



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
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November 10, 2010

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 05000277/2010004 AND 05000278/2010004

Dear Mr. Pacilio:

On September 30, 2010, 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 October 22, 2010, with Mr. Thomas Dougherty 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.

Based on the results of this inspection, one non-cited violation (NCV) was identified. However, because of the very low safety significance and because it was entered into your correction action program (CAP), the NRC is treating this finding as an NCV, consistent with Section 2.3.2 of the NRC's Enforcement Policy.

If you contest the NCV 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 accordance with Title 10 of the Code of Federal Regulations (CFR) 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the

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Sincerely,

A handwritten signature in cursive script that reads "Paul G. Krohn".

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

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

Enclosure: Inspection Report 05000277/2010004 and 05000278/2010004
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Sincerely,
/RA/

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

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U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.: 50-277, 50-278

License Nos.: DPR-44, DPR-56

Report No.: 05000277/2010004 and 05000278/2010004

Licensee: Exelon Generation Company, LLC

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

Location: Delta, Pennsylvania

Dates: July 1, 2010, through September 30, 2010

Inspectors: F. Bower, Senior Resident Inspector
A. Ziedonis, Resident Inspector
E. Burket, Reactor Inspector
J. D'Antonio, Senior Operations Engineer
K. Mangan, Senior Reactor Inspector
R. Nimitz, Senior Health Physicist
E. Torres, Project Engineer

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

Enclosure

TABLE OF CONTENTS

SUMMARY OF FINDINGS	3
REPORT DETAILS	5
1. REACTOR SAFETY	5
1R04 Equipment Alignment	5
1R05 Fire Protection	6
1R07 Heat Sink Performance	6
1R08 Inservice Inspection (ISI) Activities	7
1R11 Licensed Operator Requalification Program	7
1R12 Maintenance Effectiveness	9
1R13 Maintenance Risk Assessments and Emergent Work Control	9
1R15 Operability Evaluations	10
1R18 Plant Modifications	12
1R19 Post-Maintenance Testing	13
1R20 Refueling and Other Outage Activities	14
1R22 Surveillance Testing	15
1EP6 Drill Evaluation	15
2. RADIATION SAFETY	16
2RS01 Access Control to Radiologically Significant Areas	16
2RS02 Occupational ALARA Planning and Controls	20
2RS03 In-Plant Airborne Radioactivity Control and Mitigation	22
2RS04 Occupational Dose Assessment	24
2RS05 Radiation Monitoring Instrumentation	25
2RS06 Radioactive Gaseous and Liquid Effluent Treatment	27
4. OTHER ACTIVITIES (OA)	30
4OA2 Identification and Resolution of Problems (PI&R)	30
4OA3 Follow-up of Events and Notices of Enforcement Discretion	31
4OA5 Other Activities	32
4OA6 Meetings, Including Exit	37
ATTACHMENT: SUPPLEMENTAL INFORMATION	38
SUPPLEMENTAL INFORMATION	A-1
KEY POINTS OF CONTACT	A-1
LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED	A-1
LIST OF DOCUMENTS REVIEWED	A-3
LIST OF ACRONYMS	A-16

Enclosure

SUMMARY OF FINDINGS

IR 05000277/2010004, 05000278/2010004; 07/01/2010 - 09/30/2010; Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3; Other Activities.

The report covered a three-month period of inspection by resident inspectors and announced inspections by a senior health physicist, a regional project engineer, a senior operations engineer, and two regional reactor inspectors. One NCV was identified and one NCV was discussed. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using IMC 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. Cross-cutting aspects associated with findings are determined using Inspection Manual Chapter (IMC) 0310, "Components Within The Cross-Cutting Areas," dated February 2010. 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: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance involving a NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," in that Exelon did not assure that applicable regulatory requirements and the design basis were correctly translated into specifications, drawings, procedures, and instructions. Specifically, Exelon did not use the safety-related Function 4 degraded grid relay trip setpoint specified in the Technical Specifications (TS) as a design input in calculations to ensure adequate voltage was available to all safety-related components required to respond to a design basis loss-of-coolant accident (LOCA). Instead, Exelon used the results from calculation PE 0121, "Voltage Regulation Study," to establish the voltage level for system operability. The study credited the use of non-safety related equipment to raise the voltage level. This allowed higher voltages to be used in the design calculations for components than would be allowed by the TS setpoint. The team verified the licensing basis via Task Interface Agreement (TIA) 2009-07 and informed Exelon that the degraded grid relay setpoint must be used for design basis calculations. Exelon entered the issue into the CAP (IR 1119440), performed operability assessments, and established some compensatory measures to restore PBAPS to an operable but non-conforming condition.

The finding is more than minor because it is associated with the design control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was also similar to example 3j in IMC 0612, Appendix E, in that there was reasonable doubt as to the operability of safety-related components and Exelon was required to perform operability determinations to address potentially inadequate voltage to several safety-related components. The inspectors, including the Region I Senior Reactor Analysts (SRAs), performed a Phase 1 SDP screening, in accordance with NRC IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," and determined the finding was of very low safety significance (Green) because it was a design deficiency that impacted operability but not functionality, did not represent a loss of system safety

Enclosure

function, did not represent an actual loss of safety function of a single train, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. There was no cross-cutting issue associated with the finding because the degraded grid relay setpoints had been most recently evaluated in 2004 and the issue was not reflective of current performance. (Section 4OA5.2)

Other Findings

- Severity Level (SL) IV. The September 16, 2010, letter from the NRC to Exelon (ML102590516¹) described a NCV of 10 CFR 50.9 and 10 CFR 73.56(c). This finding is being discussed in this inspection report so that it may be captured in the plant issues matrix (PIM) and be used as an input for plant assessment purposes. (Section 4OA5.3)

¹

Accession numbers in the format of ML102590516 are used to locate documents in the NRC's electronic system for managing agency records (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

REPORT DETAILS

Summary of Plant Status

Unit 2 began the inspection period at 100 percent rated thermal power (RTP). On July 20, 2010, the unit began its end-of-cycle coast down. Planned power reductions were performed on July 23 and August 10, 2010, respectively, to remove the fifth and fourth stage feedwater (FW) heat exchangers (HXs) from service during the end-of-cycle coast down. Planned main turbine valve testing was also performed on July 23, 2010. On September 12, 2010, a planned shutdown from approximately 81 percent was commenced and the main generator breaker was opened to start the unit's 18th refueling outage ((RFO) P2R18). During the shutdown, operators inserted a planned manual scram from approximately 3 percent reactor power. The unit remained in P2R18 through the end of the inspection period.

Unit 3 began the inspection period at 100 percent RTP. On August 27, the unit performed a planned power reduction to approximately 55 percent to perform main turbine and main steam isolation valve (MSIV) testing, control rod scram time testing, and a control rod sequence exchange. On August 28, 2010, the unit was returned to 100 percent RTP where it remained until the end of the inspection period, except for one brief period to support a rod pattern adjustment.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment (71111.04Q - 3 Samples)

.1 Partial Walkdown

a. Inspection Scope

The inspectors performed a partial walkdown of three systems to verify the operability of redundant or diverse trains and components when safety-related equipment was inoperable. The inspectors performed walkdowns to identify any discrepancies that could impact the function of the system and potentially increase risk. The inspectors reviewed selected applicable operations procedures, walked down system components, and verified that selected breakers, valves, and support equipment were in the correct position to support system operation. Documents reviewed are listed in the Attachment. The three systems reviewed were:

- Unit 2, 125/250 volt direct current (VDC) circuit flow path during multiple 'A/' 'C' battery subsystem ground alarms;
- Unit 2, reactor core isolation cooling (RCIC) lineup with the vacuum pump out-of-service (OOS); and
- Unit 2, 'B' shutdown cooling with 'A' loop in-service and the 'C' residual heat removal (RHR) HX isolated and inoperable, while transitioning to Mode 5 with a two-hour time-to-boil.

Enclosure

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05Q - 5 Samples).1 Fire Protection - Toursa. Inspection Scope

The inspectors conducted fire protection walkdowns which were focused on availability, accessibility, and the condition of firefighting equipment. The inspectors reviewed areas to assess whether PBAPS had implemented the Peach Bottom Fire Protection Plan (FPP) and adequately: controlled combustibles and ignition sources within the plant; maintained fire detection and suppression capability; and maintained the material condition of passive fire protection features. For the areas inspected, the inspectors also verified that PBAPS had followed the Technical Requirements Manual (TRM) and the FPP when compensatory measures were implemented for OOS, degraded or inoperable fire protection equipment, systems, or features. The inspectors verified: that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient combustible materials were managed in accordance with plant procedures; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors toured the following areas:

- Fire water leak in PF-78V, Unit 3 moisture separator area² (Fire Zone 78V);
- Report of smoke on Unit 2 main turbine deck (Fire Zone 78U);
- Unit 2 turbine building (TB), moisture separator area – elevation 116' (Fire Zone 78W);
- Unit 2 TB, general area – elevation 135' (Fire Zone 99); and
- Unit 2 TB, emergency battery switchgear rooms – elevation 135' (Fire Zone 127).

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07 - 1 Sample)a. Inspection Scope

Based on a plant specific risk assessment and a review of issue reports (IRs) in the CAP, the inspectors reviewed PBAPS's program for maintenance and testing of the emergency service water (ESW) flow to the emergency core cooling system (ECCS) room coolers and the emergency diesel Generator (EDG) HXs. Specifically, the testing and analysis of the ECCS room cooler and EDG HXs' flow rates were reviewed for several periods of cleaning and testing from 1996 to 2010. The inspectors reviewed test results, IRs, and calculations to verify that the safety function of the coolers and HXs were maintained. The following inspection constituted one sample:

- RT-O-033-600-2, Flow Test of ESW to ECCS Coolers and Diesel Generator Coolers.

² remote camera inspection was performed to meet as low as reasonably achievable radiation dose goals.

b. Findings

No findings were identified.

1R08 Inservice Inspection (ISI) Activities (71111.08G - 1 Sample)

a. Inspection Scope

From September 20-24, the inspectors performed a review of Exelon's implementation of their risk-informed ISI program activities for monitoring degradation of the reactor coolant system (RCS) boundary and risk significant piping system boundaries for Peach Bottom Unit 2 using the criteria specified in the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI.

The sample selection was based on the inspection procedure objectives and risk priority of those components and systems where degradation would result in a significant increase in risk of core damage. The inspectors reviewed documentation, observed in-process non-destructive examinations (NDE) and interviewed inspection personnel to verify that the activities were performed in accordance with the ASME Boiler and Pressure Vessel Code Section XI requirements.

Activities inspected during the Unit 2 RFO 18 (P2R18) included direct observation of in-process manual ultrasonic testing (UT) of feedwater (FW) nozzle N4C and magnetic particle testing (MT) of a PMCap split ring, which was designed as an appurtenance to the ESW piping for leak repair.

The inspectors also examined portions of videos and pictures of in-vessel visual inspections (IVVI) of the jet pumps, the core spray (CS) pumps, control rod guide tubes, and the steam separator to verify that Exelon is inspecting and monitoring in vessel components in accordance with Boiling Water Reactor Vessel and Internals Project guidelines.

The inspectors performed direct visual inspection of the accessible portions of the drywell liner and non-wetted portions of the torus pressure boundary. The inspectors reviewed visual inspection records of the components examined during Exelon's walk down.

The inspectors reviewed two repair and replacement activities to verify that welding activities and applicable NDE were performed in accordance with ASME Code requirements. These activities included replacing an ESW cross-tie check valve (CHK-2-33-514) and installing a PMCap appurtenance to the 20" ESW piping.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11 - 2 Samples)

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

Enclosure

a. Inspection Scope

On August 23, 2010, the inspectors observed a simulator-based licensed operator evaluation during requalification training. The inspectors assessed the performance of risk significant operator actions, including the use of emergency operating procedures. The inspectors evaluated crew performance in the areas of:

- Clarity and formality of communications;
- Event classification and emergency response actions;
- Ability to take timely actions;
- Prioritization, interpretation, and verification of alarms;
- Procedure usage;
- Control board manipulations; and
- Command and control.

The inspectors verified that evaluators were identifying and documenting crew performance problems. These activities constituted one quarterly Licensed Operator Requalification Training Program inspection sample.

b. Findings

No findings were identified.

.2 Limited Senior Reactor Operator (LSRO) for Refueling Requalification Program (71111.11B - 1 Sample)

a. Inspection Scope

The following inspection activities were performed using NUREG 1021, Revision 9, "Operator Licensing Examination Standards for Power Reactors," Inspection Procedure (IP) Attachment 71111.11, "Licensed Operator Requalification Program," and Appendix A, "Checklist for Evaluating Facility Testing Material."

A review was conducted of recent operating history documentation regarding fuel handling found in the licensee's CAP. The inspectors also reviewed specific events from the licensee's CAP to determine if possible training deficiencies existed. The inspectors noted repeated instances at Peach Bottom of misoriented or mispositioned fuel bundles during refueling activities, and reviewed the root cause evaluation and corrective actions that were performed by the facility.

The inspectors evaluated the 2010 Limerick and Peach Bottom LSRO refueling operating tests and the Limerick LSRO written examinations for quality and compliance with the Examination Standards. Administration of five job performance measures to four operators at Limerick was observed on August 2, 2010.

On September 7, 2010, the results of the biennial written examinations at Limerick and annual operating tests for 2010 were reviewed to determine whether pass/fail rates were consistent with the guidance of NUREG-1021, Revision 9, "Operator Licensing Examination Standards for Power Reactors." All LSROs passed their examinations. Performance of all individuals over two years was reviewed and indicated no adverse

Enclosure

trends. The remediation plans for one individual's written failure in 2008 were reviewed to assess the effectiveness of the remedial training.

