



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION I
2100 RENAISSANCE BLVD.
KING OF PRUSSIA, PA 19406-2713

May 5, 2017

Mr. Bryan Hanson
Senior Vice President, Exelon Generation Company, LLC
President and Chief Nuclear Officer, Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: PEACH BOTTOM ATOMIC POWER STATION – INTEGRATED INSPECTION
REPORT 05000277/2017001 AND 05000278/2017001

Dear Mr. Hanson:

On March 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Peach Bottom Atomic Power Station (PB), Units 2 and 3. On April 21, 2017, the NRC inspectors discussed the results of this inspection with Mr. Pat Navin, Peach Bottom Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC inspectors did not identify any finding or violation of more than minor significance.

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

Sincerely,

/RA/

Daniel L. Schroeder, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket Nos. 50-277 and 50-278
License Nos. DPR-44 and DPR-56

Enclosure:
Inspection Report 05000277/2017001
and 05000278/2017001 w/Attachment:
Supplementary Information

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U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.: 50-277 and 50-278

License Nos.: DPR-44 and DPR-56

Report No.: 05000277/2017001 and 05000278/2017001

Licensee: Exelon Generation Company, LLC

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

Location: Delta, Pennsylvania

Dates: January 1, 2017 through March 31, 2017

Inspectors: J. Heinly, Senior Resident Inspector
B. Smith, Resident Inspector
D. Aird, Acting Resident Inspector
S. Barber, Senior Project Engineer
J. Brand, Reactor Inspector
E. Burket, Reactor Inspector
B. Dionne, Health Physicist
L. Dumont, Reactor Inspector
T. Fish, Senior Operations Engineer
B. Fuller, Senior Operations Engineer
D. Kern, Senior Reactor Inspector

Approved By: Daniel L. Schroeder, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Enclosure

TABLE OF CONTENTS

SUMMARY	3
REPORT DETAILS	4
1. REACTOR SAFETY	4
1R01 Adverse Weather Protection	4
1R04 Equipment Alignment.....	5
1R05 Fire Protection	5
1R06 Flood Protection Measures	6
1R07 Heat Sink Performance	6
1R11 Licensed Operator Requalification Program and Licensed Operator Performance.....	7
1R12 Maintenance Effectiveness	9
1R13 Maintenance Risk Assessments and Emergent Work Control	10
1R15 Operability Determinations and Functionality Assessments	10
1R19 Post-Maintenance Testing	11
1R22 Surveillance Testing	11
1EP2 Alert and Notification System Evaluation	12
1EP3 Emergency Response Organization Staffing and Augmentation System	12
1EP5 Maintaining Emergency Preparedness (EP)	13
2. RADIATION SAFETY	13
2RS1 Radiological Hazard Assessment and Exposure Controls	13
2RS3 In-Plant Airborne Radioactivity Control and Mitigation	15
4. OTHER ACTIVITIES	15
4OA1 Performance Indicator Verification	15
4OA2 Problem Identification and Resolution.....	16
4OA5 Other Inspection	20
4OA6 Meetings, Including Exit.....	21
SUPPLEMENTARY INFORMATION.....	A-1
KEY POINTS OF CONTACT	A-1
LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED	A-1
LIST OF DOCUMENTS REVIEWED.....	A-1
LIST OF ACRONYMS.....	A-13

SUMMARY

Inspection Report 05000277/2017001 and 05000278/2017001; 01/01/2017 – 03/31/2017; Peach Bottom Atomic Power Station (PB), Units 2 and 3; Integrated Inspection Report.

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

Cornerstone: Initiating Events, Mitigating Systems, and Barrier Integrity

No NRC-identified or self-revealing findings were identified during this inspection.

Other Findings

None.

REPORT DETAILS

Summary of Plant Status

Unit 2 began the inspection period at 100 percent rated thermal power (RTP). On January 17, 2017, Unit 2 experienced an emergent down power to 40 percent RTP after the '2A' recirculation pump tripped. The recirculation pump speed drive system was repaired and the '2A' recirculation pump was returned to service and the operators achieved 100 percent RTP on January 19, 2017. On January 23, 2017, operators downpowered to 75 percent RTP to address an indication issue with the turbine stop valves in the digital electrohydraulic control system. A loose connection was repaired and the unit was returned to full power operation the following day. On February 14, 2017, operators downpowered the unit to 80 percent RTP and removed the '2C' feedwater pump from service due to flow oscillations. The feedwater pump linkage was repaired and the unit was returned to full power on February 16, 2017. The unit remained at 100 percent RTP except for brief periods to support planned testing and control rod pattern adjustments.

Unit 3 began the inspection period at 100 percent power. Unit 3 remained at 100 percent RTP until the end of the inspection period, except for brief periods to support planned testing and control rod pattern adjustments.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 1 sample)

Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors reviewed PB's preparation and response to a winter storm on February 8 and 9, 2017. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), technical specifications (TSs), control room logs, and the corrective action program (CAP) to determine what temperatures or other seasonal weather could challenge these systems, and to ensure PB personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including PB's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during cold and blizzard weather conditions. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

No findings were identified.

1R04 Equipment Alignment

Partial System Walkdowns (71111.04Q – 4 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 3 reactor core isolation cooling (RCIC) during a high-pressure coolant injection (HPCI) system outage window (SOW) on January 25, 2017
- Unit 3 'B' core spray (CS) loop with 'C' residual heat removal (RHR) train out-of-service (OOS) on March 9, 2017
- Unit 2 HPCI with RCIC OOS on March 15, 2017
- Unit 2 and Unit 3 E-2 emergency diesel generator (EDG) during E-3 EDG overhaul on March 30, 2017

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, TSs, work orders (WOs), issue reports (IRs), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted the system's performance of its intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether Exelon staff had properly identified equipment issues and entered them into the CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05Q – 5 samples)

.1 Resident Inspector Quarterly Walkdowns

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that Exelon controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition.

The inspectors also verified that station personnel implemented compensatory measures for OOS, degraded or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Unit 2 'A/C' CS, 91'6" elevation on January 26, 2017
- Unit 2 reactor building closed-cooling water (RBCCW), 116' elevation on January 27, 2017
- Unit 3 RB general area, 165' elevation on February 28, 2017
- Unit 3 RB, north control rod drive equipment and west corridor, 135' elevation on March 2, 2017
- Unit 2 turbine building, turbine area, 165' elevation on March 2, 2017

1R06 Flood Protection Measures (71111.06 – 1 sample)

Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

The inspectors conducted an inspection of underground bunkers/manholes subject to flooding that contain cables whose failure could affect risk-significant equipment during the week of January 19, 2017. The inspectors performed walkdowns of risk-significant manhole 17 and 18, which contained E-1, E-2, E-3, and E-4 EDG cables, to verify that the cables were not submerged in water, that cables and/or splices appeared intact, and to observe the condition of cable support structures. When applicable, the inspectors verified proper sump pump operation and verified level alarm circuits were set in accordance with station procedures and calculations to ensure that the cables will not be submerged. The inspectors also ensured that drainage was provided and functioning properly in areas where dewatering devices were not installed. For those cables found submerged in water, the inspectors verified that PB had conducted an operability evaluation for the cables and were implementing appropriate corrective actions (CAs).

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07A – 1 sample)

a. Inspection Scope

The inspectors reviewed the Unit 3 'A' fuel pool heat exchanger (HX) replacement and testing on February 23, 2017. The inspectors reviewed the design basis for the component and verified PB's commitments to NRC Generic Letter 89-13, "Service Water System Requirements Affecting Safety-Related Equipment." The inspectors observed actual performance tests for the HXs and/or reviewed the results of previous inspections of the fuel pool cooling HXs. The inspectors discussed the results of the most recent inspection with engineering staff and reviewed pictures of the as-found and as-left conditions. The inspectors verified that PBAPS initiated appropriate CAs for identified deficiencies. The inspectors also verified that the number of tubes plugged within the HX did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance
(71111.11 – 3 samples)

.1 Quarterly Review of Licensed Operator Regualification Testing and Training (1 sample)

a. Inspection Scope

The inspectors observed licensed operator simulator training scenarios on January 25, 2017, which included mitigating the effects of the loss of RBCCW system and the loss of primary containment. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classifications made by the shift manager and the TS action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room
(1 sample)

a. Inspection Scope

The inspectors observed and reviewed the licensed operator performance from the main control room during the '2A' recirculation trip and recovery actions on January 18, 2017. The inspectors observed use of and compliance with procedures, crew communications, interpretation, diagnosis, and understanding of plant alarms, use of human error prevention techniques, documentation of activities, and management oversight of the evolution to verify that the crew was following procedures and plant expectations for conduct of operations.

