



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
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February 10, 2012

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

SUBJECT: PEACH BOTTOM ATOMIC POWER STATION - NRC INTEGRATED
INSPECTION REPORT 05000277/2011005 AND 05000278/2011005

Dear Mr. Pacilio:

On December 31, 2011, the U. S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3. The enclosed integrated inspection report documents the inspection results, which were discussed on January 20, 2012, with Mr. Thomas Dougherty, Peach Bottom Site Vice President, and other members of your staff.

The inspection 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.

This report documents one self-revealing finding and one inspector-identified finding of very low safety significance (Green). One finding was determined to involve a violation of NRC requirements. Additionally, two licensee-identified violations, which were determined to be of very low safety significance, are listed in this report. However, because of the very low safety significance and because they are entered into your corrective action program (CAP), the NRC is treating the findings as a non-cited violations (NCVs), consistent with Section 2.3.2 of the NRC's Enforcement Policy. If you contest any 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, U. S. NRC, Washington, DC 20555-0001; and the NRC Senior Resident Inspector at the PBAPS. In addition, if you disagree with the cross-cutting aspects assigned to the findings in this report, you should provide a response within 30 days of the date of this inspection, with the basis for your disagreement, to the Regional Administrator, Region 1, and the NRC Resident Inspector at PBAPS.

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Sincerely,

A handwritten signature in cursive script, reading "Paul G. Krohn". The signature is written in dark ink on a white background.

Paul G. Krohn, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket Nos.: 50-277, 50-278
License Nos.: DPR-44, DPR-56

Enclosure: Inspection Report 05000277/2011005 and 05000278/2011005
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Sincerely,
/RA/

Paul G. Krohn, Chief
Reactor Projects Branch 4
Division of Reactor Projects

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REGION I

Docket Nos.: 50-277, 50-278

License Nos.: DPR-44, DPR-56

Report No.: 05000277/2011005 and 05000278/2011005

Licensee: Exelon Generation Company, LLC

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

Location: Delta, Pennsylvania

Dates: October 1, 2011 through December 31, 2011

Inspectors: S. Hansell Senior Resident Inspector
A. Ziedonis, Resident Inspector
S. Barr, Senior Emergency Preparedness Inspector
E. Miller, Region 1 Project Engineer
R. Nimitz, Senior Health Physicist
J. Tomlinson, Operations Engineer
K. Young, Senior Reactor Inspector

Approved by: Paul G. Krohn, Chief
Reactor Projects Branch 4
Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000277/2011005, 05000278/2011005; 10/01/2011 - 12/31/2011; Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3; Maintenance Effectiveness and Radioactive Gaseous and Liquid Effluent Treatment.

The report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. One self-revealing (Green) finding and one inspector-identified finding were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspect associated with the findings was determined using IMC 0310, "Components Within the Cross-Cutting Areas." Findings for which the SDP does not apply may be Green, or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

Green. The inspectors determined that Exelon's failure to promptly correct a condition adverse to quality associated with a safety-related motor-operated valve (MOV) constituted a Green, self-revealing NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action." Specifically, corrective actions to prevent recurrence of MOV program testing failures due to degraded stem lubrication in 2009 were not performed in a timely manner to prevent the inoperability of a safety-related MOV due to degraded lubrication, as identified on September 22, 2011. PBAPS entered this issue into the CAP via issue reports (IRs) 1266600 and 1266604.

This finding was more than minor because it was associated with the configuration control attribute of the Barrier Integrity (BI) cornerstone and affected the cornerstone objective of providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the Unit 3 reactor water cleanup (RWCU) outboard isolation valve MO-3-12-018 did not develop sufficient thrust at the torque switch trip setpoint during diagnostic testing on September 22, 2011. The RWCU MOV would not have been able to perform its safety function to close during the most limiting design condition. Using the Phase 1 worksheet in Appendix 4 of IMC 0609, "SDP," the finding affected the BI cornerstone and was of very low safety significance (Green) because it did not represent an actual open pathway in the physical integrity of containment.

This finding had a cross-cutting aspect in the area of Problem Identification & Resolution (PI&R), CAP, because Exelon did not take appropriate corrective actions to address the adverse trend of degraded stem lubrication on a safety-related MOV in a timely manner (Section 1R12) [P.1(d)].

Cornerstone: Public Radiation Safety

Green. The inspectors identified a Green finding associated with the failure to establish, implement, and maintain adequate quality assurance (QA) program elements in the area

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of effluent and environmental monitoring as required by Peach Bottom, Units 2 and 3 Technical Specification (TS), Section 5.4.1. Specifically, Exelon's QA program for effluent and environmental monitoring was not sufficient to ensure: 1) that both adequate and timely evaluation and assessment of changes described in the Public Land Use Census were conducted for purposes of dose validation and sampling program modification; 2) that changes in meteorological parameters, used for public dose projections and assessment, were promptly and adequately evaluated; and 3) that laboratory QA programs for effluent and environmental sample analysis measurement systems were adequate and implemented properly. Exelon placed these issues in its CAP as Action Requests (ARs): 1226969, 1226202, 1299543, 1299476, 1302720, and 1303308.

The finding is more than minor because it is associated with the Public Radiation Safety cornerstone attribute of programs and processes and adversely affected the associated cornerstone objective in that failure to establish, implement, and maintain an adequate QA program in the effluents and environmental monitoring program area adversely affected the licensee's ability to ensure adequate protection of public health and safety. The finding was assessed for significance using IMC 0609, Appendix D, and determined to be of very low safety significance (Green) because: the issue was contrary to TSs and is a radioactive effluent release program deficiency; there was no indication of a spill or release of radioactive material on the licensee's site or to the offsite environs that would impact public dose assessment, and there was no substantial failure to implement the radioactive effluent release program. The licensee re-assessed the dose to members of the public from routine releases and determined that projected doses did not, nor were likely to, exceed applicable limits, including as low as is reasonably achievable (ALARA) design specifications of 10 CFR Part 50, Appendix I; or 10 CFR 20.1301(e). The cause of this finding is related to the cross-cutting area of Human Performance, Work Practices, Aspect H.4(b) because the licensee did not ensure personnel followed procedure compliance requirements activities for effluent and environmental monitoring program. (Section 2RS06) [H.4(b)].

Other Findings

Two violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by Exelon have been entered into the CAP. These violations and the corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 2 began the inspection period at 100 percent rated thermal power (RTP). On November 19, 2011, operators reduced power to approximately 80 percent to perform main turbine valve testing, and planned maintenance on the 'C' reactor feed pump (RFP). The unit was returned to 100 percent RTP the next day. The unit remained at RTP through the end of the inspection period, except for brief periods to support planned testing and rod pattern adjustments.

Unit 3 began the inspection period shutdown for the 18th refueling outage (RFO) (P3R18). On October 13, the reactor mode switch was placed in start-up and the unit was synchronized to the grid on October 14. On October 17, the unit was returned to 100 percent RTP. On October 26, an unplanned downpower was performed to approximately 79 percent to remove the 'B' RFP from service to repair an oil leak in the feed pump turbine speed control hydraulic system. The unit was returned to 100 percent RTP later that same day following successful repairs. On November 30, an emergent downpower to approximately 94 percent was performed to swap the in-service lubricating oil pump for the 'B' recirculation pump motor generator (MG) set due to elevated noise and vibrations associated with the 'E' lube oil pump. After placing the 'F' lubricating oil pump in-service, the unit was returned to 100 percent power later that same day. Unit 3 remained at RTP until the end of the inspection period, except for brief periods to support planned testing and rod pattern adjustments.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 - 1 sample)

Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors performed a review of PBAPS's readiness for the onset of seasonal cold temperatures. The review focused on the auxiliary boiler system heating steam supply, emergency diesel generators (EDGs), emergency service water (ESW) and high pressure service water (HPSW) pump rooms, the outer intake cooling water pump structure building, and the inner intake cooling water screen structure. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), Technical Specifications (TSs), control room logs, and the CAP to determine what temperatures or other seasonal weather could challenge these systems, and to ensure PBAPS personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including PBAPS's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during cold weather conditions. The inspectors also reviewed CAP items to verify that PBAPS was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures. Documents reviewed for each section of this inspection report are listed in the Attachment.

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b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04Q - 3 samples)

Partial System Walkdowns

a. Inspection Scope

The inspectors performed partial walkdowns of the following three systems:

- Unit 3, alternate reactor pressure vessel injection with residual heat removal (RHR), on October 11, 2011
- Unit 3, standby liquid control (SLC) during Unit 2 SLC unavailability on November 15, 2011
- E-4 EDG availability during E-3 fuel oil transfer pump suction problem on December 14, 2011

The inspectors selected these systems based on their risk-significance relative to the Reactor Safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, TSs, work orders (WOs), condition reports (CRs), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors 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 PBAPS staff had properly identified equipment issues and entered them into the CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05Q - 5 samples)

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 PBAPS 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 3, reactor building (RB) north and south control rod drive equipment areas, elevation 135'-0 inches on November 9 (Fire Zones PF-13H and 13P)
- Unit 3, refuel floor, elevation 234'-0 inches on November 9 (Fire Zone PF-55)
- Unit 2, RB closed loop cooling water room, elevation 116'-0 inches on November 10 (Fire Zone PF-5F)
- Unit 2 reactor recirculation MG and alternate shutdown area on November 10 (Fire Zone PF-4C)
- HPSW and ESW intake structure on November 14 (Fire Zone 144)

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11)

.1 Resident Inspector Quarterly Review (71111.11Q - 1 sample)

a. Inspection Scope

The inspectors observed licensed operator simulator training on November 7, which included a loss of offsite electrical power with a failure of one emergency bus to load, failure of the reactor core isolation cooling (RCIC) system to operate, and a failure of high pressure coolant injection (HPCI) system to automatically start. 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 classification made by the shift manager (SM), the SM's identification of TS action statements, and the shift technical advisor's verification of the SM's decisions. 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 In-office Review of Licensee Administered Annual Operating Tests and Written Exams for Limited Refueling Senior Reactor Operators (71111.11B - 1 sample)

a. Inspection Scope

On December 21, 2011, one NRC region-based inspector conducted an in-office review of the licensee-administered annual operating tests and comprehensive written exam results for Limerick and Peach Bottom Limited Refueling Senior Reactor Operators for 2011. The inspection assessed whether pass rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, "Operator Regualification Human Performance SDP." The inspector verified that:

- Individual pass rates on the written exam were greater than 80 percent.
(Pass rate was 100 percent)

- Individual pass rates on the job performance measures of the operating exam were greater than 80 percent. (Pass rate was 91 percent)
- Individual pass rates on the simulator operating exam were greater than 80 percent. (Pass rate was 100 percent)
- Overall pass rate among individuals for all portions of the exam was greater than or equal to 75 percent. (Overall pass rate was 91 percent)

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 PBAPS 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 PBAPS 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). Additionally, the inspectors ensured that PBAPS staff was identifying and addressing common cause failures that occurred within and across MR system boundaries.

- Unit 3 RWCU system leaks on October 16 and 22, 2011
- Unit 3 RWCU outboard isolation MOV diagnostic testing failure and degraded lubrication on November 14, 15, and 21, 2011

b. Findings

Introduction. The inspectors determined that Exelon's failure to promptly correct a condition adverse to quality associated with a safety-related MOV constituted a Green, self-revealing NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action." Specifically, corrective actions to prevent recurrence of MOV program testing failures due to degraded stem lubrication in 2009 were not performed in a timely manner to prevent the inoperability of a safety-related MOV due to degraded lubrication, as identified on September 22.

Description. During as-found diagnostic testing performed by Exelon on September 22, the Unit 3 RWCU outboard MOV MO-3-12-018 did not develop sufficient thrust at the torque switch trip setpoint to ensure that the valve would close under the most limiting design basis differential pressure scenario. Subsequent inspection by Exelon maintenance personnel determined that the MOV stem lubrication, Exxon Nebula EP-1, was dry and caked on the valve stem with no functioning lubricant on the stem threads. PBAPS determined that the cause of the underthrust condition was attributed to degraded stem lubrication and the resultant increased coefficient of friction on the valve

stem. Immediate corrective actions included cleaning and removing the Nebula EP-1 grease, applying MOV Long-Life grease to the valve stem, and performing successful as-left diagnostic testing. PBAPS's extent-of-condition (EOC) efforts are summarized in the last paragraph of the "Description" section of this finding.

PBAPS root cause evaluation report 892191-08 determined that degraded MOV stem lubrication resulted in four safety-related MOV program test failures in March and April of 2009. PBAPS performed multiple corrective actions to address the 2009 MOV program testing failures, as well as an EOC scoping that included inspection, diagnostic testing, and/or corrective maintenance on 45 safety-related MOVs in March and April of 2009. Additional corrective actions included revising MOV program procedures and preventive maintenance (PM) frequencies. PBAPS also identified degraded Nebula EP-1 grease on MOV program valves in 2006, 2007, and 2008, as discussed in root cause evaluation report 892191-08, Attachment 1. The root cause evaluation identified that PBAPS had the longest allowable MOV PM lubrication intervals (10 years) in the United States nuclear industry. Another factor related to MOV stem lubrication, the vendor cancelled production of Nebula EP-1 in 2001, stating a one-year limited shelf life. Additionally, Exelon internal operating experience identified a MOV test failure due to degraded stem lubrication at Braidwood on June 21, 2010. As a result of the PBAPS and Braidwood degraded MOV grease events, Exelon has initiated corporate actions to transition all sites from Nebula EP-1 to MOV Long-Life by the end of 2014.

Root cause evaluation report 892191-08 required changing the MOV stem lubricant to MOV Long-Life grease as a corrective action to prevent recurrence of MOV program testing failures due to degraded stem lubrication. PBAPS implemented a risk-informed (high, medium and low risk) corrective action plan based on the level of susceptibility to degraded stem lubrication. RWCU outboard isolation valve MO-3-12-018 was included in the "medium," risk population of MOV program valves that had not yet been converted to MOV Long-Life grease at the time of the diagnostic test failure on September 22. MO-3-12-018 was scheduled for PM and conversion to MOV Long-Life following as-found diagnostic testing, which constituted a six-year PM interval. PBAPS identified that the MOV program scoping for MO-3-12-018 did not include the correct high temperature stem factor, which would have reduced the PM frequency to four years.