Two years of records for requalification training attendance and license reactivation for all four LSROs were reviewed for compliance with license conditions and NRC regulations. Medical records for these four individuals were also reviewed.

A sampling of feedback was reviewed and training materials were evaluated for response to this feedback. These materials were also reviewed for incorporation of plant modifications and industry events.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q - 2 Samples)

a. Inspection Scope

The inspectors evaluated PBAPS's work practices and follow-up corrective actions for safety-related structures, systems, and components (SSCs) and identified issues to assess the effectiveness of PBAPS's maintenance activities. The inspectors reviewed the performance history of SSCs and assessed PBAPS's extent-of-condition (EOC) determinations for those issues with potential common cause or generic implications to evaluate the adequacy of the PBAPS's corrective actions. The inspectors assessed PBAPS's problem identification and resolution (PI&R) actions for these issues to evaluate whether PBAPS had appropriately monitored, evaluated, and dispositioned the issues in accordance with Exelon procedures, including ER-AA-310, "Implementation of the Maintenance Rule," and the requirements of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance." In addition, the inspectors reviewed selected SSC classifications, performance criteria and goals, and PBAPS's corrective actions that were taken or planned, to evaluate whether the actions were reasonable and appropriate. The inspectors performed the following two samples:

- Station Blackout (SBO) System (System 51H); and
- MSIVs (System 07).

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 - 5 Samples)

a. Inspection Scope

The inspectors evaluated PBAPS's implementation of the Maintenance Risk Program with respect to the effectiveness of risk assessments performed for maintenance activities that were conducted on SSCs. The inspectors also verified that the licensee managed the risk in accordance with 10 CFR Part 50.65(a)(4) and procedure WC-AA-101, "On-line Work Control Process." The inspectors evaluated whether PBAPS had taken the necessary steps to plan and control emergent work activities and to

Enclosure

manage overall plant risk. The inspectors selectively reviewed PBAPS's use of the online risk monitoring software and daily work schedules. The activities selected were based on plant maintenance schedules and systems that contributed to risk. The inspectors completed five evaluations of maintenance activities on the following:

- Unit 3, 'A' circulating pump trip (IR 1093772);
- Unplanned unavailability of the SBO (191-00) line cable (IR 1098574);
- Emergent work to investigate a leak from 'A' ESW discharge piping (IR 1099140);
- Installation of reactor protection system (RPS) test box to support drywell equipment hatch shield block removal (work order (WO) R1114224-24); and
- Control of work and management of risk in response to receipt of a low pressure alarm on independent spent fuel storage installation (ISFSI) cask number 50 (IR 1109955).

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15 - 7 Samples)

a. Inspection Scope

The inspectors reviewed seven issues to assess the technical adequacy of the operability evaluations, the use and control of compensatory measures, and compliance with the licensing and design bases. Associated adverse condition monitoring plans (ACMPs), engineering technical evaluations, and operational and technical decision making (OTDM) documents were also reviewed. The inspectors verified these processes were performed in accordance with the applicable administrative procedures and were consistent with NRC guidance. Specifically, the inspectors referenced procedure OP-AA-108-115, "Operability Determinations," and NRC IMC Part 9900, "Operability Determinations & Functionality Assessments for Resolutions of Degraded or Nonconforming Conditions Adverse to Quality or Safety." The inspectors also used TSs, TRM, Updated Final Safety Analysis Report (UFSAR), and associated Design Basis Documents (DBDs) as references during these reviews. The following degraded equipment issues were reviewed:

- Northeast Technology Corporation (NETCo) issued Notice of Inability to Evaluate Possible 10 CFR 21 Reportability (IR 1093925);
- ACMP action level exceeded for total dissolved combustible gas in the 3 'B' main power transformer (MPT) (IR 1097166);
- Operability evaluation for the ASME Code Class III through-wall pinhole leak in the 'A' ESW piping (IR 1099140-02);
- EDG fuel oil low cetane levels (IR 1085064);
- E-4 EDG ventilation fan following unexpected trip and motor starter unit replacement (IR 1095983);
- Acceptability of boron poison areal density during procurement of TN-68 spent fuel dry storage casks (IR 1044591); and
- Operability Evaluation 10-007 and corrective actions needed for spent fuel pool (SFP) Boraflex degradation (IR 1127773) and SFP criticality with 45% B-10 loss (Technical Evaluation, Revision 3 - IR 864431-15).

Enclosure

b. Findings

Introduction: The inspectors identified an unresolved item (URI) related to issues of concern with the degrading Boraflex panels in the PBAPS SFPs. Additional information and specialized technical support from the NRC's Office of Nuclear Reactor Regulation (NRR) are required to determine whether a performance deficiency exists. Specifically, NRR will be requested to provide a technical review of the PBAPS's operability determination ((OD) 10-007) to determine if it is technically sufficient and to confirm the time limitations associated with the referenced technical evaluation. This will support an evaluation of whether PBAPS's corrective actions to address the non-conservative TS (4.3.1.1.a) associated with the design limit for peak in-core reactivity (k_{∞}) of spent fuel have been timely when judged against the standards established in NRC Administrative Letter (AL) 98-10, "Dispositioning of TSs That Are Insufficient To Assure Plant Safety," and the requirements in 10 CFR 50, Appendix B, Criterion XIV, "Corrective Actions." Additionally, the inspectors will use the results of the NRR technical review to determine whether the PBAPS OD has demonstrated with reasonable assurance that the subcritical margin limit for the SFP as specified by TS 4.3.1.1.b ($K_{\text{effective}} \leq 0.95$) will continue to be met through the time limit established in the technical evaluation and until the licensee's specified corrective actions can be completed. The current technical evaluation concludes that with administrative limits on the reactivity of the fuel added to SFPs, $K_{\text{effective}}$ will conservatively remain below 0.95 until approximately 2014.

Description: Since 1996, PBAPS has known that the Boron-10 (B-10) neutron absorber used in the Units 2 and 3 SFPs' racks had begun a degrading trend. Specifically, the degradation caused some of the Boraflex neutron absorber material imbedded in the rack panels to fall below the minimum certified B-10 density of 0.021 grams B-10 per square centimeter (g/cm^2). The panels had degraded from the as-manufactured average areal density of 0.0235 g/cm^2 that was 11.9 percent greater than minimum certified density. In response to degrading trends, PBAPS secured analyses from AEA Technology and NETCo that quantified the reactivity effects associated with varying degrees of B-10 density loss in the Westinghouse racks. The reactivity penalty derived from this analysis was transposed into Global Nuclear Fuel (GNF) SFP criticality analyses. PBAPS asserted that these analyses were incorporated into the plants' licensing and design bases through the 10 CFR 50.59 process. However, none of these methods have been reviewed and approved by the NRC for application at Peach Bottom.

In 2007, PBAPS recognized that the B-10 degradation of the Units 2 and 3 SFPs storage was projected to exceed the 10 percent loss limit ($0.0189 \text{ g}/\text{cm}^2$) established by the AEA Technology, NETCo, and GNF analytical methods. PBAPS also recognized that the K_{∞} value in TS (4.3.1.1.a) would become non-conservative and the guidance in NRC AL 98-10, "Dispositioning of TSs That Are Insufficient to Assure Plant Safety," would apply. Subsequently, PBAPS submitted a license amendment request (LAR) to change the K_{∞} value in the TS. In response to issues raised by the NRC's technical reviewers, PBAPS made several supplemental submittals to the LAR before it was withdrawn by a letter dated June 18, 2010 (ML101690377).

Subsequently, PBAPS developed OD 10-007 to address the non-conservative TS (4.3.1.1.a). The OD evaluated the acceptability of storing fuel bundles in the Unit 2 and 3 SFP storage racks with a minimum B-10 average areal density of $0.01155 \text{ gm}/\text{cm}^2$,

Enclosure

which is 55% of 0.021g/cm² (45% degradation). In comparison, it is noted that the most degraded panel in either units' SFP storage racks was measured in January 2010, to be degraded to an areal density of 0.0169 g/cm² (19.5 percent of 0.021g/cm²) and has been projected to have degraded to 0.0146 g/cm² (30.5 percent of 0.021g/cm²) on November 1, 2010. The degradation projections have been made by the RACKLIFE version 2.0 computer modeling program; however, it is noted that the licensee plans to convert to version 2.1 of RACKLIFE program. The OD referenced and relies on Revision 3 of a technical evaluation (IR 864431-15, and two previous revisions) that PBAPS has used since 2009 to justify continued operability of the SFPs and to show that the SFP will be maintained 5% subcritical ($K_{\text{eff}} \leq 0.95$). The basis for the approach in these documents was to reduce the design basis limiting fuel assembly reactivity to a maximum K_{infinity} of 1.26. The current technical evaluation concludes that with administrative limits on the reactivity of the fuel added to SFPs, $K_{\text{effective}}$ will conservatively remain below 0.95 until the maximum B-10 density depletion reaches approximately 45 percent in 2014. As an additional compensatory measure, PBAPS plans to remove from service any SFP storage rack panels with Boraflex degraded more than 45 percent. PBAPS's current plans are to submit a new LAR in late 2011.

The inspectors reviewed OD 10-007 and concluded that assistance from NRR was needed to determine the technical adequacy and correctness of the licensee's operability evaluation and to confirm the time limitations associated with the referenced technical evaluation. This assistance is needed by the region to determine whether one or more performance deficiencies exist. Specifically, to evaluate whether PBAPS's corrective actions to address the non-conservative TS (4.3.1.1.a) associated with the design limit for peak in-core reactivity (k_{infinity}) of spent fuel have been timely when judged against the standards established in NRC AL 98-10, "Dispositioning of TSs That Are Insufficient To Assure Plant Safety," and the requirements in 10 CFR 50, Appendix B, Criterion XIV, "Corrective Actions." Additionally, the inspectors will use the results of the NRR technical review to determine whether the PBAPS OD has demonstrated with reasonable assurance that the subcritical margin limit for the SFP as specified by TS 4.3.1.1.b ($K_{\text{effective}} \leq 0.95$) will continue to be met through the time limit established in the technical evaluation and until the licensee's specified corrective actions can be completed.

The inspectors plan to submit their technical questions to NRR in accordance with Office Instruction, COM-106, "Control of Task Interface Agreements." Therefore, this issue remains unresolved pending NRR's response to the TIA and subsequently inspector review. **URI 05000277, 278/2010004-01, Non-conservative TS and Potential Non-compliance Associated with Degraded SFP Boraflex Panels.**

1R18 Plant Modifications (71111.18 - 3 Samples)

.1 Temporary Modifications (2 Samples)

a. Inspection Scope

The inspectors reviewed the following two temporary modifications to ensure that it did not adversely affect the availability, reliability, or functional capability of any risk-significant SSCs and to verify that modification implementation did not place the plant in an unsafe condition. The inspectors reviewed the temporary configuration change package (TCCP) and WO and, as applicable, walked down the area, and interviewed

Enclosure

various personnel. The control of the modification was compared to the procedural requirements. The inspectors also verified that the installation was consistent with the modification documentation; that the drawings and procedures were updated as applicable; and that the post-installation testing was adequate. Documents reviewed are listed in the Attachment.

- The temporary modification (WO C0233635-A44 and IR 961233-85) was installed to provide ultrasonic flow instrumentation to support the operation of the torus dewatering system; and
- Temporary SBO control Power (Engineering Change Requests (ECR) 10-00042).

b. Findings

No findings were identified.

.2 Permanent Modifications (1 - Sample)

a. Inspection Scope

The inspectors reviewed one permanent modification to verify that modification implementation did not place the plant in an unsafe condition. The review was also conducted to verify that the design bases, licensing bases, and performance capability of risk significant SSCs had not been degraded as a result of these modifications. The inspectors verified the modified equipment alignment through control room instrumentation observations; UFSAR, drawings, procedures, and WO reviews; staff interviews; and plant walkdowns of accessible equipment. Documents reviewed are listed in the Attachment. The following ECR for a permanent modification was reviewed:

- ECR 10-00236 was developed to generically approve the installation and use of SmartCover ® level indicators in electrical manholes to detect water intrusion. The level indicators use an ultrasonic sensor to detect water level and will be mounted under the manhole lids. Data is wirelessly transmitted from the level instrument.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 - 6 Samples)

a. Inspection Scope

The inspectors reviewed completed test records or observed selected post-maintenance testing (PMT) activities. The inspectors verified whether the tests were performed in accordance with the approved procedures or instructions and assessed the adequacy of the test methodology based on the scope of maintenance work performed. In addition, the inspectors assessed the test acceptance criteria to evaluate whether the test demonstrated that components satisfied the applicable design and licensing bases and the TS requirements. The inspectors reviewed the recorded test data to verify that the acceptance criteria were satisfied. The inspectors reviewed six PMTs performed in conjunction with the following maintenance activities:

Enclosure

- Replace and align power supply in Unit 2 steam leak temperature monitoring switch, TIS-80547A (WO C0234375);
- Vibration monitoring activities for the Unit 2 'A' condensate pump in response to elevated vibration levels (IR 1083310);
- Unit 2 'A' CS, surveillance test (ST)-O-014-301-2, performed following 2 'A' CS LOOP planned maintenance;
- Unit 2, removal of 4th and 5th stage FW heaters for end-of-cycle coastdown;
- E-4 EDG ventilation fan run following motor starter replacement (A1769577); and
- Investigate, inspect and test the 2 'C' RHR HX for leakage (WO C0233586-12, -17, -19, and -33).