The inspectors observed some control room briefings and power changes. Additionally, the inspectors observed power changes to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

.3 Licensed Operator Requalification (71111.11B – 1 sample)

a. Inspection Scope

The following inspection activities were performed using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 10, and Inspection Procedure (IP) Attachment 71111.11, "Licensed Operator Requalification Program."

Examination Results

On December 29, 2016, the results of the annual operating tests were reviewed in-office to determine if pass/fail rates were consistent with the guidance of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 10, and Inspection Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)." The review verified that the failure rate (individual or crew) did not exceed 20 percent.

- The overall individual operator failure rate was 0 percent
- The overall crew failure rate was 0 percent

Written Examination Quality

The inspectors reviewed a sample of biennial written examinations administered during the 2017 examination cycle for qualitative and quantitative attributes as specified in Appendix B of Attachment 71111.11B, "Licensed Operator Requalification."

Operating Test Quality

The inspectors reviewed the operating tests (scenarios and job performance measures (JPMs)) associated with the on-site examination week. The exam materials were reviewed for qualitative and quantitative attributes as specified in Appendix C of 71111.11B, "Licensed Operator Requalification Program."

Licensee Administration of Operating Tests

The dynamic simulator exams and JPMs administered during the week of February 27, 2017, were observed. These observations included facility evaluations of crew and individual operator performance during the dynamic simulator exams and individual performance of JPMs.

Examination Security

The inspectors assessed the facility staff's handling of exam material. The inspectors also checked JPMs, scenarios, and written examinations for excessive overlap of test items from week to week.

Conformance with Operator License Conditions

License reactivation and license proficiency records were reviewed to ensure that Title 10 of the *Code of Federal Regulations* (10 CFR) 55.53 license conditions and applicable program requirements were met.

The inspectors also reviewed a sample of records for requalification training attendance, and a sample of medical examinations for compliance with license conditions and NRC regulations.

Simulator Performance

Simulator performance and fidelity was reviewed for conformance to the reference plant control room. A sample of simulator deficiency reports was also reviewed to ensure facility staff addressed identified modeling problems. Simulator test documentation was also reviewed.

Problem Identification and Resolution

A review was conducted of recent operating history documentation found in inspection reports, Exelon's CAP, and the most recent NRC plant issues matrix. The inspectors also reviewed specific events from Exelon's CAP which indicated possible training deficiencies, to verify that they had been appropriately addressed. The NRC resident inspectors were also consulted for insights regarding licensed operators' performance.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 2 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structures, systems, and components (SSCs) performance and reliability. The inspectors reviewed system health reports, CAP documents, maintenance WOs, and maintenance rule (MR) basis documents to ensure that Exelon was identifying and properly evaluating performance problems within the scope of the MR. For each sample selected, the inspectors verified that the SSC was properly scoped into the MR in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by the Exelon staff was reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and CAs to return these SSCs to (a)(2) status. Additionally, the inspectors ensured that Exelon staff was identifying and addressing common cause failures that occurred within and across MR system boundaries.

- Unit 2 and Unit 3 non-safety related cranes on March 2, 2017
- Unit 2 and Unit 3 area radiation monitors on March 28, 2017

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples)a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Exelon performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that Exelon personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When Exelon performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk.

The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Elevated risk for the station blackout line, the #2 startup feed bus and the diesel driven fire pump which were all OOS on January 3, 2017
- Elevated risk for Unit 3 HPCI SOW on January 23 - 24, 2017
- Elevated risk for Unit 2 HPCI SOW on February 21, 2017
- Unit 3 RCIC SOW on February 27, 2017
- Units 2 and 3 planned maintenance on emergency cooling tower valves on March 13, 2017

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 4 samples)a. Inspection Scope

The inspectors reviewed operability determinations (ODs) for the following degraded or non-conforming conditions based on the risk significance of the associated components and systems:

- Unit 2 and Unit 3 EDGs tornado missile hazard vulnerability on January 10, 2017
- Unit 2 and Unit 3 E-3 EDG temperature bearing high on February 9, 2017
- Unit 2 RCIC lube oil cooling motor-operator valve (MOV) failure on March 21, 2017
- Unit 2 'C' CS elevated motor vibrations on March 28, 2017

The inspectors evaluated the technical adequacy of the ODs to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TSs and UFSAR to Exelon's evaluations to determine whether the components or systems were operable.

The inspectors confirmed, where appropriate, compliance with bounding limitations associated with the evaluations, including compliance with in-service testing requirements. Where compensatory measures were required to maintain operability, such as in the case of operator workarounds, the inspectors determined whether the measures in place would function as intended and were properly controlled by Exelon.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 6 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests (PMTs) for the maintenance activities listed below to verify that procedures and test activities tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with the information in the applicable licensing basis and/or design basis documents, and that the test results were properly reviewed and accepted and problems were appropriately documented. The inspectors also walked down the affected job site, observed the pre-job brief and post-job critique where possible, confirmed work site cleanliness was maintained, and witnessed the test or reviewed test data to verify quality control hold points were performed and checked, and that results adequately demonstrated restoration of the affected safety functions.

- Unit 3 RCIC torus suction valve relay replacement on January 13, 2017
- Unit 3 HPCI maintenance outage PMT on January 25, 2017
- Unit 2 HPCI maintenance outage PMT on February 22 - 24, 2017
- Unit 3 RCIC system outage window (SOW) PMT on March 1, 2017
- Unit 3 'A' LOOP RHR SOW on March 10, 2017
- Unit 2 RCIC lube oil MOV actuator and motor diagnostic testing on March 22, 2017

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 5 samples)

a. Inspection Scope

The inspectors observed performance of surveillance test (STs) and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied TSs, the UFSAR, and Exelon procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions.

The inspectors reviewed the following STs:

- Unit 2 automatic depressurization system logic system functional test (LSFT) on January 11, 2017
- Unit 2 and Unit 3 E-4 EDG emergency core cooling system start on January 27, 2017
- Unit 3 HPSW/emergency service water (ESW) room sump pump functional and capacity test on February 17, 2017
- Unit 2 main steam isolation valve closure SCRAM response test on February 22, 2017
- Unit 3 'B' RHR LSFT on February 23, 2017

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP2 Alert and Notification System Evaluation (71114.02 – 1 sample)

a. Inspection Scope

On March 16, 2017, the inspectors interviewed the Exelon siren program owner and conducted a review of the alert and notification system (ANS) to assess the maintenance and testing programs. The inspectors reviewed the associated ANS procedures and the Federal Emergency Management Agency approved ANS design report to ensure compliance with design report commitments for system maintenance and testing. The inspection was conducted in accordance with NRC IP 71114, Attachment 2. Title 10 of the CFR 50.47(b)(5) and the related requirements of 10 CFR Part 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP3 Emergency Response Organization Staffing and Augmentation System (71114.03 – 1 sample)

a. Inspection Scope

The inspectors conducted a review of the PB Emergency Response Organization (ERO) augmentation staffing requirements and the process for notifying and augmenting the ERO. The review was performed to verify the readiness of key Exelon staff to respond to an emergency event and to verify Exelon's ability to activate their emergency response facilities (ERF) in a timely manner. The inspectors reviewed the PB Emergency Plan for ERF activation and ERO staffing requirements, the ERO duty roster, applicable station procedures, augmentation test reports, and CA reports related to this inspection area. The inspectors also reviewed a sample of ERO responder training records to verify training and qualifications were up to date.