At the close of the inspection period, PBAPS had transitioned 128 of the 182 MOV program valves to MOV Long-Life grease. In addition to the previously discussed corrective actions in response to the MO-3-12-018 degraded grease, PBAPS performed an EOC review of all MOVs that have not yet been converted to MOV Long-Life grease, including MOV program calculations to identify additional errors such as the aforementioned high temperature stem factor on MO-3-12-018. Field walkdowns were also performed on all Unit 3 MOVs with Nebula EP-1 grease, as well as all accessible Unit 2 MOVs with Nebula EP-1 grease. Based on the EOC review, 14 MOVs had their grease conversion dates moved forward. Additionally, PBAPS has expedited corrective actions to complete the MOV Long-Life conversion on all MOV program valves from December 2014 to December 2013. The NRC inspectors reviewed the final EOC scoping and determination performed by PBAPS, and found that it was appropriate to the circumstances.

Analysis. The inspectors determined that Exelon's failure to promptly correct a condition adverse to quality associated with a safety-related MOV constitutes a performance deficiency. Specifically, degraded Exxon Nebula EP-1 stem lubricant caused RWCU

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outboard isolation valve MO-3-12-018 to fail diagnostic testing on September 22, 2011, after a root cause evaluation required changing the stem lubricant to MOV Long-Life grease to prevent recurrence of multiple safety-related MOV diagnostic testing failures in March and April of 2009. This finding was more than minor because it was associated with the containment configuration control attribute of the Barrier Integrity cornerstone and affected the cornerstone objective of providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the RWCU outboard isolation valve MO-3-12-018 did not develop sufficient thrust at the torque switch trip setpoint during diagnostic testing on September 22, 2011, and therefore would not have been able to perform its safety function to close during the most limiting design condition. Using the Phase 1 worksheet in Attachment 4 of IMC 0609, "SDP," the inspectors determined that this finding was of very low safety significance (Green) because it did not represent an actual open pathway in the physical integrity of reactor containment.

This finding had a cross-cutting aspect in the area of PI&R, CAP, because Exelon did not take appropriate corrective actions to address a safety issue in a timely manner [P.1(d)]. Specifically, Exelon failed to address the adverse trend of degraded MOV stem lubricant in a timely manner, which resulted in loss of the RWCU outboard isolation valve closing safety function for the most limiting design condition.

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," states, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to the above, Exelon failed to promptly correct a condition adverse to quality associated with degraded stem lubrication on RWCU outboard isolation valve MO-3-12-018. Specifically, root cause evaluation 892191-08 required Exelon to change MOV stem lubrication from Nebula EP-1 to MOV Long-Life, as a corrective action to prevent recurrence of multiple MOV program testing failures due to degraded stem lubrication identified in 2009. As a consequence of Exelon's failure to promptly correct this condition adverse to quality, MO-3-12-018 failed diagnostic testing due to degraded Nebula EP-1 stem lubrication on September 22, 2011. Because this finding is of very low safety significance and has been entered into the CAP via IRs 1266600 and 1266604, this violation is being treated as a Green NCV consistent with the NRC Enforcement Policy. **(NCV 05000278/2011005-01, Untimely Corrective Action to Correct MOV Degraded Stem Lubrication)**

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 - 3 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 PBAPS 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 cornerstone. As applicable for each activity, the inspectors verified that PBAPS personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When PBAPS 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

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TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Unit 3 average power range monitor (APRM) 2-out-of-4 voter failure on November 4, 2011
- E-2 EDG emergent work on November 8 and 10, 2011
- E-2 EDG declared inoperable due to voltage regulator malfunction and emergent work on December 5, 2011

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 - 5 samples)

a. Inspection Scope

The inspectors reviewed five operability determinations for the following degraded or non-conforming conditions:

- Operability Evaluation 11-003: Control rod seismic impact from fuel channel friction on October 6, 2011
- Technical Evaluation 1268076-02: Past operability review of Unit 3 automatic depressurization system valve 71B on November 3, 2011
- Unit 2 reactor feedwater pump control station loss of power on November 10, 2011
- Unit 3 SLC tank temperature control degraded equipment on November 15, 2011
- Primary containment overpressure credit for emergency core cooling pumps on November 23 and 29, 2011

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations 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 PBAPS's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by PBAPS. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 - 1 sample)

Permanent Modifications

a. Inspection Scope

The inspectors evaluated the permanent modification to the Multiple Spurious Operation Motor Control Center Breaker implemented by Engineering Change Request (ECR) 10-00449, "Multiple Spurious Operation Motor Control Center Breaker Rework" on November 16 and 17. The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the upgrade and design change, which included 10 CFR Part 50.59 documentation and post-modification testing results. The inspectors also conducted field walkdowns of the modifications to verify that the temporary modifications did not degrade the design bases, licensing bases, and performance capability of the affected systems.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 - 8 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 ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure was consistent with the information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

- Unit 3 main steam isolation valve (MSIV) stroke timing on October 3, 2011, following P3R18 maintenance activities
- Unit 3 E-23 vital bus loss of coolant accident (LOCA) / loss of offsite power (LOOP) testing on October 5, 2011, following planned maintenance
- Unit 3 low pressure turbine acceptance testing during start-up between October 14 and 17, 2011, following P3R18 retrofit modification
- Unit 3 'B' reactor protection system (RPS) MG set between October 23 to 24, 2011, following flywheel inboard bearing replacement
- Unit 2 MO-2-10-154B last performed diagnostic test on May 18, 2011, following planned maintenance
- Unit 3 APRM 3 voter card replacement and partial surveillance test (ST) SI3N-60A-APRM-31FS on November 4, 2011
- Unit 3 M-004-400 reactor vessel head bolt tensioning verification in response to industry operating experience on November 29, 2011
- E-1 EDG inspection post-maintenance functional test on November 28 and 29, 2011 following two-year maintenance overhaul

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 - 1 sample)Peach Bottom Unit 3 Outage - Refueling (P3R18)a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 3 maintenance and refueling outage (3R18), which was conducted September 11 through October 14, 2011. This sample completes the inspection activity begun in the PBAPS 3rd quarter 2011 inspection report, 2011005. The inspectors reviewed PBAPS's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and cooldown processes and monitored controls associated with the following outage activities:

- Refueling Activities - verified that PBAPS was using adequate controls to ensure the location of the fuel assemblies were properly tracked and verified that procedures for foreign material control and retrieval were implemented on the refueling floor
- Core Verification - independently reviewed selected portions of other core verification activities
- Torus Closure - conducted a thorough walkdown of accessible torus areas above the suppression pool water line prior to reactor startup to verify that all debris, tools, and diving gear were removed
- Drywell Closure - conducted a thorough inspection and walkdown of containment prior to reactor startup to identify any remaining debris, tools, and equipment were removed prior to reactor startup
- Reactor Startup Preparations – reviewed the tracking of startup prerequisites and observed selected Plant Operations Review Committee meetings where outstanding outage issues and startup reviews were discussed
- Startup and Ascension to Full Power Operation – observed selected activities including: reactor criticality; portions of the plant heat-up, main generator synchronization to the grid; portions of the power ascension to full power operation
- Licensee Identification and Resolution of Problems - reviewed corrective action reports related to RFO and startup activities to verify that PBAPS was identifying issues at the appropriate level and taking adequate corrective action

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 - 3 samples)a. Inspection Scope (2 routine surveillances; 1 in-service test (IST))

The inspectors observed performance of surveillance tests (STs) and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied TSs, the UFSAR, and PBAPS 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:

- RT-O-010-304-3, RHR/HPSW system valves alternate control testing on November 14 and 15
- ST-O-023-301 -2, Unit 2 HPCI Pump, Valve, Flow, and Unit Cooler IST on December 12
- ST-O-052-154-2, E-4 EDG Simulated Unit 2 Emergency Core Cooling System (ECCS) Signal Auto Start with Offsite Power Available on December 21

b. Findings

No findings were identified.

Emergency Preparedness (EP)1EP6 Drill Evaluation (71114.06 - 1 sample)a. Inspection Scope

The inspectors evaluated the conduct of a routine PBAPS emergency drill on December 5 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 discussed the results of the station drill critique with the lead drill controller, and reviewed the items entered into the CAP, to compare inspector observations with those identified by PBAPS staff in order to evaluate PBAPS's critique and to verify whether the PBAPS staff was properly identifying weaknesses in the CAP.

b. Findings

No findings were identified.

2. RADIATION SAFETY**Cornerstone: Occupational Radiation Safety (OS)**

2RS01 Access Control to Radiologically Significant Areas (71124.01 – 1 sample)

a. Inspection Scope

The inspectors reviewed selected activities, and associated documentation, in the below listed areas. The evaluation of Exelon's performance was against criteria contained in Title 10 of the CFR Part 20, applicable TSs, and applicable station procedures.

Inspection Planning

The inspectors reviewed Performance Indicators (PIs) for the Occupational Exposure cornerstone.

Radiological Hazard Assessment

The inspectors conducted walkdowns of the facility, including the dry-active waste collection location and the low-level waste storage facility, including associated yard area, to evaluate material and radiological conditions. The inspectors made independent radiation measurements to verify conditions. During the walk-downs the inspectors selectively reviewed survey data, as available.

The inspectors selectively reviewed radiologically risk-significant work activities that involve exposure to radiation. The inspectors verified that appropriate pre-work surveys were performed. The inspectors evaluated the radiological survey program to determine if hazards were properly identified (e.g., discrete particles, hard-to-detect radionuclides, transient radiation dose rates and dose rate gradients).

Instructions to Workers

The inspectors selectively reviewed occurrences where a worker's electronic dosimeter noticeably malfunctioned or alarmed to verify appropriate worker response and inclusion of issues in CAP, as applicable. The inspectors evaluated licensee dose evaluations as applicable for these occurrences.

Contamination and Radioactive Material Control

The inspectors observed locations where the licensee monitors potentially contaminated material leaving the Radiological Controlled Area (RCA), and inspected the methods used for control, survey, and release from these areas. The inspectors selectively evaluated the radiation monitoring instrumentation sensitivity for the type(s) of radiation present.

Radiological Hazards Control and Work Coverage

The inspectors toured the facility and evaluated ambient radiological conditions (e.g., radiation levels or potential radiation levels).

The inspectors conducted selective inspection of posting and physical controls for high radiation areas (HRAs) and very high radiation areas (VHRAs), to verify conformance with the Occupational PI.

Radiation Worker Performance

The inspectors selectively reviewed radiological problem reports since the last inspection to identify human performance errors and to determine if there were any observable patterns. The inspectors discussed corrective actions for identified concerns with licensee personnel.

Radiation Protection Technician Proficiency

The inspectors selectively reviewed outage radiological problem reports to identify those that indicate the cause of the event to be radiation protection technician error and to evaluate corrective action approach taken by the licensee to resolve the reported problems. The inspectors discussed corrective actions for identified concerns with licensee personnel.

Problem Identification and Resolution

The inspectors determined if problems associated with radiation monitoring and exposure control were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee CAP. The inspectors discussed corrective actions for identified concerns with Exelon personnel.

b. Findings

No findings were identified.

2RS02 Occupational As Low As is Reasonably Achievable Planning and Controls (71124.02 – 1 sample)

a. Inspection Scope

Inspection Planning

The inspectors selectively reviewed pertinent information regarding plant collective exposure history, current exposure trends, and ongoing or planned activities in order to assess current performance and exposure challenges. The inspectors reviewed as low as is reasonably achievable (ALARA) results associated with the 2011 Unit 3 outage. The inspectors selectively reviewed conformance with the ALARA program aspects of 10 CFR 20.1101.

Radiological Work Planning

The inspectors selectively compared accrued results achieved (dose rate reductions, person-rem used), as available, with the intended dose established in the licensee's ALARA planning for selected work activities (Unit 3 2011 outage) including person-hour estimates. The inspectors focused on work activities with an accrued dose of five person-rem. The inspectors determined, as applicable, and where analyses were completed at the time of the inspection, the reasons for inconsistencies between intended and actual work activity doses.

The inspectors determined if post-job (work activity) reviews were conducted and if identified problems were entered into the CAP including lessons learned.

The inspectors selectively reviewed 2011 Station ALARA Committee meeting minutes. The inspectors selectively reviewed outage report information collected and assembled as of the date of the inspection.

Verification of Dose Estimates and Exposure Tracking

The inspectors selectively verified work activities that Exelon had established measures to track, trend, and if necessary to reduce, occupational doses for ongoing work activities. The inspectors reviewed control rod drive work, recirculation pump work, in-vessel work, scaffolding, Unit 3 main condenser work, and reactor disassembly and re-assembly.

Source Term Reduction and Control

The inspectors discussed source term mitigation effectiveness with licensee staff associated with the Unit 3 outage.

Problem Identification and Resolution

The inspectors determined if problems associated with ALARA planning and controls were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee CAP. The inspectors discussed corrective actions for identified ALARA concerns with Exelon personnel.

b. Findings

No findings were identified.

2RS03 In-Plant Airborne Radioactivity Control and Mitigation (71124.03 – 1 sample)

a. Inspection Scope

Inspection Planning

The inspectors reviewed the reported PIs to identify any related to unintended dose resulting from intakes of radioactive materials.

Problem Identification and Resolution

The inspectors reviewed and discussed problems associated with the control and mitigation of in-plant airborne radioactivity to evaluate the licensee's identification and resolution of issues in the CAP.

b. Findings

No findings were identified.

2RS04 Occupational Dose Assessment (71124.04 – 1 sample)

a. Inspection Scope

Inspection Planning

The inspectors selectively reviewed licensee procedures associated with dosimetry operations. The inspectors evaluated procedure guidance for personnel monitoring.

External Dosimetry

The inspectors evaluated the use of the licensee's personnel dosimeters that require processing were National Voluntary Laboratory Accreditation Program (NVLAP) accredited. The inspectors determined if the licensee used a "correction factor" to address the response of the electronic dosimeter (ED) as compared to its thermoluminescent dosimeter (TLD) for situations when the ED must be used to assign dose.

Internal Dosimetry

The inspectors selectively reviewed routine bioassay (in vivo) procedures and whole body count results used to assess dose from potentially internally deposited nuclides using whole body counting equipment.

Special Dosimetry Situations

The inspectors selectively reviewed exposure results, and monitoring controls employed, associated with declared pregnant individuals during the current assessment period.

The inspectors selectively reviewed the licensee's implementation of monitoring for external dose for the Unit 3 outage in situations in which non-uniform fields are expected or large dose rate gradients (i.e., use of multi-badging or determination of effective dose equivalent for external exposures (EDEXs) using an NRC approved method).

Neutron Dose Assessment

The inspectors selectively evaluated the licensee's neutron dosimetry program, including dosimeter type(s) and/or survey instrumentation.