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

.1 Peach Bottom Unit 2 RFO 18 (P2R18)

a. Inspection Scope

The Unit 2 RFO (P2R18) was conducted from September 12, 2010, through the end of the inspection period. Prior to the start of P2R18 on September 12, 2010, the inspectors reviewed the station's work schedule and the Outage Risk Assessment Management (ORAM) Plan against procedures OU-PB-104, "Shutdown Safety Management Program;" OU-PB-104-1001, "Shutdown Risk Management for Outages;" and OU-AA-103, "Shutdown Safety Management Program." The ORAM plan was reviewed to confirm that the PBAPS had appropriately considered risk, industry experience, and previous site specific problems in developing and implementing a plan that maintained shutdown safety defense-in-depth. During the RFO, the inspectors observed portions of the shutdown and cooldown processes and selectively monitored the activities listed below to verify PBAPS controls over the outage activities:

Observed Plant Operations Review Committee meetings where the reactor shutdown and shutdown safety plans were discussed;

- Observed the control room operators reduce power to approximately 3 percent, initiate a planned manual scram of Unit 2, and stabilize the plant in Mode 3;
- Observed selected plant cool down activities;
- Conducted drywell walkdowns to check for degraded conditions;
- Outage scope change and significant outage scheduling changes due to an adverse trend in reactor water chemistry;
- Maintenance of secondary containment as required by TS;
- Configuration management, including maintenance of defense-in-depth, commensurate with the outage risk plan for the key safety functions and compliance with the applicable TS when taking equipment OOS;
- Monitoring of decay heat removal operations, including alternate decay heat removal via the SFP;
- Monitoring reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions and controls to prevent inventory loss during operations with a potential to drain the reactor vessel;

Enclosure

- Monitoring the status and configuration of electrical systems and switchyard activities to ensure that TSs were met;
- Monitored activities that could affect reactivity;
- Monitored refueling activities, including fuel handling; and
- Identification and resolution of problems related to RFO activities.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 - 5 Samples)

a. Inspection Scope (3 Routine Surveillances; 1 Isolation Valve; and 1 In-service Test (IST) Sample)

The inspectors reviewed or observed selected portions of the following surveillance tests (STs), and compared test data with established acceptance criteria to verify the systems demonstrated the capability of performing the intended safety functions. The inspectors also verified that the systems and components maintained operational readiness, met applicable TS requirements, and were capable of performing design basis functions. The five STs reviewed or observed included:

- ST/LLRT 20.01A.02, MSIV Local Leak Rate Test [Isolation Valve Sample];
- ST-O-013-301-3, RCIC Pump, Valve, and Flow and Unit Cooler Functional and IST [IST Sample];
- ST-M-13C-400-2, RCIC Vacuum Pump Discharge Check Valve IST;
- M-C-797-046, Control of Fuel Inspection Activities, and M-018-013, New Fuel Receipt and Inspection of Unchanneled Fuel; and
- ST-J-07A-600-2, Integrated Leak Rate Test (extension/deferral).

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06 - 2 Samples)

.1 Drill Observation (1 Drill Sample)

a. Inspection Scope

The inspectors observed the conduct of a PBAPS emergency drill on July 12, 2010, to identify any weaknesses and deficiencies in classification and notification activities. The drill was conducted to provide drill and exercise performance (DEP) opportunities for the DEP performance indicator (PI). The inspectors observed operators respond to events in the simulator control room through the declaration and notification of an alert. The inspectors observed the operations shift manager transition emergency response command and control responsibilities to the site emergency director in the technical support center (TSC). The inspectors relocated to the TSC to observe command and control of the emergency response organization and dose assessment as the event escalated to the declaration and notification of a site area emergency, followed by further

Enclosure

escalation to a general emergency. The inspectors verified that the event classification and notifications were done in accordance with EP-AA-1007, "Exelon Nuclear Radiological Emergency Plan Annex for PBAPS." The inspectors verified that the drill evaluators correctly counted the drill's contribution in the calculation of the DEP PI. The inspectors also verified that operations personnel in the simulator control room identified weaknesses or deficiencies during the critique of the drill. The following simulated events were classified during this training exercise:

- FG1 - General Emergency, Fission Product Barrier Degradation: Loss of RCS and Loss of Primary Containment Barrier and Potential Loss of Fuel Clad Barrier;
- FS1 - Site Area Emergency, Fission Product Barrier Degradation: Loss of RCS and Loss of Primary Containment Barrier; and
- FA1 - Alert, Fission Product Barrier Degradation: Loss of RCS Barrier.

b. Findings

No findings were identified.

2. Simulator Training Observation (1 Simulator Training Sample)

a. Inspection Scope

On August 23, 2010, the inspectors reviewed and observed the classification and notification aspects of a licensed operator requalification training examination scenario in the PBAPS simulator. The conduct of the simulator-based training evolution was evaluated in accordance with the guidance in NRC IP 71114.06, "Drill Evaluation." The inspectors verified the adequacy of drill conduct, and verified that training evaluators captured the results for the DEP PI. The inspectors also verified that any weaknesses or deficiencies were captured and discussed during the critique of the training exercise, in order to properly identify and correct any weaknesses. The inspectors observed the evaluation, classification, and notification of the simulated events to ensure they were accurate and timely.

b. Findings

No findings were identified.

2. **RADIATION SAFETY**

Cornerstone: Occupational Radiation Safety (OS)

2RS01 Access Control to Radiologically Significant Areas (71124.01)

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 10 CFR 20, applicable TSs, and applicable station procedures.

Enclosure

Inspection Planning

The inspectors reviewed PIs for the Occupational Exposure cornerstone. The inspectors also reviewed the results of recent radiation protection program audits and assessments, as available, and any reports of operational occurrences, as applicable, related to occupational radiation safety since the last inspection.

Radiological Hazard Assessment

The inspectors discussed plant operations, as applicable, to identify any significant new radiological hazard for onsite workers or members of the public. The inspectors assessed the potential impact of the changes and monitoring, as appropriate, to detect and quantify the radiological hazard.

The inspectors toured radiological controlled areas and reviewed radiological surveys from selected plant areas (e.g., re-fueling floor, reactor cavity, reactor building, TB, condenser areas, drywell, torus), to verify that the thoroughness and frequency of the surveys were appropriate for the given radiological hazard.

The inspectors conducted walk-downs of the facility, including the dry-active waste collection location, to evaluate material conditions and potential radiological conditions. The inspectors made independent radiation measurements to verify conditions.

The inspectors selected various radiological risk-significant work activities (reactor cavity, in vessel work activities, drywell work activities, condenser work, RHR system work, dry well work, and torus diving activities) that involved exposure to radiation to verify that appropriate pre-work surveys were performed to identify and quantify the radiological hazard and to establish adequate protective measures. The evaluation included, as applicable: identification of discrete particles, the presence of alpha emitters, the potential for airborne radioactive materials, potential changes in radiological conditions, and non-uniform exposures of the body.

The inspectors selectively reviewed and discussed air sample survey records associated with various work activities to verify that samples were representative of the breathing zone and collected and counted in accordance with procedures, as appropriate.

The inspectors reviewed ongoing work activities in the radiological controlled area (RCA) to evaluate methods used by the licensee to update workers on changes in conditions.

Instructions to Workers

The inspectors toured the radiologically controlled areas, including outage work areas, and reviewed labeling of containers of radioactive materials to verify labeling was consistent with requirements and was informative to workers, as applicable.

The inspectors reviewed various radiation work permits (RWPs), as low as reasonably achievable (ALARA) reviews, and radiological surveys, used to access high radiation areas (HRAs), to identify work control instructions or control barriers specified, use of stay times or permissible dose, and appropriate electronic personal dosimeter (EPD) alarm set-points were in conformance with survey indications. The inspectors evaluated

Enclosure

licensee changes to set-points for specified conditions and updating of radiation work permits. The inspectors reviewed ongoing remote monitoring via teledosimetry.

Contamination and Radioactive Material Control

The inspectors observed locations where the licensee monitors potentially contaminated material leaving the RCA, and inspected the methods used for control, survey, and release from these areas. The inspectors observed the performance of personnel surveying and releasing material for unrestricted use to verify that the work was performed in accordance with plant procedures and the procedures were sufficient to control the spread of contamination and prevent unintended release of radioactive materials from the site. The inspectors selectively evaluated the radiation monitoring instrumentation sensitivity for the type(s) of radiation present.

The inspectors reviewed the licensee's criteria for the survey and release of potentially contaminated material. The inspectors verified that there was guidance on how to respond to an alarm that indicates the presence of radioactive material.

The inspectors reviewed the licensee's procedures and records to verify that the radiation detection instrumentation was used at its typical sensitivity level based on appropriate counting parameters including application of alarm set-points based on the instrument's typical sensitivity. The inspectors also discussed alarm set-points and typical detection capabilities with cognizant licensee personnel.

The inspectors selected three sealed sources from the licensee's inventory records that presented the greatest radiological risk and verified that the sources were accounted for and have been verified to be intact.

The inspectors discussed the occurrence of any transactions involving nationally tracked sources to evaluate reporting in accordance with 10 CFR 20.2207.

Radiological Hazards Control and Work Coverage

The inspectors toured the facility and reviewed ongoing work and evaluated ambient radiological conditions (e.g., radiation levels or potential radiation levels). The inspectors verified the existing conditions were consistent with posted surveys, RWPs, and worker briefings, as applicable.

The inspectors observed ongoing work activities and verified the adequacy of radiological controls, such as required surveys (including system breach radiation, contamination, and airborne surveys), radiation protection job coverage (including audio and visual surveillance for remote job coverage), and contamination controls. The inspectors selectively evaluated the licensee's means of using EPDs in high noise areas as HRA monitoring devices (e.g., use of teledosimetry).

The inspectors verified that radiation monitoring devices thermoluminescent dosimeters (TLDs) were placed on the individual's body consistent with the method that the licensee is employing to monitor dose from external radiation sources. The inspectors verified by direct observation that the dosimeters were placed in the location of highest expected dose. As part of this review, the inspectors reviewed, for high-radiation work areas with

Enclosure

significant dose rate gradients, the use of dosimetry to effectively monitor exposure to personnel.

The inspectors selectively reviewed radiation work permits for work within potential airborne radioactivity areas with the potential for individual worker internal exposures. The inspectors evaluated airborne radioactive controls and monitoring, including potentials for significant airborne levels (e.g., grinding, grit blasting, system breaches, entry into tanks, cubicles, reactor cavities). The inspectors directly observed system breach activities, including use of local ventilation system and respiratory protection equipment to minimize airborne radioactive exposure.

The inspectors observed ongoing work activities within flooded pools and examined the licensee's physical and programmatic controls for highly activated or contaminated materials (nonfuel) stored within storage pools. The inspectors verified that appropriate controls (i.e., administrative and physical controls) were in place to preclude inadvertent removal of these materials from the pool.

The inspectors conducted selective inspections of posting and physical controls for HRAs and very high radiation areas (VHRAs), to the extent necessary to verify conformance with the Occupational PI. The inspectors evaluated down-posting of areas from HRAs.

Risk-Significant HRA and VHRA Controls

The inspectors discussed with the Radiation Protection Manager the controls and procedures for high-risk HRAs and VHRAs and any procedural changes since the last inspection. The inspectors discussed methods employed by the licensee to provide stricter control of VHRA access, including potential reduction in the effectiveness and level of worker protection (e.g., use of lock boxes).

The inspectors discussed with health physics supervisors controls for special areas that have the potential to become VHRAs during certain plant operations, including controls to ensure that an individual is not able to gain unauthorized access to the VHRA.

Radiation Worker Performance

The inspectors observed radiation worker performance with respect to stated radiation protection work requirements to determine if performance reflected the level of radiological hazards present. The inspectors interviewed numerous workers conducting work activities in the RCA to determine if workers were aware of the radiological conditions in their workplace and the RWP controls/limits in place.

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

Radiation Protection Technician Proficiency

The inspectors observed the performance of the radiation protection technician with respect to all radiation protection work requirements to determine if technicians were

Enclosure

aware of the radiological conditions in their workplace and the RWP controls/limits and if their performance is consistent with their training and qualifications with respect to the radiological hazards and work activities.

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 the corrective action approach taken by the licensee to resolve the reported problems.

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's CAP. The inspectors discussed corrective actions for identified concerns. (See Section 4OA2.)

b. Findings

No findings were identified.

2RS02 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

Inspection Planning

The inspectors 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 determined the plant's three-year rolling average (TYRA) collective exposure.

The inspectors determined the site-specific trends in collective exposures using various methods such as plant historical data, including outage work dose based on task, evaluation of ALARA data, and licensee source term data.

The inspectors reviewed site-specific procedures associated with maintaining occupational exposures ALARA including the processes used to estimate and track exposures from specific work activities.

Radiological Work Planning

The inspectors obtained from the licensee a list of work activities ranked by actual or estimated exposure that were planned or in progress and selected work activities of the highest exposure significance. These included reactor disassembly, control rod drive work, scaffolding, RHR work, torus diving, and valve work.

The inspectors reviewed the ALARA work activity evaluations, exposure estimates, and exposure mitigation requirements. The inspectors determined if the licensee reasonably grouped the radiological work into work activities, based on historical precedence, industry norms, and/or special circumstances.

Enclosure

The inspectors determined if the licensee's planning identified appropriate dose mitigation features; considered, commensurate with the risk of the work activity, alternate mitigation features; and defined reasonable dose goals. As applicable, the inspectors verified that the licensee's ALARA assessment had taken into account decreased worker efficiency from use of respiratory protective devices.

The inspectors determined if the licensee's work planning considered the use of remote technologies (such as teledosimetry, remote visual monitoring, and robotics) as a means to reduce dose and the use of dose reduction insights from industry operating experience and plant-specific lessons learned. The inspectors verified the integration of ALARA requirements into work procedure and (RWP documents).

The inspectors compared accrued results achieved (dose rate reductions, person-rem used), as available, with the intended dose established in the licensee's ALARA planning for these work activities including person-hour estimates. The inspectors determined, as applicable, the reasons for inconsistencies between intended and actual work activity doses.

