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

August 8, 2016

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

SUBJECT: PEACH BOTTOM ATOMIC POWER STATION – INTEGRATED INSPECTION REPORT 05000277/2016002 AND 05000278/2016002

Dear Mr. Hanson:

On June 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Peach Bottom Atomic Power Station (PB), Unit 2 and Unit 3. The enclosed inspection report documents the inspection results, which were discussed on July 15, 2016, with Mr. Michael Massaro, Peach Bottom Site Vice President, and other members of your staff.

The NRC inspectors examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

The inspectors documented three findings of very low safety significance (Green) in this report. Two of the findings involved violations of NRC requirements. The NRC is treating these violations as noncited violations (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the NCVs in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Peach Bottom. In addition, if you disagree with the cross-cutting aspect assigned to any finding, or a finding not associated with a regulatory requirement 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 Regional Administrator, Region I, and the NRC Resident Inspector at Peach Bottom.

In accordance with Title 10 of the *Code of Federal Regulations* (CFR) 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any), will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC's website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

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 05000277/2016002
and 05000278/2016002
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

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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.	05000277/2016002 and 05000278/2016002
Licensee:	Exelon Generation Company, LLC
Facility:	Peach Bottom Atomic Power Station, Units 2 and 3
Location:	Delta, Pennsylvania
Dates:	April 1, 2016 through June 30, 2016
Inspectors:	J. Heinly, Senior Resident Inspector B. Smith, Resident Inspector P. Boguszewski, Reactor Engineer C. Graves, Health Physicist J. Kulp, Senior Reactor Inspector M. Modes, Senior Reactor Inspector J. Patel, Reactor Inspector
Approved By:	Daniel L. Schroeder, Chief Reactor Projects Branch 4 Division of Reactor Projects

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SUMMARY

Inspection Report 05000277/2016002, 05000278/2016002; 04/01/2016 – 06/30/2016; Peach Bottom Atomic Power Station (PB), Unit 2 and Unit 3; Follow-Up of Events and Notices of Enforcement Discretion, Maintenance Risk Assessments and Emergent Work Control, and Problem Identification and Resolution.

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. The inspectors identified two non-cited violations (NCVs) and one finding, which were of very low safety significance (Green). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)," dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Aspects Within Cross-Cutting Areas," dated December 19, 2013. All violations of the Nuclear Regulatory Commission (NRC) requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated July 9, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

Cornerstone: Initiating Events

- Green. A self-revealing finding of very low safety significance (Green) was identified for the failure of Exelon operators to use human performance error reduction tools during equipment manipulation in accordance with HU-AA-101, "Human Performance Tools and Verification Practices." Specifically, on March 28, 2016, an equipment operator failed to use self-check (STAR) while removing a circuit breaker from service and incorrectly tripped the E-124 480 volt supply breaker which required a rapid manual power reduction to 80 percent rated thermal power (RTP) due to lowering main condenser vacuum and a partial loss of feedwater heating. Exelon entered the issue into their corrective action program (CAP) under issue report (IR) 2646772 and performed a root cause which identified corrective actions to address the adverse human performance behaviors at the station.

  The finding was more than minor because it was associated with the human performance attribute of the Initiating Events cornerstone and affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown, as well as power operations. Specifically, an equipment operator failed to adequately use human performance error reduction tools and opened an incorrect breaker which required a rapid downpower. The inspectors evaluated the finding in accordance with Exhibit 1 of IMC 0609, Appendix A, "The SDP for Findings At-Power," dated June 19, 2012, and determined the finding was of very low safety significance (Green) because it did not result in a reactor trip and the loss of mitigation equipment relied upon for transition to a stable shutdown condition.

  This finding was determined to have a cross-cutting aspect in the area of Human Performance, Field Presence, because Exelon did not ensure that deviations from standards and expectations, which were identified by leaders, were corrected promptly. Specifically, Exelon identified that adverse human performance behaviors existed with certain equipment operators, however, those observations were not appropriately input into their performance management system, such that the behaviors could be addressed. Thus, these adverse behaviors were a primary contributor to this human performance error. [H.2] (Section 4OA3)

Cornerstone: Mitigating Systems

- Green. The NRC identified a very low safety significance (Green) NCV of Technical Specification (TS) 5.4.1 for Exelon's failure to adequately implement procedure requirements governing the storage of material in a safety-related structure. Specifically, on April 26, 2016, Exelon technicians stored ladders vertically without them being adequately tied off to prevent the ladders from falling over in accordance with MA-AA-716-026, "Station Housekeeping / Material Condition Program." The inspectors identified that the ladders were stored in the PB Unit 2 reactor building (RB), such that they could fall over and impact safety-related equipment. The inspectors promptly notified Exelon, the ladders were immediately removed, and the condition was documented under IR 2661309.

  This finding was more than minor because it was associated with the protection against external factors attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the reliability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the finding using IMC 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The SDP for Findings At-Power," Exhibit 2. The inspectors determined this finding to be of very low safety significance (Green) because the degraded condition was not a design deficiency that affected system operability; did not represent an actual loss of function of a system; did not represent an actual loss of function of a single train or two separate trains for greater than its TS allowed outage time; and did not represent an actual loss of function of one or more non-TS trains of equipment designated as high safety significant. The finding was determined to have a cross-cutting aspect in the area of Human Performance, Procedure Adherence, because Exelon technicians did not store ladders in safety-related buildings in accordance with station procedures, such that they could not fall over and damage safety-related equipment. [H.8] (Section 1R13)

- Green. The inspectors identified an NCV of very low safety significance (Green) of PB Unit 2 and Unit 3 Facility Operating License condition 2.C.(4) for failure to implement and maintain in effect all provisions of the approved fire protection program. Exelon did not correct a condition adverse to the fire protection program alternative shutdown capability in a timely manner. Specifically, Exelon did not establish testing requirements for transfer/isolation switches since the identification of the issue on February 6, 2014, and the due date to complete this action was extended to February 24, 2018. As a result, Exelon has delayed assurance that the components credited for alternative shutdown capability would perform their fire protection design basis function. Exelon entered this issue into their CAP as IR 02669323.

  This performance deficiency (PD) was more than minor because it was associated with the protection against external factors (fire) attribute of the Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, by failing to correct the condition, Exelon has not ensured that the control circuit for the safe shutdown components would be isolated from the effects of fire damage. The inspectors determined that the finding was of very low safety significance (Green) based on IMC 0609, Appendix F, "Fire Protection SDP," task number 1.3.1, because Exelon had demonstrated reasonable expectation of functionality for these switches by having comparable switches in the test program and periodically testing those switches. The test results did not indicate any kind of significant failures of these switches.

This finding was determined to have a cross-cutting aspect in the area of Human Performance, Resources, in that, Exelon extended the due date to complete the corrective action to support the completion of higher priority items, indicating lack of resources. [H.1] (Section 4OA2.2)

Other Findings

None.

REPORT DETAILS

Summary of Plant Status

Unit 2 began the inspection period at 100 percent RTP. On April 28, 2016, operators reduced power to 54 percent RTP to support maximum extended load line limit analysis plus (MELLLA+) acceptance testing and summer readiness maintenance. The unit was returned to full power on May 1, 2016. On May 27, 2016, the '2C' reactor feed pump was tripped due to erratic operation, and the unit ran back to 53 percent RTP. The unit was returned to full power on May 30, 2016. On June 16, 2016, operators reduced power to 5 percent RTP to support an emergent repair on the '2K' safety relief valve (SRV). The unit was returned to full power on June 18, 2016, and 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.

Unit 3 began the inspection period at 100 percent RTP. Operators reduced power to 72 percent RTP on May 6, 2016, to support MELLLA+ acceptance testing and a rod pattern adjustment. Unit 3 returned to 100 percent power on May 8, 2016. Operators reduced power to 58.5 percent RTP on May 26, 2016, for summer readiness maintenance on the main condenser and was returned to 100 percent RTP on May 27, 2016. 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 – 2 samples)

.1 Summer Readiness of Offsite and Alternate Alternating Current (AC) Power Systems

a. Inspection Scope

The inspectors performed a review of plant features and procedures for the operation and continued availability of the offsite and alternate AC power system to evaluate readiness of the systems prior to seasonal high grid loading. The inspectors reviewed Exelon's procedures affecting these areas and the communications protocols between Exelon Generation and COMED/PECO transmission operators. This review focused on changes to the established program and material condition of the offsite and alternate AC power equipment. The inspectors assessed whether Exelon established and implemented appropriate procedures and protocols to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system. The inspectors evaluated the material condition of the associated equipment by interviewing the responsible system engineer, reviewing IRs and open work orders (WOs), and walking down portions of the offsite and AC power systems. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

No findings were identified.

.2 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors reviewed Exelon's readiness for the onset of seasonal high temperatures. The review focused on the emergency diesel generators (EDGs) and the circulating water pump house ventilation. The inspectors reviewed the updated final safety analysis report (UFSAR), TS, control room logs, and the CAP to determine what temperatures or other seasonal weather could challenge these systems, and to ensure Exelon personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including Exelon'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 hot weather conditions.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04Q – 2 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 2 and Unit 3 E-1, E-3, and E-4 EDG partial walkdowns during E-2 EDG overhaul on April 26, 2016
- Unit 3 reactor core isolation cooling (RCIC) during high-pressure coolant injection (HPCI) inservice testing on June 21, 2016

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, WOs, 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.

