revise the maintenance procedure for the installation of emergency diesel generator piston rings after identifying oil scraper rings that were installed backwards. Second, the team identified that the licensee did not implement corrective actions to correct design control issues related to lead shielding packages and did not effectively accomplish corrective actions related to the control of lead shielding blankets.

Additional details on these findings and minor performance deficiencies are included later in this report.

Assessment	71152B
Use of Operating Experience: The team determined that the licensee appropriately evaluated industry operating experience for its relevance to the facility. The licensee appropriately incorporated both internal and external operating experience into plant procedures and processes, as well as lessons learned for training and pre-job briefs.	
Self-Assessments and Audits: The team reviewed a sample of self-assessments and audits to assess whether the licensee was identifying and addressing performance trends. The team concluded that the licensee had an effective self-assessment and audit process.	

Assessment	71152B
Safety Conscious Work Environment: The team interviewed approximately 20 individuals. The purpose of these interviews was to evaluate the willingness of the licensee staff to raise nuclear safety issues; to evaluate the perceived effectiveness of the corrective action program at resolving identified problems; and to evaluate the licensee's safety conscious work environment. The personnel interviewed were randomly selected by the inspectors from the Operations, Engineering, Maintenance, Security, and Radiation Protection work	

groups. To supplement these discussions, the team interviewed the Employee Concerns Program (ECP) representative to assess his perception of the site employees' willingness to raise nuclear safety concerns. The team also reviewed the ECP case log and select case files.

All individuals interviewed indicated that they would raise safety concerns. All individuals felt that their management was receptive to receiving safety concerns and generally addressed them promptly, commensurate with the significance of the concern. Most interviewees indicated they were adequately trained and proficient on initiating condition reports. All interviewees were aware of the licensee's ECP, stated they would use the program if necessary, and expressed confidence that their confidentiality would be maintained if they brought issues to the ECP. When asked whether there have been any instances where individuals experienced retaliation or other negative reaction for raising safety concerns, all individuals interviewed stated that they had neither experienced nor heard of an instance of retaliation at the site. The team determined that the processes in place to mitigate potential safety conscious work environment issues were adequately implemented.

Failure to Correct Erosion of Structural Backfill Material in the Pipe Trench			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000277,05000278/2021012-01 Open/Closed	[P.2] - Evaluation	71152B
<p>The inspectors identified a Green finding and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for Exelon's failure to adequately correct a condition adverse to quality associated with the erosion of structural backfill material in the pipe trench on the west side of the site. Specifically, continued erosion of backfill and settlement of the buried safety-related piping can lead to increased loading on the piping not intended by the design.</p>			
<p><u>Description:</u> During the week of May 10, 2021, while conducting visual inspections in the reactor buildings, Exelon staff found three safety-related piping hangers on the high pressure service water system for Units 2 and 3 and one piping hanger on the Unit 2 emergency service water system that were not supporting pipes as designed, as evidenced by a gap between the pipe and the support. These support issues resulted in a reasonable doubt of operability for the associated piping systems and required Exelon to perform emergent analysis. Exelon staff completed immediate corrective actions to restore the function of the supports by installing metal shims such that the bottom of the pipe was now in contact with the structural steel support. Exelon staff also evaluated the impact of the "degraded" supports and determined that the emergency service water and high pressure service water systems remained capable of performing their design safety functions.</p>			
<p>The high pressure service water system is designed to provide a reliable supply of cooling water for the residual heat removal system under post-accident conditions (shutdown cooling and torus cooling). The emergency service water system is designed to provide a reliable supply of cooling water to the diesel generator coolers, emergency core cooling system and reactor core isolation cooling compartment air coolers, core spray pump motor oil coolers, and other selected equipment during various design basis events. The high pressure service water and emergency service water systems are designed as seismic class I, and portions of both systems are buried in a common pipe trench on the west side of the site and backfilled</p>			



with select material. The structural backfill is designed to provide for drainage and support the buried components such as piping and electrical ducts.