Verification of Dose Estimates and Exposure Tracking Systems

The inspectors selected at least five ALARA work packages and reviewed the assumptions and bases for the collective exposure estimate for reasonable accuracy. The inspectors reviewed applicable procedures to determine the methodology for estimating exposures from specific work activities and the intended dose outcome. The inspectors also reviewed approvals by the station ALARA committee as applicable.

The inspectors verified, for the selected work activities, that the licensee established measures to track, trend, and if necessary to reduce, occupational doses for ongoing work activities, including criteria to prompt additional reviews and/or controls. The inspectors evaluated the adequacy of and the licensee's method of adjusting exposure estimates, or re-planning work, when unexpected changes in scope or emergent work are encountered.

Source Term Reduction and Control

The inspectors used licensee records to determine the historical trends and current status of significant tracked plant source terms known to contribute to elevated facility aggregate exposure. The inspectors discussed source term mitigation with licensee staff and reviewed the station's Five-Year ALARA plan. The inspectors discussed contingency plans for potential changes in the source term as the result of changes in plant fuel performance issues or changes in plant primary chemistry.

Radiation Worker and Radiation Protection Technician Performance

The inspectors observed both radiation worker and radiation protection technician performance during work activities being performed in radiation areas, airborne radioactivity areas, or HRAs. The inspectors determined if workers demonstrated the ALARA philosophy in practice and whether there were any procedure compliance issues. The inspectors observed performance to determine whether the training and skill level were sufficient with respect to the radiological hazards and the work involved.

Enclosure

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's CAP. The inspectors discussed corrective actions for identified ALARA concerns. (See Section 4OA2)

b. Findings

No findings were identified.

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

a. Inspection Scope

Inspection Planning

The inspectors reviewed the plant's Final Safety Analysis Report (FSAR), as applicable, to identify areas of the plant designed as potential airborne radiation areas and any associated ventilation systems or airborne monitoring instrumentation. The inspectors also reviewed the FSAR for overview of respiratory protection program and a description of the types of devices used.

The inspectors selectively reviewed the licensee's procedures for maintenance, inspection, and use of respiratory protection equipment, including procedures for air quality maintenance. The inspectors also selectively reviewed, and directly observed, the use of respiratory protection equipment during ongoing work activities.

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

Engineering Controls

The inspectors selectively evaluated the licensee's use of ventilation systems as part of its engineering controls to control airborne radioactivity. The inspectors discussed procedural guidance for use of installed plant systems to verify system use, to the extent practicable, during high-risk activities. The inspectors discussed verification of plant ventilation systems during reactor cavity work.

The inspectors selectively reviewed installed ventilation systems used to mitigate the potential for airborne radioactivity. The inspectors discussed use of installed systems during work activities.

The inspectors selected two temporary ventilation system setups (high efficiency particulate air) filters to support work in contaminated areas. The inspectors discussed the use of these systems as regards procedural guidance and ALARA (RHR system work, reactor cavity work, condenser bay work).

The inspectors selected installed systems to monitor and warn of changing airborne concentrations in the plant. The inspectors evaluated the alarms and set-points to prompt licensee/worker action to ensure that doses are maintained within the limits of

Enclosure

10 CFR Part 20 and ALARA. The inspectors observed monitoring of ambient conditions by use of telemetry air monitoring systems.

The inspectors evaluated the licensee's use of trigger points for evaluating levels of hard-to-detect airborne radionuclides.

Use of Respiratory Protection Devices

The inspectors evaluated the licensee's use of respiratory protective devices to maintain occupational doses ALARA. The inspectors selected two work activities where respiratory protection devices were used to limit the intake of radioactive materials, and evaluated the use of respirators. The inspectors evaluated the licensee's means to verify that the level of protection (protection factor) provided by the respiratory protection devices during use was at least as good as that assumed in the licensee's work controls and dose assessment.

The inspectors evaluated the use of certified equipment (respiratory protection devices) to limit the intake of radioactive materials and evaluated that the devices were used consistent with their National Institute for Occupational Safety and Health / Mine Safety and Health Administration certification or any conditions of their NRC approval.

The inspectors reviewed records of air testing for supplied-air devices and self-contained breathing apparatus bottles to verify that air used in these devices meets or exceeded appropriate quality. The inspectors evaluated the plant breathing air supply systems met the minimum pressure and airflow requirements for the devices in use. The inspectors selectively reviewed use of supplied air systems.

The inspectors selected individuals qualified to use respiratory protection devices, and verified that they have been deemed qualified to use the devices.

The inspectors observed individuals assigned to wear a respiratory protection device and observed them donning and functionally checking the device as appropriate. The inspectors discussed their use of the devices including how to properly respond to any device malfunction or unusual occurrence.

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 in the CAP. (See Section 40A2.)

b. Findings

No findings were identified.

Enclosure

2RS04 Occupational Dose Assessment (71124.04)a. Inspection ScopeInspection Planning

The inspectors reviewed the results of available radiation protection program audits related to internal and external dosimetry to gain insights into overall licensee performance in the area of dose assessment.

The inspectors reviewed the most recent National Voluntary Laboratory Accreditation Program (NVLAP) accreditation report for the licensee dosimetry.

The inspectors reviewed licensee procedures associated with dosimetry operations, including issuance/use of external dosimetry (routine, multi-badging, extremity, neutron, etc.), assessment of internal dose (operation of whole body counter, assignment of dose based on derived air concentration hours, urinalysis, etc.), and evaluation of and dose assessment for radiological incidents. 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 NVLAP accredited. The inspectors determined if the licensee uses a "correction factor" to address the response of the electronic dosimeter (ED) as compared to its TLD for situations when the ED must be used to assign dose.

Internal Dosimetry

The inspectors reviewed routine bioassay (in vivo) procedures used to assess dose from internally deposited nuclides using whole body counting equipment. The inspectors determined if the procedures address methods for determining if an individual is internally or externally contaminated, the release of contaminated individuals, the determination of entry route (ingestion, inhalation), and assignment of dose.

The inspectors evaluated routine whole body counting to verify that the frequency of such measurements is consistent with the biological half-life of the potential nuclides available for intake.

The inspectors evaluated the minimum detectable activity (MDA) of the licensee's instrumentation used for passive whole body counting to determine if the MDA was adequate to determine the potential for internally deposited radionuclides sufficient to prompt additional investigation.

Special Dosimetric Situations

The inspectors reviewed the licensee's program to inform workers, as appropriate, of the risks of radiation exposure to the embryo/fetus, the regulatory aspects of declaring a pregnancy, and the specific process to be used for (voluntarily) declaring a pregnancy.

Enclosure

The inspectors selected one individual who had declared their pregnancy during the current assessment period, and verified that the licensee's radiological monitoring program (internal and external) for declared pregnant workers was technically adequate to assess the dose to the embryo/fetus.

The inspectors reviewed the licensee's methodology for monitoring external dose in situations in which non-uniform fields are expected or large dose gradients could exist (e.g., diving activities) to verify that the licensee established criteria for determining when alternate monitoring techniques (i.e., use of multi-badging or determination of effective dose equivalent for external exposures using an approved method) were to be implemented. The inspectors selectively reviewed use of multi-badging (e.g., diving).

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. (See Section 4OA2.)

b. Findings

No findings were identified.

2RS05 Radiation Monitoring Instrumentation (71122.05)

a. Inspection Scope

Inspection Planning

The inspectors reviewed the plant's FSAR, as applicable, to identify radiation instruments associated with monitoring area radiological conditions, including airborne radioactivity, process streams, effluents, materials/articles, and workers.

The inspectors obtained a listing of in-service survey instrumentation including air samplers and small article monitors (SAMs), along with instruments used for detecting and analyzing workers' external contamination (personnel contamination monitors (PCMs)) and workers' internal contamination (portal monitors (PMs)), whole body counters, etc.), including neutron monitoring instrumentation to determine whether an adequate number and type of instruments are available to support operations.

The inspectors selectively obtained and reviewed copies of licensee and third-party (independent) evaluation reports of the radiation monitoring program since the last inspection, including audits of the licensee's offsite calibration facility (if applicable) and reviewed the reports for insights into the licensee's program

The inspectors selectively reviewed procedures that govern instrument source checks and calibrations. The inspectors review the calibration and source check procedures for adequacy.

Walkdowns and Observations

The inspectors walked down three effluent radiation monitoring systems (Unit 2 and 3 plant vent sampling station, stack monitoring system), to verify that effluent/process monitor configurations align with Offsite Dose Calculation Manual (ODCM) descriptions. The inspectors looked for monitor degradation and/or OOS tags.

The inspectors selected at least five 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. The inspectors evaluated instrumentation in use within the RCA to validate current calibration and source checking.

The inspectors observed licensee staff performance as the staff demonstrated source checks of portable survey instruments. The inspectors reviewed source checking of at least three different types of portable survey instruments for the source check demonstration.

The inspectors walked down five area radiation monitors, including portable area monitors, and continuous air monitors to determine whether they were appropriately positioned relative to the radiation source(s) or area(s) they were intended to monitor. The inspectors selectively compared monitor response (via local or remote indication) with actual area conditions for consistency. The inspectors evaluated instrumentation in-place on re-fueling bridge and work platforms.

The inspectors selected PCMs, PMs, and SAMs and verified that the periodic source checks were performed in accordance with licensee procedures.

Calibration and Testing Program

The inspectors selected laboratory analytical instruments used for radiological analyses (e.g., gross alpha, gross beta) to verify that daily performance checks and calibration data indicate that the frequency of the calibrations was adequate and there were no indications of degraded instrument performance. The inspectors reviewed applicable control charts.

The inspectors reviewed alarm set-point data for various personnel and equipment monitors at three RCA exits to verify that the alarm set-point values were reasonable under the circumstances to ensure that licensed material was not released from the site.

Instrument Calibrator

The inspectors selectively verified that the licensee periodically measures calibrator output over the range of the instruments used through measurements by ion chamber/electrometer (or equivalent measuring devices) using National Institute of Standards Technology traceable sources and that correction factors for these measuring devices were properly applied by the licensee in its output verification.

Calibration and Check Sources

The inspectors selectively reviewed the licensee's latest 10 CFR Part 61 source term to determine if the calibration sources used were representative of the types and energies of radiation encountered in the plant.

Enclosure

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 inspectors evaluated the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involve radiation monitoring instrumentation. (See Section 4OA2.)

b. Findings

No findings were identified.

Cornerstone: Public Radiation Safety (PS)

2RS06 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

a. Inspection Scope

Inspection Planning and In-office Inspection

The inspectors performed in-office preparation before the inspection to review available documentation (e.g., annual reports submitted).

Event Report and Effluent Report Reviews

The inspectors reviewed the 2008 and 2009 Annual Radiological Effluent Release Report(s) issued since the last inspection. The inspectors determined if the reports were submitted as required by the ODCM/TSS. The inspectors reviewed the reports for anomalous results, unexpected trends or abnormal releases identified by the licensee for further inspection to determine if they were evaluated, were entered in the CAP, and were adequately resolved.

The inspectors reviewed the Radiological Effluent Release Reports to identify radioactive effluent monitor operability issues reported by the licensee as provided in effluent release reports. The inspectors reviewed these issues during the onsite inspection, as warranted, given their relative significance. The inspectors determined if the issues were entered into the CAP and adequately resolved.

ODCM and FSAR Reviews

The inspectors reviewed the FSAR descriptions of the radioactive effluent monitoring systems, treatment systems, and effluent flow paths to verify configurations during inspection walk-downs.

The inspectors reviewed, as available, changes to the ODCM made by the licensee since the last inspection, to review the technical basis or evaluations of the change and to determine whether they were technically justified and maintained effluent releases ALARA.

Enclosure

Groundwater Protection Initiative (GPI) Program

The inspectors reviewed reported groundwater monitoring results, and changes to the program for identifying and controlling contaminated spills/leaks to groundwater. (Note: During this inspection, the inspectors conducted an inspection relative to NRC Temporary Instruction (TI) 2515/173, "Review of the Implementation of the Industry Groundwater Protection Voluntary Initiative." (See Section 4OA5.1)

Procedures, Special Reports & Other Documents

The inspectors reviewed, as available, licensee event reports, event reports and/or special reports related to the effluent program issued since the previous inspection. The inspectors reviewed these documents to identify any additional focus areas for the inspection based on the scope/breadth of problems described in these reports.

Walkdowns and Observations

The inspectors walked down the plant stack and Unit 2 and Unit 3 Plant Vent Monitoring systems. The inspectors walked down the standby gas treatment system (SBGTS) to evaluate material condition.

The inspectors determined if the licensee made any significant changes to its effluent release points, e.g., changes subject to a 10 CFR 50.59 review or requiring NRC approval of alternate discharge points.

Sampling and Analyses

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

Effluent Flow Measuring Instruments

The inspectors selectively reviewed the methodology used to determine the effluent stack and plant vent flow rates.

Air Cleaning Systems

The inspectors selectively reviewed the in-place testing and laboratory charcoal testing for the SBGTS as specified in the TSS.

Dose Calculations

The inspectors evaluated any significant changes in reported dose values compared to the previous period, as applicable, including factors which may have resulted in the change.

The inspectors selectively reviewed and discussed the bases and methodology for calculation of 10 CFR 50 Appendix I dose values to verify dose to members of the public.

Enclosure

The inspectors discussed changes in the station offsite dose calculations, as applicable, since the last inspection. The inspectors selectively 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.

Groundwater Protection Initiative (GPI) Implementation

The inspectors selectively reviewed implementation of the Groundwater monitoring program. (Note: During this inspection, the inspectors conducted an inspection relative to NRC TI-2515/173, "Review of the Implementation of the Industry Groundwater Protection Voluntary Initiative." (See Section 4OA5.1)

The inspectors reviewed monitoring results of the GPI to determine if the licensee has implemented its program as intended and to identify any anomalous or missed results and to determine if the licensee has identified and addressed deficiencies through its CAP.