.2 Full System Walkdown (71111.04S – 1 sample)

a. Inspection Scope

During the week of May 16, 2016, the inspectors performed a complete system walkdown of accessible portions of the Unit 2 and Unit 3 emergency service water (ESW) system to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests (STs), drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hanger and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the system to verify as-built system configuration matched plant documentation, and that system components and support equipment remained operable. The inspectors confirmed that systems and components were aligned correctly, free from interference from temporary services or isolation boundaries, environmentally qualified, and protected from external threats. The inspectors also examined the material condition of the components for degradation and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related IRs and WOs to ensure Exelon appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05Q – 5 samples)

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 out-of-service, degraded or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Unit 2 and Unit 3 emergency cooling tower basin on April 5, 2016
- Unit 3 HPCI room on April 20, 2016
- Unit 2 and Unit 3 main control room (MCR) on April 25, 2016
- Unit 2 refueling floor on June 28, 2016
- Unit 3 ‘A’ and ‘C’ core spray (CS) rooms on June 28, 2016

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to identify internal flooding susceptibilities for the site. The inspectors review focused on the circulating water pump structure on May 5, 2016. The inspectors verified the adequacy of equipment seals located below the flood line, floor and water penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, control circuits, and temporary or removable flood barriers. It assessed the adequacy of operator actions that Exelon had identified as necessary to cope with flooding in this area and also reviewed the CAP to determine if Exelon was identifying and correcting problems associated with both flood mitigation features and site procedures for responding to flooding.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07 – 3 samples)

Triennial Samples: Review of Normal Heat Sink, Containment Spray Pump Oil Cooler, and High Pressure Service Water (HPSW) Pump Oil Cooler

a. Inspection Scope

The inspectors reviewed Exelon's 2012 application to remove the normal heat sink temperature averaging requirement from the PB TS. The averaging of temperature, over time, was intended to give the facility time to respond to rising normal heat sink temperatures. The inspectors noted the maximum temperature of the normal heat sink was established, at that time, to be 92°F and subsequently used as the basis for the extended power uprate (EPU) application. The inspectors noted a number of critical heat exchangers (HXs) were modified during the uprate process; for example, by changing to more corrosion resistant tube materials. The inspectors verified the location of the six normal heat sink temperature measuring locations, three for each unit, and reviewed historical data taken from these locations. The inspectors compared this data to determine if the average of the temperatures, used to establish normal heat sink temperature, were representative of the normal heat sink bulk temperature. The inspectors reviewed the application's evaluation of the effect 92°F had on important HXs. The inspectors used this evaluation as the basis to choose the HPSW pump motor coolers and the CS motor oil coolers for focused review.

For each cooler (HX) the inspectors:

- Determined if the test methodology, used to obtain the HX efficiency, was consistent with accepted industry practices
- Ascertained that during HX testing that conditions were consistent with the selected methodology
- Evaluated the test acceptance criteria compared with the design basis values
- Evaluated differences between testing conditions and design conditions to determine they did not negatively affect the results

- Verified the frequency of testing to determine if it was sufficient to detect degradation prior to unacceptable loss of heat removal capabilities and the testing accommodated test instrument inaccuracies
- Determined if tube and shell side heat loads were equal or if adequate information was available in test results to calculate these two values
- Verified that methods used to inspect and clean HXs were consistent with expected industry standards and have established acceptance criteria
- Evaluated if as-found results were recorded, evaluated, and appropriately dispositioned in order to make sure the as-left condition was acceptable
- Verified whether the number of plugged tubes were within pre-established limits, based on heat transfer capacity and design heat transfer assumptions, and whether the number of plugged tubes was appropriately accounted for in HX performance calculations
- Reviewed available eddy current test reports and visual inspection records to determine the structural integrity of the HX

The inspectors also reviewed Exelon's implementation of a license renewal commitment involving HX inspection activities. In the original application for a renewed license, Exelon credited HX inspection activities for providing aging management for the HPCI gland seal condenser and the HPCI and RCIC lube oil coolers. The application stated that inspection activities consist of periodic component visual inspections and cleaning of HXs and coolers that are outside the scope of NRC Generic Letter 89-13. The inspectors reviewed preventative maintenance record A1489749 showing the inspection of HPCI gland seal condenser #23-2 at Unit 2 and A1316956 for condenser #23-2 at Unit 3.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11Q – 2 samples)

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed a licensed operator simulator training scenario on June 6, 2016, which included several plant equipment failures that resulted in a manual SCRAM and anticipated transient without scram (ATWS). 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 MCR

a. Inspection Scope

The inspectors observed and reviewed the licensed operator performance from the MCR during the reactivity evolutions listed below. 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.

- Unit 2 troubleshooting of the digital feedwater control computer on April 8-9, 2016
- Unit 2 downpower for rod pattern adjustment and planned maintenance activities on April 29, 2016

The inspectors observed control room briefings and power changes. Additionally, the inspectors observed power ascension 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.

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 corrective actions 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 13 kV distribution system a(1) action plan on May 23, 2016
- Unit 2 and Unit 3 MCR ventilation and chiller system on June 29 - 30, 2016

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 4 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 during Unit 2 MO-2-2-2486 ESW valve maintenance on April 19, 2016
- Elevated risk during Unit 2 'B' HPSW planned maintenance on April 21, 2016
- Elevated risk during Unit 2 E-2 EDG overhaul on April 25, 2016
- Elevated risk during Unit 2 'K' SRV solenoid coil low resistance readings on June 6, 2016

b. Findings

Introduction. The NRC identified a very low safety significance (Green) NCV of TS 5.4.1 for Exelon's failure to implement procedure requirements governing storage of material in a safety-related structure. Specifically, on April 26, 2016, Exelon technicians stored ladders vertically without being adequately tied off to prevent the ladders from falling over in accordance with MA-AA-716-026, "Station Housekeeping / Material Condition Program." The inspectors identified that the ladders were stored in the PB Unit 2 RB, such that they could fall over and impact safety-related equipment.

Description. On April 26, 2016, the inspectors were performing a walkdown of the E-324-RB motor control center (MCC) in the Unit 2 RB to ensure it was adequately protected for the current E-2 diesel generator system outage window. The inspectors identified that Exelon technicians had stored high reach ladders (12 foot high) in the vertical position without proper restraint in close proximity to the safety-related E-324-RB MCC and a rack of safety-related pressure transmitters. The inspectors promptly notified Exelon and the ladders were immediately removed and the condition was documented under IR 2661309.

Exelon controls the storage of materials in safety-related buildings through MA-AA-716-026, "Station Housekeeping / Material Condition Program." Step 4.4.1.6 of the procedure requires that *". . . . ladders temporarily left in the plant, are secured/stored as follows: . . . if ladder is to remain erected in place, then TIE-OFF ladder at the base and near the top to assure ladder cannot fall over and cause injury or damage."* However, Exelon technicians had stored a rack of seven ladders in the upright position without being tied off, such that they could possibly fall over. The inspectors identified that the ladders, if they fell over would not likely damage the E-324 MCC, but had the potential to impact a rack of safety-related pressure transmitters which were within striking distance of the ladders.

The most risk significant function that would have been impacted was the CS/residual heat removal (RHR) valve opening permissive. This pressure transmitter senses reactor pressure and provides an input to open CS/RHR valves after the reactor coolant system (RCS) has been depressurized below 425 psi. The falling ladders impact on the pressure transmitter could have resulted in the pressure transmitter failing high which would prevent the actuation of one channel of the CS/RHR valve permissive logic function and reduce the reliability of the safety function.

Analysis. The inspectors determined that Exelon's failure to store ladders in the Unit 2 RB in accordance with MA-AA-716-026, "Station Housekeeping / Material Condition Program," was a PD which was within Exelon's ability to foresee and prevent, and should have been corrected. Specifically, Exelon stored ladders in the upright position without being secured, and they had the potential to fall over and damage safety-related pressure transmitters, and potentially prevent one channel of the CS/RHR valve opening permissive from performing its safety function. This finding is more than minor because it was associated with the protection against external factors attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the reliability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the finding using IMC 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The SDP for Findings At-Power," Exhibit 2. The inspectors determined this finding to be of very low safety significance (Green) because the degraded condition was not a design deficiency that affected system operability; did not represent an actual loss of function of a system; did not represent an actual loss of function of a single train or two separate trains for greater than its TS allowed outage time; and did not represent an actual loss of function of one or more non-TS trains of equipment designated as high safety significant. The finding has a cross-cutting aspect in the area of Human Performance, Procedure Adherence, because Exelon technicians did not store ladders in safety-related buildings in accordance with station procedures, such that they could not fall over and damage safety-related equipment. [H.8]

Enforcement. TS 5.4.1 requires that written procedures shall be established, implemented and maintained as recommended by Regulatory Guide (RG) 1.33, November 1972. RG 1.33, Appendix A, requires administrative procedures for control of maintenance activities in the plant. Specifically, procedure MA-AA-716-026, "Station Housekeeping / Material Condition Program," requires, in part, that ladders being stored in the plant shall be tied-off and secured such that they cannot fall over and cause damage to plant equipment. Contrary to the above, on April 26, 2016, Exelon stored unsecured ladders in the Unit 2 RB, such that if they fell over they could have damaged safety-related equipment. Because this finding is of very low safety significance and it was entered into Exelon's CAP as IR 2661309, this violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy. **(NCV 05000277/2016002-1, Improperly Stored Material in RB)**

1R15 Operability Determinations and Functionality Assessments (71111.15 – 6 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 3 RCIC low flow when lined up from the torus on April 19, 2016
- Unit 2 and Unit 3 MCR envelope inoperable requiring compensatory measures on April 25, 2016
- Unit 2 'B' battery charger 'fail' alarm received on April 27, 2016
- Unit 2 and Unit 3 E-4 EDG governor oil leak on May 13, 2016
- Unit 2 and Unit 3 4kV micro switch Part 21 on May 19, 2016
- Unit 2 'K' SRV solenoid valve actuation circuit ground indications on June 6, 2016

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.