Shallow Dose Equivalent

The inspectors selectively reviewed personnel contamination instances to evaluate frequency, causes, and dose assessment, as appropriate. The inspectors also discussed identification and logging of personnel contamination occurrences during the Unit 3 outage including actions taken to identify and limit personnel contamination events. The inspectors reviewed a common cause analysis associated with personnel contamination events (AR 1268194).

Dose Assignment

The inspectors evaluated assignment of dose of record for total effective dose equivalent, shallow dose equivalent, and lens dose equivalent.

Problem Identification and Resolution

The inspectors selectively reviewed corrective action documents to verify that problems associated with occupational dose assessment were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee's CAP. The inspectors discussed corrective actions for identified concerns with Exelon personnel.

b. Findings

No findings were identified.

2RS05 Radiation Monitoring Instrumentation (71122.05 - 1 sample)

a. Inspection Scope

Inspection Planning

The inspectors reviewed the plant updated final safety analysis report (UFSAR), as applicable, to identify radiation instruments associated with monitoring area radiological conditions, including airborne radioactivity, process streams, effluents, materials/articles, and workers.

Walkdowns and Observations

The inspectors selected portable survey instruments in use or available for issuance and checked calibration and source check stickers for currency, and to assess instrument material condition and operability.

Calibration and Testing Program

The inspectors selectively reviewed calibration of Units 2 and Unit 3 drywell high range monitors. The inspectors selectively verified electronic calibration and source calibration.

The inspectors selectively reviewed and discussed the licensee's capability to collect high range, post-accident iodine effluent samples.

The inspectors selectively reviewed and discussed high-range effluent monitor calibrations.

Problem Identification and Resolution

The inspectors selectively reviewed corrective action documents associated with radiation monitoring instrumentation to determine if the licensee identified issues at an appropriate threshold and placed the issues in the CAP for resolution. In addition, the

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inspectors evaluated the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involve radiation monitoring instrumentation. The inspectors discussed corrective actions for identified concerns with Exelon personnel.

b. Findings

No findings were identified.

Cornerstone: Public Radiation Safety (PS)

2RS06 Radioactive Gaseous and Liquid Effluent Treatment (71124.06 - 1 sample)

a. Inspection Scope

Offsite Dose Calculation Manual (ODCM) and UFSAR Reviews

The inspectors selectively reviewed UFSAR descriptions of the radioactive effluent monitoring systems, treatment systems, and effluent flow paths.

The inspectors selectively reviewed changes to the ODCM made by the licensee since the last inspection to identify differences.

The inspectors discussed, and selectively determined, if the licensee had identified any non-radioactive systems that have become contaminated as disclosed either through an event report or are documented in the ODCM since the last inspection. The inspectors selectively determined if any newly contaminated systems had an unmonitored effluent discharge path to the environment.

Walk downs and Observations

The inspectors selectively walked down components of the gaseous and liquid discharge systems to verify equipment configuration, flow paths, and material conditions.

The inspectors selectively reviewed liquid waste discharge permits.

Sampling and Analyses

The inspectors selectively reviewed, as available, effluent discharges made with inoperable (declared out-of-service) effluent radiation monitors to verify that controls were in-place to ensure compensatory sampling was performed consistent with the Radiological Effluents Technical Specification (RETS)/ODCM.

The inspectors selectively determined if the facility was relying on the use of compensatory sampling in lieu of adequate system maintenance.

The inspectors selectively reviewed the results of the inter-laboratory and intra-laboratory comparison program to verify the quality of the radioactive effluent sample analyses.

Dose Calculations

The inspectors selectively reviewed liquid and gaseous waste discharges to verify that the projected doses to members of the public were accurate and based on representative samples of the discharge path.

The inspectors selectively evaluated the methods used to determine the isotopes that were included in the source term to ensure all applicable radionuclides were included, within detection standards.

The inspectors selectively reviewed changes in the licensee's offsite dose calculations since the last inspection to verify changes were consistent with the ODCM and Regulatory Guide (RG) 1.109. The inspectors also reviewed meteorological dispersion and deposition factors used in the ODCM and effluent dose calculations to ensure appropriate factors were being used for public dose calculations.

The inspectors reviewed the latest Public Land Use Census to verify that changes had been factored into the dose calculations and to verify calculated doses were within the 10 CFR Part 50, Appendix I and TS dose criteria.

The inspectors selectively reviewed, as available, abnormal gaseous or liquid tank discharges and associated dose calculations, evaluations, and corrective actions.

Ground Water Protection Initiative Implementation

The inspectors selectively reviewed implementation of the ground water monitoring program. The inspectors reviewed monitoring results of the Ground Water Protection Initiative (GPI) to determine if the licensee had implemented its program as intended and to identify any anomalous or missed results and to determine if the licensee had identified and addressed deficiencies through its CAP.

Problem Identification and Resolution

The inspectors verified that problems associated with the effluent monitoring and control program were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the CAP. The inspectors discussed corrective actions for identified concerns with Exelon personnel.

b. Findings

Introduction. The inspectors identified a Green Finding associated with failure to establish, implement, and maintain adequate QA program elements in the area of effluent and environmental monitoring as required by Peach Bottom Units 2 and 3 TSs Section 5.4.1.c, "Quality assurance for effluent and environmental monitoring." Specifically, Exelon's QA program for effluent and environmental monitoring was not sufficient to ensure: 1) that both adequate and timely evaluation and assessment of changes described in the 2010 Public Land Use Census were conducted for purposes of dose validation and sampling program modification; 2) that changes in meteorological parameters, used for public dose projections and assessment, were promptly and

adequately evaluated; and 3) that laboratory quality assurance programs for effluent and environmental sample analysis measurement systems were adequate and implemented properly.

Description. Peach Bottom Units 2 and 3 TSs require in Section 5.4.1.c, among other requirements, that QA procedures for effluent and environmental monitoring be established, implemented, and maintained.

Exelon established various effluent and environmental monitoring QA program procedures to provide QA for important elements of the effluent and environmental monitoring program that could collectively and individually impact public dose projections attributable to effluent releases from the Peach Bottom Station. These QA elements covered such matters as: 1) evaluation of public land use around the station to ensure dose pathway analyses were conducted taking into consideration current land use around the facility; 2) evaluation of changes to important meteorological parameters used for public dose projection; and 3) various laboratory QA program elements to provide assurance that onsite and vendor laboratories were providing acceptable analytical results. The inspectors identified six examples where the effluent and environmental QA program was ineffective as follows:

- Exelon did not conduct an evaluation of its 2010 Land Use Census results in accordance with Procedure CY-AA-170-1000, Revision 5, "Radiological Environmental Monitoring Program and Meteorological Program Implementation." The evaluation supports the determination, from a QA perspective, of the need for additional new monitoring stations (compensatory measures) based on changes in the land use and calculated dose or dose commitment. Procedure CY-AA-170-1000 required in section 4.5, that the census be reviewed against the requirements listed in the station's ODCM, and the ODCM required that compensatory measures be taken to add new environmental monitoring locations, within 31 days, if needed. Exelon had completed its 2010 Land Use Census (dated January 4, 2011) for Peach Bottom and provided a summary of the census to the NRC in its May 31, 2011, Annual Radiological Operating Report (No. 68). Exelon subsequently conducted an evaluation of the 2010 Land Use Census in July 2011, which included new information, and concluded no change in monitoring was required. Exelon placed this issue into its CAP (AR 1226969).
- Exelon did not conduct an assessment of its long term meteorological data to compare the 2010 annual meteorology values of X/Q (dispersion factor) and D/Q (deposition factor) against long term averages to determine if non-conservative trends existed. Exelon Procedure CY-AA-170-1000, Revision 5, "Radiological Environmental Monitoring Program and Meteorological Program Implementation," required in Section 4.3.4, that the annual meteorological X/Q (dispersion) and D/Q (deposition) values be compared to the long term historical X/Q and D/Q values for significant changes in a non-conservative direction. The procedure required that if the values were found to be trending non-conservatively higher over a period of time, then action was to be initiated, including initiating the corrective action process, if there was a gap between ODCM requirements and sample locations. Exelon subsequently compared the data in June 2011 and placed this issue in the CAP (AR 1226202).

- The inspectors identified that Exelon's QA program for meteorological data evaluation failed to detect that the existing ground-level meteorological X/Q value, for the Units 2 and 3 vent stacks, used in the ODCM for purposes of dose projection, was non-conservative relative to the latest calculated long term meteorological average values resulting in potential incorrect dose calculations. Exelon subsequently evaluated this new data in December 2011 and concluded there was no significant change in critical sector dose projections and that public dose projections continued to be well within 10 CFR Part 50, Appendix I, ALARA design values and 10 CFR 20.1301(e). Exelon placed this issue into its CAP (AR 1299543).
- The inspectors identified that Exelon did not conduct an evaluation of its first, second, and third quarter 2011 inter-laboratory cross-check samples to determine if sample analyses met applicable QA requirements, as required by Procedure CY-AA-130-201, Revision 1, "Radiochemistry Quality Control," Section 4.3. The cross-check samples that were not evaluated included: tritium; gross alpha; Sr-89/90; and filter gas and solid samples. The inter and intra laboratory samples were subsequently evaluated in December 2011 using the criteria within Procedure CY-AA-130-201, Attachment F. Exelon placed this issue into its CAP (AR1299476).
- The inspectors identified that Exelon's QA program did not ensure that actual QA sample analysis results, obtained from a vendor laboratory for analysis, were subsequently critically evaluated against applicable criteria specified in procedures. Exelon did not conduct its onsite biennial evaluation for liquid tritium analysis during second quarter 2011 sampling activity, in that a traceable standard was not analyzed onsite in accordance with the QA program requirements specified in CY-AA-130-201 Revision 1. Exelon subsequently placed this issue into its CAP (AR 1302720), and successfully performed the analysis in December 2011.
- The inspectors identified that Exelon's QA cross-check procedure, RT-C-095-861-2, "Radiochemistry Intra-laboratory Cross-Check Analysis Program," did not contain sufficient guidance to ensure appropriate analytical data was used for sample inter-comparison resolution. Exelon subsequently identified similar concerns in other cross-check procedures. In addition, incorrect sample inter-comparison analysis results were identified (e.g., November 14, 2011 tritium sample analysis). Exelon placed this issue into its CAP (AR 1303308) to correct the procedural deficiencies and re-perform the cross-check using appropriate analytical methods.

Given the identified issues, Exelon conducted extensive re-analysis of projected offsite doses taking into consideration new Land Use Census data as well as the identified changes in meteorological parameters. Exelon concluded there was no significant impact on public doses and public dose projections remained well within 10 CFR Part 50 Appendix I ALARA design specifications. Exelon also reviewed environmental sample data and did not identify any anomalous results. Exelon also evaluated those samples results (as well as inter-comparison results) that had not been critically evaluated (or incorrectly evaluated) and concluded, based on data review, that the sample results met comparison criteria once evaluated properly. Exelon was continuing its data review. Further, Exelon conducted a liquid tritium analysis and concluded that the analysis results were within acceptance criteria. The inspectors discussed and selectively reviewed Exelon's analyses and did not identify any significant dose consequence.

Analysis. Exelon did not establish, implement, and maintain an adequate QA program in the area of effluent and environmental monitoring as required by Peach Bottom Units 2 and 3 TSs, Section 5.4.1.c, for elements of its effluent and environmental monitoring program. Specifically, Exelon's QA program for effluent and environmental monitoring was not sufficiently robust to ensure: 1) that both adequate and timely evaluation and assessment of changes described in the 2010 Public Land Use Census were conducted for purposes of dose validation and sampling program modification; 2) that changes in meteorological parameters, used for public dose projections and assessment, were promptly and adequately evaluated; and 3) that laboratory QA programs, for effluent and environmental sample analysis measurement systems were both adequate and implemented. The failures to establish, implement, and maintain such a QA program was reasonably within the Exelon's ability to foresee and should have been prevented.

The finding is more than minor because it is associated with the Public Radiation Safety cornerstone attribute of programs and processes and adversely affected the associated cornerstone objective in that failure to establish, implement, and maintain an adequate QA program in the effluents and environmental monitoring program area adversely affected the licensee's ability to ensure adequate protection of public health and safety. Specifically, Exelon's QA program for effluent and environmental monitoring, was not sufficiently robust to ensure: 1) that adequate and timely evaluations and assessment of changes described in the 2010 Public Land Use Census were conducted for purposes of dose validation and sampling program modification; 2) that changes in meteorological parameters, used for public dose projections and assessment, were evaluated in an adequate and timely manner; and 3) that laboratory QA programs for effluent and environmental sample analysis measurement systems were adequate and properly implemented.

This finding was assessed using IMC 0609, Appendix D, and determined to be of very low safety significance (Green) because: the issue was contrary to the licensee's TSs; there was no indication of a spill or release of radioactive material on the licensee's site or to the offsite environs that would impact public dose assessment; and there was no substantial failure to implement the radioactive effluent release program. The licensee was able to re-assess the dose to members of the public from routine releases and determined that projected doses did not nor were likely to exceed applicable limits including ALARA design specifications of 10 CFR Part 50, Appendix I, or 10 CFR 20.1301(e). There was no effluent monitor calibration issue and the licensee had data by which to assess dose to a member of the public. Exelon plans to provide updated effluent release and dose reports, as necessary, to reflect revised analyses. The cause of this finding is related to the crosscutting area of Human Performance, Work Practices, Aspect H.4(b) because the licensee did not ensure personnel followed procedure compliance requirements activities for the effluent and environmental monitoring programs.

Enforcement. The violation related to this finding is currently under review by the NRC. When that review is completed, the decision relative to any violation will be transmitted to Exelon via separate correspondence. In accordance with NRC IMC 0612, since the significance determination of the underlying finding has been completed and does not interfere with the NRC's current review of the violation, the finding can be issued at this time. The finding and associated violation, although dispositioned separately, only count as one input into the plant assessment process. However, the number and characterization of violations is subject to change pending the NRC's final review.

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Exelon entered this matter into its CAP (ARs: 1226969, 1226202, 1299543, 1299476, 1302720, and 1303308), (FIN 05000277/2011005-02; 05000278/2011005-02; Failure to Establish, Implement, and Maintain Adequate QA for Effluent and Environmental Monitoring)

2RS07 Radiological Environmental Monitoring Program (71124.07 - 1 sample)

a. Inspection Scope

Inspection Planning

The inspectors selectively reviewed the annual radiological environmental and effluent operating reports (2009, 2010), and the results of licensee assessments since the last inspection, to verify that the Radiological Environmental Monitoring Program (REMP) was implemented in accordance with the Peach Bottom Units 2 and 3 TSs and ODCM. The inspectors reviewed the report for changes to the ODCM with respect to environmental monitoring, commitments in terms of sampling locations, monitoring and measurement frequencies, Land Use Census, inter-laboratory comparison program, program exceptions, and analysis of data.