The inspection was conducted in accordance with NRC IP 71114, Attachment 3. Title 10 CFR 50.47(b)(2) and related requirements of 10 CFR Part 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP5 Maintaining Emergency Preparedness (EP) (71114.05 – 1 sample)

a. Inspection Scope

The inspectors reviewed a number of activities to evaluate the efficacy of Exelon's efforts to maintain the PB's EP Program. The inspectors reviewed: memorandums of agreement with offsite agencies; PB's maintenance of equipment important to EP; records of evacuation time estimate and population evaluation; and provisions for, and implementation of, primary, backup, and alternate ERF maintenance.

The inspectors further evaluated Exelon's ability to maintain PB's EP program through their identification and correction of EP weaknesses, by reviewing a sample of drill reports, self-assessments, and 10 CFR 50.54(t) reviews. Also, the inspectors reviewed a sample of EP-related issue reports initiated at PB's from March 2015 through March 2017. The inspection was conducted in accordance with NRC IP 71114.05. Title 10 CFR 50.47(b) and the related requirements of 10 CFR Part 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupation Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01 – 7 samples)

a. Inspection Scope

The inspectors reviewed Exelon's performance in assessing and controlling radiological hazards in the workplace. The inspectors used the requirements contained in 10 CFR 20, TSs, applicable Regulatory Guides (RGs), and the procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the performance indicators (PIs) for the occupational exposure cornerstone, radiation protection (RP) program audits, and reports of operational occurrences in occupational radiation safety since the last inspection.

Radiological Hazard Assessment (1 sample)

The inspectors conducted independent radiation measurements during walkdowns of the facility and reviewed the radiological survey program, air sampling and analysis, continuous air monitor use, recent plant radiation surveys for radiological work activities, and any changes to plant operations since the last inspection to verify survey adequacy of any new radiological hazards for onsite workers or members of the public.

Instructions to Workers (1 sample)

The inspectors reviewed high radiation area (HRA) work permit controls and use; observed containers of radioactive materials and assessed whether the containers were labeled and controlled in accordance with requirements.

The inspectors reviewed several occurrences where a worker's electronic personal dosimeter alarmed. The inspectors reviewed Exelon's evaluation of the incidents, documentation in the CAP, and whether compensatory dose evaluations were conducted, when appropriate. The inspectors verified follow-up investigations of actual radiological conditions for unexpected radiological hazards were performed.

Contamination and Radioactive Material Control (1 sample)

The inspectors observed the monitoring of potentially contaminated material leaving the radiological controlled area and inspected the methods and radiation monitoring instrumentation used for control, survey, and release of that material. The inspectors selected several sealed sources from inventory records and assessed whether the sources were accounted for and were tested for loose surface contamination. The inspectors evaluated whether any recent transactions involving nationally tracked sources were reported in accordance with requirements.

Radiological Hazards Control and Work Coverage (1 sample)

The inspectors evaluated in-plant radiological conditions and performed independent radiation measurements during facility walk-downs and observation of radiological work activities. The inspectors assessed whether posted surveys; radiation work permits (RWPs); worker radiological briefings and radiation protection job coverage; the use of continuous air monitoring, air sampling and engineering controls; and dosimetry monitoring were consistent with the present conditions. The inspectors examined the control of highly activated or contaminated materials stored within the spent fuel pools and the posting and physical controls for selected HRAs, locked high radiation areas (LHRAs) and very high radiation areas (VHRA) to verify conformance with the occupational performance indicator (PI).

Risk-Significant HRA and VHRA Controls (1 sample)

The inspectors reviewed the procedures and controls for HRAs, VHRAs, and radiological transient areas in the plant.

Radiation Worker Performance and Radiation Protection Technician Proficiency (1 sample)

The inspectors evaluated radiation worker performance with respect to radiation protection work requirements. The inspectors evaluated radiation protection technicians in performance of radiation surveys and in providing radiological job coverage.

Problem Identification and Resolution (1 sample)

The inspectors evaluated whether problems associated with radiation monitoring and exposure control (including operating experience) were identified at an appropriate threshold and properly addressed in the CAP.

b. Findings

No findings were identified.

2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03 – 2 samples)

a. Inspection Scope

The inspectors reviewed the control of in-plant airborne radioactivity and the use of respiratory protection devices in these areas. The inspectors used the requirements in 10 CFR 20, RG 8.15, RG 8.25, NUREG/CR-0041, TS, and procedures required by TS as criteria for determining compliance.

Self-Contained Breathing Apparatus (SCBA) for Emergency Use (1 sample)

The inspectors reviewed the following: the status and surveillance records for SCBAs staged in-plant for use during fires, routine operations and emergencies; Exelon's SCBA procedures and maintenance and test records; the refilling and transporting of SCBA air bottles; SCBA mask size availability; and the qualifications of personnel performing service and repair of this equipment.

Problem Identification and Resolution (1 sample)

The inspectors evaluated whether problems associated with the control and mitigation of in-plant airborne radioactivity were identified at an appropriate threshold and addressed by Exelon's CAP.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Unplanned Scrams, Unplanned Power Changes, and Unplanned Scrams with Complications (6 samples)

a. Inspection Scope

The inspectors reviewed PB's information submitted for the initiating events PIs listed below to assess the accuracy and completeness of the data reported to the NRC for these PIs. The PI definitions and the guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, and Exelon procedure LS-AA-2001, "Collecting and Reporting of NRC PI Data," Revision 14, were used to verify that procedure and reporting requirements were met. The inspectors reviewed raw PI data collected from January 1, 2016 to December 31, 2016, and compared graphical representations from the applicable PI reports to the raw data to verify the data was included in the report.

The inspectors also examined a selected sample of operations logs and plant computer thermal power data trends to verify the PI data was appropriately captured for inclusion into the PI report and that the individual PIs were correctly calculated.

- Unit 2 Unplanned Scrams per 7,000 Critical Hours (IE01)
- Unit 3 Unplanned Scrams per 7,000 Critical Hours (IE01)
- Unit 2 Unplanned Power Changes per 7,000 Critical Hours (IE03)
- Unit 3 Unplanned Power Changes per 7,000 Critical Hours (IE03)
- Unit 2 Unplanned Scrams with Complications (IE04)
- Unit 3 Unplanned Scrams with Complications (IE04)

b. Findings

No findings were identified.

.2 EP Performance Indicator Verification (71151 – 3 samples)

a. Inspection Scope

The inspectors reviewed data for the following three EP PIs: (1) drill and exercise performance; (2) ERO drill participation; and, (3) ANS reliability. The last NRC EP inspection at Peach Bottom was conducted in the second calendar quarter of 2016. Therefore, the inspectors reviewed supporting documentation from EP drills and equipment tests from the second calendar quarter of 2016 through the fourth calendar quarter of 2016 to verify the accuracy of the reported PI data. The acceptance criteria documented in NEI 99-02, "Regulatory Assessment PI Guidelines," Revision 7, was used as reference criteria.

b. Findings

No findings were identified.

40A2 Problem Identification and Resolution (71152 – 2 samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by IP 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that Exelon entered issues into the CAP at an appropriate threshold, gave adequate attention to timely CAs, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended CR screening meetings. The inspectors also confirmed, on a sampling basis, that, as applicable, for identified defects and non-conformances, Exelon performed an evaluation in accordance with 10 CFR Part 21.

b. Findings

No findings were identified

.2 Annual Sample: Trash Rack Cleaning and Frazil Ice Vulnerability Review (1 sample)

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's evaluation and CAs associated with intake structure trash rack cleaning and frazil ice build-up conditions. Specifically, the inspectors reviewed an apparent cause evaluation (ACE) documented in CR 2614867, which evaluated a lowering of intake canal water level that occurred on January 20, 2016, due to partial ice blockage of the non-safety related trash racks and reviewed the history and applicable CAs for other ice blockage issues at PB going back to 2005.

The inspectors reviewed Exelon's CA reports, performed intake structure walk downs, reviewed several associated preventive maintenance (PM) activities involving annual diver inspection and cleaning of outer trash rack, intake area inspections and cleaning, silt level measurements and cleaning, and performance of intake canal dredging. In addition, the inspectors reviewed applicable mitigation and icing condition operations procedure AO 29.2, Discharge Canal to Intake Pond Cross-tie gate Operation Frazil Ice mitigation and Icing Condition Operations, to evaluate the quality and effectiveness of the Exelon ice mitigation program, as implemented at PB. Finally, the inspectors interviewed plant personnel, including a diving team supervisor and the system engineer, to evaluate the adequacy of Exelon's CAs and to assess the overall performance of the intake cooling water system.

b. Findings and Observations

No findings of significance were identified.