1R18 Plant Modifications (71111.18 – 2 samples)

a. Inspection Scope

The inspectors reviewed the temporary and permanent modifications listed below to determine whether the modification affected the safety function of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing results, and conducted field walkdowns of the modification to verify that the temporary modification did not degrade the design bases, licensing bases, and performance capability of the affected system.

- MELLLA+ permanent modification and implementation of changes to the power/flow map on April 28, 2016
- Installation of monitoring instrumentation to the Unit 2 'B' battery charger temporary modification on May 27, 2016

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 point were performed and checked, and that results adequately demonstrated restoration of the affected safety functions.

- Unit 2 and Unit 3 reactor protection system (RPS) trip testing after oscillating power range monitor jumper removal on April 25, 2016
- Unit 2 and Unit 3 E-2 EDG run following engine overhaul on May 3-5, 2016
- Unit 2 and Unit 3 'A' ESW pump run following planned maintenance on May 23, 2016
- Unit 2 'A' loop HPSW testing following planned maintenance on June 6, 2016
- Unit 2 '2K' SRV testing following solenoid valve replacement on June 17, 2016
- Unit 2 'B' CS testing following planned system outage window on June 27, 2016

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample*)*

a. Inspection Scope

The inspectors observed a Unit 2 forced outage (2M08) to repair the '2K' SRV actuation solenoid valve. On June 16, 2016, Exelon performed a controlled downpower from full power to 5 percent RTP and took the main generator off line to set conditions for maintenance. Maintenance technicians performed troubleshooting activities and replaced a faulted solenoid valve assembly on the '2K' SRV. Following the maintenance and a successful post-maintenance test, Exelon commenced power ascension and placed the main generator on line on June 18, 2016. Exelon returned Unit 2 to full power on June 18, 2016.

During the outage, the inspectors observed portions of the downpower and power ascension and monitored controls associated with the following outage activities:

- Taking the main generator off-line
- Low power operations
- Drywell initial entry
- Placing the main generator on-line

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 5 samples)

a. Inspection Scope

The inspectors observed performance of 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 and Unit 3 RCS leak rate testing on April 5, 2016
- Unit 2 'A' automatic depressurization system (ADS) logic system functional test (LSFT) on April 19, 2016
- Unit 3 HPCI LSFT on April 20, 2016
- Unit 3 RHR 'B' pump, valve, and flow IST on May 25, 2016
- Unit 2 and Unit 3 E-2 EDG emergency core cooling system (ECCS) signal auto start and full load test on June 13, 2016

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 – 1 sample)

Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine PB emergency drill on June 27, 2016, to identify any weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator and technical support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the station drill critique to compare inspector observations with those identified by Exelon staff in order to evaluate Exelon's critique and to verify whether the Exelon staff were properly identifying weaknesses and entering them into the CAP.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational and Public Radiation Safety

2RS5 Radiation Monitoring Instrumentation (71124.05 – 3 samples)

a. Inspection Scope

The inspectors reviewed performance in assuring the accuracy and operability of radiation monitoring instruments used to protect occupational workers during plant operations and from postulated accidents. The inspectors used the requirements in 10 CFR 20; RGs; applicable industry standards; and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed: UFSAR; radiation protection (RP) audits; records of in-service survey instrumentation; and procedures for instrument source checks and calibrations.

Walk-Downs and Observations (1 sample)

The inspectors conducted walk-downs of plant area radiation monitors and continuous air monitors. The inspectors assessed material condition of these instruments and that the monitor configurations aligned with the UFSAR. The inspectors checked the calibration and source check status of various portable radiation survey instruments and contamination detection monitors for personnel and equipment.

Calibration and Testing Program (1 sample)

For the following radiation detection instrumentation, the inspectors reviewed the current detector and electronic channel calibration, functional testing results alarm set-points and the use of scaling factors: laboratory analytical instruments, whole body counter, containment high-range monitors, portal monitors; personnel contamination monitors; small article monitors; portable survey instruments; area radiation monitors; electronic dosimetry; air samplers; and continuous air monitors. The inspectors reviewed the calibration standards used for portable instrument calibrations and response checks to verify that instruments were calibrated by a facility that used National Institute of Science and Technology (NIST) traceable sources.

Problem Identification and Resolution (1 sample)

The inspectors verified that problems associated with radiation monitoring instrumentation (including failed calibrations) were identified at an appropriate threshold and properly addressed in the CAP.

b. Findings

No findings were identified.

Cornerstone: Public Radiation Safety (PS)

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06 – 6 samples)

a. Inspection Scope

The inspectors reviewed the treatment, monitoring, and control of radioactive gaseous and liquid effluents. The inspectors used the requirements in 10 CFR 20, 10 CFR 50, Appendix I; TS; offsite dose calculation manual (ODCM); applicable industry standards; and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors conducted in-office review of the PB 2014 and 2015 annual radioactive effluent and environmental reports, radioactive effluent program documents, UFSAR, ODCM, and applicable event reports.

Walk-Downs and Observations (1 sample)

The inspectors walked down the gaseous and liquid radioactive effluent monitoring and filtered ventilation systems to assess the material condition and verify proper alignment according to plant design. The inspectors also observed potential unmonitored release points and reviewed radiation monitoring system (RMS) surveillance records and the routine processing and discharge of gaseous and liquid radioactive wastes.

Calibration and Testing Program (1 sample)

The inspectors reviewed gaseous and liquid effluent monitor instrument calibration, functional test results, and alarm set-points based on NIST calibration traceability and ODCM specifications.

Sampling and Analyses (1 sample)

The inspectors reviewed: radioactive effluent sampling activities, representative sampling requirements; compensatory measures taken during effluent discharges with inoperable effluent radiation monitoring instrumentation; the use of compensatory radioactive effluent sampling; and the results of the inter-laboratory and intra-laboratory comparison program including scaling of hard-to-detect isotopes.

Instrumentation and Equipment (1 sample)

The inspectors reviewed the methodology used to determine the radioactive effluent stack and vent flow rates to verify that the flow rates were consistent with TS/ODCM and UFSAR values. The inspectors reviewed radioactive effluent discharge system surveillance test results based on TS acceptance criteria. The inspectors verified that high-range effluent monitors used in emergency operating procedures are calibrated and operable and has post-accident effluent sampling capability.

Dose Calculations (1 sample)

The inspectors reviewed: changes in reported dose values from the previous annual radioactive effluent release reports; several liquid and gaseous radioactive waste discharge permits; the scaling method for hard-to-detect radionuclides; ODCM changes; land use census changes; public dose calculations (monthly, quarterly, annual); and records of abnormal gaseous or liquid radioactive releases.

Problem Identification and Resolution (1 sample)

The inspectors evaluated whether problems associated with the radioactive effluent monitoring and control program were identified at an appropriate threshold and properly addressed in Exelon's CAP.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (REMP) (71124.07 – 3 samples)

a. Inspection Scope

The inspectors reviewed the REMP to validate the effectiveness of the radioactive gaseous and liquid effluent release program and implementation of the Groundwater Protection Initiative (GPI). The inspectors used the requirements in 10 CFR 20; 40 CFR 190; 10 CFR 50 Appendix I; and the site's TSs, ODCM, Nuclear Energy Institute (NEI) 07-07, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed: PB 2014 and 2015 annual radiological environmental and effluent monitoring reports; REMP program audits; ODCM changes; land use census; UFSAR; and inter-laboratory comparison program results.

Site Inspection (1 sample)

The inspectors walked down various thermoluminescent dosimeter and air and water sampling locations and reviewed associated calibration and maintenance records. The inspectors observed the sampling of various environmental media as specified in the ODCM and reviewed any anomalous environmental sampling events, including assessment of any positive radioactivity results. The inspectors reviewed any changes to the ODCM. The inspectors verified the operability and calibration of the meteorological tower instruments and meteorological data readouts. The inspectors reviewed environmental sample laboratory analysis results, laboratory instrument measurement detection sensitivities; and results of the laboratory quality control program audit, and the inter- and intra-laboratory comparison program results. The inspectors reviewed the groundwater monitoring program as it applies to selected potential leaking SSCs; and 10 CFR 50.75(g) records of leaks, spills, and remediation since the previous inspection.

GPI Implementation (1 sample)

The inspectors reviewed: groundwater monitoring results; changes to the GPI program since the last inspection; anomalous results or missed groundwater samples; leakage or spill events, including entries made into the decommissioning files (10 CFR 50.75 (g)); evaluations of surface water discharges; and Exelon's evaluation of any positive groundwater sample results including appropriate stakeholder notifications and effluent reporting requirements.