The inspectors selectively reviewed the ODCM to identify locations of environmental monitoring stations.

The inspectors selectively reviewed the Peach Bottom Units 2 and 3 Updated Final Safety Analysis Report (UFSAR) for information regarding the environmental monitoring program and meteorological monitoring instrumentation.

Site Inspection

The inspectors selectively reviewed any significant changes made by the licensee to the ODCM as the result of changes to the Public Land Use Census, long-term meteorological conditions (e.g., 3-year average), or modifications to the sampler stations since the last inspection. The inspectors reviewed technical justifications for any changed sampling locations.

The inspectors evaluated detection sensitivities with respect to TS/ODCM used for counting samples (i.e., the samples meet the TS/ODCM required lower limits of detection (LLD)).

Identification and Resolution of Problems

The inspectors determined if problems associated with the REMP were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the CAP. In addition to the above, the inspectors verified the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involve the REMP. The inspectors discussed corrective actions for identified concerns with Exelon personnel.

b. Findings

No findings were identified.

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2RS08 Radioactive Solid Waste Processing and Radioactive Material, Handling Storage, and Transportation (71124.08 - 1 sample)

a. Inspection Scope

Inspection Planning

The inspectors selectively reviewed the solid radioactive waste system description in the UFSAR, the process control program (PCP), and the recent radiological effluent release reports for information on the types, amounts, and processing of radioactive waste disposed.

Radioactive Material Storage

The inspectors selectively reviewed areas where containers of radioactive waste were stored, to verify that the containers were labeled in accordance with 10 CFR 20.1904, "Labeling Containers," or controlled in accordance with 10 CFR 20.1905, "Exemptions to Labeling Requirements," as appropriate.

The inspectors selectively toured the facility to verify that the radioactive materials storage areas were controlled and posted in accordance with the requirements of 10 CFR Part 20, "Standards for Protection against Radiation."

Radioactive Waste System Walkdown

The inspectors reviewed and discussed liquid and solid radioactive waste processing systems. The inspectors also selectively reviewed various photographs, live camera views, and radiological surveys to access material conditions of rooms and tanks. The inspectors reviewed area status logs for radioactive waste areas and systems.

Shipment Preparation

The inspectors selectively observed shipment packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and licensee verification of shipment readiness (Shipment PM-11-151). The inspectors observed radiation workers during the conduct of the radioactive material shipment preparation. The inspectors determined if the shippers were knowledgeable of the shipping regulations and whether shipping personnel demonstrated adequate skills to accomplish the package preparation requirements. The inspectors verified that the licensee's training program provided training to personnel responsible for the conduct of radioactive waste processing and radioactive material shipment preparation activities.

Identification and Resolution of Problems

The inspectors determined if problems associated with radioactive waste processing, handling, storage, and transportation, were being identified by the licensee at an appropriate threshold, are properly characterized, and are properly addressed for

resolution in the licensee CAP. The inspectors discussed corrective actions for identified concerns with Exelon personnel.

b. Findings

No findings were identified.

4. **OTHER ACTIVITIES**

4OA1 Performance Indicator Verification (71151 - 14 samples)

Cornerstone: Mitigating Systems

.1 Mitigating Systems Performance Index (10 samples)

a. Inspection Scope

The inspectors sampled PBAPS's submittals of the Mitigating Systems Performance Index (MSPI) for the following systems for the period of October 1, 2010 through September 30, 2011:

- Unit 2 and Unit 3 Emergency Alternating Current Power System (MS06)
- Unit 2 and Unit 3 HPCI System (MS07)
- Unit 2 and Unit 3 RCIC System (MS08)
- Unit 2 and Unit 3 RHR System (MS09)
- Unit 2 and Unit 3 Support Cooling Water System (MS10)

To determine the accuracy of the PI data reported during this period, the inspectors used definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment PI Guideline," Revision 6. The inspectors also reviewed PBAPS operator narrative logs, condition reports (CRs), MSPI derivation reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.2 Safety System Functional Failures (2 samples)

a. Inspection Scope

The inspectors sampled PBAPS's submittals for the safety system functional failure PI for both Unit 2 and Unit 3 for the period of October 1, 2010, through September 30, 2011. To determine the accuracy of the PI data reported during this period, inspectors used definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment PI Guideline," Revision 6, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73." The inspectors reviewed PBAPS's operator narrative logs, operability assessments, MR records, maintenance WOs, condition reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.3 Occupational Exposure Control Effectiveness (71151 - 1 Sample)

a. Inspection Scope

The implementation of the Occupational Exposure Control Effectiveness PI Program was reviewed. The inspectors selectively reviewed CAP records for occurrences involving HRAs, VHRAs, and unplanned personnel radiation exposures since the last inspection in this area and the previous four complete quarters. The review was against the applicable criteria specified in NEI 99-02, "Regulatory Assessment PI Guideline," Revision 6. The purpose of this review was to verify that occurrences that met NEI criteria were recognized and identified as PIs.

b. Findings

No findings were identified.

.4 RETS/ODCM Radiological Effluent Occurrences (71151 - 1 Sample)

a. Inspection Scope

The implementation of the RETS/ODCM PI was reviewed. The inspectors selectively reviewed CAP records and projected monthly and quarterly dose assessment results due to radioactive liquid and gaseous effluent releases; for the past four complete quarters. The review was against the applicable criteria specified in NEI 99-02, "Regulatory Assessment PI Guideline," Revision 6. The purpose of this review was to verify that occurrences that met NEI criteria were recognized and identified as PIs.

As part of this review, the inspectors also reviewed Exelon's evaluations and public dose assessments, as necessary, associated with identification of localized onsite ground water contamination within the restricted area.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152 - 4 samples)

.1 Routine Review of PI&R Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that PBAPS 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 CR screening meetings.

b. Findings and Observations

No findings were identified.

.2 Review of Refuel Floor and Fuel Handling (FH) Corrective Actions (71152 - 1 annual sample)

a. Inspection Scope

The inspectors reviewed the CRs and the corresponding corrective actions from the last RFO on Units 2 and 3. The inspectors interviewed key site personnel regarding the incidents and changes to the refueling process. The inspectors evaluated effectiveness of the corrective actions, EOC, and station personnel knowledge of the process changes. The inspectors reviewed Peach Bottom procedures related to FH and the recent training provided to the FH personnel. The inspectors assessed Exelon's problem identification threshold, cause analyses, EOC reviews, compensatory actions, and the prioritization and timeliness of corrective actions to determine whether Exelon personnel were appropriately identifying, characterizing, and correcting problems associated with this issue, and whether the planned or completed corrective actions were effective. The inspectors compared the actions taken to the requirements of Exelon's CAP and 10 CFR Part 50, Appendix B, "QA Criteria for Nuclear Power Plants and Fuel Reprocessing Plant." In addition, the inspectors performed in plant walkdowns and interviewed site personnel to assess the effectiveness of the implemented corrective actions.

The inspectors reviewed Peach Bottom's process to identify, prioritize, and resolve refuel floor distractions in an attempt to minimize operator burdens. The inspectors observed Exelon personnel conducting fuel movement in the reactor vessel during the September 2011 Unit 3 RFO.

b. Findings and Observations

No findings were identified.

The inspectors determined that the Exelon corrective actions were comprehensive and implemented in a timely fashion. Specifically, the just-in-time training of the FH crews was performed at the site prior to the Unit 3 outage. The inspectors observed good communications between the FH crew members during fuel movement. The inspectors observed a constant management presence during FH activities. The inspectors observed that plant personnel involved with the FH activities were knowledgeable regarding the previous FH events and associated corrective actions. The inspectors observed a strong commitment toward zero FH events.

The inspectors observed that the revised Potential Obstruction Compensatory Plan, completed the day before the FH and core verification, would have provided more benefit to refueling personnel if it had been updated at the start of the Unit 3 RFO. The revision to the Plan was a corrective action determined from the FH events during the 2010 Unit 2 RFO.

.3 Review of the Units 2 and 3 Spent Fuel Pool (SFP) Boraflex Degradation Corrective Actions (71152 – 1 annual sample)

a. Inspection Scope

The inspectors assessed Peach Bottom's historical SFP shutdown margin. The inspectors compared Exelon's SFP Boraflex CAP documentation and 10 CFR Part 50, Appendix B, "QA Criteria for Nuclear Power Plants." The SFP criticality calculations listed in IR 1225840-13 were evaluated to determine the significance of the Boraflex degradation. The Exelon SFP Boraflex technical evaluation was reviewed to determine if the SFP TS sub-criticality margin remained less than .95 Keff. The inspectors also interviewed site personnel to assess the effectiveness of the implemented corrective actions.

b. Findings and Observations

The inspectors identified one observation related to Exelon's implementation of the corrective actions associated with the SFP Boraflex degradation issue. The issue is currently under review by the NRC as an Unresolved Item discussed in inspection report 2010004. When that review is completed, the final decision will be transmitted to Exelon via a separate correspondence or in the resident inspector quarterly report. The inspectors also determined that once the TIA response was provided by Nuclear Reactor Regulation (NRR), PBAPS's corrective actions were adequate.

The inspectors reviewed Exelon's Technical Evaluation written to support continued operation of the SFP storage racks provided by Peach Bottom. The Technical Evaluation applied additional margins to account for the changes in fuel designs, code deficiencies, and estimated boron degradation in the SFP racks. The inspectors also reviewed the TIA provided by Nuclear Reactor Regulation (NRR) in response to a TS Amendment request. Exelon subsequently revised the calculation contained in the Technical Evaluation, applying some additional conservatism raised by the NRR review. Actual conditions in the SFPs did not appear to exceed the TS $K_{eff} \leq 0.95$ limit. Based on the information provided by Exelon, the inspectors considered that TS 4.3.1.1.b., "Fuel Storage Criticality," was not exceeded.

.4 Semi-Annual Review to Identify Trends (1 semi-annual Resident Inspector sample)

a. Inspection Scope

The inspectors performed a detailed review of items entered into the CAP to identify trends (either NRC or licensee-identified), and develop insights into PBAPS's progress in identifying and addressing themes. The inspectors reviewed a list of approximately 8,844 IRs that PBAPS initiated and entered into the CAP action tracking system (Passport) from June 1, 2011 through December 1, 2011. The list was reviewed and screened to complete the required semi-annual PI&R trend review. The inspectors evaluated the IRs against the requirements of Exelon CAP procedure, LS-AA-125, and 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action."

b. Findings and Observations

No findings were identified.

Based on the overall review of the selected sample, the inspectors concluded that PBAPS was appropriately identifying and entering issues into the CAP, adequately evaluating the identified issues, and properly identifying adverse trends before they became more safety significant problems. However, the inspectors did note the three adverse trends discussed below.

Human performance and configuration control continued to be focus areas for PBAPS during the second half of 2011. PBAPS identified four configuration control events from June 1 through December 1, 2011, (IRs 1234874 (two events), 1245157, and 1271883); seven total in 2011, and five configuration control events were identified in 2010. A common cause analysis (CCA) was performed in June of 2011 (IR 1203953), and a Configuration Control Recovery Team was implemented to focus on correcting the adverse trend. Since July 1, two additional configuration control events were noted. None of the configuration control events in 2011 resulted in significant consequences.

Industrial safety issues continue to challenge PBAPS. There were three Occupational Safety and Health Administration recordable injuries in September of 2011 (IRs 1261688, 1264502, and 1265372). Additionally, there were 45 first aid events during the September and October 2011 Unit 3 RFO (P3R18). PBAPS identified this negative trend, and has performed a CCA to address the adverse trend in industrial safety performance during P3R18 (IR 1277414). The inspectors noted that PBAPS has performed additional causal investigations in the area of industrial safety performance: a CCA was completed in April of 2011 to address an inadequate trend in industrial safety performance between January 1 and April 25 of 2011 (IR 1203002); and an Apparent Cause Evaluation was completed in November of 2011 in response to Nuclear Oversight (NOS) identifying PBAPS's failure to complete actions to address unsatisfactory performance from 2010 in the area of industrial safety.

The inspectors identified an adverse trend in the area of equipment reliability. During the review period from June 1 to December 1, 2011, PBAPS submitted five licensee event reports (LERs) related to degraded or failed equipment, and also noted a sixth equipment reliability issue:

- Failed Relay Results in Unplanned EDG Actuation during Surveillance Testing (LER 05000277/2011-003-00)
- EDG Oil Leak (LER 05000277/2011-004-00)
- Hardened Grease in a Safety-Related MOV (LER 05000278/2011-001, this finding was documented in Section 1R12 of this report)
- Leaking Relief Valve in the RHR System (LER 05000278/2011-002-00)
- Actuator Diaphragm Thread Seal Leakage in an Automatic Depressurization System Safety Relief Valve (SRV) (LER 05000278/2011-003-00)
- Repetitive Leaks on the Unit 3 'B' RWCU System (IR 1281888)

The inspectors verified that all of the equipment issues identified above have been entered into the PBAPS's CAP.

Enclosure

.5 Review of Licensee Actions to Resolve Vital Bus Degraded Voltage Protection Issues
(71152 – 1 annual sample)

a. Inspection Scope

The inspectors reviewed licensee actions to resolve vital bus degraded voltage protection issues. The inspectors selected IR 01119440 as a PI&R sample for a detailed follow-up review because it tracked the analysis and disposition of the issue. There were numerous IRs associated with the vital bus degraded voltage protection issue. As documented in NRC Inspection Report 05000277/2008007 and 05000278/2008007, an unresolved item (URI) was opened to determine whether the approved PBAPS licensing basis included the use of automatic load tap changers (LTCs) to protect the vital emergency buses from unacceptable low voltage conditions during a design basis LOCA. As documented in inspection report 05000277/2010004 and 05000278/2010004, the NRC, Region I, requested that a formal review (task interface agreement (TIA) 2009-007) be conducted by the NRC, Nuclear Reactor Regulation to resolve the issue. The final TIA response determined that PBAPS license basis for degraded voltage relay settings did not include credit for the LTCs on the startup transformers to protect the class 1-E safety-related equipment during a design basis LOCA. The inspection report also closed the URI and enforcement action was documented. The licensee subsequently issued LER 2010004-00 which was reviewed by the NRC and closed as documented in inspection report 05000277/2010005 and 05000278/2010005 with no additional enforcement action.