Exelon staff performed a corrective action program evaluation under AR 04424065 and determined the cause of the pipe support gaps was due to settlement of the buried sections of pipe because of backfill soil erosion. Specifically, water is introduced and then removed from the backfill, smaller soil particles are carried away with the water resulting in a reduction in backfill volume, and then compaction/collapse of the lower density areas causes the buried pipes in the trench to settle and pivot about the wall penetration and results in an uplift for the pipes inside the building. Exelon staff identified that pipe support gaps was a historical issue occurring as far back as 1997 and referenced an equipment apparent cause evaluation under AR 00864304 from 2009 that was performed when a damaged underground electrical duct bank was discovered in the pipe trench. This evaluation documented multiple contributing causes to backfill erosion including the drainage ditch not maintained, road to reactor building transition not maintained sealed, and potential leakage of a buried pipe. Exelon determined the conclusion from this original cause evaluation remained valid.

Exelon procedure PI-AA-125, "Corrective Action Program (CAP) Procedure," Revision 7, defines a condition adverse to quality as an all-inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, defective items, and non-conformances. The procedure defines a corrective action as an action taken or planned to restore a condition adverse to quality to an acceptable condition or capability.

The inspectors reviewed the cause evaluations from 2009 and 2021 to assess the effectiveness of the current and previous corrective actions for erosion of backfill. The inspectors also performed walkdowns of the roadway above the pipe trench to assess the general condition of the area. The inspectors observed conditions that contribute to water ingress into the pipe trench:

- Roadway is sunken to various depths in multiple areas and is not graded to drain water away from the plant. AR 4236628 from 2019 documented further sinking of the roadway west of the dewatering building approximately 4.5" under the steel plates. Drawing C-52, "Underground Piping Details, Revision 14, specifies a 2.0% grade from the wall of the reactor building away from the plant and states that the roadway is top finished.
- Ongoing excavation as part of the cathodic protection system modification where the length of the roadway above the pipe trench spanning between Units 2 and 3 has been excavated and filled with gravel (i.e., not sealed).
- Southern storm drain near the dewatering building has a corroded drainpipe that is missing a large section around the circumference. AR 4436966 documented an erosion cavity approximately 2 ft by 5 ft around the drain and excavated cathodic protection trench that formed after a large rainstorm. Borescope inspection of the drain below the surface identified disconnection of the vertical drain from the main drainage pipe buried in the pipe trench.

The inspectors observed that Exelon had not developed or planned corrective actions to address the continued erosion of backfill material in the pipe trench. The planned corrective action was to increase the inspection frequency of the pipe supports in the reactor building which, the inspectors concluded, would only address changes in pipe loading after it occurred and would not address the loss of structural backfill to pipe and electrical ducts underground. The inspectors noted that Exelon staff assigned several considerations and enhancements

(characterized as ACITs under PI-AA-125) such as determining solutions to improve water drainage, investigating the use of soil injection, and evaluating the maximum settlement of the buried piping; however, the inspectors noted these items did not have clear, direct actions or controlled due dates to provide for planned resolution of this condition adverse to quality. The inspectors determined the failure to establish corrective actions was a performance deficiency.

Corrective Actions: Exelon staff entered the issue in their corrective action program under AR 04443058 to evaluate the overall condition of soil erosion and to assess the cumulative impact on the piping systems. Exelon staff also took immediate corrective actions to restore the function of the pipe supports. Commensurate with the very low safety-significance of the violation, NRC inspectors determined that Exelon's corrective actions to immediately restore the function of the pipe supports and maintain system operability by increasing the frequency of piping inspections is sufficient in the near term while long term corrective actions to address the soil erosion are developed under AR 04443058.

Corrective Action References: AR 04424065 and AR 04443058

Performance Assessment:

Performance Deficiency: The inspectors identified a performance deficiency for Exelon's failure to correct a condition adverse to quality associated with the erosion of structural backfill material in the pipe trench on the west side of the site

Screening: The inspectors determined the performance deficiency was more than minor because if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, continued erosion of backfill material and settlement of the buried piping can lead to increased pipe loading not analyzed and pipe exterior corrosion protective coatings in contact with material that was not intended. The inspectors reviewed IMC 0612, Appendix E, and did not find any examples that were applicable to this performance deficiency.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The inspectors determined the finding was of very low safety significance (Green) because the impacted piping and connected components have been currently demonstrated to maintain their operability and/or PRA functionality.

Cross-Cutting Aspect: P.2 - Evaluation: The organization thoroughly evaluates issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. Exelon staff did not develop resolutions to address the causes of continued backfill erosion in the pipe trench, which contains buried safety-related components for both Units 2 and 3.