The inspectors selectively reviewed identified leakage or spill events, as applicable and selectively reviewed 10 CFR 50.75 (g) records and selectively reviewed evaluations including the source of the leak or spill and mitigation, as applicable.

The inspectors reviewed the evaluation of discharges from onsite surface water bodies (e.g., ponds, retention basins, lakes), as applicable, that contain or potentially contain radioactivity, and if the licensee was accounting for discharges from these surface water bodies as part of the effluent release report.

The inspectors verified that on-site Groundwater sample results and a description of any significant on-site leaks/spills into Groundwater were documented in reports.

The inspectors discussed any new, significant effluent discharge points, as applicable, to determine if the ODCM was updated to include the new release point.

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. (See Section 4OA2.)

b. Findings

No findings were identified.

4. **OTHER ACTIVITIES (OA)**

4OA2 Identification and Resolution of Problems (PI&R) (71152 - 1 Annual Sample)

Enclosure

.1 Review of Items Entered into the CAP

a. Inspection Scope

As required by IP 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed screening of all items entered into the licensee's CAP. This was accomplished by reviewing the description of each new action request (AR) / IR and attending daily management review committee meetings.

b. Findings

No findings were identified.

.2 Temporary Configuration Change Program (TCCP) (1 - Annual Sample)

a. Inspection Scope

The inspectors focused on PBAPS's problem identification, evaluation, and resolution of the corrective actions to address the TCCP programmatic issues at PBAPS as identified by the NRC, Exelon Nuclear Oversight, and other outside assessors. As an example, a SL IV Violation of 10 CFR 50.59 was issued on November 12, 2009, when the licensee implemented a temporary configuration change without a 50.59 review that likely would have required a license amendment before its implementation

(NCV 05000278/2009004-01, Failure to Perform a 50.59 Review Prior to Installing Jumpers on 'E' Wide-Range Neutron Monitoring System.)

The inspectors reviewed PBAPS's immediate and follow-up actions, apparent cause evaluation, EOC review, and corrective actions. The inspectors conducted interviews with site personnel, reviewed condition reports (CRs), training documentation, active temporary configuration changes, and revisions 16 & 17 of the TCCP procedure, CC-AA-112, Temporary Configuration Changes. The documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings were identified. The inspectors concluded that Exelon has identified and taken appropriate actions to resolve the issues with the TCCP. As a result of the SL IV violation, a knowledge deficiency regarding the usage of clearances in support of maintenance versus in support of operations was identified. The inspectors reviewed the clearance and tagging re-qualification training that explains the differences between the two situations. Also, the inspectors reviewed changes to the clearance and tagging process that includes routine reviews of all active clearances past 60 days. As part of PBAPS's TCCP improvement actions that were documented in IR 1039022, a revision to the TCCP procedure was performed to ensure design considerations were consistently considered prior to conducting temporary configuration changes to the facility. The inspectors reviewed the procedure revision and determined that the new changes were appropriate to address the program gaps that existed in the old revision.

Enclosure

.3 ISI of NDE Activitiesa. Inspection Scope

The extent of oversight of ISI/NDE activities, including the topics of current ISI oversight and surveillance were reviewed. The inspector reviewed a sample of CRs shown in Attachment 1 to confirm that identified problems were being documented for evaluation and proper resolution.

b. Findings

No findings were identified.

.4 Occupational Radiation Safety Program and Effluent Monitoring Programa. Inspection Scope (71124.01, 71124.06)

The inspectors selectively reviewed audits and assessments of the Occupational Radiation Safety Program and Effluent Monitoring Program. The inspectors also reviewed selected corrective action documents written since the previous inspection. (See documents reviewed.)

The review was against criteria contained in 10 CFR 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 - 1 Sample).1 Personnel Performance - Unit 2 - Fuel and Fuel Component Handling Eventsa. Inspection Scope

The inspectors reviewed Exelon's actions to address human performance events associated with fuel and fuel component handling in the reactor core and SFP during the Unit 2 P2R18 RFO. The inspectors also reviewed corrective action documents (IRs 1115041, 1117854, 1114828, and 1117251) that are listed in detail in the Attachment to this report. In addition, the inspectors observed fuel handling activities from the refueling platform and via remote monitoring equipment, and discussed the identified problems and evaluation activities with cognizant Exelon personnel.

b. Findings

Introduction: The inspectors identified an URI related to potential procedure inadequacy issues that allowed inadequate coordination of simultaneous close proximity activities within the reactor vessel and personnel performance error issues while handling fuel in the reactor core and the SFP. These events appear to be examples where inadequate procedures contributed to fuel handling issues. This issue will remain unresolved pending completion of PBAPS's investigation and cause evaluation processes under the CAP.

Enclosure

Description: On September 18, 2010, during Core Shuffle I, the safety spotter had to stop the refueling bridge to avoid contact with the CS inspection (CSI) submarine. On September 19, 2010, during the execution of fuel move 302 of Core Shuffle I, a discharged fuel bundle (JLM491), that had been picked up from the core, came in contact with the CSI submarine as the refueling bridge began transiting to the SFP (IR 1115041). Both fuel movement and NDEs using a remotely operated vehicle (CSI submarine) were being conducted within the same core quadrant. On September 24, 2010, during preparations for Core Shuffle II, a dummy fuel bundle came in contact with a discharged fuel bundle at location JJ-37 in the SFP while the refueling bridge's mast was being lowered over an occupied storage cell using the travel override pushbutton (IR 1115041). At the time, the mast was being exercised in accordance with a refuel bridge ST. At the end of the inspection period, PBAPS's causal analysis activities were still in progress; therefore, this item remains unresolved: **URI 05000277, 278/2010004-02, Potentially Inadequate Fuel Handling Procedures Lead to Personnel Performance Errors While Handling Fuel.**

40A5 Other Activities

.1 (Closed) TI-2515/173, Review of the Implementation of the Industry Groundwater Protection Voluntary Initiative

a. Inspection Scope

An NRC assessment was performed of Peach Bottom's Groundwater Protection Program to determine whether Exelon implemented the voluntary Industry Groundwater Protection Initiative (GPI), dated August 2007 (Nuclear Energy Institute (NEI) 07-07, ADAMS Accession Numbers ML072610036 and ML072600292³). The inspectors interviewed personnel, performed walk-downs of selected areas as needed, and reviewed the following items:

- Records of the site characterization of geology and hydrology;
- Evaluations of SSCs that contain or could contain licensed material and evaluations of work practices that involved licensed material for which there is a credible mechanism for the licensed material to reach the groundwater;
- Implementation of an onsite groundwater monitoring program to monitor for potential licensed radioactive leakage into groundwater;
- Procedures for the decision making process for potential remediation of leaks and spills, including consideration of the long term decommissioning impacts;
- Records of leaks and spills recorded, if any, in Exelon's decommissioning files in accordance with 10 CFR 50.75(g);
- Exelon briefings of local and state officials on Exelon's GPI;
- Protocols for notification to the local and state officials, and to the NRC regarding detection of leaks and spills;
- Protocols and/or procedures for thirty-day reports if an onsite groundwater sample exceeds the criteria in the Radiological Environmental Monitoring Program;
- Groundwater monitoring results as reported in the Annual Effluent and/or Environmental Monitoring Report; and

³ Accession numbers in the format of ML011360516 are used to locate documents in the NRC's electronic system for managing agency records (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

- Exelon and industry assessments of implementation of the GPI.

b. Findings and Observations

No findings were identified. Implementation of the Industry GPI is voluntary. Under the final Initiative, each site was to have developed an effective, technically sound Groundwater Protection Program by August 2008.

The inspectors determined that, at the time of this inspection, Exelon had not taken action on all groundwater initiative objectives (as outlined in the TI) as follows:

- GPI Objective 1.2 g - At the time of this inspection, a specific frequency had been established for periodic reviews of SSCs and work practices. However, the frequency had not yet been placed in a procedure. This matter was identified in a self-assessment and placed in the CAP. (IR924237)
- GPI Objective 1.3 f - At the time of the inspection, Exelon had established a program for the preventative maintenance of groundwater wells. However, the program had not yet been incorporated into all applicable implementing procedures. Exelon placed this issue into its CAP. (IR924237)
- GPI Objective 1.4 a.- At the time of this inspection, written procedures had not been established outlining the decision making process for remediation of leaks or spills or other instances of inadvertent releases, including consideration of migration pathways. Exelon identified this issue during an assessment of GPI implementation and placed this issue into its CAP. (IR924237)
- Objective 1.4 c.- At the time of this inspection, an evaluation had not been performed and documented on the decommissioning impacts resulting from remediation activities or the absence thereof (e.g., do licensee procedures include a decision making process to evaluate prompt remediation or delayed remediation and its impact on decommissioning). Exelon identified this issue during an assessment of GPI implementation and placed this issue into its CAP. (IR924237)
- GPI Objective 1.5 - Exelon developed program procedures to establish a record keeping program to meet the requirements of 10 CFR 50.75(g) and developed an historical spill/leak list. However, Exelon identified during a June 2010 audit, that the individual record files did not reflect some information contained in station files. Exelon initiated a review to ensure all appropriate information, consistent with criteria in 10 CFR 50.75(g) and the program procedure, were included in its decommissioning files. Exelon placed this matter into its CAP. (IR1081998)
- GPI Objective 3.2 a. - An independent, knowledgeable individual had not performed, under the auspices of NEI, an initial review within one year of the initial self-assessment, per GPI Objective 3.1.a. This assessment was completed on February 28, 2010. Exelon placed this matter into its CAP. (IR1041430).

Enclosure

.2 (Closed) URI 05000277 and 278/2008007-03 - Vital Bus Degraded Voltage Protection

a. Inspection Scope

During the 2008 Component Design Bases Inspection (CDBI), the team identified an URI to determine if the PBAPS approved licensing bases included the use of automatic load tap changers (LTCs) to protect the vital bus from unacceptable low voltage conditions during a LOCA. Specifically, during a review of Exelon's load flow and vital bus voltage calculations to verify the minimum vital bus voltage needed to ensure operation of safety-related loads required during design basis events was adequate, the team determined that voltages used in these analyses were not based on the trip set point of the TS Function 4 (LOCA) degraded voltage relay. Instead, Exelon used higher voltages than were afforded by the Function 4 relays by crediting voltage improvement due to operation of the non-safety related startup transformer LTCs in their analysis.

The team found that if the LTCs were not credited, voltage levels on the vital buses as supplied by offsite power might not be sufficient to provide adequate voltage to safety-related equipment; however, the voltage levels could be high enough to prevent the transfer of the buses to the onsite power source (EDGs). The licensee stated that their approach was acceptable because the NRC had given this credit when it reviewed and approved certain voltage studies submitted as part of licensing actions related to the degraded voltage relays. In particular, Exelon stated that their evaluation submitted to the NRC as part of license amendment number 143/145 included the operation of the tap changers and the NRC had approved this in the license amendment.

To resolve the issue, Region I initiated a TIA to request assistance from the Office of NRR in answering questions regarding the licensing basis for the degraded voltage relays at PBAPS. Specifically, in TIA 2009-007, Region I requested assistance in determining the current licensing basis for the degraded bus voltage protection, and whether the current licensing basis for degraded voltage relay settings included credit for the LTCs on the startup transformers to protect the Class 1E equipment during a design basis LOCA. NRR issued the final response to the TIA on September 29, 2010 (ML102710178), which included a review of all the license amendments and the safety evaluations (SEs) associated with the degraded grid relays.

The inspectors reviewed the final TIA response and the licensing amendments, to evaluate the adequacy of the Exelon's calculations and analyses to ensure adequate voltage was available to the safety-related loads following a design basis LOCA. Documents reviewed are listed in the Attachment.

b. Findings

Introduction: The inspectors identified a finding of very low safety significance (Green) involving a NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," in that Exelon did not use the voltage levels provided by the degraded grid relay setpoints to determine the operability of safety-related components. Specifically, the inspectors found that calculation PE 0121, in which the voltage used to determine operability of safety-related equipment was determined, credited operation of the non-safety related LTCs to determine the voltage level instead of the degraded grid relay setpoints specified in the TSs.

Enclosure

Description: As noted in the final TIA 2009-007 response, NRR determined that the PBAPS current licensing basis for degraded voltage relay settings does not include credit for the LTCs on the startup transformers to protect the Class 1E safety-related equipment during a design basis LOCA. Specifically, NRR concluded the following:

- The PBAPS current licensing basis describes operation of the LTCs to supply the design specified voltage to Class 1E equipment during a design basis LOCA if the LTCs are capable of maintaining proper voltage levels and off-site power is available. However, the under voltage relays are relied upon for the safety-related function to separate from the off-site power source and protect Class 1E equipment if proper voltage is not maintained. Therefore, the degraded voltage relay setpoints must be determined and used in component design bases calculations such that proper voltage levels as defined by GL 79-36 will be supplied to Class 1E equipment without reliance on the LTCs.
- The licensee must demonstrate that the existing degraded voltage trip setpoints, including allowable values and time delays shown in PBAPS TS Table 3.3.8.1, are adequate to protect and provide the required minimum voltage to all safety-related equipment. Since the LTCs are not safety-related and are subject to operational limitations and credible single failures, they cannot be relied on to establish degraded voltage relay setpoints and time delay input for design basis calculations.