Identification and Resolution of Problems (1 sample)

The inspectors evaluated whether problems associated with the REMP were identified at an appropriate threshold and properly addressed in Exelon's CAP.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification (71151)

.1 RCS Specific Activity and RCS Leak Rate (4 samples)

a. Inspection Scope

The inspectors reviewed Exelon's information submitted for the RCS specific activity and RCS leak rate PIs for both Unit 2 and Unit 3 for the period of April 1, 2015 through March 31, 2016. To determine the accuracy of the PI data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment PI Guideline," Revision 7. The inspectors also reviewed RCS sample analysis and control room logs of daily measurements of RCS leakage, and compared that information to the data reported by the PI. Additionally, the inspectors observed surveillance activities that determined the RCS identified leakage rate, and chemistry personnel taking and analyzing an RCS sample.

b. Findings

No findings were identified.

.2 Radiological Effluent TS/ODCM Radiological Effluent Occurrences (1 sample)

a. Inspection Scope

The inspectors reviewed Exelon's submittals for the radiological effluent TS/ODCM radiological effluent occurrences PI for the first quarter 2015 to the fourth quarter 2015. The inspectors used PI definitions and guidance contained in the NEI Document 99-02, Revision 7, to determine if the PI data was reported properly. The inspectors reviewed the public dose assessments for the PI for public radiation safety to determine if related data was accurately calculated and reported.

The inspectors reviewed the CAP database to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous and liquid effluent summary data and the results of associated offsite dose calculations to determine if indicator results were accurately reported.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 3 samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure (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 corrective actions, 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 condition report 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: Review of Apparent Cause Evaluation (ACE) and Extent of Condition (EOC) Associated with Inadequate Surveillance Testing of PB's Remote Shutdown System (1 sample)

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's ACE and corrective actions associated with condition report (CR) IR 02556042, MO-2-12-131, "Will Not Stroke Open From Remote Shutdown Panel," written on September 16, 2015. The CR identified that during the performance of ST, in accordance with procedure ST-0-013-201-2, "Motor Operated RCIC Steam Supply Valve," MO-2-12-131 did not open from the remote shutdown panel. As a result, remote shutdown panel function was declared inoperable and TS 3.3.3.2 was entered. Exelon's immediate corrective actions included initiating WOs to troubleshoot the issue and understand the cause of the failures. Exelon completed an ACE for this issue on October 20, 2015.

The inspectors assessed Exelon's problem identification threshold, causal analyses, EOC reviews, operational decision making, and the prioritization and timeliness of corrective actions to determine whether Exelon was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors focused on the EOC reviews performed by Exelon for similar remote shutdown panels.

The inspectors compared the actions taken to the requirements of Exelon's CAP and Title 10 of the CFR Part 50, Appendix B. In addition, the inspectors reviewed documentation associated with this issue, interviewed engineering personnel, and performed field walkdown to assess the material condition of the components.

b. Findings and Observations

Introduction. The inspectors identified an NCV of very low safety significance (Green) of PB Unit 2 and Unit 3 Facility Operating License Condition 2.C.(4) for failure to implement and maintain in effect all provisions of the approved fire protection program. Specifically, Exelon did not correct a condition adverse to the fire protection program alternative shutdown capability in a timely manner.

Description. On May 23, 2013, Exelon wrote a fleet-wide CR (IR 1517272) to request that each plant evaluate a Limerick Generating Station finding related to alternative shutdown panel transfer/isolation switches that were not being periodically tested, as required. This CR assigned an action (Assignment # 11) for Exelon to perform a review of PB's alternative shutdown panel transfer/isolation switches to determine if adequate periodic testing was being performed. As a result of this review, on February 6, 2014, Exelon generated IR 1618302 identifying twenty transfer/isolation switches as not being tested that were credited for fire protection alternative shutdown capability and redundant shutdown capability. Exelon initiated a corrective action to add new periodic testing requirements for these switches and assigned a due date to complete this action by March 28, 2015. Later, Exelon extended this due date to February 24, 2018, to support completion of other priority tasks. Subsequently, on October 20, 2015, Exelon completed an ACE to determine the cause of the inadequate ST of remote shutdown system transfer/control switch for motor operated RCIC steam supply valve MO-2-13-131. This ACE included an EOC review to determine potential applicability of the issue to exist in other similar transfer switches. The EOC review concluded that Exelon already has identified fire protection safe shutdown credited switches that were not being tested in IR 1618302, and have adequate corrective actions planned.

The inspectors determined that Exelon had identified and planned corrective actions to address the issue of twenty switches that were not periodically tested. However, the inspectors found that there were no actions taken since the identification of the issue and noted that the due date to complete the corrective action was extended several times. The inspectors also determined that this was a missed opportunity for Exelon to adequately assess EOC during its performance of the ACE. The inspectors identified that the EOC review should have looked at the corrective action and should have reached a conclusion that there had been no progress made since the identification of the issue. The inspectors also found that there was no technical evaluation performed to justify why it was acceptable to extend the due date to February 24, 2018, for testing these switches.

The inspectors found that eight of twenty switches were credited in safe shutdown analysis for alternative shutdown capability (10CFR 50, Appendix R III.G.3) and the remaining twelve were credited for redundant shutdown capability (10CFR 50, Appendix R III.G.2). The design basis functions of these switches were to transfer control of the safe shutdown components from the normal control station (control room) to alternative control stations; and to provide electrical isolation that prevents spurious actuations. The inspectors determined that failure to test these switches did not ensure that these switches would perform their intended function. On May 12, 2016, Exelon wrote a CR (IR 02669323) to address this issue. Exelon evaluated this issue and

determined that there was a reasonable expectation of functionality for these switches based on the review of similar model switches already in a test program that periodically tests those switches for its transfer/isolation functions. The inspectors reviewed Exelon's functionality determination and agreed with the conclusions.

Analysis. The inspectors determined that Exelon's failure to correct a condition adverse to the fire protection program alternative shutdown capability in a timely manner was a PD. Specifically, the due date to complete the corrective action was extended out to February 24, 2018, without any supporting technical evaluation justifying the delay for testing the switches. The inspectors determined that the failure to address this issue in a timely manner was a condition adverse to the fire protection program. Specifically, it affected the only method of alternative shutdown capability (Method D in PB Safe Shutdown Analysis) for safely shutting down the plant during a significant fire event that would require evacuation of the control room and taking control of the safe shutdown components from alternative control stations.

This PD was more than minor because it was associated with the protection against external factors (fire) attribute of the Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, by failing to correct the condition, Exelon did not ensure that the control circuit for the safe shutdown components would be isolated from the effects of fire damage. The inspectors determined that the finding was of very low safety significance (Green) based on IMC 0609, Appendix F, "Fire Protection SDP," task number 1.3.1 because Exelon had demonstrated reasonable expectation of functionality for these switches by having comparable switches in the test program and periodically testing those switches. The test results did not indicate any kind of significant failures of these switches.

This finding was determined to have a cross-cutting aspect in the area of Human Performance, Resources, in that, Exelon extended the due date to complete the corrective action to support the completion of higher priority items, indicating a lack of resources [H.1].

Enforcement. PB Unit 2 and Unit 3 Facility Operating License Condition 2.C.(4), in part, requires Exelon to implement and maintain in effect all provisions of the approved fire protection program as described in the UFSAR and as approved by the NRC. The fire protection program is described in a document transmitted to the NRC on September 30, 1986, titled, "Fire Protection Program, Peach Bottom Atomic Station, Unit 2 and Unit 3," and is incorporated by reference into the UFSAR. Fire Protection Program, Chapter 3, Section 3.1.2, Item # 11 describes Quality Assurance (QA) Program, which stated that measures should be established to assure the conditions adverse to the fire protection are promptly identified, reported, and corrected. Contrary to the above, from February 6, 2014, to present, Exelon did not correct the conditions adverse to fire protection program alternative shutdown capability. Exelon had not implemented periodic testing program sufficient to verify the transfer and isolation functions of the switches credited to achieve safe shutdown of the plant during a fire event. Because this finding was of very low safety significance (Green) and was entered into Exelon's CAP as IR 02669323, the NRC is treating this violation as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy. **(NCV 05000277; 278/2016002-02, Untimely Corrective Actions to Address Condition Adverse to the Fire Protection Program Alternative Shutdown Capability)**

.3 Annual Sample: TS Required Chemistry Survey Analyses not Performed on Time (1 sample)

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's analysis and corrective actions associated with CR 02454745, "TS Required Chemical Survey Analyses not Timely," written February 18, 2015, and CR 02471526, "Chemistry Department HU Behaviors," written March 20, 2015. Specifically, human performance errors and poor prioritization contributed to several untimely chemical sampling and evaluations conducted between 2010 and 2015.

The inspectors assessed Exelon's problem identification threshold, operability evaluations, EOC reviews, compensatory actions, and prioritization and timeliness of Exelon's corrective actions, and determined whether Exelon was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned corrective actions were appropriate. The inspectors compared the actions taken and operability evaluations to the requirements of Exelon's CAP, 10 CFR 50, Appendix B, TS, RG 1.78, "Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room during a Postulated Hazardous Chemical Release," and applicable procedures. In addition, the inspectors performed field walk-downs, interviewed engineering personnel to assess the effectiveness of the implemented corrective actions, and ensured that adequate design measures were in place to maintain control room habitability.

b. Findings and Observations

No findings were identified.