The inspectors reviewed CR 2614867 which described a condition that occurred on January 20, 2016, where operators responded to an indication of lowering water level in the intake canal. Operators identified the lowering intake canal water level was due to ice partially blocking the flow of water from the pond through the non-safety related trash racks. Both maintenance and operations personnel removed ice from in front of the trash racks, restoring adequate flow through the racks and thus returning water level in the intake canal to normal. At that time, operators determined the lowering intake water level was not significant and did not challenge plant safety systems. Exelon staff completed an ACE and compared this incident with recent historical intake canal level lowering incidents at PB due to icing and debris blocking flow through the trash tracks and developed applicable CAs to address the conditions. Inspector review noted that the station properly entered applicable procedures and TSs, including Technical Requirements Manual 3.15, "River Level," and SE-3, "Loss of Conowingo Pond," until level was restored. Additionally, operator response was in accordance with procedures and training to operate pre-staged ice removal equipment which prevented the canal water level from lowering further.

After discussions with Exelon staff and review of documents, the inspectors noted that there were four instances from 2005 to 2016 in which intake canal water level lowered due to ice and debris buildup decreasing flow through the trash racks. PB investigations determined that in three instances the required PM activity to perform winter cleaning of the trash racks had been re-scheduled so that it was not performed at the optimum and intended time-frame. Prior to 2005, PBAPS had a PM to clean and inspect the bubbler system in the summer time. Subsequently, a new CA from a 2005 ACE was created to perform a second PM for a diver inspection and cleaning of the outer trash rack during

the winter around the November or December timeframe. During an ACE due to a lowering intake canal water level incident that occurred in January 2016 (IR 02614867), Exelon staff identified the winter PM activity had been properly performed from 2008 through 2012. However, their evaluation determined that in the summers of 2013-2015, both PM activities (summer and winter PMs) had been performed during the summer. Exelon determined their maintenance staff did not fully understand the importance of performing the second PM during the winter months and reasoned that it would be acceptable to perform it earlier. Exelon staff determined that because the winter PM was moved earlier in the year, it was able to be scheduled and completed without additional evaluation required by the PM program. Exelon staff also concluded that performing the winter PM earlier (during the summer) increased the possibility of debris and ice blockage of the intake outer trash rack during the winter months.

The inspectors determined that the failure to ensure PM activities, which were classified as CAs, were implemented to address prior icing occurrences at PB was a performance deficiency (PD). However, based on review of related documentation, interviews with the system engineer and diver supervisor, review of intake structure system design and structural drawings, and review of completed diving inspections and silt removal activities, the inspectors determined that the ice and debris conditions at the PB intake trash racks had limited or only minimal impact on safety systems. Therefore, in accordance with IMC 0612, Section 0612-14, the inspectors determined this PD was minor because it did not adversely affect the mitigating system cornerstone objective of availability, reliability, or capability of the safety-related cooling water systems. The inspectors verified that CAs have been put in place to ensure the winter PM is performed between the months of November and December. In addition the inspectors noted that PB has scheduled and planned actions to replace the remaining five trash racks with new racks that are less susceptible to ice formation, procedure revisions to ensure pre-emptive actions are taken when ice build-up or blockage is suspected, and to perform dredging of the intake canal.

Notwithstanding, the inspectors had two observations regarding CAs. First, the inspectors observed the wording in the PM stated, in part, "clean leaves and debris from outer trash racks after fall schedule in November...." The inspectors questioned whether the wording was of sufficient clarity to ensure the PM was not completed too early. Exelon staff initiated IR 3977566 to re-consider the clarity of the PM scheduling guidance.

The inspectors also observed that a PM activity to inspect the area between the trash rack and the outer traveling screen which was deleted without proper evaluation or engineering justification as directed by the PB PM procedure WC-AA-120. In response Exelon staff initiated IR 3977546 to evaluate this condition. Exelon staff determined the likely cause of this deletion involved their staff not properly implementing step 4.1.7 of the PM program procedure which requires, in part, that modifications to critical component or MR PMs receive a technical review by the system manager with final review and approval by an engineering branch manager. The inspectors determined that not implementing this portion of the PM procedure was a PD. However, based on review of related documentation, interviews with the system engineer and diver supervisor, review of intake structure system design and structural drawings, and review of completed diving inspections and silt removal activities, the inspectors determined that silt levels in the area between the trash rack and the outer traveling screens were low and did not impact any of the safety-related pumps.

In accordance with IMC 0612, Section 0612-14, the inspectors determined this PD was minor because it did not adversely affect the mitigating system cornerstone objective of availability, reliability, or capability of the safety-related cooling water systems.

.3 Annual Sample: Station Gaps in Human Performance Tool Usage (1 sample)

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's root cause report (RCR) and CAs associated with IR 2646772, which was written to document four events that were caused by inadequate use of human performance tools.

The inspectors assessed Exelon's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of Exelon's CAs to determine whether Exelon was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed CAs were appropriate. The inspectors compared the actions taken to the requirements of Exelon's CAP and 10 CFR 50, Appendix B. In addition, the inspectors interviewed personnel and observed activities to assess the effectiveness of the implemented CAs.

b. Findings and Observations

No findings were identified.

The inspectors noted that Exelon screened and evaluated the four following individual events as potentially similar in their RCR:

- Unit 2 'A' reactor protection system (RPS) channel half scram when the RPS test box was removed (IR 2588736, November 2015; ACE)
- Wrong test switch manipulated during Unit 2 LSFT (IR 2614949, January 2016; ACE)
- Potable water supply infiltrated with unchlorinated water (IR 2618015, February 2016; ACE)
- Unit 2 electrical transient due to the loss of the E124 load center (IR 2646772, March 2016; RCR)

The first three events occurred over a three month period from late 2015 until early 2016 with each event identifying human error as major causal factor. While the fourth, a more significant event, occurred one month later and caused a transient due to a degradation in main condenser vacuum which without prompt operator actions could have led to a reactor scram. It also involved human error. Although these events were evaluated individually, Exelon decided to perform a root cause investigation (RCI) to address the broader organizational and programmatic aspects of these events. The inspector reviewed PI-AA-125, CAP, and determined that conduct of an RCI for these four events was consistent with the requirements of Section 4.3.3 of this procedure. The inspectors noted that the RCI used many evaluation methods, including: Event and Causal Factor Charting, interviewing, trend data review, and barrier analysis, to determine the root and contributing causes for these events. By using Taproot, another RCI technique, Exelon determined that the root cause was also a generic cause and developed CA to address its broader nature. Exelon identified the root cause as the station's failure to identify and/or correct individuals with at risk behaviors, while a contributing cause of failure to effectively use station accountability programs was also identified.

Exelon considered at risk behaviors as over-confidence, complacency, lack of proficiency, and inaccurate risk perception. The focus of these causes was the human errors that led to these events/issues.

Exelon developed a number of immediate CAs to address the causes for these events, which included, but were not limited to: 1) removing involved parties from assigned parties until remedial training was completed; 2) performing for cause fitness for duty and fatigue assessments; 3) performing work stand downs until appropriate briefings were conducted; and 4) issuing a standing order to use reverse briefs on the proper selection of human error prevention tools. The inspector reviewed each of these immediate CAs and verified that they were all completed by their due dates, the latest of which was June 2016.

As long term CAs, Exelon required each department to modify undesirable behaviors, to reinforce positive behaviors, and effect long term change by placing personnel with at risk behaviors in department excellence programs. To verify the adequacy of these long term actions, the inspector observed a sample of ongoing operations and maintenance activities. These included observation of a maintenance activity to verify the capacity of a HPSW sump pump and also a planned rod sequence exchange during the week of February 13, 2017. Prior to beginning these evolutions, the inspector noted that plant staff used various HU tools described in HU-AA-101, "Human Performance Tools and Verification Practices," consistent with the guidance in department excellence plans. These tools included self-check, peer check, 3-Way communications, and 2 minute drills at the job site. The inspector noted that the implementation of the tools was effective to ensure that these evolutions were performed in a human error free manner. The inspector concluded that Exelon had provided reasonable assurance that the immediate and long term CAs were effective.