Based on the above, the inspectors informed Exelon that the voltage levels used in their current calculations were not correct and that to show the safety-related equipment would be operable during design basis events the TS degraded grid relay setpoints must be used. Exelon performed electrical calculations using the most limiting voltage level allowed by the TSs and determined that multiple components would not have adequate voltage. Exelon performed an operability determination, which included electrical calculations that assumed voltage levels based on the degraded grid relay reset value, and established some compensatory actions. Exelon concluded that these components could be considered operable but that PBAPS was non-conforming with the licensing basis. The deficiencies were entered into Exelon's CAP for resolution. The team reviewed Exelon's operability evaluation and compensatory measures, and found them reasonable.

Analysis: The team determined that the failure to ensure that adequate voltage was provided to all safety-related components as allowed by the degraded voltage relays was a performance deficiency and was reasonably within Exelon's ability to foresee and prevent. The finding was more than minor because it was associated with the design control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Also, this issue was similar to Example 3j of NRC IMC 0612, Appendix E, "Examples of Minor Issues," because the condition resulted in reasonable doubt of the operability of the offsite power source supply voltage to 4160V safety buses, and additional analysis was necessary to determine operability.

The inspectors, including the Region I SRAs, determined the significance of the finding using IMC 0609.04, "Phase 1 - Initial Screening and Characterization of Findings." The finding was determined to be of very low safety significance (Green) because it was a design deficiency that impacted operability but not functionality, did not represent a loss

Enclosure

of system safety function, did not represent an actual loss of safety function of a single train, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. Specifically, the actual ability of offsite power to maintain adequate voltage during a design basis LOCA was not impacted by the finding.

There was no cross-cutting issue associated with the finding because the degraded grid relay setpoints had been most recently evaluated in 2004 and the issue was not reflective of current performance.

Enforcement: 10 CFR 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in § 50.2 and as specified in the license application, for those SSCs to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions. Contrary to this requirement between April 13, 1989, and September 29, 2010, Exelon did not use the setpoint for safety-related SSC's, specifically the Function 4 degraded grid relay trip setpoint, as a design input to ensure adequate voltage was available to all safety-related components required to respond to a design basis LOCA. Specifically, calculation PE 0121, "Voltage Regulation Study," was used to establish the voltage level as the design input for system operability instead of the TS value for the trip setpoint of the Function 4 relay. Because this violation was of very low safety significance (Green) and has been entered into Exelon's CAP (IR 1119440), this violation is being treated as a NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **NCV 05000277, 278/2010004-03, Failure to Ensure Adequate Voltage was Available to Safety-related Equipment.**

.3 NRC Investigation Report Nos. 1-2009-053 and 1-2009-046; EA-10-093 and EA-10-121

a. Inspection Scope

On September 16, 2010, the NRC issued a letter to Exelon Generation Company, LLC (Exelon). The letter referred to two investigations by the U. S. NRC's Office of Investigations (OI) that were conducted at Exelon's PBAPS. The investigations were conducted to determine whether two individuals separately engaged in deliberate misconduct while employed at Peach Bottom. Both occurrences were initially reported to the NRC by Exelon.

b. Findings and Observations

The September 16, 2010, letter from the NRC to Exelon (ML102590516⁴) described a SL IV NCV of 10 CFR 50.9 and 10 CFR 73.56(c). This finding is being discussed in this inspection report so that it may be captured in the Plant Issues Matrix (PIM) and be used as an input for plant assessment purposes. Issues associated with this finding have been entered in the CAP as IR 956017 and IR 1129794. The finding is designated in the PIM as **NCV 05000-277 & 278/ 2010009-01, Inaccurate Personnel History Questionnaire.**

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Accession numbers in the format of ML011360516 are used to locate documents in the NRC's electronic system for managing agency records (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Enclosure

4OA6 Meetings, Including Exit

.1 Quarterly Resident Exit Meeting Summary

On October 22, 2010, 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 asked the licensee whether any of the information discussed as being included in the report should be considered proprietary. No proprietary information was identified.

.2 LSRO Exit Meeting Summary

On September 8, 2010, the inspectors presented the inspection results and observations to members of licensee management. The inspectors verified that no proprietary information was documented as a result of this inspection.

.3 ISI Exit Meeting Summary

The inspectors presented the inspection results to Mr. Garey Stathes, Plant Manager, and other members of the PBAPS staff, at the conclusion of the inspection on September 24, 2010. The conclusions and observations presented were acknowledged by the staff. The inspectors verified that no proprietary information was documented as a result of this inspection.

.4 Occupational Radiation Safety Program Exit Meeting Summary

The inspectors presented the inspection findings to members of Exelon nuclear management on August 6, August 27, and September 19, 2010. Exelon personnel acknowledged the inspection findings. The inspectors verified that no proprietary information was documented as a result of this inspection.

.5 Closure of URI 2008007-03 Exit Meeting Summary

In accordance with the NRR instruction governing the TIA process, the draft TIA response was discussed during telephone conference calls between Exelon, NRR, and Region I staff on September 23 and 28, 2010. On October 13, 2010, the team conducted a telephone exit meeting regarding the inspection results with Mr. T. Dougherty, Site Vice President, and other members of Exelon staff. The team verified that no proprietary information is documented in this report.

.6 Management Meetings

Between September 22 and 24, 2010, Mr. P. Krohn, Chief, USNRC, Region I, Division of Reactor Projects, Branch 4, toured the Unit 2 drywell, torus, and other selected areas of the plant and met with PBAPS staff.

On September 27, 2010, Mr. D. Collins, Acting Deputy Director, USNRC, Region I, Division of Reactor Projects, toured the Unit 2 drywell and other selected areas of the plant, and met with senior managers from PBAPS.

Enclosure

On September 29, 2010, Mr. W. Dean, Regional Administrator, USNRC, Region I, toured the Unit 2 drywell and other selected areas of the plant, and met with senior managers from PBAPS.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

SUPPLEMENTAL 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
 R. Franssen, Work Management Director
 L. Lucas, Chemistry Manager
 R. Holmes, Radiation Protection Manager
 T. Wasong, Training Director
 C. Goff, Operations Training Manager
 A. Raush, Manager, Programs Engineering
 J. Searer, ISI Program Engineer
 J. Hawkins, NDE Engineer
 R. Smith, Reg. Assurance
 R. DiSabatino, ISI/IVVI Program Engineer

NRC Personnel

P. Krohn, Branch Chief
 F. Bower, Senior Resident Inspector
 A. Ziedonis, Resident Inspector
 E. Burkett, Reactor Inspector
 J. D'Antonio, Senior Operations Engineer
 K. Mangan, Senior Reactor Inspector
 R. Nimitz, Senior Health Physicist
 E. Torres, Project Engineer

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000277, 278/2010004-01	URI	Non-conservative TS and Potential Non-compliance Associated with Degraded SFP Boraflex Panels (Section 1R15)
05000277, 278/2010004-02	URI	Potentially Inadequate Fuel Handling Procedures Lead to Personnel Performance Errors While Handling Fuel (Section 4OA3.1)

Attachment

Opened/Closed

05000277, 278/2010004-03	NCV	Failure to Ensure Adequate Voltage was Available to Safety-Related Equipment (Section 4OA5.2)
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Closed

05000277, 278/2008007-03	URI	Vital Bus Degraded Voltage Protection (Section 4OA5.2)
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Discussed

05000277, 278/2010009-01	NCV	Inaccurate Personnel History Questionnaire (Section 4OA5.3)
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05000278/2009004-01	NCV	Failure to Perform a 50.59 Review Prior to Installing Jumpers on 'D' Wide-Range Neutron Monitoring System (Section 4OA2.2)
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LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

AO 57B.12-2, Revision 18, 125/250 VDC 'A' and 'C' Station Battery Ground Alarms
 AR A1759338, 2 'A' - 2 'C' Batteries Ground Alarm Received
 IR 1094841, OP-PB-108-115-1001, "Annunciator Ref Category" Improvement
 IR 1095121, 2 'A' / 'C' Battery Ground - Will Not Clear
 Narrative Logs, Dayshift, Monday, August 2, 2010
 Narrative Logs, Dayshift, Friday, July 30, 2010
 Narrative Logs, Nightshift, Tuesday, July 28, 2010

AR 1753023, RCIC Lubricating Oil Cooling Water Pressure Low Out-of-Band
 ARC-222 20C204C A-3, Revision 4, RCIC Turbine Bearing Oil Low Pressure
 IR 1087059, RCIC Vacuum Pump Discharge Check Momentarily Stuck Closed
 IR 1090868, Determine How RCIC Vacuum Pump OOS Effects Transient Ops
 M-360, Sheet 1, Revision 55, P&I Diagram, RCIC Pump Turbine Details
 PLOT 5013, Revision 3, Licensed Operator Training Lesson Plan Presentation,
 Slides 29 and 36
 RRC 13.1-2, Revision 3, RCIC System Operation during a Plant Event
 SE-13.1-2, Revision 0, RCIC Manual Operations on Loss of 125/250 VDC Bus 2DS-W-A
 SO 13.1.B-2, Revision 9, RCIC System Manual Operation
 ST-O-013-301-2, RCIC Pump, Valve, Flow and Unit Cooler Functional and IST,
 Completed 03/30/10

ACPS 10-02-039, 2 'C' RHR Pump Control Switch - Do not Operate
 HPSW Supply Block Valve Closed to Isolate 2 'C' RHR HX Leak
 2 'C' RHR HX Outlet Valve Closed due to HX Leak; 2 'C' RHR Pump Torus Suction Valve
 Closed to Isolate Leak
 IR 1080382, DPI-2-10-130A Indication Lowering with 2 'A' HPSW In-Service
 IR 1112293, Unit 2 Long Path Recirculation Primary Containment Isolation Valve Motor
 Operator Tripped on Thermals
 IR 1112337, MO-2-10-15D Showed Split Indication
 GP-3, Revision 119, Normal Plant Shutdown
 GP-6, Revision 18, Refueling Operations
 GP-12, Revision 24, Core Cooling Procedure

Section 1R05: Fire Protection

ARC-306 30C208R, E-2, 'A' Moist Sep Drain Tank High Level
 IR 1094142, Fire Header Leak
 IR 1094297, Fire System Tamper Switched Not Indicating on 3AC227
 IR 1094654, PSO2 EOS Critique July 23 to July 26 Nightshift
 IR 1095663, Potential Radwaste Release and Resin Generation
 AR A1768888, Fire Header Leak, Outer Block Valve to Unit 3 Main Steam Stop Valve Platform
 Narrative Logs, Nightshift, Saturday July 24, 2010
 PF-78V, Revision 5, Unit 3 Moisture Separator Area - Elevation 116'-0"
 IR 1110404, Smoke Noted from GE Generator Rewind Machine Shop Sea Van
 PF-78U, Revision 6, Unit 2 TB, Turbine Generator Area - Elevation 165'-0"
 PF-78W, Revision 4, Unit 2 TB, Moisture Separator Area - Elevation 116'-0"
 PF-99, Revision 4, Unit 2 TB, General Area - Elevation 135'-0"

PF-127, Revision 7, Unit 2 TB, Emergency Battery Switchgear Rooms - Elevation
135'-0"
ST-M-037-399-02, Revision 9, Fire Damper Inspection
Drawing A-168, Sheet 1, Revision 13, Fire Detection and Suppression - Floor Plan at Elevation
135'-0"
Drawing A-167, Sheet 6280, Revision 9, Fire Detection and Suppression - Floor Plan at
Elevation 116'-0"

Section 1R07: Heat Sink Performance

RT-O-033-600-2, Flow Test of ESW to ECCS Coolers and Diesel Generator Coolers, performed
08/22/10
ESW System Engineer Flow Test Historical DataSheets

Section 1R08: Inservice Inspection (ISI) Activities

IRs

349552	873016	1097871	1098456	1114081
448566	900644	1098214	1099140	1114707
500617	953160	1098276	1099407	1114718
798768	971841	1098434	1113640	1114821
866349	1063154	1098438	1113907	1114823

IR 1116429, 2R18 Radwaste Discharge Piping Guided Wave Inspection Results
IR 1119339, Initial Operability Determination Basis Incorrect
IR 1124987, Evaluate Reducing Requirements for Radiography
IR 1124909, Re-examination of CHK-0-33-515A Downstream of PM CAP

AR

A1545908
A1554416

Audits/Self Assessments

ASME Section XI ISI Program Self Assessment Report, dated 07/29/2010
NOSA-PEA-10-08 (AR #1090976), ISI, IST, and Appendix J Audit Report, dated 08/11/2010
P2R18 ISI Check-In Self Assessment Report, dated 8/31/2010

ECR

10-00323

Miscellaneous

Peach Bottom IISI Program Health Report, 2nd Quarter 2010
ASME Section XI Repair/Replacement Plan 10-053 (A1680776)
ASME Section XI Repair/Replacement Plan 10-141 (A1770532)

NDE Procedures

ER-AA-335-003, Magnetic Particle Examination, Revision 3
GE-PDI-UT-2, Performance Demonstration Initiative (PDI) Generic Procedure for the Ultrasonic
Examination of Austenitic Pipe Welds, Revision 4
GE-UT-300, Procedure for Manual Examination of Reactor Vessel Assembly Welds in
Accordance with PDI, Ver. 10
GEH-VT-204, Procedure for IIVVI of BWR 4 Reactor Pressure Vessel Internals, Ver. 12
MA-PB-793-001, Visual Examination of Containment Vessels and Internals, Revision 2

NDE Examination Reports

006100, Manual UT of N4C-IRS, dated 9/21/2010
008010, PT of Support-1(IA), dated 9/23/2010
028800, MT of HB1(IA), dated 9/18/2010
109000, Manual Phased Array UT of Safe-End to Nozzle N1B, dated 9/19/2010
301276, MT of 14GB-H47(IA), dated 9/19/2010
NDE-122, MT of PMCap split ring and backing bar, dated 9/21/2010

Program Procedures

ER-AA-330, Conduct of ISI Activities, Revision 8
ER-AA-330-009, ASME Section XI Repair/Replacement Program, Revision 5