The inspectors assessed Exelon's problem identification threshold, EOC reviews, operability evaluations, technical evaluations, modification packages, and interim compensatory measures. The inspectors also assessed Exelon's prioritization and timeliness of corrective actions to determine whether Exelon was appropriately identifying, characterizing, and correcting problems associated with the identified issue and whether the completed or planned corrective actions were appropriate to prevent recurrence. Additionally, the inspectors performed walkdowns of accessible portions of affected motor control centers (MCCs) and components to assess if abnormal conditions existed. The inspectors also interviewed plant personnel to gain insights regarding the identified issues and implemented or planned corrective actions.

b. Findings and Observations

No findings were identified.

The inspectors determined that Exelon properly implemented their CAP regarding the initial discovery of the reviewed issue. The IR package was complete and included, operability evaluations, technical evaluations, interim compensatory measures, EOC reviews, and contained implemented and planned corrective actions. Additionally, the elements of the IR, technical evaluations, and operability evaluations were detailed and thorough. Implemented and planned corrective actions appeared appropriate to minimize the potential of recurrence. The inspectors determined that corrective actions included performing an operability evaluation, which included electrical calculations that used the most limiting voltage level allowed by the TS (excluding the LTC), identifying components that would not have adequate voltage to operate under the identified condition, implementing interim compensatory measures (revising operations procedures and operator training) to operate equipment that would not have adequate

voltage to operate in the design basis LOCA, and creating and implementing modification packages for MOVs and MCCs to allow equipment to operate under the analyzed condition. The inspectors found the operability evaluation and interim compensatory measures reasonable. Exelon had completed all modifications associated with MOVs and MCCs that would not have adequate voltage during a design basis LOCA.

Additional corrective actions included performing an evaluation of vital buses at a lower voltage (3737 volts) than the TS lower limit for the function four LOCA relay setting. This analysis was performed to identify equipment needing margin improvement, but remained operable for the TS function four relay setting band. The inspectors determined that Exelon had completed modifications on some of the equipment identified in the analysis and had scheduled modifications on the remaining equipment identified.

.6 Identification and Resolution of Problems (71124.01, 71124.02, 71124.03, 71124.04, 71124.05, 71124.06)

a. Inspection Scope

The inspectors selectively reviewed corrective action documents for occupational radiation safety program and effluent and environmental monitoring program. See documents reviewed.

The review was against criteria contained in 10 CFR Part 20, TSs, ODCM, and applicable station audit and surveillance procedures.

b. Findings

No findings were identified.

4OA3 Follow-up of Events and Notices of Enforcement Discretion (71153 - 4 samples)

.1 (Closed) LER 05000277/2011003-00: Delayed Relay Operation Results in E-3 EDG Actuation during Surveillance Testing

On September 21, 2011, during the P3R18 RFO, an unplanned, valid actuation of the E-3 EDG occurred during surveillance (functional) testing of the E-33 4 kV emergency bus undervoltage relays. The E-3 EDG started unexpectedly when time delay relay 3-54-183-1708 did not operate properly, resulting in a delayed E-33 bus fast-transfer between the TS off-site sources. This delay resulted in the operation of an additional undervoltage relay and thereby caused a valid actuation of the E-3 EDG on low voltage. Because the E-33 bus delayed fast transfer occurred prior to the EDG reaching full speed and voltage, the EDG output breaker was not required to close.

The cause of the event was due to the failure of the 3-54-183-1708 time delay relay to properly function. The relay was replaced and tested satisfactorily. There was no actual safety consequences associated with this event. PBAPS entered this item into the CAP for additional evaluation and investigation. The inspectors determined that there was no performance deficiency associated with the failed relay. This LER is closed.

.2 (Closed) LER 05000277/2011004-00: Oil Leak Resulting in E-1 EDG Inoperability

On September 23, 2011, during the P3R18 RFO, an oil leak was discovered on the E-1 EDG when the engine was being shutdown during 4kV emergency bus testing. The leak was determined to be from a crack on the lube oil drain line for the combustion air intake blower (supercharger). Analysis determined that the leak previously existed and the EDG would not have been able to perform its safety function to successfully run for a 24-hour mission time.

PBAPS determined that the cause of the event was ineffective maintenance practices, and the drain line should have previously been replaced during maintenance activities. The leaking drain line was replaced on September 23, 2011, and the E-1 EDG was tested successfully with no leaks in the drain line. PBAPS entered this issue into the CAP, performed EOC inspections, and took corrective action to revise the associated maintenance procedure. The enforcement aspects of this LER are discussed in Section 4OA7. This LER is closed.

.3 (Closed) LER 05000278/2011001-00: Containment Isolation Valve Inability to Close for a Design Basis Event due to Degraded Lubricant

On September 22, 2011, during the P3R18 RFO, it was identified that the ability of the Unit 3 RWCU outboard isolation valve (MO-3-12-018) to close was degraded due to a motor-operator greasing deficiency. This deficiency was identified during performance of routine MOV maintenance and diagnostic testing. It was determined that this condition was prohibited by TSs since this primary containment isolation valve was determined to be inoperable for containment isolation purposes during the previous operating cycle for a time period longer than allowed by TS. The cause of the greasing deficiency was due to inadequate lubrication. The valve was repaired on September 23, 2011. There was no actual safety consequences associated with this event. The enforcement aspects of this LER are discussed in Section 1R12. This LER is closed.

.4 (Closed) LER 05000278/2011002-00: RHR Leaking Relief Valve Results in Condition Prohibited by TS

On September 19, 2011, during the P3R18 RFO, Engineering personnel determined that a leak on the inlet connection to the 'D' RHR suction piping thermal relief valve was due to cracking of the relief valve body and not due to a mechanical joint leak as originally identified during cycle 18 operations on April 27, 2010. On April 27, 2010, PBAPS identified the leak to be one drop per two minutes, and incorrectly determined that the leak was from a threaded connection. Subsequent non-destructive evaluation following the September 19, 2011 determination confirmed the leak to be through the relief valve body. Based on analysis, PBAPS determined the relief valve could have become detached from the piping during the worst case design basis seismic event. This condition would result in the 'D' RHR pump being inoperable, thereby affecting the RHR low pressure coolant injection function.

PBAPS determined the cause of the delay in identifying the inoperable condition was due to inadequate technical rigor when evaluating the operability of the relief valve on April 27, 2010. The leaking relief valve was replaced on October 2, 2011. EOC reviews were performed for similar components in Unit 2 and Unit 3. Operations has instituted

additional training and procedure revisions to drive improved performance regarding operability evaluations. There were no actual safety consequences as result of this event. This event was considered as a condition prohibited by TSs and loss of safety function. The enforcement aspects of this LER are discussed in Section 4OA7. This LER is closed.

4OA5 Other Activities

.1 NRC Review of Exelon's Response to NCV EA-11-128

a. Inspection Scope

On September 12, 2011, the NRC transmitted a NCV and a Green finding to Exelon related to a change Exelon made to the emergency action level (EAL) basis for EAL HU6, which introduced a decrease in effectiveness to Peach Bottom's Emergency Plan (EP) and resulted in a violation of the requirements stipulated in 10 CFR 50.54(q). Specifically, the licensee modified the EAL Basis in EAL HU6, Revision 16, which extended the start of the 15-minute emergency classification clock beyond a credible notification that a fire is occurring or indication of a valid fire detection system alarm. This change decreased the effectiveness of the EP by reducing the capability to perform a risk significant planning function in a timely manner. The NCV and finding were described in detail in NRC Inspection Report Nos. 05000277/2011502 and 05000278/2011502.

In response to the NCV and finding, Exelon entered the issue into their CAP as IR 01184333 and subsequently implemented Revision 21 of the Peach Bottom EP, which restored the EAL HU6 Basis to the Revision 15 guidance, thereby removing the decrease in effectiveness. The inspectors reviewed IR 01184333 and the revised version of the HU6 Basis, and discussed the corrective actions with the Peach Bottom Emergency Preparedness staff.

b. Findings and Observations

No findings were identified. The inspectors determined that Exelon's response and corrective actions were reasonable and appropriate to address the NCV and finding, and their underlying performance deficiency. The NRC considers the issue to be closed.

.2 Independent Spent Fuel Storage Installation (60855)

a. Inspection Scope

The inspectors selectively reviewed routine operational surveillance data, including radiological surveillance, for the Independent Spent Fuel Storage Installation (ISFSI) facility. The inspectors toured the facility and made independent radiation measurements of the facility. The data was evaluated against 10 CFR Part 20 and applicable Exelon procedures.

b. Findings

No findings were identified.

40A6 Meetings, Including Exit

Quarterly Resident Exit Meeting Summary

On January 20, 2012, the resident inspectors presented the inspection results to Mr. Thomas Dougherty and other PBAPS staff, who acknowledged the findings. Mr. P. Krohn, Chief, USNRC, Region 1, Division of Reactor Projects, Branch 4, attended this quarterly inspection exit meeting. The inspectors verified that no proprietary information was retained by the inspectors nor documented in this report.

40A7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of the NRC Enforcement Policy for being dispositioned as NCVs.

- TS 5.4.1 states, in part, that written procedures shall be implemented and maintained as recommended in RG 1.33, Appendix A, November 1972. RG 1.33, Appendix A, Section I, "Procedures for Performing Maintenance," subsection 1, states the following: "Maintenance which can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. Skills normally possessed by qualified maintenance personnel may not require detailed step-by-step delineation in a procedure." Contrary to the above, PBAPS did not properly preplan and perform maintenance which affected the E-1 EDG. Specifically, PBAPS determined that a damaged lubricating oil drain line should have been identified and replaced during planned maintenance activities prior to the occurrence of leakage. As a consequence of not identifying and replacing the damaged drain line, PBAPS determined that the E-1 EDG was unable to perform its 24-hour mission time, and therefore was inoperable, during the period of time between April 27, 2011, and September 23, 2011.

The finding was determined to be of very low safety significance, for both Peach Bottom Units 2 and 3, in accordance with IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations" (IMC 0609A) using SDP Phases 1, 2 and 3. Phase 1 screened the finding to Phase 2 because it represented a loss of the E-1 EDG safety function, between April 27 and September 23, 2011 (149 days), longer than the TS limiting condition for operation (LCO) of 14 days. A Region I Senior Reactor Analyst (SRA) conducted a Phase 3 analysis because the Phase 2 analysis, conducted by the inspectors using the Peach Bottom Pre-solved Risk-Informed Inspection Notebook, indicated that the finding could be more than very low significance.

The SRA used the Peach Bottom Standardized Plant Analysis Risk (SPAR) model, Revision 8.19 and 8.17, for Units 2 and 3 respectively and SAPHIRE 8 to conduct the Phase 3 analysis, with the conservative assumption that the E-1 EDG would not have operated at all for its 24 hour mission time over the 149 day exposure period. This analysis was conservative given the EDG could have operated for over two hours assuming that the drain line broke and the potential that operators could have temporarily limited the leakage from the supercharge lube oil drain line. This

analysis indicated an increase in core damage frequency (Δ CDF) for internal initiating events in the range of one core damage accident in 2,500,000 years of reactor operation, in the low E-7 range per year for each unit. The dominate core damage sequences included losses of offsite power with the failure of all EDGs resulting in a station blackout (SBO), followed by the failure of operators to reduce direct current loading to allow extended operation of the RCIC system and depressurize the reactor, and with inability to recover offsite power, the SBO source of power from the Conowingo Dam or an EDG in two hours. In accordance with IMC 0609A, for a finding with an internal events Δ CDF above $1E-7$, the SRA assessed the impact of the finding on: 1) External events such as fire, seismic and flooding, determining, using the external events portion of the Peach Bottom Unit 2 and 3 SPAR models, that the total Δ CDF (internal plus external) would not be above the $1E-6$ threshold; and 2) the increase in large early release frequency (Δ LERF), determining that given the operators ability, following core damage, to recover offsite power and depressurize and inject water to the reactor from low pressure sources and to flood the containment that the Δ LERF was in the low E-8 per year range.

Because this finding is of very low safety significance and has been entered into Exelon's CAP under IR 1266837, this violation is being treated as a Green, licensee-identified NCV consistent with the NRC Enforcement Policy.

- TS LCO 3.5.1, Condition A, requires that one inoperable low pressure ECCS injection subsystem should be restored to an OPERABLE status within seven days during operational modes 1 and 2, or requires action to place the unit in operational mode 3 within 12 hours. Contrary to the above, the 'D' LPCI pump was inoperable during a period of time between April 27, 2010, and October 2, 2011. Specifically, PBAPS determined that the leaking relief valve body, as identified on April 27, 2010, could have become detached from the 'D' RHR suction piping during the worst case design basis seismic event. This condition would result in the 'D' RHR pump being inoperable, thereby affecting the RHR LPCI function. Because the 'B' RHR pump was unaffected by this event, there was no total loss of the 'B' LPCI train safety function. The inspectors determined that this event screens to Green using the Table 4b seismic screening criteria in Attachment 4 of IMC 0609, "SDP." Because this finding is of very low safety significance and has been entered into Exelon's CAP under IR 1264909, this violation is being treated as a Green, licensee-identified NCV consistent with the NRC Enforcement Policy.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Exelon Generation Company Personnel

T. Dougherty, Site Vice President
 G. Stathes, Plant Manager
 J. Armstrong, Regulatory Assurance Manager
 T. Moore, Site Engineering Director
 P. Navin, Operations Director
 J. Kovalchick, Security Manager
 P. Cowan, Work Management Director
 B. Reiner, Chemistry Manager
 R. Holmes, Radiation Protection Manager
 J. Bower, Training Director
 B. Hennigan, Operations Training Manager
 R. Shortes, Radiological Engineering Manager
 J. Stenclik, Chemistry Supervisor
 H. McCrory, Technical Support Manager
 R. Reiner, Manager, Chemistry, Environmental and Radwaste
 C. Crabtree, Senior Environmental Chemist
 D. Dullum, Regulatory Assurance
 N. Burkins, Instrument Supervisor
 M. Pawlowski, Radwaste Shipper
 M. Ballew, Radiation Protection Supervisor
 E. Schwartz, Chemist
 R. Ridge, Instrument Physicist
 D. Hornberger, Radwaste Chemist

NRC Personnel

P. Krohn, Branch Chief
 S. Hansell, Senior Resident Inspector
 A. Ziedonis, Resident Inspector
 S. Barr, Sr. Emergency Preparedness Inspector
 E. Miller, Project Engineer
 R. Nimitz, Senior Health Physicist
 J. Tomlinson, Operations Engineer
 K. Young, Senior Reactor Engineer