4OA5 Other Inspection

.1 Temporary Instruction (TI) 2515/192, "Inspection of the Licensee's Interim Compensatory Measures Associated with the Open Phase Condition Design Vulnerabilities in Electric Power System"

a. Inspection Scope

The objective of this performance based TI is to verify implementation of interim compensatory measures associated with an open phase condition (OPC) design vulnerability in electric power system for operating reactors. The inspectors conducted an inspection to determine if Exelon had implemented the following interim compensatory measures. These compensatory measures are to remain in place until permanent automatic detection and protection schemes are installed and declared operable for OPC design vulnerability. The inspectors verified the following:

- Exelon had identified and discussed with plant staff the lessons-learned from the OPC events at the US operating plants, including the Byron station OPC event and its consequences. This includes conducting operator training for promptly diagnosing, recognizing consequences, and responding to an OPC event
- Exelon had updated plant operating procedures to help operators promptly diagnose and respond to OPC events on off-site power sources credited for safe shutdown of the plant

- Exelon had established and continue to implement periodic walkdown activities to inspect switchyard equipment such as insulators, disconnect switches, and transmission line and transformer connections associated with the offsite power circuits to detect a visible OPC
- Exelon had ensured that routine maintenance and testing activities on switchyard components have been implemented and maintained. As part of the maintenance and testing activities, Exelon assessed and managed plant risk in accordance with 10 CFR 50.65(a) (4) requirements.

b. Findings and Observations

No findings were identified. The inspectors verified the TI criteria were met.

40A6 Meetings, Including Exit

Quarterly Resident Exit Meeting Summary

On April 21, 2017, the inspectors presented the inspection results to Pat Navin, Peach Bottom, Site Vice President, and other members of Exelon's staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

**SUPPLEMENTARY INFORMATION
KEY POINTS OF CONTACT**

Exelon Generation Company Personnel

P. Navin, Site Vice President
M. Herr, Plant Manager
N. Alexakos, Emergency Preparedness Manager
J. Armstrong, Regulatory Assurance Manager
S. Belitsky, Assistant Maintenance Manager
P. Breidenbaugh, Maintenance Director
D. Dullum, Regulatory Assurance Engineer
S. Eichfeld, Senior Design Engineer
C. Hardee, Project Manager
D. Henry, Engineering Director
B. Holmes, Radiation Protection Manager
J. Koester, Fire Marshal
H. McCrory, Radiation Protection Support Manager
J. McDonald, Requal Lead
C. Millard, Operations Training Manager
B. Miller, Project Engineer
L. Padre, I&C Supervisor
R. Ridge, Dosimetry Physicist
R. Riley, Rad Waste Shipper
M. Rubright, Respiratory Physicist
D. Turek, Operations Director
M. Weidman, Work Management Director
B. Wright, System Manager

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

None.

LIST OF DOCUMENTS REVIEWED

* -- Indicates NRC-identified

Section 1R01: Adverse Weather Protection

Procedures

OP-AA-108-111-1001, Severe Weather and Natural Disaster Guidelines, Revision 15
OP-PB-108-111-1001, Preparation for Severe Weather, Revision 16

Section 1R04: Equipment Alignment

Procedures

COL 14.1.A-3B, CS System LOOP B, Revision 11
COL 23.1.A-2, HPCI System, Revision 33
COL 33.1.A-2, ESW System (Unit 2 and Common), Revision 32
COL 52A.1.A-2, E-2 Diesel Generator Normal Standby, Revision 15

IRs

2506199 2566110 3966560

Drawings

M-362, Sheet 2, P&I Diagram, CS Cooling System, Revision 62

M-365, Sheet 1, P&I Diagram HPCI System, Revision 63

Section 1R05: Fire Protection

Procedures

OP-AA-201-009, Control of Transient Combustible Material, Revision 19

OP-PB-102-106, Operator Response Time Program at PB, Revision 6

PF-4B, Unit 2 Radwaste Building; RBCCW Room, Elevation 116'-0", Revision 9

PF-5A, Unit 2 RB, '2A' and '2C' CS Room, Elevation 91'-6", Revision 3

PF-13H, Unit 3 RB, North Control Rod Drive Equipment and West Corridor, Elevation 135',
Revision 8

PF-13J, Unit 3 RB, General Area, 165' Elevation, Revision 3

PF-78U, Unit 2 Turbine Building

ST-I-037-275-3, RB 135' General Area Smoke Detectors Functional Test,
Revision 3

ST-I-037-276-3, RB 165' Elevation, Smoke Detectors Functional Test, Revision 4

ST-M-37B-310-2, Verification of Fire Hose Hydrostatic Testing

ST-M-037-399-2, Fire Damper Inspection, Revision 11

ST-O-37B-326-2, RB Water Curtain Simulated Actuation Test

T-302-2 Area 02 Fire Guide, Revision 10

ARs

A1753580

IRs

3968258 3978106

Miscellaneous

Generic 86-10, Evaluation Supporting Configuration of Penetration RW2-116-105-3039

PBAPS Fire Protection Program, Revision 21

PBAPS Technical Requirement Manual, Unit 3

PBAPS, Units 2 & 3, Specification No. NE-00164, Revision 6

Transient Combustible Permit ID#592, dated February 14, 2017

Section 1R06: Flood Protection Measures

Procedures

ER-AA-3003, Cable Condition Monitoring Program, Revision 2

ARs

A2651755

IRs

3963696

Section 1R07: Heat Sink Performance

Procedures

ECR 13-00379, Fuel Pool Cooling HX Replacements, Unit 2 and Unit 3, Revision 1

WOs

4181006

Miscellaneous

AM-EX 2580-00, Instructions for the Installation, Operation, and Maintenance of PB's Fuel Pool Coolers, Revision 0

Specification NE-00343, Specification for Replacement Fuel Pool HXs, Revision 4

Section 1R11: Licensed Operator Requalification Program

Procedures

AO 2A.1-2, Recirculation System Single Loop Operation, Revision 28

GP-5-2, Power Operations, Revision 4

HR-AA-07-101 NRC Licensed Operator Medical Examination

ON-110, Loss of Primary Containment, Revision 4

ON-113, Loss of RBCCW, Revision 20

OT-112, Unexpected/Unexplained Change in Core Flow, Revision 44

PSEG-0209R-110-01, Off Normal Procedures: ON-110, Loss of Primary Containment, Revision 0

PSEG-0209R-113-01, Off Normal Procedures: ON-113, Loss of RBCCW

RT-O-02A-205-2, Recirc System Baseline Data Single Loop Operation, Revision 5

ST-O-02F-525-2, Jet Pump Operability-Single Loop Operation, Revision 18

ST-O-60A-205-2, APRM Calibration and Thermal Limit Check for Single Loop Operation, Revision 17

SO 2A.1.B-2, Starting the Second Recirculation Pump, Revision 55

TQ-AA-150 Operator Training Programs

TQ-AA-155 Conduct of Simulator Training and Evaluation

TQ-AA-201 Examination Security and Administration

Simulator Scenarios and JPMs

PLOR 128P

PLOR-096P

PLOR-308CA

PLOR-307CA

PLOR-241C

PLOR-092C

PLOR-153C

Biennial Written Exams

2016 Written exams for Crews B and D

Simulator Testing

TQ-AA-306-JA-02 Simulator Testing Report Update

SBT Scenarios

0718R	0729R	0724R	0719R	0716R
0715R	0713R	0707R	0744R	0737R
0730R	0706R	0704R	0702R	0728R
0727R	0720R			

Self-Assessments

AR 02621328, Focused Area Self-Assessment of Requalification Training Program

IRs

02432704	02457570	02515158	02623288
02443870	02523299	02586814	02680828

IRs

3963836

Section 1R12: Maintenance EffectivenessProcedures

AO 63C.1-3, Removing and Returning to Service an Area Radiation Monitor, Revision 4
EP-AA-121-F-07, PB Equipment Matrix, Revision 7