Enforcement:

Violation: 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as deficiencies, defective material, and non-conformances are promptly identified and corrected. PI-AA-125, "Corrective Action Program (CAP) Procedure," Revision 7, step 4.5.2 states, in part, to create a corrective action for any planned actions necessary to restore a condition adverse to quality.

Contrary to the above, from at least May 10, 2021 to present, Exelon staff did not establish measures to correct the condition adverse to quality associated with the erosion of structural backfill material in the pipe trench.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Minor Performance Deficiency

71152B

Minor Performance Deficiency: The team identified a minor performance deficiency due to the licensee's inadequate corrective actions regarding the control of design modifications for permanent lead shielding and the control of lead shielding blankets in the facility. In 2015 Exelon initiated IR 2490285 which identified that the governing procedure for lead shielding, RP-PB-552, "Shielding Program," contained a category for non-permanent long term shielding exceeding one year which was contrary to the design specification NE-00048, "Use of Temporary Shielding." Shielding in place for greater than one year was required to be controlled in accordance with procedure CC-AA-103, "Configuration Change Control for Permanent Physical Plant Changes," which was not performed. Exelon revised RP-PB-552 and performed a 10 CFR 50.59 review in accordance with LS-AA-104 to accept the shielding on an interim basis. The associated evaluation credited previous annual inspections and long-term temporary shielding requirements but was not an installation performed in accordance with CC-AA-103.

In 2019 Exelon initiated IR 4265109 which identified that lead shielding blankets were draped over an existing lead curtain without being properly secured. The shielding was not installed in accordance with RP-PB-552 and NE-00048. Exelon removed the blankets improperly placed and created an action to perform lead shielding inspections more frequently on a quarterly basis rather than annual.

The team determined that Exelon personnel had stopped performing quarterly inspections in 2021 based on no additional issues being identified, but no approval was sought or documented for this change to the action. The team also performed a walkdown and identified lead shielding blankets laying on Unit 3 'D' core spray pump torus suction line piping without any knowledge or approval by Radiation Protection or Engineering staff or associated reviews and approvals. The team also identified multiple shielding packages with scaffold frameworks in close proximity to safety-related piping, including a shielding package in which supporting chains were routed in contact and across piping and piping insulation such that the chain pushed laterally against the piping. NE-00048 specifies for temporary shielding that all scaffold framework be installed with at least 12 inches clearance to nuclear safety-related equipment unless evaluated on a case-by-case basis by engineering. Finally, the team identified that the long term temporary shielding identified in 2015 was still categorized and tracked as such, and the required permanent design change process in accordance with CC-AA-103 was not performed.

The team determined that the shielding blankets placed on the Unit 3 'D' core spray piping was a performance deficiency since RP-PB-552 requires review and approval by Radiological Engineering which was not performed. The team determined that the long term temporary shielding packages installed for more than a year were a performance deficiency since the packages were required by design specification NE-00048 (and subsequently a revised RP-PB-552) to be installed in accordance with CC-AA-103 as permanent design change to the facility which was not performed.

Exelon initiated IR 4437733 to re-review the action to perform quarterly inspections and conduct a department clock reset. Exelon initiated IR 4440364 for the shielding blankets found on the piping and removed the blankets promptly. Exelon initiated IR 4440428 for the shielding package with chains in contact with piping and/or piping insulation and generated an action to review the package and recommend adjustments as required. Exelon initiated IR 4440269 for the long-term temporary shielding not installed per CC-AA-103 with recommended actions to verify all shielding meets RP-PB-552 installation criteria and develop engineering change packages per CC-AA-103. Lastly, Exelon reviewed the installed long-term shielding packages and determined that, while no permanent design change package was performed, they had been evaluated by Engineering for acceptability under 10 CFR 50.59, "Changes, tests, and experiments."

Screening: The inspectors determined the performance deficiency was minor. Specifically, the team concluded that for the specific lead shielding packages the team observed the weights, configurations, and good material conditions did not represent sufficient doubt of operability, or actual inoperability, to classify as more than minor.

Minor Performance Deficiency	71152B
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Minor Performance Deficiency: The team identified a minor performance deficiency due to the licensee's inadequate corrective actions stemming from an adverse trend review that did not adequately consider design attributes and surveillance results. Specifically, the team identified an evaluation that was inaccurate for DPIS-3503A and DPIS-3503B, "Suppression Chamber – Reactor Building Pressure Instruments." The instruments provide open logic to the torus to reactor building vacuum breakers and annunciation in the control room. The instruments have a local gauge with a needle displaying vacuum and output signals with an alarm setpoint at 10.5 inches water vacuum and a vacuum breaker actuation setpoint at 13.8 inches water vacuum.