TS 5.5.13 requires a control room habitability program to ensure that control room operators can control the reactor safely in the event of a radiological or chemical release. CR 02454745 and the associated ACE determined that the chemical evaluation was not performed in a timely manner. Specifically, a chemical evaluation for onsite, offsite, and mobile sources was completed in 2009, but required additional information from a vendor of mobile sources. Corrective actions were initiated to obtain the required information, however, during this time a new permanent offsite vendor was selected in 2011, which delayed this evaluation.

Inspectors reviewed the ACE 02454745 and associated actions, the vendor completed chemical survey and comparison of results with RG 1.78 recommendations, and the results of HABIT, "Computer Codes for Evaluation of Control Room Habitability." The inspectors verified that validation of control room operator actions had been conducted in the event of identification of a chemical release and that unfiltered in-leakage was within TS limits as demonstrated by chemical testing. The inspectors also noted that the baseline inspection of control room required self-contained breathing apparatus inspection and maintenance, and respiratory qualification of operators was most recently conducted in 2015 with no findings identified.

The apparent cause evaluation (IR 02471526) identified human performance errors among chemistry technicians that contributed to required chemistry samples not being conducted in a timely manner and resulted in four individual IRs (2405118, 2433265, 2435191, and 2458532). These IRs indicated a possible decline in desired work group behaviors identified during Nuclear Oversight observations.

Two IRs dealt with mislabeled equipment usage and sample markings and the other two IRs referred to late compensatory sampling, even though they were within the allowed grace period. Corrective actions pertaining to these IRs included: a training evaluation, reinforcement of expectations and error prevention tools; supervisor observations; and a better tracking mechanism of compensatory sampling.

The inspectors verified that no TS required samples were missed since these corrective actions were implemented, reviewed the compensatory sampling tracking database, and discussed with chemistry supervision and technicians chemistry fundamentals and expectations. The inspectors noted that a reason for chemistry samples being untimely was that technicians were waiting until the sample was almost due and then became interrupted by other required chemistry priorities. To address this concern, Exelon initiated a requirement to ensure TS required samples are performed at 75 percent of the required time frequency and that a tracking mechanism for this action was generated. Also, the inspectors observed a chemistry supervisor conduct an observation of technicians performing a required chemistry surveillance and noted positive communication and reinforcement of expectations. The inspectors concluded that completed and planned actions were reasonable to correct the problem and prevent recurrence.

.4 Semi-Annual Trend Review (1 sample)

a. Inspection Scope

The inspectors performed a semi-annual review of site issues to identify trends that might indicate the existence of more significant safety issues. As part of this review, the inspectors included repetitive or closely-related issues that were documented by Exelon in trend reports, site PIs, major equipment problem lists, system health reports, MR assessments, and maintenance or CAP backlogs. The inspectors also reviewed Exelon's CAP database for the first and second quarters of 2016 to assess IRs written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRC's daily IR review (Section 4OA2.1). The inspectors reviewed the Exelon quarterly trend reports for the past two quarters to verify that Exelon personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

b. Findings and Observations

No findings were identified

The inspectors evaluated a sample of IRs generated during the past two quarters by departments that provide input to the quarterly trend reports. The inspectors determined that, in most cases, the issues were appropriately evaluated by Exelon staff for potential trends and resolved within the scope of the CAP. The inspectors identified adverse trends existed in station human performance and the thoroughness of routine equipment walkdowns.

The station experienced an increase in the number and severity of human performance errors across multiple departments that impacted plant performance. The most severe human performance event occurred on March 28, 2016, when an operator incorrectly opened the supply breaker to the E-124 MCC, which required an emergent manual power reduction on Unit 2.

This issue is documented as a very low safety significant finding in section 4OA3. The station recognized the human performance adverse trend and documented it in the CAP under IR 2646772 and performed a root cause evaluation. Corrective actions included additional supervisory oversight, and improvements in the existing department excellence programs designed to address adverse human performance behaviors.

The inspectors identified that the station had not been performing thorough routine equipment walkdowns. The inspectors identified numerous equipment related issues in the field that were readily apparent and should have been identified by equipment operators, maintenance technicians and engineering personnel. Specifically, the inspectors identified bolts missing on the E-1 EDG (IR 2638753), degraded external flood seals (IR 2638779), materials stored in transient combustible free zones (IR 2665911), and the '2A' RHR check valve swing arm found on the floor (IR 2626047). Each issue was evaluated to determine if a PD existed and whether it was more than minor. The inspectors review concluded that the issues were minor. However, the station identified that a trend in the thoroughness of walkdowns existed and documented it in the CAP under IR 2640514. Corrective actions included assigning issue identification mentors and creating a job aid to improve the quality of equipment walkdowns.

The inspectors discussed these issues with various station personnel, including station management. Station management acknowledged the issues, and verified they were captured in the CAP. The inspectors determined that Exelon has implemented corrective actions commensurate with the safety significance. The inspectors will continue to evaluate the long term effectiveness of the corrective actions in addressing the adverse trends.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 1 sample)

Plant Events

a. Inspection Scope

For the plant event listed below, the inspectors reviewed and/or observed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems. The inspectors communicated the plant events to appropriate regional personnel, and compared the event details with criteria contained in IMC 0309, "Reactive Inspection Decision Basis for Reactors," for consideration of potential reactive inspection activities. As applicable, the inspector verified that Exelon made appropriate emergency classification assessments and properly reported the event in accordance with 10 CFR Parts 50.72 and 50.73. The inspectors reviewed Exelon's follow-up actions related to the events to assure that Exelon implanted appropriate corrective actions commensurate with their safety significance.

- Emergent downpower to 80 percent RTP due to a human performance error on March 28, 2016

b. Findings

Introduction. A self-revealing finding of very low safety significance (Green) was identified for the failure of Exelon operators to use human performance error reduction tools during equipment manipulation in accordance with HU-AA-101, "Human Performance Tools and Verification Practices." Specifically, on March 28, 2016, an equipment operator failed to use self-check (STAR) while removing a circuit breaker from service and incorrectly tripped the E-124 480 volt supply breaker which required a rapid manual power reduction by operators to 80 percent rated thermal power (RTP) due to lowering main condenser vacuum and a partial loss of feedwater heating.

Description. On March 28, 2016, equipment operators were performing a clearance application to de-energize the E-124-P-A MCC for scheduled maintenance. After opening and racking out the correct E-124-P-A circuit breaker, the equipment operator was to install a lock on the breaker, in accordance with the clearance requirements, to prevent racking back in the breaker. When preparing to apply the lock to the breaker, the peer checker turned to get the clearance package and while doing so, inadvertently dropped several procedures on the floor. The performer became distracted and turned to see where the peer checker had gone. When the performer returned to the MCC, the performer incorrectly positioned their body in front of the adjacent breaker cubicle (location 18" to the left). The operator failed to perform STAR to validate the correct component and proceeded to depress the trip push button which resulted in opening the main feed breaker (E-124) and de-energized the entire E-124 MCC. The loss of the E-124 MCC required a rapid manual power reduction to prevent a potential reactor scram. MCR operators directed re-closure of the E-124 feeder breaker, returned the feedwater heaters to service, restored main condenser vacuum, and stabilized the plant.

HU-AA-101, "Human Performance Tools and Verification Practices," describes the human performance error prevention tools that are to be used by field workers to promote safe, error-free operation. STAR is a tool required to be used by all operators to aid in component identification and equipment manipulations. The tool ensures the operator is working on the correct component and prevents configuration control events. During this event, equipment operators became distracted during the manipulation of the E-124 breaker tag-out and failed to use STAR to validate proper configuration control was maintained. This condition was entered into Exelon's CAP under IR 2646772.

Analysis. Failure to use human performance error reduction tools during equipment manipulations, in accordance with HU-AA-101, was a PD that was within Exelon's ability to foresee and correct and should have been prevented. The finding was more than minor because it was associated with the human performance attribute of the Initiating Events cornerstone and affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, an equipment operator failed to use human performance error reduction tools and opened an incorrect breaker which resulted in a rapid downpower. The inspectors evaluated the finding in accordance with Exhibit 1 of IMC 0609, Appendix A, "The SDP for Findings At-Power," dated June 19, 2012, and determined the finding was of very low safety significance (Green) because it did not result in a reactor trip and the loss of mitigation equipment relied upon for transition to a stable shutdown condition.