IRs

2593138	2642644	3975226
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Miscellaneous

Table SC/R-1 Radiation - Alarm and Action Levels
Expert Panel Meeting Agenda, March 2, 2017

Section 1R13: Maintenance Risk Assessments and Emergent Work ControlProcedures

ER-AA-600, Risk Management, Revision 7
OP-PB-108-117, Protected Equipment Program, Revision 4
OP-PB-108-117-1000, PB Protected Equipment Tracking Sheet, Attachment 1
OP-PB-108-117-1000, PB Protected Equipment Program, Revision 3
WC-AA-101, On-Line Work Control Process, Revision 26
WC-AA-101-1004, Unit 3 RCIC TSA (WW 1709), Revision 7
WC-AA-101-1006, On-Line Risk Management and Assessment, Revision 2
WC-AA-104, Integrated Risk Management, Revision 24
WC-PB-101-1001, Guideline for the Performance of On-Line Work/On-Line System Outages,
Revision 8

IRs

3958801

Drawings

M-330-Sheet 1, P&I Diagram Emergency Cooling System, Revision 37

WOs

4178370373

Clearances

17-3-23-0004	17-3-23-0001	17-3-23-0003
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Miscellaneous

Paragon Software 1.3

PB Protected Equipment Sheet, dated January 23, 2017

PB Protected Equipment Sheet, dated February 21, 2017

1R15: Operability Determinations and Functionality AssessmentsProcedures

AO 53.2-0, Equipment Checks After a Thunderstorm or High Wind Event, Revision 8

OP-AA-108-111-1001, Severe Weather and Natural Disaster Guidelines, Revision 15

OP-PB-108-111-1001, Preparation for Severe Weather, Revision 16

RT-O-100-591-2, Attachment 9, Flex Building Equipment Cabinet #3, Revision 3

SE-11, Attachment B, Responding to a Diesel Generator Trip or Failure to Start, Revision 4

IRs

3961028 3961479 3961487 3985223

3986093 3972336 3975210

WOs

04612581

Drawings

M-360, Sheet 1, P&I Diagram, RCIC Pump Turbine Details, Revision 56

Miscellaneous

BROCO, Tactical Cutting Torch Kits Operating Instructions Manual, dated June 2011

DSS-ISG-2016-01, Clarification of Licensee Actions in Receipt of Enforcement Discretion per Enforcement Guidance Memorandum EGM 15-002, "Enforcement Discretion for Tornado-generated Missile Protection Noncompliance," dated February 2016

Memorandum to Daniel H. Dorman, Regional Administrator, Region 1, from Patricia K. Holahan, Director Office of Enforcement, dated June 10, 2015

Memorandum to Daniel H. Dorman, Regional Administrator, Region 1, from Patricia K. Holahan, Director Office of Enforcement dated February 7, 2017

Reactor Plant Event Notification Worksheet, EN# 52478

Tornado Missile Protection Project Status and Path Forward, dated January 2017

Section 1R19: Post-Maintenance TestingProcedures

CC-AA-204, Vendor Technical Manual Revision Notice, Revision 10

ST-M-013-600-2, RCIC Filled and Vented Verification, Revision 1

ST-O-010-301-3, 'A' RHR LOOP Pump, Valve, Flow, and Unit Cooler Functional and Inservice Test, Revision 43

ST-O-013-301-3, RCIC Pump, Valve, Flow and Unit Cooler Functional and In-Service Test, Revision 48

ST-O-013-350-3, RCIC Valve Alignment and Filled and Vented Verification, Revision 5

ST-O-023-301-2, HPCI Pump, Valve, Flow, and Unit Cooler Functional and In-Service Test, Revision 73

WC-AA-101-1004, Revision 7, Attachment 2

IRs

3965628 3966164 3966165 3966209

3966229 3979767 3983280

WOs

04252661

04580060

Miscellaneous

Drawing 6280-M-365, HPCI System Flow Diagram, Revision 63

Teledyne Test Services, Valve Number: PCV-3-23-050, dated January 25, 2017

Section 1R22: Surveillance TestingProcedures

CY-PB-110-427, Main Stack Gaseous Sampling with a Marinelli, Revision 1

SI2M-60F-RT7-B4M2, Response Time Test of Main Steam Isolation Valve Closure SCRAM –
Channel B, Revision 8

SO 54.7.E, 4 kV Diesel Generator Auto Start and Loading, Revision 5

ST-C-095-857-2, Main Stack and Roof Vents Total Iodine and Particulate Release Rates,
Revision 14

ST-I-010-100-3, RHR LOOP 'A' LSFT, Revision 22

ST-O-052-154-3, E-4 D/G Simulated Unit 3 Emergency Core Cooling System Signal Auto Start
with Offsite Power Available, Revision 11IRs

1636300

2666345

3977866

3977875

MiscellaneousCALC PM-1048, Design Basis for Internal Flood Protection for the HPSW/ESW Pump Structure,
Revision 1Crane Pumps & Systems Figure 7360, Demersible Sewage & Drainage Pumps, dated
July 2007**Section 1EP2: Alert and Notification System Evaluation**IRs

2484090

2484094

2489293

2514618

2523431

2523434

2536640

2542718

2552325

2556090

2567243

2570378

2598429

2629220

2632364

2635553

2637056

2652391

2658010

2674422

2684538

2700148

2705588

2706828

2726250

2736574

3944859

3977959

3980274

Miscellaneous

Design Report, PB Public Alert and Notification System, Revision 0

Full Sounding Test Report, dated 6/1/2016

Letter from FEMA, Region III, to PEMA, Subject: PB Public ANS System Final Report,
dated 8/8/2013

Quarterly Growl Test Report, dated 4/1/2015

Weekly Silent Test Reports, dated 4/22/2015, 9/16/2015, and 9/22/2015

Procedures

- EP-AA-1000, Exelon Nuclear Standardized Radiological EP, Revision 28
- EP-AA-1007, Radiological Emergency Plan Annex for PBAPS, Revision 32
- EP-MA-121-1002, Exelon East Alert Notification System (ANS) Program, Revision 13
- EP-MA-121-1003, Exelon East ANS Siren Monitoring, Troubleshooting, and Testing ANS Systems, Revision 7
- EP-MA-121-1004, Exelon East ANS Maintenance Program, Revision 10

Section 1EP3: Emergency Response Organization Staffing and Augmentation System

IRs

2432704	2480598	2488834	2488836	2488841	2489095
2504502	2515158	2662304	2662352	2662358	2662363
2662368	2662373	2662388	2684102	2684103	2684109
2691813	2704839	2726276	2742549	2662355	2632361

Drill Reports

- ERO Augmentation Drill Memo, 2/17/15, 1st Quarter Unannounced Call in Drill, dated 3/4/2015
- ERO Augmentation Drill Memo, 5/12/15, 2nd Quarter Unannounced Call in/Drive in Drill, dated 5/29/2015
- ERO Augmentation Drill Memo, 8/18/15, 3rd Quarter Unannounced Call in Drill, dated 8/26/2015
- ERO Augmentation Drill Memo, 11/22/15, 4th Quarter Unannounced Call in Drill, dated 12/9/2015
- ERO Augmentation Drill Memo, 2/25/16, 1st Quarter Unannounced Call in Drill, dated 3/3/2016
- ERO Augmentation Drill Memo, 5/23/16, 2nd Quarter Unannounced Call in Drill, dated 5/27/2016
- ERO Augmentation Drill Memo, 8/10/16, 3rd Quarter Unannounced Call in Drill, dated 8/10/2016
- ERO Augmentation Drill Memo, 11/17/16, 4th Quarter Unannounced Call in Drill, dated 12/5/2016
- ERO Augmentation Drill Memo, 2/21/17, 1st Quarter Unannounced Call in Drill, dated 2/28/2017

Miscellaneous

- RT-E-101-910-2, Review of Emergency Preparedness Contact Information, performed 8/2/2016
- ERO Roster, dated 3/23/2017
- ERO On-shift Rosters for 1/16/2017, 3/25/2017, and 3/27/2017
- ERO Qualification Status Database, dated 3/28/2017