During normal operation the primary containment is maintained at a positive pressure relative to the reactor building. Due to the instruments' design, the indicators normally display below zero with the local needle gauge approaching or on the backstop. However, the instruments were not designed to remain routinely under-ranged, i.e. below zero, which places the linkages that move the cams under greater stress. The Unit 3 instruments, DPIS-3503A and DPIS-3503B, were found to be out of tolerance in 2005, 2011, 2014, 2016, 2019, and 2020. DPIS-3503A was found to actuate the vacuum breaker at a value less than the specified range on two occasions. DPIS-3503B was found initially stuck in the under-range position each surveillance, until releasing when applied pressure increased sufficiently: 7.5" in 2005, value not recorded in 2011, 8" in 2014, 8" in 2016, and 15" in 2019.

In 2014 Exelon initiated IR 2381544 and performed an evaluation of the instruments due to the surveillance results. The evaluation concluded that no adverse trend existed based on no historical issues being identified and stating that the pointer was for local indication only. When the sticking recurred in 2016 and 2019, Exelon initiated IR 2637387 and IR 4237955, respectively, and referenced the evaluation each time to conclude no additional actions were required. However, the team determined that the sticking condition was an historical issue that prevented the instrument from responding properly until sufficient pressure was applied. In particular, the condition was not solely a local pointer indication problem. Therefore, the adverse trend evaluation was inadequate since it did not properly consider the impact and potential for future degradation. In particular, the sticking in 2019 impacted the capability of the instrument to actuate the alarm and open the vacuum breaker. The instrument did not release until reaching 15" which exceeded the alarm acceptable range of 9.6" to 11.4". In

addition, this sticking impacted the as found range for the actuation of the opening of the vacuum breaker with an acceptable range of 12.4” to 15.2”. However, the as found trip actuation was improperly recorded as 14.6” even though the instrument did not initially respond until reaching 15”.

As a result, Exelon did not establish and prioritize actions to correct the underlying condition adverse to quality in accordance with PI-AA-120, “Issue Identification and Screening Process,” i.e. the instruments being routinely under-ranged during normal operation. However, notwithstanding the conclusion of the evaluation and IRs, Exelon created a work request from which a work order later replaced DPIS-3503B in 2019. By replacing the instrument, accumulated degradation was reset. However, the new instrument was also under-ranged with the indicating needle on the backstop, which the team observed during the inspection. Therefore, the underlying issue with the instrument design not being appropriate to the conditions was not corrected. The team also shared the observation that PI-AA-120 states that multiple examples of similar safety-related equipment problems where the equipment is operable, but has degraded, reflects a potential common failure mechanism and is a significance level 3 issue, and the previous IRs were coded level 4. Finally, the team noted that procedure CC-AA-309-101, “Engineering Technical Evaluations,” provides the expectations for technical content and rigor for technical evaluations performed by Engineering, including input on conditions that are outside of expected ranges, or otherwise degraded, and requires that technical evaluations be complete, accurate, and technically adequate.

In response to the PIR team observation, Exelon initiated IR 4439031 that documented the observation, created an action to consider revising the 2014 evaluation, and initiated an engineering change request to perform a design change to replace the instruments with a design appropriate to the conditions.

Screening: The inspectors determined the performance deficiency was minor. Although the DPIS-3503B instrument exceeded the acceptable range for alarm actuation in 2019, and the as found breaker actuation setpoint was affected and an improper value was recorded, the instrument released at 15” which remained below the acceptable range for breaker actuation. Also, the team reviewed operator actions for the alarm and determined there would be no meaningful impact to nuclear safety had vacuum exceeded the alarm acceptable range but remained below the breaker actuation acceptable range. Finally, notwithstanding the use and re-use of the evaluation to conclude no action was required, Exelon later replaced the instrument.