This finding was determined to have a cross-cutting aspect in the area of Human Performance, Field Presence, because Exelon did not ensure that deviations from standards and expectations which were identified by leaders were corrected promptly. Specifically, Exelon identified that adverse human performance behaviors existed with certain equipment operators, however, those observations were not appropriately input into their performance management system, such that the behaviors could be addressed. Thus, these adverse behaviors were a primary contributor to this human performance error. [H.2]

Enforcement. This finding does not involve any enforcement action since no regulatory requirement violation was identified. Specifically, the human error reduction tools in HU-AA-101, "Human Performance Tools and Verification Practices," are not required to be implemented as part of Exelon's' 10 CFR 50, Appendix B, QA Program. Because the finding does not involve a violation of regulatory requirements and has very low safety significance, it is identified as FIN. (**FIN 05000277/2016002-03, Human Performance Event Results in Emergent Downpower)**

4OA6 Meetings, Including Exit

Quarterly Resident Exit Meeting Summary

On July 15, 2016, the inspectors presented the inspection results to Mr. Michael Massaro, 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
M. Massaro, Site Vice President
P. Navin, Plant Manager
J. Armstrong, Regulatory Assurance Manager
P. Breidenbaugh, Director Maintenance
C. Crabtree, Chemistry Groundwater Task Manager
A. Donley, Chemistry REMP/RETS Task Manager
D. Dullum, Regulatory Assurance Engineer
D. Henry, Engineering Director
B. Holmes, Radiation Protection Manager
A. Huber, Mechanical Design Engineering
J. Lahr, Field Scientist, Normandeau Associates
M. Martinek, Normandeau Associates
H. McCrory, Tech Support Manager
M. Mettler, Normandeau Associates
P. Pautler, Shift Manager
M. Rector, Engineering Response Team Manager
J. Stenclik, Chemistry Meteorology Task Manager
D. Turek, Operations Manager
M. Weidman, Director Work Management

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

05000277/2016002-01	NCV	Improperly Stored Material in Reactor Building (Section 1R13)
05000277/278/2016002-02	NCV	Untimely Corrective Actions to Address Condition Adverse to the Fire Protection Program Alternative Shutdown Capability (Section 4OA2.2)
05000277/2016002-03	FIN	Human Performance Event Results in Emergent Downpower (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

* -- Indicates NRC-identified

Section 1R01: Adverse Weather

Procedures
OP-AA-108-107-1002, Interface Procedure Between COMED/PECO and Exelon Generation (Nuclear/Power) for Transmission Operations, Revision 9 SE-11, Loss of Off-site Power, Revision 21
WC-AA-8003, Interface Procedure Between COMED/PECO and Exelon Generation (Nuclear/Power) for Design Engineering and Transmission Planning Activities, Revision 6
WC-AA-107, Seasonal Readiness, Revision 16

ARs
A1890525
A1991155
A1999802
A2009960
A2022623
A2026509
A2031124
A2034710

IRs
2674525
2674526
2562986

Section 1R04: Equipment Alignment

Procedures
COL 33.1.A-2, ESW System (Unit 2 and Common), Revision 32
HU-AA-101, Human Performance Tools and Verification Practices, Revision 9
OP-AA-101-113-1001, Attachment 3, Crew Free Clock Reset Criteria, Revision 18
PI-AA-125-1001, Root Cause Analysis Manual, Revision 2
SO 13.1.A-3, RCIC System, Revision 17
SO 13.1.B-3 COL, RCIC System Control Board Lineup, Revision 13
SO 33.1.A, ESW System Setup for Normal Standby Operation, Revision 2
SO 52A.1.B, Diesel Generator Operations, Revision 54

Drawings
ESW/ECW Simplified Diagram

IRs
00246155
00660599
2668827

Miscellaneous
ESW System, Design Basis Document- DBD No. P-S-02, Revision 12
PB UFSAR, Chapter 10.9, ESW System, Revision 25
TS ESW System and Normal Heat Sink, B.3.7.2, Revision 4

Section 1R05: Fire Protection

Procedures
PF-0, Pre-Fire Strategy Plan Area and Location Index, Revision 9
PF-13D, Unit 3 RB; 3 'A' & 3 'C' CS Room, Revision 3
PF-57, Unit 2 RB Refuel Floor, Revision 6
PF-62, Unit 3 RB; HPCI Room, Revision 7
PF-108, Turbine Building Common, MCR, Revision 6
PF-136, ECT, General Area, Revision 3

ARs
A1836776
A2043566

IRs
*2671664
*2671665

Drawings
6280-M-365, HPCI System, Revision 66

Section 1R06: Flood Protection Measures

Procedures
OP-AA-102-106, Operator Response Time Validation Sheet, Revision 3

IRs
*2666345

Miscellaneous
ARC 00C226C, A ESW Pump Room Flooded, Revision 8
PM-1048, Design Basis for Internal Flood Protection for the HPSW/ESW Pump Structure, Revision 0
P-T-09, Internal Hazards, Revision 10

Section 1R07: Heat Sink Performance

Procedures
RT-O-014-310-2, CS Motor Oil Cooler Heat Transfer Capability Test, Revision 13
RT-O-014-310-3, CS Motor Oil Cooler Heat Transfer Capability Test, Revision 15
RT-O-032-310-2, (ST362922/R1308203), HPSW Oil Cooler Heat Transfer Capability Test, Revision 12, 6/26/15
RT-O-032-310-2, (ST217684/R1295780), HPSW Oil Cooler Heat Transfer Capability Test, Revision 12, 7/30/15
RT-O-032-310-2, (ST362884/R1311337), HPSW Oil Cooler Heat Transfer Capability Test, Revision 12, 8/10/15
RT-O-032-310-3, (ST217685/R1295147), HPSW Oil Cooler Heat Transfer Capability Test, Revision 12, 7/15/15

RT-O-032-310-3, (ST362924/R1320101), HPSW Oil Cooler Heat Transfer Capability Test, Revision 14, 12/3/15
RT-O-032-310-3, (ST362886/R1322892), HPSW Oil Cooler Heat Transfer Capability Test, Revision 14, 12/18/15

Miscellaneous
PM-824, Develop and Equation to Extrapolate, from Actual Data, the Maximum Anticipated Bearing Oil Temperature on the HPSW Pump Motors, 3/15/ 2015

Section 1R11: Licensed Operator Requalification Program

Procedures
GP-5-2, Power Operations, Revision 3
SO 6D.2.A-2, Reactor Feedwater Pump Shutdown, Revision 37

Miscellaneous
Work Week Schedule and Plans

Section 1R12: Maintenance Effectiveness

Procedures
ER-AA-310, Implementation of the MR, Revision 9
ON-115 Procedure, Loss of Normal MCR Ventilation – Procedure, Revision 21

IRs
2557268

Drawings
6280, E-5343, Sheet 1, Station Blackout Substation Single Line, Revision 21

Miscellaneous
MR Monthly Monitoring Evaluations
MR System Basis Documents for 13kV system
MR System Basis Documents for MCR Ventilation and Chiller System

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
MA-AA-716-026, Station Housekeeping/Material Condition Program, Revision 14
OP-AA-108-117, Protected Equipment Program, Revision 4
OP-AA-201-012-1001, Operations On-Line Fire Risk Management, Revision 1
OP-PB-108-117-1000, Peach Bottom Protected Equipment Program, Revision 1

IRs
2049762
2657427
*2659119
2660741
*2661309

WOs
R0967577
R13432699
M2043566

ARs
A2043566

Drawings
6280-M-330, Emergency Cooling System, Revision 37
6280-M-333, P&I Diagram Instrument Nitrogen
6280-M-351, P&I Diagram Nuclear Boiler

Miscellaneous
PB Protected Equipment Tracking Sheet on June 6, 2016

1R15: Operability Evaluations

Procedures
CC-AA-309-1001, Required TDH of RCIC Pump – 600 gpm Supply at Max RPV Pressure,Revision 8
CC-PB-201, Hazard Barrier Control Program, Revision 5
ER-AA-302-1006, Motor-Operated Valve (MOV) Maintenance and Testing Guidelines, Revision 13
ER-AA-302-1007, MOV Limitorque Actuator Capability Determination Methodology, Revision 9
M-C-700-201, Meggering of Motors, Revision 7
OP-AA-108-115, ODs (CM-1), Revision 16
RT-O-013-725-3, RCIC Response Time Test, Revision 13
ST-O-013-301-3, RCIC Pump, Valve, Flow and Unit Cooler Functional and in-Service Test, Revision 44
ST-O-013-301-3, RCIC Pump, Valve, Flow and Unit Cooler Functional and In-Service Test, Revision 45

Drawings
6280, M-1-S-52, Sheet 4, Electrical Schematic Diagram Automatic Blowdown System,Revision 39

Miscellaneous
Calculation Sheet, ME-0299, Revision 2
Log Entries Search Report, dated June 3, 2016

AR
1998202 2033941 2036720 2047755

IRs
2613448 2624310 2637694 2640316 2655273
2675024 2675135 2676957

WOs
C0256242 R0998138 R1321847

Miscellaneous
PB UFSAR, Chapter 4.4, Nuclear System Pressure Relief System, Revision 25
PB, Units 2 and 3, RCIC System, DBD No. P-S-39, Revision 16
Surveillance Testing Recommendations for HPCI and RCIC Systems, dated December 8, 1989, SIL No. 336R1

Section 1R18: Plant Modifications

Procedures
CC-AA-112, Temporary Configuration Changes, Revision 23
CC-AA-415, Maintenance Specification – Measurement and Test Equipment, Revision 0
OP-PB-102-106, Operator Response Time Program at Peach Bottom, Revision 00
RT-I-006-230-2, Feedwater Control System Stability/Response Test, Revision 8
RT-I-01D-900-2, Pressure Regulator Stability Test, Revision 4
SP 5015, Special – 5015 Unit 2 MELLLA+ Implementation Testing, Revision 1
ST-O-011-301-2, Standby Liquid Control Pump Functional Test for IST, Revision 25
ST-O-011-301-2, Standby Liquid Control Pump Functional Test for IST, Revision 26