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened/Closed

05000278/2011005-01

NCV

Untimely Corrective Action to Correct MOV
 Degraded Stem Lubrication
 (Section 1R12)

Opened

05000277/2011005-02	FIN	Failure to Establish, Implement, and
05000278/2011005-02		Maintain Adequate QA for
		Effluent and Environmental Monitoring
		(Section 2RS06)

Closed

05000277/2011003-00	LER	Delayed Relay Operation Results in E-3 EDG Actuation during Surveillance Testing (Section 4OA3.1)
05000277/2011004-00	LER	Oil Leak Resulting in E-1 EDG Inoperability (Section 4OA3.2)
05000278/2011001-00	LER	Containment Isolation Valve Inability to Close for a Design Basis Event due to Degraded Lubricant (Section 4OA.3)
05000278/2011002-00	LER	RHR Leaking Relief Valve Results in Condition Prohibited by TS (Section 4OA3.4)
05000277/2011502-01	NCV	(Traditional Enforcement) Changes to EAL Basis Decreased the Effectiveness of the Plan without Prior NRC Approval (Section 4OA5)
05000277/2011502-02	FIN	Changes to EAL Basis Decreased the Effectiveness of the Plan without Prior NRC Approval (Section 4OA5)
05000278/2011502-02		

Discussed

05000277/2010004-01	URI	Non-conservative TS and Potential Non- Compliance Associated with Degraded SFP Boraflex Panels (Section 4OA2.3)
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LIST OF DOCUMENTS REVIEWED

* -- Indicates NRC-identified

Section 1R01: Adverse Weather Protection

Procedures

RT-I-066-200-2, Heat Trace System Testing, Revision 9, Completed 09/01/11
 RT-I-066-200-2 (Partial PMT) Heat Trace System Testing, Revision 9, Completed 10/05/11
 RT-O-040-620-2, Outbuilding HVAC and Outer Screen Inspection for Winter Operation,
 Revision 16, Completed 11/13/11
 RT-O-040-630-2, Winterizing Procedure, Revision 12, Completed 11/12/11

CRs

IR 941208, Trash Racks Need to be Replaced
 IR 1078304-10, 2010-2011 Winter Readiness Critique
 IR 1165388, Request for AR to Support Trash Rack Replacement
 IR 1197180, 2011-2012 Winter Readiness Tracking Assignments
 IR 1201542, Heater Fan Still Running with Control Switch in Off
 IR 1239380, Heat Trace Exposed with No Insulation on Valve
 IR 1239385, Heat Trace Missing Insulation on Valve
 IR 1239394, Insulation Falling Apart on Valve HV-2-27B-26113
 IR 1241418, Winter Readiness Attachment 3 Plant Manager Approval Overdue (06/30/11)
 IR 1242337, Conduit if Broken Off due to Steam Leaks
 IR 1244622, 2011-2012 Winter Readiness Tracking Assignments (Snow)
 IR 1250769, Unit 2 Condensate Storage Tank Low Level Alarm Challenges HPCI/RCIC

Operability

IR 1258256, Administration Building Heat Trace Alarm Panel All Circuits in Alarm
 IR 1258267, RT-I-066-200-2 Unsat
 IR 1277263, 2AE129 Thermostat Cover is Broken / Temp Adjustment Knob is Missing
 IR 1278340, 3AE154 Unit Heater Will Not Energize
 IR 1283033, Louver #1 at Unit 2 Circ Pump Structure Missing
 IR 1283034, Louver #2 at Unit 2 Circ Pump Structure Could Not be Operated
 IR 1283323, Low Temperature at Main Stack Radiation Monitor Building
 IR 1284011, Torus Lining Project RCA Exit Trailer (Mini Mobile) No Heat
 IR 1284600, Roof Exhauster Dampers Will Not Close
 IR 1284613, Roof Exhauster Dampers Will Not Close
 IR 1284621, Fan Will Not Start
 IR 1284689, Deicing Sparger Broken Under Water
 IR 1289743, Document Unsat Sign-off on Winterization Routine Test due to Clearance
 IR 1291388, 2011-2012 Winter Readiness Certification Letter Approval
 IR 1296229, Winter Readiness Open Items Not Complete Prior to 12/01/11

WOs / Action Requests

A1780640-01, Request Deferral to Complete RT-I-066-200-3
 A1794038-04, Plan Activity for Temporary Power and Lighting to Mini Mobile Trailer
 A1803090, Unit 2 Circulating Water Pump Structure Louvers and Screens
 A1815797, Unit 2 Circ Bay Intake Dampers Require Rebuild
 C0231975-13, Install Heat Trace per ECR 10-00055

Miscellaneous

Peach Bottom Certification Letter for Winter Readiness, dated November 15, 2011

Section 1R04: Equipment Alignment

Procedures

TSG 4.1, Peach Bottom Station Operational Contingency Guidelines, Revision 18

CRs

IR 769425-08 and Attachments 1-3 and 6-8, Engineering Computations and TRT 08-029 for
TSG 4.1 Changes

IR 1268445, Valve Actuator Would Not Go Into Manual Mode

Drawings

M-361, Sheet 1, RHR System P&ID, Revision 81

Miscellaneous

IMC 0609, Appendix L, B.5.b SDP

NRC Safety Evaluation Related to Order EA-02-026, Docket Numbers 50-277 and 50-278,

Section 3.4.9: Inject Water into the Drywell

Temporary Instruction 2515/171, Verification of Site Specific Implementation of B.5.b Phase 2
and 3 Mitigation Strategies, Revision 1

Section 1R05: Fire Protection

Procedures

EP-AA-1007, Radiological EP Annex for PBAPS, Revision 22

PF-4B, Unit 2 Radwaste Building, RBCCW Room – Elevation 116'-0 inch, Revision 4

PF-4C, Radwaste Building; Unit 2 Recirculating Pump MG Set Room – Elevation
135'-0", Revision 7

PF-144, Circulating Water Pump Structure – General Area, Revision 4

CRs

*IR 1270600, Review Criteria for Table H2-Vital Area

Miscellaneous

NEI 99-01, Method for Development of Emergency Action Levels, Revision 5

Section 1R11: Licensed Operator Regualification Program

Procedures

Regualification Scenario Guide, PSEG1111R, Revision 1

Section 1R12: Maintenance Effectiveness

Procedures

CH-10, Chemistry Goals, Revision 16

CY-AB-120-100, Reactor Water Chemistry, Revision 12

CY-PB-120-100, Reactor Water Chemistry – GEH Fuel Warranty Limits, Revision 0

ST-C-095

T-103, Sheet 1, Secondary Containment Control

ER-AA-302-1004, MOV Performance Trending, Revision 6

CRs

IR 1277268, Unit 3 RWCU System Secured due to Steam Leak
 IR 1279788, Potential Small Unit 3 Main Condenser Tube Leak
 IR 1279935, Unit 3 Reactor Water Influent Conductivity Step Change Trends
 IR 1280025, Unit 3 RWCU System Secured due to Leak
 IR 1280255, Action Level 1 Entered for Unit 3 Reactor Conductivity
 IR 1280228, 'B' RWCU Pump Discharge Block Valve
 IR 1280406, Issue to Track 90 Days Completion for TC
 IR 1281063, Rejectable Indication Found on Unit 3 RWCU Piping
 IR 1281385, Leak Observed at "T" Weld
 IR 1281888, Action Level 1 Entered For Unit 3 Reactor Chlorides
 IR 1281989, Unit 3 RBCCW High Radiation Alarm
 IR 1289399, Request to Provide Engineering with Vibration Data
 IR 1290153, Root Cause Manpower Inadequate
 IR 1295254, Request for CMO to Obtain RWCU Piping Vibration Data
 IR 1295469, Request Work Management Create Unit 3 'B' RWCU Online Work Window
 IR 892191-08, Root Cause Evaluation - MOV Degraded Stem Lubrication
 IR 1097085, Nuclear Event Report 10-047-Y MOV Failure due to Degraded Stem Lubrication
 IR 1266604, MO-3-12-018 As-Found Underthrust
 IR 1266600, MO-3-12-018 Operator Grease Condition Unsatisfactory
 IR 1277605, MOV Program Health Declined to Yellow in Third Quarter 2011
 IR 1296205, MO-2-23-024: Perform Valve PM in 1203 Instead of 1303

Miscellaneous

T04336, Peach Bottom License Renewal Chemistry Commitments
 Unified Control Room Log, Sunday, October 16, 2011, Night Shift
 Unified Control Room Log, Tuesday, October 18, 2011, Day Shift
 Unified Control Room Log, Saturday, October 22, 2011, Day Shift
 Unified Control Room Log, Sunday, October 23, 2011, Day Shift

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

SO 52A.1.B, Diesel Generator Operations, Revision 48
 ST-O-052-702-2, E-2 Diesel Generator 24-Hour Endurance Test

CRs

IR 1220525, Failure of Unit 3 APRM #1 2/4 Voter
 IR 1230841, Five Critical Component Failures Due to Reactor Nuclear Instrumentation Over
 Past Year
 IR 1286163, APRM-LM-3-PB3 2/4 Logic Module Did Not Drop Out RPS Logic
 IR 1286435, A2 Channel ½ Scram during APRM Logic Module Repair
 IR 1287120, APRM Voter Card Failures – Need Accelerated Replacement
 IR 1144694, Operating Experience Review: EDG Voltage Regulator Inspection Improvement
 IR 1287186, EDG Voltage Not Responding
 IR 1287282, Clearance and Tagging

Drawings

E-5-13, Sheet 2, Standby Diesel Engine Generators, Revision 17

Miscellaneous

Unified Control Room Log, Friday, November 4, 2011, Day Shift

Section 1R15: Operability Evaluations

Procedures

NF-AB-135-1420, Establishing Channel Distortion Monitoring Populations, Revision 0

CRs

IR 1254155-04, Operability Evaluation 11-03, Seismic Effects on NWR Control Rod SCRAM at Low Reactor Pressures, Revision 0

IR 1254155, Part 21 SC 11-04 Seismic Impact on Channel Distortion

IR 1254027, Title: Part 21 SC 11-04 Seismic Impact on Channel Distortion

IR 1270659, Failure to Include Seismic Input in Channel-Blade Guidance

IR 1267512, CHK-3-16A-33205B Leaks Through

IR 1267639, HV-3-16A-33170C Has Through-Seat Leakage

IR 1267641, CHK-3-16A-33205C Leaks Through

IR 1268076, RV-3-02-071B Failed Leak Test during ST-M-01G-600-3

Drawing

M-833, Sheet 1, Instrument Nitrogen, Revision 37

M-851, Sheet 1, Nuclear Boiler, Revision 37

Miscellaneous

ME-213, ADS SRV Air Accumulator Sizing

Unified Control Room Log, Monday, October 3, 2011, Day Shift

Section 1R18: Plant Modifications

CRs

IR 1290922, ECR 10-00449 HPCI Cable Incorrectly Routed

Drawings

E-1236, Sheet 2, Raceway Layout RB, Unit 3, Area 16, Elevation 135'-0 inch, Revision 77

E-1236, Sheet 3, Raceway Layout RB, Unit 3, Area 16, Elevation 135'-0 inch, Revision 77

M-1-S-36, Sheet 22, Electrical Schematic Diagram HPCI, Revision 77

Miscellaneous

Peach Bottom Fire Protection Plan, Section 5.1, Analysis and Capability to Achieve Safe Shutdown, Revision 16

Peach Bottom Fire Protection Plan, Section 5.2, Description of Reactor Shutdown Methods, Revision 16

Peach Bottom Fire Protection Plan, Section 5.3.11, Fire Area 13S, Revision 18

NRC Event Notification EN 47442: Peach Bottom 8-hour Non-Emergency Event Notification for HPCI System Steam Supply Valve Cable Unprotected during Postulated Fire

Unified Control Room Log, Tuesday, November 15, 2011, Night Shift

Section 1R19: Post-Maintenance Testing

Procedures

ST-O-07G-470-3, MSIV Closure Timing, Revision 16, Performed 10/03/11
 ST-O-054-752-3, E-23 4kV Bus Under Voltage Relays and LOCA LOOP Functional Test and
 E-234 Alternative Shutdown Control Functional Test, Revision 22, Performed 10/05/11
 ARC 30C208L A-2, Turbine Vibration Thrust High, Revision 18
 ARC 20C208L A-2, Turbine Vibration Thrust High, Revision 10
 SI-3N-60A-APRM-31FS, Functional Check of APRM 3
 RT-O-052-251-2, E1 Diesel Generator Inspection Post-Maintenance Functional Test,
 Revision 21, Performed 11/20/11
 M-004-400, Reactor Pressure Vessel Reassembly, Revision, 29

CRs

IR 1262081, MSIV Stroke Times UNSAT
 IR 1271818, 'A' Inboard MSIV Stroke Time
 IR 1271823, 'A' Outboard MSIV Stroke Time
 IR 1271825, 'D' Outboard MSIV Stroke Time
 IR 1271826, 'B' Inboard MSIV Stroke Time
 IR 1271827, 'D' Inboard MSIV Stroke Time
 IR 1271849, 'C' Inboard MSIV Stroke Time
 IR 1272231, NOS ID: SRO OP Basis/IR's for MSIV Stroke Times Improvement
 IR 1272796, NOS ID: "Reportable Basis" Determination in IR 1262081 is LTA
 IR 1274027, 'D' Inboard MSIV Stroke Time
 IR 1272301, 3 'A' / 3 'C' Battery Ground When Emergency Transformer Switch S38 Operated
 IR 1272310, E-3 Diesel Generator Stator Cooling High Winding Temperature Alarm
 IR 1271137, PMM1 Activity Needed to Support 3BD003 to Alternate Source
 IR 1271368, Documentation of an Alternate Compensatory Measure
 IR 1276633, Unit 3 Main Turbine Tripped due to High Vibration
 IR 1276861, 4.0 Crew Critique of Unit 3 PB Main Turbine Startup after P3R18
 IR 1276862, Unit 3 Main Turbine Tripped due to High Vibration
 IR 1276962, Unit 3 Main Turbine Tripped due to High Vibration
 IR 1276988, MCR Vibration Alarm ARC-305 A-2 Alarmed
 IR 1277000, Unit 3 Main Turbine Tripped due to High Vibration
 IR 1277081, Turbine Bearing Metal High Alarm Received on Unit 3
 IR 1279042, 3BG002 3B RPS MG Set High Temperature and Vibration
 IR 1279264, PSO4 End-of-Shift Critique for Dayshift October 17 - 20
 IR 1279985, Loose Terminations in Panel 3BC114
 IR 1278641, NER NC-11-038 – Browns Ferry MOV Failure Lessons
 IR 1296131, MOV Operator Inspection in Response to Operating Experience / Part 21
 IR 1286163, APRM-LM-3-PB3 2/4 Logic Module Did Not Drop Out of RPS Logic