Minor Performance Deficiency	71152B
<p>Minor Performance Deficiency: The inspectors identified a minor performance deficiency related to Exelon's failure to implement a self-assigned corrective action. This matter was identified during the inspectors' review of the corrective action program evaluation (CAPE) performed under AR 04361516, which documented excessive lube oil usage during the E2 emergency diesel generator run in August 2020. The CAPE assigned one corrective action: to perform an E2 emergency diesel generator overhaul during the next available system outage window. Upon completion of the overhaul, in January 2021, the CAPE was revised to capture seven potential causes of the high lube oil consumption. One such cause was that two of the lower piston scraper rings were installed upside down, causing the rings to scrape oil toward the combustion chamber rather than away from it.</p>	

The revised CAPE included a new corrective action, listed as Action 38, to revise the diesel maintenance procedure M-052-011 with current Fairbanks Morse guidance for inspection and installation of the upper and lower piston oil scraper rings. Exelon assigned a due date of June 11, 2021, for this corrective action. However, the inspectors identified that the corrective action was never generated in Exelon's action tracking system (PassPort), and was therefore not implemented by the due date.

The inspectors raised this matter to Exelon, who identified that there was an open action, under a related condition report, that was similar to the missed corrective action. Specifically, AR 04398998 had been written following the January 2021 E2 emergency diesel generator overhaul to document the cylinder liners/piston inspection results. Under this AR the station had created a procedure change request action (PCRA) to revise M-052-011 to add steps to ensure that rings are installed and verified in the correct orientation. The inspectors noted that, per Exelon procedures, PCRA's are not to be used for corrective actions; they can be extended with supervisor approval, whereas corrective actions require approval by the Management Review Committee (MRC). The original due date for the PCRA was March 25, 2021, but the due date was subsequently extended multiple times, most recently to August 13, 2021. As a result of the multiple extensions, the procedure was not revised in time to meet the 04361516-38 corrective action due date of June 11, 2021, and the station also missed the opportunity to revise the procedure prior to the next diesel overhaul, which was the E3 emergency diesel generator in June 2021.

The inspectors determined that Exelon had failed to implement corrective action 04361516-38 by the MRC-approved due date, and did not seek out an extension as required by their procedures. Specifically, Exelon procedure PI-AA-125, "Corrective Action Program (CAP) Procedure," Revision 7, provides that due dates for corrective actions can be extended, but that such "extensions for... CAs ... shall be approved by the MRC or MRC Chairman (Plant Manager)." The inspectors determined that Exelon's failure to receive MRC approval to exceed a corrective action due date constituted a performance deficiency that was reasonably within their ability to foresee and correct and should have been prevented.

Exelon entered this performance deficiency into their corrective action program under AR 04439261. Corrective actions included locking in the due date for the PCRA, creating a new corrective action under AR 04361516 to track the PCRA completion, and revising the CAPE with the updated actions.

Screening: The inspectors determined the performance deficiency was minor. Specifically, even though the procedure was not updated prior to the next diesel overhaul, the inspectors determined through interviews that the piston scraper rings were most likely installed correctly and even if the piston scraper rings were installed incorrectly they would not, on their own, impact functionality of the diesel.

Minor Performance Deficiency	71152B
<p>Minor Performance Deficiency: The team identified a minor performance deficiency due to the licensee not initiating an IR for a loss of FME integrity. In April of 2020, the 'B' emergency cooling tower fan tripped. Exelon initiated IR 4333925 and determined the cause of the trip was high vibration. However, the equipment operator in the field did not note any unusual noise or vibration. Exelon replaced the vibration microswitch, sent the failed switch to a laboratory for special testing, and performed a work group evaluation. The laboratory determined that the switch reset exhibited high resistance, and/or failed to actuate, and therefore failed contact continuity acceptance criteria in seven of the first ten tests. Then, the</p>	

switch and contacts passed all testing acceptance criteria in the next ten documented tests, with further good performance during subsequent testing. The lab then examined the contacts, and although they found them mostly free of corrosion, they identified fiberglass-like particles on the contacts. The lab noted that such particles having dielectric properties could interrupt contact continuity. The lab report also noted that the special testing performed, in contrast to failure analysis, created a potential to dislodge and lose interfering material, if it was previously present. Exelon documented this information in the work group evaluation.