Procedures

- EP-AA-1000, Exelon Nuclear Standardized Radiological EP, Revision 28
- EP-AA-1007, Radiological EP Annex for PBAPS, Revision 32
- EP-AA-1102, ERO Fundamentals, Revision 11
- EP-AA-112-100-F-06, ERO Notification or Augmentation, Revision V
- EP-AA-120-F-02, EP Staff Initial Developmental Checklist, Revision H
- OP-PB-112-101-1016, Minimum Shift Staffing, Revision 6
- TQ-AA-113, ERO Training and Qualification, Revision 30

Section 1EP5: Maintenance of Emergency Preparedness**Audits & Self Assessments**

AR 2573794, NRC Emergency Preparedness Graded Exercise Review, dated 1/8/2016
 AR 2726800, NRC EP Program Inspection, Check-in Self-Assessment, dated 1/27/2017
 NOSA-PEA-15-03 (AR 2466679), EP Audit Report, dated 4/29/2015
 NOSA-PEA-16-03 (AR 2635212), EP Audit Report, dated 4/20/2016

IRs

2202207	2467618	2504499	2573794	2586854	2591663
2602198	2602208	2635212	2655360	2681372	2683983
2702908	2716517	2717364			

Drill Reports

Evaluation Report, PB 2016 Environmental Phase Radiological Monitoring Drill, dated 9/13/2016
 Evaluation Report, 2016 Medical Drill, dated 5/26/2016
 Evaluation Report, PB June 2016 Station PI Drills Results
 Evaluation Report, June 10, 2016, PB Site Assembly & Accountability Drill Results, dated June 2016
 Evaluation Report, PB September 2016 Station PI Drills Results

Procedures

EP-AA-120, EP Administration, Revision 20
 EP-AA-122, Drills and Exercise Program, Revision 18
 EP-AA-124, Inventories and Surveillances, Revision 10
 EP-AA-121, Emergency Response Facilities and Equipment Readiness, Revision 15
 EP-AA-122-100, Drills and Exercise Planning and Scheduling, Revision 6
 EP-AA-1000, Exelon Nuclear Standardized Radiological EP, Revision 28
 EP-AA-1007, Radiological Emergency Plan Annex for PB, Revision 32
 EP-MA-124-1001, Facilities Inventories and Equipment Tests, Revision 11

Miscellaneous

1481380-08, OPEX Evaluation for NRC IN 2013-01: Emergency Action Level Thresholds Outside the Range of Radiation Monitors, dated 4/11/2013
 DS-FP, Instrument Data Sheet 2077, Instrument RY-2979, Revision 0
 Instrument Calibration Sheet, Unit 2, RY-2979B, Vent Stack Rad Mon Microprocessor B, dated 3/25/2015
 KLD TR-731, PBAPS 2014 Population Update Analysis, dated 12/11/2014
 KLD TR-798, PBAPS 2015 Population Update Analysis, dated 11/10/2015
 KLD TR-853, PBAPS 2016 Population Update Analysis, dated 9/10/2016
 SI2R-63E-2979-B1CE, Vent Stack Rad Monitor RY-2979B Electronic Calibration Check, performed 9/14/2016

Surveillances

EP-AA-124-F-02, Alternative Facility/Liaison Kit Inventory, performed 6/19/2015 and 12/8/2016
 EP-MA-124-1001-F-01, Control Room/Simulator Inventory, performed 7/1/2015, 4/17/2015, and 4/15/2016
 EP-MA-124-1001-F-02, TSC/OSC Equipment Test – Software and Reference Document Inventory, performed 4/27/2015, 8/18/2015, and 5/2/2016
 EP-MA-124-1001-F-03, Technical Support Center Inventory, performed 6/27/2016
 EP-MA-124-1001-F-09, Limerick/PB Hospital Inventory, performed 5/8/2015
 EP-MA-124-1001-F-14, Monthly/Yearly NARS Communications Test, performed 7/1/2015 and 8/21/2015
 RT-E-101-911-2, Radiation Protection Emergency Kit Inventory, performed 5/19/2015

Section 2RS1: Radiological Hazard Assessment and Exposure ControlProcedures

RE-35-2, PB 2 TIP System Operation, Revision 16
 RP-AA-210-1004, Shallow Dose Equivalent Program Review, Revision 0
 RP-AA-300, Radiological Survey Program, Revision 14
 RP-AA-300-1002, Electron Capture Isotope Control, Revision 6
 RP-AA-301, Radiological Air Sampling Program, Revision 10
 RP-AA-302, Determination of Alpha Level and Monitoring, Revision 8
 RP-AA-350, Personnel Contamination Monitoring, Decontamination and Reporting, Revision 18
 RP-AA-350-1002, Managing Large Scale Contamination Events, Revision 0
 RP-AA-376, Radiological Postings, Labeling and Markings, Revision 8
 RP-AA-376-1001, Radiological Postings, Labeling and Marking Standard, Revision 14
 RP-AA-460, Controls for High and LHRAs, Revision 29
 RP-AA-460-001, Controls for VHR Areas, Revision 6
 RP-AA-503, Unconditional Release Survey Method, Revision 14
 RP-AA-503-F-01, Unconditional Release Instructions Using the Small Articles Monitor (SAM) for Personal Items Used in the RCA and in a Contaminated Area, Revision 4
 RP-AA-800, Control, Inventory, and Leak Testing of Radioactive Sources, Revision 7
 RP-AB-460, TIP Area Access Radiological Controls, Revision 3
 RP-PB-300-1004, Use of RP Response Cards, Revision 2
 SF-421, Radiation Protection Requirements for Spent Fuel Casks TN-68-01 through TN-68-44 and TN-68-48 through TN-68-92 Loading and Transport Operations, Revision 8

IRs

02738722	03971322	03975793	03978201
03984414	03988779	03988785	03988973

Miscellaneous

NSTS Confirmatory Form 2017 Annual Inventory Reconciliation for DPR-44, January 13, 2017
 PB A Cabinet Inventory List for LHRA Keys, March 23, 2017
 PB Multiple Air Sample Sheet for RWP 313 – Decon Bullpen Air Sample, February 15, 2017
 PB Multiple Air Sample Sheet for RWP 334 – ‘3A’ Fuel Pool HX BZA, February 23, 2017
 PB Multiple Air Sample Sheet for RWP 334 – ‘3B’ Fuel Pool HX BZA, March 6, 2017
 PB Survey # 16-01189, Map # T3-26-27, West Condenser Pit, October 16, 2016
 PB Survey # 16-067, Map # RSB-5, LLRW DAW Storage Area, March 10, 2017
 PB Survey # 16-10264, Map # TB-97, Turbine Hall General Area, November 17, 2016
 PB Survey # 17-1303, Map # T3-38-40, East Condenser Platform, January 7, 2017
 PB Survey # 17-1870, Map # R3-43, B Non Regen HTX, January 19, 2017
 PB Survey # 17-2991, Map # OUT-13.20, SE Quadrant, March 21, 2017

PEA-16-005, 2016 PB Unit 2 Alpha Assessment, March 16, 2017
RP-AA-210-1001 Attachment 13 Multiple Dosimetry EDE Evaluation Sheet, RX 2 RWP 926
Equipment Pit Diving to Remove Instruments from Steam Dryer, October 2016
RP AA 460 Attachment 10 LHRA Key Log, March 23, 2017
RP-AA-460 Attachment 5 - HRA and LHRA Briefing Form, March 22, 2017
RP-AA-700-1237 Attachment 1 - Contamination Monitor Test Results, November 30, 2016
RWP PB-C-17-00205, Dry Cask Activities with Added Controls, January 1, 2017
ST-H-071-806-2 ISFSI Cask TN-68-80 through TN-68-92 Surface Dose Rate and
Contamination, March 24, 2017
ST-H-099-820-2, Radioactive Source Accountability & Leak Test, March 8, 2017
ST-H-099-820-2, Radioactive Source Accountability & Leak Test, September 21, 2016