Drawings

M-833, Sheet 1, Instrument Nitrogen, Revision 37
 M-851, Nuclear Boiler, Revision 37

WOs / Action Requests

C0240372, Investigate and Repair as Required

Miscellaneous

Outage Control Center Log, Friday, October 7, 2011, Night
 Unified Control Room Log, Tuesday, October 4, 2011, Dayshift
 TS 3.8.1
 MAT PB 09-0533-3: LP Turbine Retrofit Mod Acceptance Test, Performed 10/14-17/2011
 Unified Control Room Log, Friday, October 14, 2011, Day Shift
 Unified Control Room Log, Friday, October 14, 2011, Night Shift
 Unified Control Room Log, Saturday, October 15, 2011, Night Shift
 Unified Control Room Log, Saturday, October 15, 2011, Day Shift
 Unified Control Room Log, Sunday, October 23, 2011, Day Shift
 Exelon Nuclear MOV Program MOV Post-Test Data Review Worksheet, MO-2-10-154B, Test
 Date 05/18/11
 WO R1161992-07, MO-2-10-154B-OP As-Left Diagnostic Test
 M-213, Automatic Depressurization System Accumulator Sizing

Section 1R20: Refueling and Other Outage Activities

Procedures

SA-AA-111, Heat Stress Control, Revision 8
 T-103, Secondary Containment Control, Revision 17

CRs

IR 1271280, Additional Oversight Needed for Future Outages
 *IR 1271674, NRC Resident Inspector-Identified Loose Conduit
 IR 1271780, RHR RV-3-10-072D Leakage Operability Determination
 IR 1272329, MSIV AO-3-01A-080D PMT Diagnostic UNSAT
 IR 1274674, HPCI Piping Needs Additional Venting
 IR 1277414, Industrial Safety Events during P3R18 Were Unsatisfactory
 IR 1271889, P3R18 MSRV/MSSV As-Found Lift Test Results
 IR 1271909, Threshold for Entering Near Misses in CAP May be Too High
 IR 1273083, Adverse Trend in FME Events
 IR 1273354, P3R18 Drywell Critical Insulation Inspection Results
 IR 1274320, AO-3-02-021 Penflex Conduit Needs Replaced
 IR 1274322, Penflex to Temperature Monitor Detached
 IR 1274325, Penflex to 71A SRV Detached
 IR 1274328, Penflex to Pot-3-02-070B Degraded
 IR 1274329, Main Steam Piping Insulation Band Needs to be Installed
 IR 1274330, J Box Screws Missing
 IR 1274332, AO-3-44A-30258-01-OP Penflex is Detached at Limit Switch
 IR 1274333, Insulation Damaged on Cooler Piping
 IR 1274334, Penflex to Magnetrol Switch is Underneath Insulation Blanket
 IR 1274335, Found Ground Straps Off of Pump and Pump Motor
 IR 1274338, Temp Probe on Top of RV-3-02-071C (TBO491) is Determined
 IR 1275808, High Vibration on 3 'C' Feed Pump Turbine
 IR 1276474, Off-Gas Isolations during Off-Gas Startup
 IR 1276502, PC-9417A Appears to be Causing SJAE Discharge Isolations
 IR 1276510, Off-Normal Procedure Entry
 IR 1276519, PIC-3239B: SJAE Pressure Oscillating
 IR 1277268, Unit 3 RWCU System Secured Due to Steam Leak
 IR 1277329, Unit 3 Fire Water System Leak
 IR 1277836, Heat Stress Awareness Missed

IR 1277810, 4.0 Crew Critique of Unit 3 RWCU Leak
IR 1277876, Contamination Associated with the Unit 3 RWCU System Secured
IR 1281266, P3R18 Ended 86 Hours and 12 Minutes Behind Day 0 Schedule

Miscellaneous

Outage Control Center Log, Sunday, October 9, 2011, Night
Outage Control Center Log, Monday, October 10, 2011, Night
Unified Control Room Log, Thursday, October 13, 2011, Night Shift

Section 1R22: Surveillance Testing

Procedures

RT-O-010-304-3, RHR/HPSW System Valves Alternative Control Testing, Revision 11
RT-O-010-304-3, RHR/HPSW System Valves Alternative Control Testing, Revision 12,
Performed 11/13/11
RT-O-010-304-3, RHR/HPSW System Valves Alternative Control Testing, Revision 12,
Temporary Change 11-204, Performed 11/13/11
RT-O-023-750-3, HPCI Functional Test from Alternative Control Panels, Revision 15
RT-O-023-750-3, HPCI Valve and Component Test from Alternative Control Panels,
Revision 13
ST-O-052-154-2, E-4 EDG Simulated Unit 2 ECCS Simulated Auto Start with Offsite Power
Available, Revision 11, Performed 12/21/2011
SO 52A.1.B, Diesel Generator Operations, Revision 48
ST-O-052-314-2, E4 EDG Slow Start Full Load and IST Test, Revision 20, Performed
12/21/2011

CRs

IR 1289964, Temporary Change to RT-O-010-304-3
IR 1289882, Issue Encountered during Testing of MO-3-10-025B
IR 1174494, Differential Temperatures High Out of Spec
IR 1305598, Erratic Reading on Main Control Room E-4 EDG Allterex Volts CD Meter

Drawings

M-1-S-65, Sheet 56, Electrical Schematic Diagram RHR, Revision 100

Miscellaneous

Unified Control Room Log, Sunday, November 13, 2011, Day Shift

Section 1EP6: Drill Evaluation

Procedures

EP-AA-1007, Exelon Nuclear Radiological EP Annex for PBAPS, Revision 22
OT-101, High Drywell Pressure, Revision 13
OT-101 Bases, High Drywell Pressure Bases, Revision 14

CRs

IR 1083470, NOS ID: During EP Drill RCIC Isolated with HPCI Inoperable
IR 1298444, NOS ID: EP Drill Deficiencies Not Corrected
IR 1307225, 12/05/11 EP Drill – EP03 Facilities and Equipment Issues
IR 1307226, 12/05/11 EP Drill – Atom Road Access / Egress
IR 1307227, 12/05/11 Drill – Evaluate EP-AA-113-F-04 for Revision

IR 1307230, 12/05/11 EP Drill – Review WebEOC and PMS Drill Actions
IR 1305868, Unsat Demonstration Criteria in 12/05/11 DEP Drill

Miscellaneous

NOSCPA-PB-11-16, Peach Bottom Emergency Preparedness Performance Report (AR 1279553-35)

PBAPS December 5, 2011 Station DEP Drill Scenario and Evaluator Notebook

PBAPS December 5, 2011 Drill Evaluation Report

Section 2RS01: Access Control to Radiologically Significant Areas

Procedures

RP-AA-460, Control for High and Locked HRAs, Revision 20

RP-AA-460-001, Control for VHRAs, Revision 2

RP-AB-460, TIP Area Access Controls, Revision 1

RT-H-099-960-2, Outside Radioactive Material Storage Area Inspection and Survey, Revision 7

RP-AA-201, Access to the RCA for Escorted Visitors, Revision 4

Documents

Dose Records

Contamination Control – Personnel Contamination Data

Dosimetry Performance Testing Data

Corrective Action Documents (various ARs)

PI Verification Data

PI Summary Data

Section 2RS02: Occupational ALARA Planning and Controls

Procedures

RP-AA-401, Operational ALARA Planning and Controls, Revision 13

Documents

General Source Term Data

BRAC Point Data

Business Plan and Site ALARA Plan Goals (P3R18)

Work-In-Progress Job Reviews and ALARA Reviews

Outage Report Data (added scope analysis)

Post-Job Review Data (control rod drives, strain gauge, recirculation pump work, in-vessel work, cavity decontamination, reactor vessel disassembly/reassembly, turbine work/scaffolding, and condenser work)

ARs

129559, 1217457, 1263077, 1264425, and 1262272

Section 2RS03: In-plant Airborne Radioactivity Control and Mitigation

Documents

Corrective Action Documents

Airborne Radioactivity Intake Assessments

Section 2RS04: Occupational Dose Assessment

Procedures

RP-AA-210, Dosimetry Issue, Usage, and Control, Revision 18

Documents

NRC Safety Evaluation, Application to Use Weighting Factors for External Exposure, dated December 20, 2006

Exposure Control and Dose Records

General Source Term Data

Personnel Contamination Event Logs

Personnel Intake Investigations

Corrective Action Documents (various ARs: 1268194)

Data for Conduct of EDEX Assessment

Section 2RS05: Radiation Monitoring Instrumentation

Procedures

RP-AA-301, Radiological Air Sampling Program, Revision 4

RP-AA-210-1001, Dosimetry Logs and Forms, Revision 5

CY-AA-170-000, Radioactive Effluent and Environmental Monitoring Program, Revision 5

CY-AA-170-1100, QA for Radiological Monitoring Program, Revision 1

CY-AA-170-200, Radioactive Effluent Control Program, Revision 1

RT-C-095-892-2, Periodic Intra-laboratory Analysis, Revision 1

RT-C-095-897-2, Quarterly Cross-Check Sample Analyses, Revision 1

RT-C-095-846-2 Gamma Isotopic Analysis of Unmonitored Liquid Effluent

ST-C-095-805-2, Liquid Radwaste Discharge

ST-C-095-858-2, Determination of SR-89, Sr-90, and ALPHA Activity for Main Stack and Roof Vents Particulates Filters, Revision 6

ST-C-095-0855-2, Analysis of Gaseous Releases for Tritium, Revision 3

ST-C-095-862-2, Determination of Instantaneous Noble gas Release

ST-C-095-900-2, Plant Effluent Concentration Dose Analysis, Revision 1

SI2R-63F-050-A1CE, Main Stack Radiation Monitor Electronic Calibration Check

RY-0-17-050A, Revision 11

ST-C-095-805-2, Liquid Radwaste Discharge, Revision 13 (Alarm set-point)

ST-C-095-868-2, Drywell High Range Radiation Monitor Calibration

ST-C-095-868-3, Drywell High Range Radiation Monitor Calibration

SI2R-63E-2979-B1CE, Vent Stack Radiation Monitor RY-2979B, Electronic Calibration

SI3R-63E-3979-B1CE Vent Stack Radiation Monitor RY-3979B Electronic Calibration

Documents

Calculation and Bases for Effluent Radiation Monitor Calibrations

Criteria for Choosing Radiological Gaseous Effluent EAL Threshold

Radiation Monitor System Notebook

Instrument Calibration Records (Gas Air Samplers, RM-14, RO-20, Telepole, RadPro 5, Ludlum, REM ball)

Out-of-Tolerance Reports

NVLAP Dosimeter Accreditation (Scope of Accreditation)

Shepard Calibrator Source Calibration Data

Shepard 89 Verification March 3, 2011

Area Radiation Monitor Calibration Data (CH-36, CH-18-2, CH-18-3, CH-27)

Effluent Lower Limit of Detection Determination Data (October 6, 2011 (gaseous, liquids)
General Source Term Data
2010 Annual QA Report
Drywell High Radiation Monitor Calibration Procedures (Unit 2 and Unit 3) (various)
Wide Range Gas Monitor Calibration Data (various)
Teledyne Brown Quarterly Reports
Contamination Monitoring Instrument Matrix

ARs

1299543, 1299476

Section 2RS06: Radioactive Gaseous and Liquid Effluent Treatment

Procedures

EN-AA-408-4000, Revision 0, Radiological Ground Water Protection Program Implementation
EN-PB-408-4160, Revision 0, Peach Bottom RGPP Reference Material

Documents

2010 Annual Radioactive Effluent Release Report No. 53
Land Use Census, January 4, 2011
Annual Radiological Environmental, Effluent Release Reports-2008, 2009
ODCM and Changes
Reports (various) - Routine Ground Water
General Source Term Data
Ground Water Analyses
Corrective Action Documents (various ARs)

Section 2RS07: Radiological Environmental Monitoring Program

Procedures

ODCM, Revision 13

Documents:

2010 Annual Radioactive Effluent Release Report No. 53
Land Use Census, January 4, 2011 (2010)
Annual Radiological Environmental, Effluent Release Reports-2009, 2010
ODCM and Changes
Reports (various) - Routine Ground Water
General Source Term Data
Ground Water Analyses
Corrective Action Documents (various ARs)

**Section 2RS08: Radioactive Solid Waste Processing and Radioactive Material Handling,
Storage, and Transportation**

Procedures

RT-W-20D-965-2, Low Level Radwaste Storage Facility Waste Container Storage
Cell Inspection
OP-AA-102-102, General Area Checks and Operator Field Rounds, Revision 9

Documents

Radioactive Waste Facilities Walk-down Reports and Status
Radioactive Waste Shipment Records (Shipment PM-11-151)
Shipper and radiation Worker Training Records

Section 40A1: Performance Indicator Verification

MSPI Deviation Reports and System Manager Notebooks:

October 2010 through September 2011, Unit 2 and Unit 3 RHR/HPSW
October 2010 through September 2011, Unit 2 and Unit 3 ESW
October 2010 through September 2011, Unit 2 and Unit 3 EDGs
October 2010 through September 2011, Unit 2 and Unit 3 HPCI
October 2010 through September 2011, Unit 2 and Unit 3 RCIC

Procedures:

ER-AA-600-1047, Mitigating Performance Index Basis Document, Revision 5
ER-AA-2008, MSPI Failure Determination Evaluation
ER-AA-2020, Equipment Performance and Information Exchange (EPIX), Revision 5
LS-AA-2001, Collecting and Reporting of NRC PI Data, Revision 14
LS-AA-2080, Monthly Data Elements for NRC SSFFs, Revision 4
LS-AA-2200, MSPI Data Acquisition and Reporting,
Revision 4
ST-C-095-865-2, Revision 1, Determination of Annual Dose Equivalent for All Uranium Fuel
Cycle Source

CRs:

IR 1159200, PRA Model Change and CDE Updates Required
IR 1174526, E-4 EDG Out-of-Date as Found Value ST-0-052-414-2
IR 1167998, E-3 EDG Standby Lube Oil Circ Pump Would Not Turn Off
AR 1830889, 0AP060 Pump DP in Action Range D
AR 1804236, E-2 Diesel Generator Control Power Light Not Lit
AR 1772696, RT-0-098-500-2 Dailey Production Log
ARs 1259944, 1265695, 1270773, 129559, 1263077, 1264425, 1262272, 1259944, 1265180,
1265391, 1266002, 1266237, 1266279, 1266283, 1266454, 1168966, 1173026,
1201437, 1226472, 1226687, 1227440, 1235086)

Miscellaneous:

LER 11-001-00, HPCI System Inoperable due to Leaking Cooling Water Header Relief Valve
NEI 99-02, Regulatory Assessment Indicator Guideline, Revision 6
PBAPS MSPI Basis Document, Revision 3
Technical Evaluation 1174526-02
Annual Radiological Environmental, Effluent Release Reports - 2008, 2009
Public Dose Projections (Liquid, Gaseous)
Reports (various) - Routine Ground Water data

Section 40A2: Identification and Resolution of Problems

Procedures

LS-AA-125, CAP Procedure, Revision 15
OU-AA-4002, Revision 1, Fuel and Core Component Handling Performance Monitoring
Process, Revision 2

OU-AB-4001, Revision 5, BWR FH Practices, Revision 6
SO 18.1.A-3, Revision 24, Operation of Refueling Platform, Revision 25
RT-R-004-990-2, Boraflex Surveillance Using the Racklife Program
NF-PB-310-2000, Special Nuclear Material and Core Component Movement - Peach Bottom
OP-AA-108-115
NET-264-02 P Revision 4

CRs

*IR 516731-04, Revise SF-220 as Needed to be in Compliance with OM-12 Revision 2
IR 1222491, Unit 2 Control Rod 02-35 High Temperature and Control Rod Drift
IR 1272847, Teflon Seat Ring Disc on 126 Valve of Hydraulic Control Unit 18-59 Found Torn
*IR 1281090, TRM 3.9 Typo Needs to be Corrected
IR 1281553, Hydraulic Oil Leak on Fitting to 3 'B' RFP Control Valve Actuator
IR 1281565, Emergent Clearance Written for Unit 3 'B' RFP Turbine Hydraulic
Power Units
IR 1281601, Filter Differential Pressure High
IR 1281806, Insulation Ineffective (Needs Replacing) on RWCU Piping
IR 1282235, Inconsistencies with Maneuver Guidance from Fleet Norm
IR 1282317, 4.0 Crew Critique – GP-9 to Remove 3 'B' RFP from Service
IR 1284565, Review Operations Procedures for Power Reduction Improvement
*IR 1293507, Revise SF-221 to Ensure Compliance with OM-12, Revision 2
*IR 1293511, Revise SF-290 as Necessary to Ensure Compliance with OM-12, Revision 2
*IR 1295818, LER Numerical Designation Error
IR 1295435, Increased Rate of LERS for 2011
IR 971001, Orientation of Fuel Bundle in Incorrect in Fuel Prep Machine
IR 971385, Fuel Channel Dropped in Unit 3 SFP
IR 972679, P3R17 Fuel Bundle Mispositioned during Core Shuffle II
IR 1114828, Level 4 Event Refuel Bridge Stopped by Spotter
IR 1115041, P2R18 Fuel Bundle Came in Contact with SCI Sub
IR 1117854, P2R18 Dummy Bundle Came in Contact with Bundle in SFP
IR 1257323, Failed PMT on 30H332 Refuel Platform Mono Hoist Motor
CR-1261969-03, Engineering to Submit Technical Evaluation Being Conducted Under ACIT 02
to MRC for Review and Approval
IR 1225840-13, Update - PB Review of NRC TIA Response for SFP Boraflex
IR 1261969-04, Document Detailed Exelon Review of TIA 2011-004

WOs / Action Requests

WO R1147790, Perform Refueling Operations on Unit 3 Reactor Encoder Check, Check
Bridge/Trolley Encoders

Miscellaneous

Abnormal Condition Monitoring Plans for P3R18 Refueling Operations
Peach Bottom Station Trend Review, Second Quarter 2011 Analysis
Peach Bottom Technical Evaluation to Verify the Adequacy of the PBAPS SPF Storage Rack
Criticality Margins Dated August 16, 2010
Task Interface Agreement 2011-004, Peach Bottom Units 2 and 3 SFP Neutron Absorber
Degradation
LER 11-002-00, Event date: June 6, 2011

Section 40A2.4: Review of Licensee Actions to Resolve Vital Bus Degraded Voltage Protection Issues

Calculations

PE-0048, AC MCC Control Circuit Evaluation, Revision 9
PE-0121, Voltage Regulation Study, Revision 7
PE-0225, Degraded Grid Relays Setpoints, Revision 0

Issue Reports

00762371, NRC CDBI – URI for LTC Licensing Basis
00781059, NRC URI 2008007-3, Vital Bus Degraded Voltage Protection
00918762, Voltage Reg. Study ETAP File Has Load Flow Differences
01117782, MO-2-10-154A: Margin Improvement Modification Required
01117787, MO-3-10-154B: Margin Improvement Modification Required
01119440, LTC URI Disposition
01126155, MO-3-10-013D, Overall Gear Ratio Modification Required for Degraded Voltage
01126164, MO-3-10-034B: LS Modification Required Based on Degraded Voltage
01126193, MO-3-23-015: P3R18 Modification Based on Degraded Voltage
01138920, NRC NCV 2010004-3: Adequate Voltage to SR Equipment Not Ensured
01149455, Low Voltage at MCC Contactor Using LOCA Relay Setpoints
01149471, Low Voltage at MCC Contactor Using LOCA Relay Setpoints
01149488, Low Voltage at MCC Contactor Using LOCA Relay Setpoints
01149493, Low Voltage at MCC Contactor Using LOCA Relay Setpoints

Completed Surveillance Procedures

ST-O-010-301-2, 'A' RHR Loop Pump, Valve, Flow, & Unit Cooler Functional and Inservice Test, Revision 33, Completed 11/22/11
ST-O-010-306-2, 'B' RHR Loop Pump, Valve, Flow, & Unit Cooler Functional and Inservice Test, Revision 31, Completed 08/29/11
ST-O-010-306-3, 'B' RHR Loop Pump, Valve, Flow, & Unit Cooler Functional and Inservice Test, Revision 33, Completed 11/02/11

Drawings

E-1, Sheet 1, Single Line Diagram, Station, Revision 50 (10/04/11)
E-71, Sheet 1, Electrical Schematic Diagram, Emer. Aux. Swgr. Reg. Trans. Source 4.16KV Ckt. Breaker, Revision 38 (01/27/00)

Engineering Changes

ECR PB 02-00214 000, Evaluate ARI Starters and Associated Components
ECR PB 10-00360 000, MO-2-10-154A (B), Install Closed Torque Switch Bypass
ECR PB 10-00362 000, MO-3-10-026B, Install Closed Torque Switch Bypass

Engineering Technical Evaluations & Operability Evaluations

A17776725, Evaluate MCC Bus Voltage with the 4kV Bus Voltage at 3836V, Revision 0
10-006, IR 1119440-07, LTC URI Disposition, Revision 3
1119440-12, Documentation of MOV Operability for NRC CDBI URI, Revision 0

Licensing Documents

PBAPS TSs
PBAPS UFSAR

Miscellaneous

Shift Training Brief 10-12, Closing MO-2(3)-10-154A (B), "RHR Loop A (B) Outboard Discharge Valve" Under Startup Source Degraded Voltage Conditions, 09/29/10

Procedures

LS-AA-125, CAP Procedure, Revision 15

LS-AA-125-1001, Root Cause Analysis Manual, Revision 8

LS-AA-125-1003, Apparent Cause Evaluation Manual, Revision 9

OP-AA-108-115, Operability Determinations, Revision 10

OP-AA-108-115-1001, Operability Evaluation Passport Engineering Change Desktop Guide, Revision 1

OP-AA-108-115-1002, Supplemental Consideration for On-Shift Immediate Operability Determinations, Revision 2

Procedures (Operations)

AO 10.8.2, Unit 2, Placing Torus Cooling in Service with LOCA Signal Present or Has Occurred, Revision 10

AO 10.8.3, Unit 3, Placing Torus Cooling in Service with LOCA Signal Present or Has Occurred, Revision 10

T-204-2, Unit 2, Initiation of Containment Sprays Using RHR, Revision 5

T-204-3, Unit 3, Initiation of Containment Sprays Using RHR, Revision 4

T-231-2, Unit 2, HPSW Injection into the Torus, Revision 6

T-231-3, Unit 3, HPSW Injection into the Torus, Revision 6

RRC 10.1-2, Unit 2, RHR System Torus Cooling during a Plant Event, Revision 4

RRC 10.1-3, Unit 3, RHR System Torus Cooling during a Plant Event, Revision 5

System & Program Health Reports

4 kV, Unit 2, 3rd Quarter 2011

4 kV, Unit 3, 3rd Quarter 2011

480 V Emergency & NSR Load Center, Unit 2, 3rd Quarter 2011

480 V Emergency & NSR Load Center, Unit 3, 3rd Quarter 2011

MOV Program, 3rd Quarter 2011

Substations/Startup Sources, Units 2 & 3, 3rd Quarter 2011

WOs

C0235649, MO-2-10-154A, Margin Improvement

R0998411, E124-D-A (5322), Perform Breaker Maintenance

R1055237, E324-D-A (5545), Perform MCU Inspection

R1085871, MO-3-10-026B-OP, Perform Motor Operator P.M.

ARs

1259944, 1265695, 1270773, 129559, 1263077, 1264425, 1262272, 1259944, 1265180, 1265391, 1266002, 1266237, 1266279, 1266283, 1266454, 1168966, 1173026, 1201437, 1226472, 1226687, 1227440, 1235086)

Section 40A3: Follow-up of Events and Notices of Enforcement Discretion

Procedures

OP-AA-108-115, Operability Determinations, Revision 10

M-052-002, Diesel Engine Maintenance, Revision 35

CRs

IR 1264398, RV-3-10-72D Inlet Piping Configuration
IR 1264909, RV-3-10-072D Update from A1758904 (Leakage Source on RV)
IR 1265892, E-33 LOCA/LOOP had Unexpected E-3 EDG Start
IR 1307019, Document Corrective Actions for RV-3-10-072D (IR 1264909)
IR 582657, Oil Leak on Outboard of Engine Blower
IR 894706, Oil Leak at E-2 Blower
IR 1266837, Oil Leak from E-1 EDG Supercharger Drain Line
IR 1293991, OIO Benchmark E-1 Diesel Blower Oil Drain Line
IR 1309963, E-1 EDG Oil Leak CAP Product Quality Issues

Drawings

ISI-361, Sheet 4: ASME Section XI ISI Boundaries RHR System, Revision 11

WOs

A1825798, RHR Pump 3DP035 Suction Relief Valve
A1758094, RHR Pump 3DP035 Suction Relief Valve

Miscellaneous

Agastat Vendor Data Sheet: Nuclear Qualified Control Relays – Series EGP/EML/ETR
Electric Power Research Institute TR-106857, PM Basis - Volume 30: Relays - Control
NRC Generic Letter 90-05: Guidance for Performing Temporary Non-Code Repair of ASME
Code Class 1, 2, and 3 Piping
PBAPS PCM Templates: Relays – Control / Timing
NRC Information Notice 2007-27: Recurring Events Involving EDG Operability
PBAPS EDG Run Database, April – November 2011
PBAPS CAP Search: 3-year History of EDG Oil Leaks

Section 40A5: Other Activities

EP-AA-1007; Radiological EP Annex for PBAPS, Revisions 16 and 21
IR 01184333; EP Notice of Violation for EAL Change-Implement EAL Basis Change for
HU6; March 7, 2011
Radiological Surveys – IFSI
Inspection Reports - IFSI

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
ALARA	as low as is reasonably achievable
AR	action request
APRM	average power range monitor
ASME	American Society of Mechanical Engineers
BI	barrier integrity
CAP	corrective action program
CCA	common cause analysis
CDF	core damage frequency
CFR	Code of Federal Regulation
CRs	condition reports
EAL	emergency action level
ECCS	emergency core cooling system
ECR	engineering change request
ED	electronic dosimeter
EDEX	effective dose equivalent for external exposure
EDG	emergency diesel generator
EOC	extent of condition
EP	Emergency Plan
ESW	emergency service water
FH	fuel handling
FSAR	final safety analysis report
GPI	groundwater protection initiative
HEPA	high efficiency particulate air
HPCI	high pressure coolant injection
HPSW	high pressure service water
HRA	high radiation area
IMC	inspection manual chapter
IR	issue report
ISFSI	independent spent fuel storage installation
IST	inservice testing
LCO	limiting condition for operation
LER	licensee event report
LERF	large early release frequency
LHRA	locked high radiation area
LLD	lower limits of detection
LOCA	loss of coolant accident
LOOP	loss of offsite power
LTC	load tap changer
MCC	motor control center
MG	motor generator
MOV	motor-operated valve
MR	maintenance rule
MSIV	main steam isolation valve
MSPI	mitigating system performance indicator
NCV	non-cited violation
NEI	Nuclear Energy Institute

NIOSH	National Institute for Occupational Safety and Health
NOS	nuclear oversight
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
NVLAP	National Laboratory Accreditation Program
ODCM	offsite dose calculation manual
P3R18	Peach Bottom Unit 3 Refueling Outage Number 18
PARS	publicly available records
PBAPS	Peach Bottom Atomic Power Station
PCP	process control program
PD	performance deficiency
PI	performance indicator
PI&R	problem identification and resolution
PM	preventive maintenance
PMT	post-maintenance test
QA	quality assurance
RB	reactor building
RBCCW	reactor building closed cooling system
RCA	radiological controlled area
RCIC	reactor core isolation cooling
REMP	Radiological Environmental Monitoring Program
RETS	radiological effluents technical specification
RFO	refueling outage
RFP	reactor feed pump
RG	regulatory guide
RPS	reactor protection system
RHR	residual heat removal
RTP	rated thermal power
RWCU	reactor water cleanup
SBO	station blackout
SDP	significance determination process
SFP	spent fuel pool
SLC	standby liquid control
SM	shift manager
SPAR	standardized plant analysis risk
SRA	senior reactor analyst
SRV	safety relief valve
SSCs	structures, systems, and components
ST	surveillance test
TIA	task interface agreement
TLD	thermoluminescent dosimeter
TS	technical specification
UFSAR	updated final safety analysis report
URI	unresolved item
VHRA	very high radiation area
WBC	whole body counter
WOs	work orders