The team noted procedural requirements were not met regarding identification of foreign material (FM) within systems and components. Procedure MA-AA-716-008, "Foreign Material Exclusion Program," states that any material not part of the system or component as designed or modified, including unexpected dirt and debris is foreign material (FM) and to ensure an IR is initiated for a loss of FME integrity. It also defines a loss of FME integrity to include unexpected FM found in systems or components. Procedure MA-AA-716-008-1000, "Definitions and Measurements of FME Events," states that FM control practices that has resulted in a limiting condition for operation being entered is a significant event. It also states that FME discovered in a system or component due to failed preventive maintenance program, equipment design shortfall, or environmental conditions is equipment degradation. It also states that all IRs written to address FME should include FME in the title and requires tracking and trending FME issues. PI-AA-120, "Issue Identification and Screening Process," classifies an FME event with the potential to inhibit or has inhibited a safety-related function of a structure, system, or component as a significance level 3 IR.

Although the particles were small, Exelon did not provide information to the team to show that they were originally part of the system or component. The team therefore determined the material was akin to dirt and debris and not expected to be found in the component. The team further noted that the lab report and Exelon's work group evaluation documented that the particles were possibly interrupting the continuity of the contacts. The team shared an observation that initiating a specific IR for FM provides a means to track and trend FME issues. In addition, properly documenting such issues provides early indication of developing problems which can be investigated and resolved prior to becoming a more significant safety concern. Finally, an IR improves traceability of issues should FM be transported which allows the licensee to identify and correct the underlying cause of problems.

In response to the PIR team observation, Exelon initiated IR 4438511 to document that fiberglass fibers were identified on the contacts of the switch and that an evaluation of the PowerLabs results was not documented.

Screening: The inspectors determined the performance deficiency was minor. Specifically, Exelon replaced the microswitch, and the team did not conclude that an FME IR would reasonably have prevented an additional equipment failure in this situation.

## **EXIT MEETINGS AND DEBRIEFS**

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

- On August 12, 2021, the inspectors presented the biennial problem identification and resolution inspection results to Mr. David Henry and other members of the licensee staff.

**DOCUMENTS REVIEWED**

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71152B	Corrective Action Documents	AR 04252679	E1 EDG Cable Fault (NCV, Root Cause)	
		AR 04321794	E1 EDG Shutdown due to Intercooler Coolant Low Pressure (NCV, CAPE, LER)	
		AR 04359332	Station Battery Service Life (NCV, CAPE)	
		IR 00314158		
		IR 00493902		
		IR 02381544		
		IR 02490285		
		IR 02637387		
		IR 04217383		
		IR 04219191		
		IR 04219461		
		IR 04237955		
		IR 04254133		
		IR 04265109		
		IR 04268480		
		IR 04289548		
		IR 04291877		
		IR 04295183		
		IR 04311842		
		IR 04317675		
		IR 04333925		
		IR 04339030		
		IR 04345189		
		IR 04352704		
		IR 04358626		
		IR 04358666		
		IR 04379330		
		IR 04380273		
IR 04381492				
IR 04387917				



Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		IR 04390615		
		IR 04395311		
		IR 04397083		
		IR 04403652		
		IR 04408187		
		IR 04408199		
		IR 04416673		
		IR 04422713		
		IR 04422952		
		IR 04422965		
		IR 04424708		
		IR 04425304		
		IR 04429399		
		IR 04429484		
		Corrective Action Documents Resulting from Inspection	IR 04437488	
	IR 04437490			
	IR 04437554			
	IR 04437733			
	IR 04437986			
	IR 04438511			
	IR 04439031			
	IR 04440269			
	IR 04440364			
	IR 04440428			
	Drawings	C-51	Underground Piping South Area	Revision 37
	Miscellaneous	C-16	Specification for Installation of Underground Piping	Revision 1
		C-32	Specification for Structural Backfilling	Revision 1
		NE-00048	Use of Temporary Shielding	Revision 3
		Procedures	CC-AA-103	Configuration Change Control for Permanent Physical Plant Changes
		CC-AA-309-101	Engineering Technical Evaluations	Revision 16
		LS-AA-104	Exelon 50.59 Review Process	Revision 12
		MA-AA-716-008	Foreign Material Exclusion Program	Revision 16

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		MA-AA-716-008-1000	Definitions and Measurements of FME Events	Revision 6
		PI-AA-120	Issue Identification and Screening Process	Revision 11
		PI-AA-125	Corrective Action Program (CAP) Procedure	Revision 7
		PI-AA-125-1003	Corrective Action Program Evaluation Manual	Revision 6
		RP-PB-552	Shielding Program	Revision 6
	Work Orders	WO 04705293		
		WO 04893232		
		WO 04976510		
		WO R1250450		
		WO R1299879		
		WR 01495053		