Section 1R11: Licensed Operator Requalification Program

PSEG 1104R, "Evaluated Scenario," Revision 3
TQ-AA-150: Operator Training Programs, Revision 4
Lesson Plan NLSROR0801C Industry Events, Operating Experience, and Human Performance Fundamentals
Lesson Plan NLSRO1001C Industry Events and Selected SOERs
Lesson Plan LLOR1001I 1R13 Plant Modifications
Lesson Plan NLSROR0901D 2R10 Plant Modifications
AR 00972679 P3R17 Fuel Bundle Mispositioned During Core Shuffle II

Section 1R12: Maintenance Effectiveness

PBAPS Performance Monitoring Summary, System 51H: SBO
IR 1023838, SBO Control Power Transformer Failed
IR 1023838, Assignment 2, Equipment Apparent Cause Evaluation, SBO Control Power Transformer Failure
IR 1026493, SBO Control Power Transformer Sizing
IR 252076, SBO (00R010 (1003)) Current Transformer Caught on Fire
IR 278233, Assignment 13, Root Cause Report: SBO Line Incorrect Operability Determination
IR 305042, Expectations/Actions When Procedure Step Cannot Be Performed
IR 311464, Evaluate SBO Procedure for Improved Implementation

PBAPS Performance Monitoring Summary, System 07: Primary Containment Isolation Valves
Exelon PCM Templates: BWR MSIV
IR 0147485 (Limerick), MSIV Stroke Time Unsat
IR 0964717, AO-3-01A-086A Failed Minimum Allowed Stroke Time
IR 1025122, Replace U2 Inboard MSIV Oil Dashpot HV-2-01A-29512A
IR 1025123, Replace U2 Inboard MSIV Oil Dashpot HV-2-01A-29503A
IR 1039789, Assignment 22, SRM Margin Management Action Plans in System IQ
IR 1070185, Licensee ID'D NCV - MSIV Dashpot Oil Leak Short Stroke Time
IR 1114147, AO-2-01A-86D Failed LLRT
IR 1119763, IBMSIV AO-2-01A-080D Indicated Closed During Stroke Attempt
IR 1120612, AO-2-01C-08C: Not Backseating at Full Open
IR 1112430, MSIV AO-80A Long Stoke Time
ST-O-07G-475-2, MSIV Closure Timing at Shutdown, performed 09/13/10

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

ARC-217 20C212R A-1, Revision 3, Discharge Canal High Temperature
ARC-306 30C208R D-2, Revision 5, Condenser Low Vacuum

ARC-331 00C196 C-1, Revision 0, Condenser "Outlet Temperature High"
 EzTrend Plots of Unit 3 Main Condenser Vacuum, from 13:00 on 07/22/10 to 13:00 on 07/23/10
 IR 1092262, Unusual Noise Coming from Moto of 3BP002
 IR 1093772, 3 'A' Circulating Water Pump Trip
 IR 1093784, 3 'A' Circulating Pump Discharge Valve Has Split Indication
 IR 1093798, C&T Emergent Clearance Written
 IR 1093814, Boroscope Motor
 IR 1093901, MCR Alarm 331 C-1 Came in Unexpectedly
 IR 1093986, RT-O-59C-560-3, Electrical Output Low
 IR 1094000, Maintain Configuration Control
 IR 1094091, Discharge Canal High Temperature
 IR 1094164, 3 'A' Circulating Water Pump Trip
 IR 1094189, Diode Removed From 0AP088 "A CT Lift Pump"
 IR 1094648, Unit 3 Load Drop Required to Restart 3 'A' Circ Pump
 IR 1098574, Report from PSD of a "Nick" on the SBO Line
 IR 1099140, 8 DPM Leak from 'A' ESW Discharge Check Valve
 IR 1099235, Emergent Clearance #10001346
 IR 1099407, Additional [ESW] Leak Noticed During UT Exams
 IR 1100470, 'A' ESW Pump Discharge Piping Leak Rate Increased
 Narrative Logs, Dayshift, Friday July 23, 2010
 OT-106, Revision 22, Condenser Low Vacuum
 OT-106 Bases, Revision 21, Condenser Low Vacuum Bases
 RT-O-28B-800-2, River Temperature and Flow Monitoring
 ECR 10-00310, 8 Drop per Minute Leak from 'A' ESW Check Valve
 A0647984, Drywell Equipment Hatch Removal
 A1336077, Implement Use of RPS Test Box
 A1595522, Drywell Equipment Hatch Removal
 IR 1109300, Management Evaluation Appropriateness of RPS Black Box
 Short Duration Time Clock Log, Unit 2, 9/2/2010, R1114224-24, Install RPS Test Box to Support
 Shield Block Removal
 AR A1773748, ISFSI Alarm Received for Cask 50
 IR 1109955, ISFSI Alarm Received for Cask 50
 IR 1110979, Cable Hangs Too Low Across the Road
 IR 1111316, Near Miss in IPA Briefing
 IR 1111668, Communication Issues Lead to Delay in Arrival of Equipment
 SF-221, Revision 0, Spent Fuel Casks TN-68-48 through TN-68-64 Loading and Transport
 Operations
 ST-S-071-901-2, Revision 49, ISFSI Cask Internal Pressure Check
 WO C0234633, Repair of ISFSI Alarm Cask 50
 WO M1773748, Repair Cause of ISFSI Alarm

Section 1R15: Operability Evaluations

IR 1073156, Error in Input for Peach Bottom SFP Criticality Analysis
 Letter from P. B. Cowan (Exelon Generation Company, LLC) to U. S. NRC,
 "License Amendment Request - Revision to TS 4.3.1.1.a Concerning k-infinity," dated
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 Request (TAC NOS. MD9154 and MD9155)," dated June 24, 2010 (ADAMS Accession
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(IR 1082693/AR A1765051)

IR 1098274, Increasing Oxygen in 3 'B' MPT Oil

IR 1110123, ACMP for 3 'B' MPT Gas Levels Rising

IR 1100936, Multiple Admin. Issues Found with Station's ACMPs

IR 1099140, 8 Drop per Minute Leak from 'A' ESW Discharge Check Valve

IR 1099140, Assignment 2, Operability Evaluation for the ASME Code Class III through-wall
Pinhole Leak in the 'A' ESW Piping

IR 1099140, Assignment 4, Technical Evaluation for N-513-2 ASME Code Case Evaluation to
Verify Pipe Flaw Acceptance

AR A1770532, 8 Drop per Minute Leak from 'A' ESW Discharge Check Valve
ASME Code Case N-513-2, approved 02/20/04
Design Basis Document P-S-02, Revision 12, ESW System

IR 110470, 'A' ESW Pump Discharge Piping Leak Rate Increased

IR 1099407, Additional Leak Noticed During UT Exams

IR 1088304 (Limerick), Pinhole leak on 20" HBC-283 RHRSW to RHR HX
M-315, Sheet 1, Revision 67, Piping and Instrumentation Diagram – ESW
and HPSW Systems

M-330, Sheet 1, Revision 35, Piping and Instrumentation Diagram – Emergency Cooling
System

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Functionality Assessments of Degraded or Nonconforming Conditions Adverse to
Quality or Safety, Issue Date 04/16/08

OP-AA-108-115, Revision 9, Operability Determinations

IR 1085064, E-4 D/G Fuel Oil Post-Receipt Analysis for Cetane # < 45

IR 1071817, E-2 D/G Fuel Oil Post-Receipt Analysis for Cetane # < 45

A1769577, E4 Diesel Generator Building Ventilation Supply Fan 0DV064

ARC 0DC097 B-4, Revision 7, Diesel Generator Compartment Exhaust Air High/Low
Temperature

ARC-005 00C226D F-5, Revision 2, E-4 Diesel Generator Trouble

Exelon PCM Templates for Motor Control Centers / Molded Case Circuit Breakers

IR 1095983, Found Thermals Tripped on 0DV064 Fan

IR 1096103, 0DV064 MCA Rotor Bar Frequency in Caution Range

IR 1097552, Questions Following Unplanned E-4 EDG Inoperability

IR 1097857, EDG EACE Downgraded to Work Group Evaluation

IR 1098226, SOC Documented Engineering Director Approval When Not Given

IR 1098314, Ops Use of Informal Evaluation for Decision Making

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System 52 - EDGs

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Section 1R18: Plant Modifications

AR A1764768, CM ECR Needed for Modifications for Electrical Manholes
 WO C0233693, Install Manhole Water Detection Sensors

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IR 1081636, CM ECR Needed for Modifications for Electrical Manholes
IR 1080533, Submerged Cables in Manhole MH044
IR 1080603, Submerged Cables in Manhole MH076
IR 1080613, Submerged Cables in Manhole MH082
IR 1080636, Submerged Cables in Manhole MH084
IR 1108444, Inspect and Pump Out Manhole 16
IR 1108447, Inspect and Pump Out Manhole 17
IR 1108448, Inspect and Pump Out Manhole 18
IR 1108449, Inspect and Pump Out Manhole 40
IR 1108450, Inspect and Pump Out Manhole 89
IR 1108451, Inspect and Pump Out Manhole 28
IR 1108452, Inspect and Pump Out Manhole 91
IR 1108454, Inspect and Pump Out Manhole 92
IR 1181027, Manholes Strongly Appear to be Nonexistent
IR 1093794, Replace Power Cable to 3CP042-DR
IR 1093787, Replace Power Cable to 0CX026
IR 1093779, Add Testing Activity to SBO Test Cable Removal
IR 1093747, Administrative Revision Needed for Op Evaluation 10-002
IR 1048012, Engineering Evaluation of Submerged Cable Issue
IR 1119947, Manhole 25 Needs to be Pumped Out
IR 1119949, Manhole 26 Requires Pump Out
IR 1119068, Possible Past Water Leak from Conduit
IR 1120909, Manhole Cover Does Not Fit Properly
IR 1120123, Groundwater Intrusion into E224-P-A MCC
IR 1120156, Groundwater Intrusion into E124-P-A MCC
IR 1120916, Identify Source of Leaks Identified by Issue 1120123
IR 1120923, Identify Source of Leaks Identified by Issue 1120123
IR 1121349, Manhole 26A Structural Deficiency
IR 1125202, Test Medium Voltage Cable 3SU
IR 1120787, C0233635-13, WO Detail Description Not Accurate
IR 1113875, Thaxton Plug Leakage Delays Torus Dewatering (TDW) System Run
IR 1131255, Manhole 026B Has Alarmed
IR 1131252, LT-2-70A-061 Has Alarmed
IR 1131251, LT-2-70A-060 Has Alarmed
IR 1131250, LT-2-70A-025C Has Alarmed
IR 1131247, LT-2-70A-025A Has Alarmed
IR 1131246, LT-2-70A-009 Has Alarmed
IR 1131243, LT-2-70A-006 Has Alarmed
IR 1129133, AC High Pot Test Not Performed on Cooling Tower Cables
IR 1126793, SBO Test Cable Could Not Be Replaced Due to Conduit Damage
Adverse Condition Position Sheet 10-00-005 for SBO Control Power Transformer
AR A1745047, SBO Control Power Transformer Failed
ARC 00C893 C-1, Revision 1, SBO Switchgear 208/120V Power Low Voltage
E-1615, Revision 76, Single Line Meter and Relay Diagram
E-1617, Revision 64, Single Line Meter and Relay Diagram
E-1619, Revision 32, Single Line Meter and Relay Diagram
E-1621, Revision 65, Single Line Meter and Relay Diagram
E-1715, Revision 72, Single Line Meter and Relay Diagram
E-1717, Revision 60, Single Line Meter and Relay Diagram

E-5343, Sheet 1, Revision 16, SBO Single Line
 ECR 10-00042, Temporary SBO Control Power
 ECR 07-00168, Revision 5B to PE-0154: SBO Voltage Regulation
 ECR 05-00028, Issue Appendix H to Calc PE-01545 SBO Load Flow Analysis
 ER-AA-310, Revision 6, Implementation of the Maintenance Rule
 ER-AA-310-1004, Revision 8, Maintenance Rule – Performance Monitoring
 IR 252076, SBO (00R010 (1003) Current Transformer Caught on Fire
 IR 278233, SBO Line Incorrect Operability Determination
 IR 305042, Expectations/Actions When Procedure Step Cannot Be Performed
 IR 311464, Evaluate SBO Procedure for Improved Implementation
 IR 1024358, Online Risk Not Correctly Assessed for SBO Unavailability
 IR 1026492, SBO Control Power Transformer Sizing
 IR 1028328, SBO Control Power Transformer Failed
 IR 1109743, Challenge to Past SBO Availability Determination
 Narrative Logs (Control Room Logs) from February 4, 2010
 NRC Inspection Report 2005-002, Section 1R15
 PB-PRA-002, Revision 2, PBAPS PRA Event Tree Notebook – PB209A and PB309A Models:
 Section 10.0 - SBO Event Tree
 PE-0154, Revision 5B, SBO Voltage Regulation Conowingo Source
 P-154, Revision 5B, SBO Voltage Regulation Conowingo Source
 P-245, Revision 001A, Modify SBO Undervoltage Trip Function
 PEAM-0008, Revision 0, SBO Mechanical Timeline
 SE-11, Revision 13, Loss of Off-Site Power
 SE-11 Bases, Revision 13, Loss of Off-Site Power - Bases
 SE 11.1, Revision 5, Operating SBO Line during a LOOP Event
 SO 51H.2.A, Revision 5, Removing the SBO Bus from Service
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 WO C0231853, 00X688 Requires Replacement
 WC-AA-101, Revision 17, On-Line Work Control Process