IRs
*2642066
*2664657

Miscellaneous
CAP 102 Report PEA MRC CR Review
DBD No. P-T-12, Revision 7
ECR 12-00422, Sheet A1879381, MELLLA + Implementation ECRECR 15-00091, Sheet A1886380, EPU-NUMAC PRNM MELLLA+ Implementation, Units 2 & 3
eSOMS Clearance, Temp Configuration Change TCC-16-0024, dated June 1, 2016
eSOMS, Log Entries Search Report dated July 6, 2016
General Electric Company Assessment of BWR Mitigation of ATWS, Volume II, NEDE-24222, Class III, December 1979
GE Energy Nuclear, Licensing Topical Report General Electric Boiling Water Reactor MELLLA+, NEDC-33006P-A, Revision 3
GE Hitachi Nuclear Energy, Safety Analysis Report for PB Units 2 & 3 MELLLA+, NEDC-33720P, Revision 0
PB Units 2 & 3 MELLLA+ Overview, dated April 13, 2016
Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Amendment Nos. 305 and 309 to Renewed Facility Operating License Nos. DPR-44 and DPR-56, Exelon Generation Company, LLC, PSEG Nuclear LLC, PB, Units 2 and 3, Docket Nos. 50-277 and 50-278, Attachment 4
003N6029-R0, Exelon Generation Company LLC PB, Units 2 & Unit 3 MELLLA+ Test 99A Evaluation and Assessment, May 2016

Section 1R19: Post-Maintenance Testing

Procedures
IC-C-11-04047, Relay Trip Testing, Revision 4
M-052-006, Diesel Run After Major Overhaul, Revision 18
M-510-107, Inspection and Refurbishment of Atwood and Morrill Mark No. 234 & 237 Swing Check Valves, Revision 21
MA-AA-716-012, PMT, Revision 20
RT-O-052-252-2, E-2 Diesel Generator Inspection Post-Maintenance Functional Test, Revision 36
SI2N-60A-APRM-11FS, Functional Check of Average Power Range Monitor (APRM) “1,” Revision 09
S12N-60A-APRM-21FS, Functional Check of APRM “2,” Revision 9
S12N-60A-APRM-31FS, Functional Check of APRM “3,” Revision 9
SI2N-60A-APRM-41FS, Functional Check of APRM “4,” Revision 10

SI2P-33-23-B1C2, Calibration Check of ESW Pump B Pressure Instruments, Revision 5
ST-I-052-22-2, E-2 Diesel Generator Inspection Post-Maintenance Instrumentation and Logic Test, Revision 9
ST-I-052-262-2, E-2 Diesel Generator Inspection Post-Maintenance Handswitch Logic Test, Revision 4
ST-O-014-306-2, CS Loop B Pump, Valve, Flow, And Cooler Functional and Inservice Test, Revision 31
ST-O-033-300-2, ESW, Valve, Unit Cooler, and ECT Fans Functional Inservice Test, Revision 40

ARs
A2037398
A2049762

IRs

259751	2472724	2661340	2661824	2662233
2672825	2672684	2674414	2681170	2686357

WOs

C0260776	R1020089	R1229369	R1229980	R1233073
R1236546	R1292170	R1229270	R1349042	

Drawings
6820-M-31, P&I Diagram Nuclear Boiler, Sheet 1, Revision 71
6280-M-315, ESW and HPSW Systems, Revision 85
6280-M-330, Emergency Cooling System, Revision 37
6820-M-333, P&I Diagram Instrument Nitrogen, Sheet 1, Revision 57

Miscellaneous
ECR 16-00186, Tube Bundle Proactive Replacement, May 4, 2016
Grace Report for Online Tests, dated April 19, 2016
Relay Trip Test Data Sheet

Section 1R20: Refueling Outage

Procedures
GP-2-2, Normal Plant Start-up, Revision 5
GP-3-2, Normal Plant Shutdown, Revision 5
GP-5-2, Power Operations, Revision 3

Section 1R22: Surveillance Testing

Procedures
ER-AA-321, Administrative Requirements for Inservice Testing, Revision 12
ER-AB-331-1006, BWR RCS Leakage Monitoring and Action Plan, Revision 2
ST-I-01G-100-2, ADS Channel 'A' Logic System Functional Test, Revision 7
ST-I-023-100-3, ECCS Logic System Functional Test, Revision 19
ST-O-020-560-3, Reactor Coolant Leakage Test, Revision 15
ST-O-052-152-3, E2 D/G Simulated Unit 3 ECCS Signal Auto Start with Offsite Power Available, Revision 10
ST-O-052-212-2, E-2 Diesel Generator Slow Start Full Load and IST Test, Revision 30

ARs
A1953038
A2040932
A2049815

IRs
2650557
*2651573
*2656318

WO
R1289015
R1343921
R1346942

Section 1EP6: Drill Evaluation

Miscellaneous
EP Drill Scenario dated June 27, 2016

Section 2RS5: Radiation Monitoring Instrumentation

Procedures
CY-AA-130-201, Radiochemistry Quality Control, Revision (Revision) 3
CY-AA-130-201-F-01, Instrument Calibration and Performance Check Quality Control Schedule, Revision 1, Instruments/Detectors: Apex Detector 1, 09/26/15; Apex Detector 3, 11/30/15; LSC TriCarb 2910T, 01/21/15; and Well Counter # 1, 01/06/11
CY-AA-130-320, Perkin Elmer (Packard) 2900TR/3100TR/4910TR Liquid Scintillation Counter, Revision 4
CY-PB-130-310, Gamma Spectrometry with Apex Gamma, Revision 0
CY-PB-130-512, Operation of the VMS Procount Gamma Spectroscopy System, Revision 4
CY-AA-130-514, Operation and Calibration of NaI Well Counter, Revision 1
PI-AA-120, Issue Identification and Screening Process, Revision 5
PI-AA-125, CAP Procedure, Revision 4
RP-AA-232, Attachment 1, "Sample" Whole Body Count Log, Revision 0, Counter Name /Location: Fastscan/Pearl, 01/01 – 06/01/16
RP-AA-700-1203, Calibration of the MGP Instruments Telepole, Revision 0
RP-AA-700-1213, Operation and Calibration of PCM-2 Whole Body Frisking Monitor, Revision 0
RP-AA-700-1214, Operation and Calibration of the PCM-1B Personnel Monitor, Revision 2
RP-AA-700-1215, Calibration of Low-Vol Air Samplers, Revision 1
RP-AA-700-1235, Operation and Calibration of the PM-12 Gamma Portals, Revision 1
RP-AA-700-1235, Operation and Calibration of the PM-12 Gamma Portals, Revision 1 Attachment 3, PM-12 Calibration Data Sheet (example), PM-12 S/Ns: 1278, 09/04/14 and 09/01/15; and 13041271, 06/08/15 and 05/26/16
RP-AA-700-1239, Operation and Calibration of the SAM-12 Small Articles Monitor, Revision 2
RP-AA-700-1240, Operation and Calibration of the Canberra Argos-5PAB Personnel Contamination Monitor, Revision 1
RP-AA-700-1239, Attachment 2, SAM-12 Calibration Data Sheet (CDS), Revision 2, Serial # 12037, 08/12/14; and 08/07/15
RP-AA-700-1240, Attachment 1, ARGOS-5 Calibration Data Sheet, Revision 2, Monitor No. 1304120, 05/22/14; and 07/13/15
RP-AA-700-1203, Calibration of the MGP Instruments Telepole, Revision 0
RP-AA-700-1213, Operation and Calibration of PCM-2 Whole Body Frisking Monitor, Revision 0

RP-AA-700-1214, Operation and Calibration of the PCM-1B Personnel Monitor, Revision 2
RP-AA-700-1215, Calibration of Low-Vol Air Samplers, Revision 1
RP-AA-700-1235, Operation and Calibration of the PM-12 Gamma Portals, Revision 1
RP-AA-700-1239, Operation and Calibration of the SAM-12 Small Articles Monitor, Revision 2
RP-AA-700-1240, Operation and Calibration of the Canberra Argos-5PAB Personnel Contamination Monitor, Revision 1
RP-AA-700-1312, Calibration of Bicron Micro Rem Survey Meters, Revision 1
RP-AA-700-1401, Operation and Calibration of Eberline Model PM-7 Personnel Contamination Monitor, Revision 2
RP-PB-700-1040, Operation of the ASP-2/2E Portable Radiation Monitor with HP-210 Probe, Revision 1
RP-PB-744, Operation and Calibration of the APTEC PMW Monitor, Revision 1
RP-PB-747, Calibration Check of the MGP Instruments DMC2000S Electronic Dosimeter (ED), Revision 0
RP-PB-771, Calibration of Eberline E-530N Geiger Counter, Revision 0
RT-C-095-858-2, Germanium Detector Calibration, Revision 4, Detector 2, 04/06/15, ST-C-095-868-3, Drywell High Range Radiation Monitor Calibration, Revision 5, Detector Nos: RE-9103A, B, C, and D, 10/04/13; and 10/12/15
ST-I-063-203-3, Refuel Floor Vent Exhaust Rad Monitor Calibration and Functional Test for RIS-3-17-458A and C, Revision 6, 06/03/16