Section 2RS3: In-Plant Airborne Radioactivity Control and Mitigation

Procedures

RP-AA-233, Quality Control Operations for Canberra Whole Body Counter Using APEX In-Vivo,
Revision 0
RP-AA-440, Respiratory Protection Program, Revision 13
RP-AA-825-1014, Operation and Operation of the 3M Versaflo TR-300 PAPR System,
Revision 3
RP-AA-870-1001, Set-Up and Operation of Portable Air Filtration Equipment, Revision 6
RP-AA-870-1002, Use of Vacuum Cleaners in Radiological Controlled Areas, Revision 7
RP-AA-870-1003, Testing Portable HEPA Filter Units, Revision 4
RP-PB-825-1011, Inspection and Use of the Mururoa V4 MTH2 and V4 F1 R Air Supplied Suits,
Revision 5

IRs

03978295 03987574 03988490

Self-assessment and QA Audit Reports

Exelon Check-in Self-assessment, Respiratory Protection Program, February 12, 2017

Miscellaneous

MSA G1 SCBA Inspection Log, March 28, 2017
MSA G1 Spare Cylinder Inspection Log, March 28, 2017
RT-H-099-990-2, One Hour SCBA Pack Inspection and Functional Test, March 28, 2017
TRI Air Testing Laboratory Report Compressed Air/Gas Quality Testing No. 292304-0
Admin Hot Shop Compressor, December 20, 2016
TRI Air Testing Laboratory Report Compressed Air/Gas Quality Testing No. 292303-0 PB 3
Reactor Building 195' Elevation Air Compressor, December 20, 2016
TRI Air Testing Laboratory Report Compressed Air/Gas Quality Testing No. 292301-0 PB 2
Reactor Building 195' Elevation Air Compressor, December 20, 2016
TRI Air Testing Laboratory Report Compressed Air/Gas Quality Testing No. 292300-0 PB 2 116'
Elevation Turbine Building 4/3 Back-up Air Compressor, December 20, 2016

Section 40A1: Performance Indicator Verification

EP-AA-125-1001, EP PI Guidance, Revision 9
 EP-AA-125-1002, ERO Performance – PI Guidance, Revision 12
 EP-AA-125-1003, ERO Readiness – PI Guidance, Revision 11
 EP-AA-125-1004, ERF & Equipment, Revision 10
 LS-AA-2001, Collecting and Reporting of NRC PI Data, Revision 14
 LS-AA-2030, Monthly Data Elements for NRC Unplanned Power Changes per 7000 Critical Hours, Revision 5

IRs

2602201
 3952969
 3991078

Miscellaneous

Data Sheets for PI Data
 NEI 99-02, Unplanned Power Changes per 7,000 Critical Hours, Revision 7

Section 40A2: Problem Identification and Resolution

Procedures

AO 29.2, Discharge Canal to Intake Pond Cross-tie gate Operation Frazil Ice mitigation and Icing Condition Operations, Revision 24
 HU-AA-101, Human Performance Tools and Verification Practices, Revision 9
 OP-AA-300-1001, BWR Control Rod Movement Requirements, Revision 9
 PI-AA-120, Issue Identification and Screening Process, Revision 6
 PI-AA-125, CAP, Revision 4
 PI-AA-125-1001, Root Cause Evaluation Manual, Revision 2
 WC-AA-120, PM database Revision Requirements

IRs

00195915	00307815	02588736	02614867	02614949
02618015	02646772	02697010	02697643	03977190*
03977250*	03977546*	03977566*	03977745*	

Drawings

6280-C-66, Screen Structure Requirement Drawing, Revision 12
 6280-C84, CW Pump Structure Arrangement Drawing, Revision 7
 6280-C-85, CW Pump Structure Plan, EL 112'-00" and 116'-0"-U2, Revision 21
 6280-C-100, CW Screen Structure Bottom Plan, Revision 7
 6280-C-101, CW Screen Structure Top Slab Plan, Revision 11
 6280-C-102, CW structure Sections, Revision 9
 6280-C-103, CW structure Details, Revision 9
 6280-C-115, CW Screen Structure Bar Rack Plans and Details, Revision 9
 6280-M-330, P&I Diagram, Emergency Cooling System, Sheet 1, Revision 37
 6280-M-11-29, 18 FXH Pump Assembly (Phil. Elec. Co.) HPSW Pump, Sheet 1, Revision 10

Evaluations

ACE CR293187, Load Reduction Due to Ice Buildup on Outer Screens, dated 1/26/05
 ACE CR2614867, Lowering of Intake Canal Water Level, dated 3/5/16
 A1791853, Evaluate New Coating on Trash Racks, dated 1/31/11
 CR293187, Assignment 12, Determine the Minimum Number of Clean Trash Racks
 Needed to Allow the Flow of Intake W/in-service Along with Cross-tie gate Being Open
 or Closed, dated 5/6/05
 EWR A0004660, Silt Level Effects on the Circulating water and Intake Bay Components,
 dated 11/12/90

WOs

A2054553	C0256046	R0795971	R0807585	R1018176
R1106365	R1187171	R1219764	R1240628	R1272893
R1303419	R1311509	R1326953		

PM

C0201847	0386648	0371756
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Completed Surveillance

RT-M-033-675-2, Unit 2 Pump Intake Structure Inspection and Cleaning, Revision 5, performed
 10/29/16
 RT-M-033-675-3, Unit 3 Pump Intake Structure Inspection and Cleaning, Revision 3, performed
 9/28/09
 RT-M-033-675-3, Unit 3 Pump Intake Structure Inspection and Cleaning, Revision 5, performed
 10/5/13
 RT-M-033-675-3, Unit 3 Pump Intake Structure Inspection and Cleaning, Revision 5, performed
 9/27/15

Miscellaneous

A1034606, PB Review of NRC Information Notice 96-36, Degradation of Cooling Water
 Systems Due to Icing, dated 8/29/96
 CRREL 83-15, US Army Corps of Engineers, Cold Regions Research & Engineering
 Laboratory, Lake Water Intakes Under Icing Conditions, dated 5/83
 CRREL 91-1, US Army Corps of Engineers, Cold Regions Research & Engineering Laboratory,
 Frazil Ice Blockage of Intake Trash Racks, dated 3/91
 NRC Information Notice 2006-17, Recent Operating Experience of SW Systems Due to
 External Conditions, dated 7/31/06
 NRC Information Notice 96-36, Degradation of Cooling Water Systems due to Icing,
 dated 6/12/96

Section 40A5: Other Activities

Procedures

PLOT-5051, Substations, Revision 14
 PLORT-1201A, Seasonal Readiness, Revision 0
 SO 53.7.S, Response to a 13 kV Startup Bus Computer Alarm or Observed Voltage Outside its
 Range on Panel 00C024

IRs

3980211	3980101	1325376
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Miscellaneous

Check in self-assessment, Pre-NRC inspection of Open Phase Condition Comp
 Measures, Dated December 16, 2016

LIST OF ACRONYMS

ACE	apparent cause evaluation
ANS	alert and notification system
CAs	corrective actions
CAP	corrective action program
CFR	<i>Code of Federal Regulations</i>
CR	condition report
CS	core spray
EDG	emergency diesel generator
EP	emergency preparedness
ERF	Emergency Response Facility
ERO	Emergency Response Organization
ESW	emergency service water
HPCI	high-pressure coolant injection
HPSW	high-pressure service water
HRA	high radiation area
HX	heat exchanger
IMC	inspection manual chapter
IR	issue report
JPM	job performance measure
LHRA	locked high radiation area
LSFT	logic system functional test
MR	Maintenance Rule
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OD	operability determination
OOS	out of service
PARS	publicly available records
PB	Peach Bottom Atomic Power Station
PD	performance deficiency
PI	performance indicator
PM	preventive maintenance
PMTs	post-maintenance testing
RBCCW	reactor building closed-cooling water
RCIC	reactor core isolation cooling
RCS	reactor coolant system
RG	regulatory guide
RHR	residual heat removal
RP	radiation protection
RPS	reactor protection system
RTP	rated thermal power
RWP	radiation work permit
SCBA	self-contained breathing apparatus
SDP	significance determination process
SOW	system outage window
SSCs	structures, systems, and components
ST	surveillance test
TS	technical specification
UFSAR	Updated Final Safety Analysis Report
VHRA	very high safety analysis report
WOs	work orders