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Apex-InVivo Analysis Reports, Background and Calibration Check QA, Counter Name, Fastscan 06/08/16
AMS-4, Inst/Serial #: 334638, 12/17/14; and 04/20/16; and GAST, Instrument/Model # 0522-V103, Inst/Serial # 16871, 10/24/14; and 09/11/15 Certificate of Calibrations, Certificate #s 0010900949, Asset/Equipment #: 077276, Manufacturer Eberline, Model # ASP-1, Serial # 2502, 08/03/15; 0010910198, Asset/Equipment # 073459, Manufacturer Eberline, Model #: RM-14, Serial # 7405, 08/30/15; 0010922364, Asset/Equipment # 079301, Manufacturer Bicron, Model # Micro Rem, Serial # A681T, 11/04/15; 0010932845, Asset/Equipment #: 076426, Manufacturer Eberline, Model # RO-2A, Serial # 3538, 12/10/14; and 01/06/16; and 0010953780, Asset/Equipment # 079156, Manufacturer MGP, Model # Telepole WR, Serial # 6605-040, 12/15/15; and 04/21/16
Calibration Data Sheets, Revision 1, Instrument Manufacturers: Eberline, Instrument/Model # Determination Report 35, 05/19/16, Response Charts for APEX Detectors 2 and 4, LSC TriCarb 2910T, and Well Counter # 2, 01/01 – 06/06/16
Instrument Out-of-Tolerance Log, 06/01/15 – 06/01/16
PB 10 CFR Part 61 Program Waste Stream Review and Scaling Factor Source Calibration Certificates, Co-60, Source No.: 1835-29-1, 09/15/15; Cs-137, Source Nos. 1815-87-2, 07/01/15, K7-899, 10/15/13, and K7-900, 10/15/13; High Range Radiation Monitor Calibrator RT-11, S/N: 053, 02/01/90; and Technetium-99, Source Nos. UK 676, 06/06/12, UK 677, 06/05/12, UK 678, 06/05/12, UK 679, 06/05/12, UK 680, 06/05/12 Source Response Check Criteria Sheets, Instrument Types/Models: ARGOS-5AB, Detector Types/Models: Gas Flow Proportional, 07/17/13, and Scintillation, 07/18/14; Eberline PM-12, Detector Type/Model 8 Plastic Gamma Scintillation Detectors Center Point Indicated by Green Sticker, 01/08/14; and Thermo Small Article Monitors SAM-12 ONLY, Detector Type/Model: Plastic Scintillation, 05/13/15
WBC Calibration Acceptance Form, Page 1 of 1, 2016, Recalibration of the Canberra Apex-InVivo Fastscan Counting System at the PB, Delta, PA, 04/14/15; and 04/13/16

IRs
01609133
02496440
02511157
02629607
02651133
02679347

Section 2RS6: Radioactive Gaseous and Liquid Effluent Treatment

Procedures
CY-AA-130-201, Radiochemistry Quality Control, Revision 3
CY-AA-130-320, Packard 2900TR 3100TR Liquid Scintillation Counter, Revision 4
CY-AA-130-3200, Tritium, Gross Alpha Beta Sample Preparation for Scintillation Counting, Revision 2
CY-AA-130-3000, Gamma Isotopic, Revision 4
CY-AA-170-000, Radioactive Effluent and Environmental Monitoring Programs, Revision 6
CY-AA-170-200, Radioactive Effluent Control Program, Revision 2
CY-AA-170-210, Potentially Contaminated System Control Program, Revision 1
CY-AA-170-215, Release of Bulk Fluids from Potentially Contaminated Plant Systems, Revision 0
CY-AA-170-300, ODCM Manual Administration, Revision 2
CY-AA-170-2000, Annual Radioactive Effluent Release Report, Revision 7
CY-AA-170-2100, Estimated Error of Effluent Measurements, Revision 0
CY-AA-170-2150, PSCS Program Implementation Guidelines, Revision 0
CY-AA-170-2300, Determination of Carbon-14 in Gaseous Effluents, Revision 0
CY-AA-170-3100, ODCM Revisions, Revision 6
CY-AA-170-3100 Attachment 2, Peach Bottom ODCM, Revision 15, Change Determination Form and Change Matrix, August 20, 2015
CY-PB-110-410, Changing the Main Stack Particulate Filters and Iodine Cartridge, Revision 2
CY-PB-110-427, Main Stack Gaseous Sampling with a Marinelli, Revision 1
CY-PB-120-402, Sampling of the 'A' Waste Sampling Tank, Revision 0
CY-PB-170-2300, Open EMS Effluent Management System Implementation, Revision 1
CY-PB-170-2100, Land Use Census, Revision 0
RT-M40K-930-2, Recombiner Building Exhaust Filter Train B Test, May 31, 2016
RT-M40L-600-2, Resin Dewatering Facility Filter Train DOP Leak Test, June 3, 2016
RT-M-40P-950-2, Technical Support Center (TSC) Ventilation System Test, January 4, 2016
RT-C-095-813-2, Determination of Radioactivity in Sewage Treatment Plant Sludge by Isotopic Analysis, Revision 4
RT-C-095-814-2, Determination of Radioactivity in Raw Sewage by Isotopic Analysis, Revision 5
RT-C-095-846-2, Analysis of Unmonitored Liquid Effluents, Revision 7
RT-C-095-847-2, Sr-89, Sr-90, Fe-55, P-32, AND H-3 Analysis in Liquid Storage with a Potential for Unmonitored Release, Revision 3
RT-C-095-876-2, Calibration of the PING 1A Monitor in the Radwaste Dewatering Building, Revision 1
RT-C-095-877-2, Operability Check of the Radwaste Dewatering Building PING-1A Monitor Using the Built In Source, Revision 3
SI2F-20-442-XXC1, Calibration Check of Radwaste Liquid Effluent Flow Instruments FIT 0-20-442, FS 0-20-493 and FR 0-20-441, Revision 7
ST-C-095-805-2, Liquid Radwaste Discharges, Revision 15
ST-C-095-833-2, P-32, Fe-55, Sr-89 AND 90, Alpha and Tritium Analysis in Liquid Radwaste, Revision 10

ST-C-095-834-2, Verification of Cumulative Dose from Liquid Radwaste, Revision 4
ST-C-095-854-2, Preparation of Annual Radioactive Effluent Report, Revision 9
ST-C-095-855-2, Analysis of Gaseous Release for Tritium, Revision 4
ST-C-095-857-2, Main Stack and Roof Vents Total Iodine and Particulate Release Rates, Revision 14
ST-C-095-858-2, Determination of Sr89, Sr90, and Alpha Activity from Main Stack and Roof Vent Particulate Filters, Revision 8
ST-C-095-859-2, Determination of Total Noble Gas Release Rates, Revision 9
ST-C-095-860-2, Determination of Cumulative Dose Contribution for Gaseous and Particulate Releases, Revision 14
ST-C-095-862-2, Determination of Instantaneous Noble Gas Release, Revision 6
ST-C-095-864-2 & 3, Off Gas Monitor Response and Release Rate Verification by a Grab Sample, Revision 2
ST-M-09A-600-2, Standby Gas Treatment System Filter Train A, June 1, 2016
ST-M-09A-600-2, Standby Gas Treatment System Filter Train A, August 20, 2015
ST-M-09A-600-2, Standby Gas Treatment System Filter Train B, January 7, 2016
ST-M-40D-905-2, CR Emergency Ventilation Filter Train A Test, January 6, 2016
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IRs
2646772
2647751

LIST OF ACRONYMS

AC	alternating current
ACE	apparent cause evaluation
ADAMS	Agencywide Documents Access and Management System
ADS	automatic depressurization system
ATWS	anticipated transient without trip
CAP	corrective action program
CFR	*Code of Federal Regulations*
CR	condition report
CS	core spray
ECCS	emergency core cooling system
EDG	emergency diesel generator
EOC	extent of condition
EPU	extended power uprate
ESW	emergency service water
GPI	groundwater protection initiative
HPCI	high pressure coolant injection
HPSW	high pressure service water
HX	heat exchanger
IMC	inspection manual chapter
IP	inspection procedure
IR	issue report
LSFT	logic system functional test
MCC	motor control center
MCR	main control room
MELLLA+	maximum extended load line limit analysis plus
MOV	motor operated valve
MR	maintenance rule
NCV	non-cited violation
NEI	Nuclear Energy Institute
NIST	National Institute of Science and Technology
NRC	Nuclear Regulatory Commission
OD	operability determination
ODCM	offsite dose calculation manual
PARS	publicly available records
PB	Peach Bottom Atomic Power Station
PD	performance deficiency
PI	performance indicator
PMT	post-maintenance testing
QA	quality assurance
RB	reactor building
RCIC	reactor core isolation cooling
RCS	reactor coolant system
REMP	radiological environmental monitoring program
RG	regulatory guide
RHR	residual heat removal
RMS	radiation monitoring system
RP	radiation protection
RTP	rated thermal power

SDP	significance determination process
SRV	safety relief valve
SSCs	structures, systems, and components
ST	surveillance test
TS	technical specification
UFSAR	Updated Final Safety Analysis Report
WOs	work orders