Section 1R19: Post-Maintenance Testing

IR 1102272, Unit 2 Steam Leak Detection Drawer TIS-80547A Fault/Trip
 AR A1771525, Unit 2 Steam Leak Detection Drawer TIS-80547A Fault/Trip
 SI2T-MIS-8547-A1CQ, Calibration/Functional Check of Channel 'A', Group 1, 4 and 5 of PCIS
 Logic for TIS-80547A (8/17/2010 - Test Record)
 ACMP: Unit 2 Condensate Pump Degradation
 IR 1083310, Received 203 B-1 'A' Condensate Pump High Vibration
 IR 1093998, Leak from 2 'A' Condensate Discharge Check Valve
 ST-O-014-301-2, CS LOOP 'A' Pump, Valve, Flow, and Cooler Functional and IST,
 performed 07/29/10
 IR 1095957, PSO3 End-of-Shift Critique Nights 07/27/10 to 07/29/10
 Clearance 10001131, Megger and Lubricate Unit 2 'A' CS Room Unit Cooler Fan 'B'
 Motor Bearings
 Clearance 10001134, Unit 2 'A' CS Pump Motor and Breaker Electrical Testing, Clean
 CS Pump Unit 2 'A' Motor Oil Coolers
 AO 1E.4-2, Revision 13, Planned Removal of the Fifth or Fourth Stage FW Heaters from
 Service during End-of-Cycle Coastdown
 AO 6.7-2, Revision 6, Asymmetric FW Temperature Operation
 GP-5, Revision 69, Power Operations
 UFSAR Section 3.5.7.4, Performance Range for Normal Operations
 UFSAR Section 11.8, Condensate and FW Systems

UFSAR Section 14.5.2.3, Loss of FW Heating
 A1769577, E-4 Diesel Generator Building Ventilation Supply Fan ODV064
 IR 1095983, Found Thermals Tripped on ODV064 Fan
 IR 1106599, 3BP008 Tripped Thermals
 ECR 10-00310, 8 Drop per Minute Leak from 'A' ESW Check Valve
 IR 1111384, Emergent Clearance for ESW Hot Tap
 M-315, Revision 67, Piping & Instrumentation Diagram: ESW and HPSW Systems
 OTDM for 'A' ESW Pipe Repair Plan – Install PMCap, dated 08/26/10
 AR A1764159, 2 'C' HX Leak, DPI-2-10-130A (2 'A' RHR) Indication Lowering with
 2 'A' HPSW Pump in Service
 WO C0233586, 2 'C' RHR HX – Investigate, Repair and Replace

Section 1R20: Refueling and Other Outage Activities

IR 1102364, Instrument Panel Power Source Swaps Causing PARAGON Red Risk
 IR 1102478, OTDM to Determine P2R18 EOC Shutdown Method
 IR 1061160, Documentation of PBAPS on U2 MPT Wall Height Extension
 IR 1112748, Rise in 2 'C' RHR HX Leak Rate
 IR 1112617, Action Level 1 Entered for Unit 2 Reactor Water Influent
 IR 1105951, Conversion Errors in 2 'C' RHR HX Leak ACMP
 IR 1100480, Inability to Maintain HPSW to RHR Differential Pressure
 IR 1080382, DPI-2-10-130A (2 'A' RHR) Indication Lowering with 2 'A' HPSW Pump in Service
 IR 1080798, RHR HX Leakage for 10 CFR 100 Compliance based on pre-AST
 IR 1105951, Conversion Errors in 2 'C' RHR HX Leak ACMP
 IR 01116347, Monitor & Evaluate Replacement 2 'D' RHR HX Floating Head Gasket
 IR 01115196, 2 'C' RHR HX Floating Head Gasket Failure
 IR 01115507, Use of Technical Evaluation Inappropriate for RHR HX Repair
 IR 1112301, Unit 2 Drywell Airlock Outer Door Gear Prevents Opening Inner Door
 IR 1113275, Energy Introduced into Confined Space during Personnel Entry
 IR 1113557, Confined Space Used Without Required Rescue Plan
 IR 1114076, OCC Response to Issue Lacking
 IR 1114077, Follow up to 1113275 Confined Space Issue
 IR 1114045, Condenser Entry without Signing On Clearance
 IR 1112337, MO-2-10-15D Showed Split Indication
 IR 730210, PHC Project for MOV Limit Switch Modifications
 IR 1113284, 2 'A' RHR LOOP Check AO-2-10-046A Indicates Open with Pump Off
 IR 1118976, AHC Exam Tool FM Issue Clarification
 IR 1120665, Rod 14-15 Drifted in When Restoring the CRD Charging Header
 IR 1120672, Rod 50-15 Drifted in When Restoring the CRD Charging Header
 Safety Briefing, "Confined Space Entry Requirements," dated September 16, 2010

Section 1R22: Surveillance Testing

ST/LLRT 20.01A.02, MSIV Local Leak Rate Test, performed 09/17/10 (as-found) and 09/22/10
 (as-left for 'D' line)
 ST/LLRT 20.07A.25, LLRT Test Tap, performed 09/28-29/10 (as-left for 'A', 'C' and 'D' lines)
 IR 1114147, AO-2-01A-86D Failed LLRT
 IR 1119763, IBMSIV AO-2-01A-080D Indicated Closed During Stroke Attempt
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 Generation Company, LLC), "PBAPS, Unit 2 – Issuance of Amendment RE: One-Time
 Five –Year Containment Type A Integrated Leak Rate Test Interval Extension (TAC NO.
 ME2159)," dated June 24, 2010 (ADAMS Accession No.: ML101870555)

ST-J-07A-600-2, Integrated Leak Rate Test, Revision 7
ER-AA-380, Primary Containment Leak Rate Testing Program
ER-AA-380-1002, Integrated Leak Rate Test Planning and Implementation Guide, Revision 0
ST-M-13C-400-2, RCIC Vacuum Pump Discharge Check Valve IST, performed 08/06/10
AR A1753023, RCIC Lube Oil Cooling Water Pressure Low Out of Band
IR 1087059, RCIC Vacuum Pump Discharge Check Momentarily Stuck Closed
IR 1090868, Determine How RCIC Vacuum Pump OOS Effects Transient Operations
ST-O-013-301-3, RCIC Pump, Valve, and Flow and Unit Cooler Functional and IST,
Performed 07/22/2010
IR 1098027, NOS ID: IST Stroke Time A/C Incorrect for 2 RCIC Valves
IR 1098054, NOS ID: IST Commitments Outdate due to 4th Interval Update
M-C-797-046, Revision 9, Control of Fuel Inspection Activities
M-018-013, Revision 1, New Fuel Receipt and Inspection of Unchanneled Fuel
M-C-797-019, Revision 14, Channeling / Dechanneling of Fuel Bundles
IR 1038517, P2R18 Fuel Rechanneling
IR 1092559, Small Piece of (Red) Duct Tape Observed in a New Fuel Bundle
IR 1098327, Nick Found on New Fuel Channel during New Fuel Receipt Inspection
TSs 4.2 and 4.3, Amendment No. 214
Part 21 Report: GE Hitachi Nuclear Energy – Bent Fuel Spacer Flow Wing
Global Nuclear Fuel (GNF) Quality Update (QU) 2010-001: GNF2 Bent Spacer Flow Vanes,
dated April 27, 2010

Section 1EP6: Drill Evaluation

EP-AA-1007, Revision 19, Exelon Nuclear Radiological Emergency Plan Annex for PBAPS
IR 1097906, 7/12 Emergency Response Organization (ERO) Drill Emergency Response Facility
(ERF) Facility Issues
IR 1097907, 7/12/10 ERO Facility Enhancements
IR 1097908, 7/12/10 ERO Performance Enhancements
IR 1097912, 7/12/10 ERO Drill – Evaluate Procedure Enhancements
PBAPS 07/12/10 Team 4 DEP Drill Evaluation Report
PBAPS July 12, 2010 Training Drill Controller Manual
PBAPS Licensed Operator Requalification (LORT) Out-of-The-Box (OTB) Scenario for
August 23, 2010

Section RS01: Access Control to Radiologically Significant Areas

Annual Radiological Environmental, Effluent Release Reports- 2008, 2009
Inter-Laboratory Cross-check Analysis Results
ODCM and changes
10 CFR 50.75(g) - History file record summary/additions
Corrective Action Documents (IRs): (1101013, 1100897, 1097965, 1097986, 1097733, 862716,
964284, 965089, 968347, 968390, 987295, 993116, 1008814, 1021505, 1024528,
1039071, 1061864978055, 991763, 1050380, 1085249, 929091, 932238, 1715914,
1097965, 1097968, 1092756, 1112511, 1041403, 805361, 939717, 801157, 995764,
1098218)
Reports (various) - Routine Groundwater
Report- Hydrogeology Investigation Report
Focused Audit IR929091-2, Instrument calibration facility process
Radioactive Source Records 107, KR-2721, 00G1EZ, 68396, 81C5-63
Cobalt Source Term, Revision 3, dated January 29, 2007
Cobalt Transport Study and Reduction Plans
Peach Bottom Dose Excellence Plan

10 CFR 20.2206 - Dose submittal (2009)
RP Department Performance, dated August 18, 2010
Peach Bottom Exposure Goals- 2010
Station ALARA Committee Minutes
Peach Bottom Bench Marking Activities 2009

Procedures

RP-AA-503, Revision 2, Uncontrolled Release Survey Method
RP-AA-350-1001, Revision 0, Response to Guardhouse Portal Monitor Alarm
RP-AA-350, Revision 8, Personnel Contamination Monitoring, Decontamination, and Reporting
RP-PB-401-100, Revision 1, Radiation Protection Requirements for Irradiated Component Movement
RP-PB-300-1007, Revision 0, Removing Items from the SFP, Reactor Cavity, and Equipment Pit
RP-AA-400, Revision 7, ALARA Program
RP-AA-401, Revision 11, Operational ALARA Planning and Control
RP-PB-460, Revision 0, TIP Area Access Controls
RP-AA-460, Revision 17, 18, 19, Control of High and Locked HRAs
RP-AA-460-001, Revision 1 and 2, Control for VHRAs
RP-PB-460-1001, Revision 5, Radiation Protection Controlled Keys
RP-AA-400-1007, Revision 0, Elevated Dose Rate Response Planning
RP-AA-302, Revision 3, Determination of Alpha Levels and Monitoring
RPT-H-099-905-2, Revision 8, Laboratory Confirmation of Breathing Air Quality
RP-AA-220, Revision 6, Bioassay Program
RP-AA-250, Revision 6, External Dose Assessment form Contamination
RP-AA-270, Revision 6, Prenatal Radiation Exposure
RP-AA-210, Revision 16, Dosimetry Issue, Usage and Control
RP-AA-7000-1401, Revision 0, Operation and Calibration of the Eberline Model PM-7 Personnel Contamination Monitor
RP-PB-746, Revision 1, Calibration and Operational Checks of the Eberline PCM-2 Whole Body Contamination Monitor
RP-PB-744, Revision 0, Calibration of the APTEC PMW Monitor
RP-PB-741, Revision 0, Calibration of the NE Technology Model SAM-9 Small Article Monitor
SI2F-8-470-A1CE, B1CE, Revision 6, Calibration Check of Off Gas Stack Flow
SI3F-40B-3805-A1CE, B1CE, Revision 6, Calibration Check of Reactor Building Vent
CY-AA-130-200, Revision 9, Quality Control
CY-AA-170-1000, Revision 5, Radiological Environmental Monitoring Program and Metrological Program Implementation
EN-AA-408-4000, Revision 0, Radiological GPI
RGPP Check in – 803843
NEI GPI Peer Assessment
RP-AA-228, Revision 1, 10 CFR 50.75(g) and 10 CFR 72.30(d) Documentation Requirements
CY-PB-170-4160, Revision 5, Station RGPP Controlled Sample Point Parameters

Section 40A2: Identification and Resolution of Problems

IR 1088327, Conduct Review of Search Practices (Radiation Shipments)
IR 1094698, NOS ID: Loss of 14 Emergency Preparedness Sirens was not Entered into CAP
* IR 1095138, Documentation IR for Storm-Related PB Off-Site Siren Outage
IR 1120877, NPDES Draft Permit Review and Permit Renewal Actions
IR 1091066, Project Management - Fast-Track Cooling Towers Restoration Project
IR 1098776, Water in Unit 2 Containment Sump

IR 1091477, Clarification Required for Allowable ESF Leakage
IR 1101001, Reactivity Management PI O.2 Historical Events Require Update
IR 1105951, Conversion Errors in 2 'C' RHR HX Leak ACMP
IR 1106337, Manufacturer Information About AR 466 Anti-Ram VBS
IR 1106767, Ventilation Boundary Door Does Not Close Correctly

CRs:

873327, 994703, 961858, 988434, 1006972, 1039022

Procedures:

LS-AA-104-1000, Revision 5, Exelon 50.59 Resource Manual
LS-AA-104, Revision 6, Exelon 50.59 Review Process
CC-AA-112, Revision 16 & 17, Temporary Configuration Changes
OP-MA-109-101, Revision 10, Clearance and Tagging
LS-AA-125, Revision 14, CAP Procedure
CC-AA-103 Attachment F, Revision 20, Screening Criteria for Commercial Changes
CC-AA-103 Attachment G, Revision 20, Screening Criteria for Equivalent Changes

Other:

Clearance & Tagging Requalification Presentation
TCCP in Approved Status since September 2008 to Present

* - Indicates NRC-Identified

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

IR 1115041, P2R18 - Fuel Bundle Came in Contact with CSI Sub
IR 1117854, P2R18 - Dummy Bundle Came in Contact with Bundle in SFP
ST-O-018-120-2, Revision 14, Refueling Interlocks Functional Test with the Ability to Move Control Rods
IR 1117251, P2R18, Fuel Bundle Channeling
IR 1119282, OU-AA-4002 Fuel Handling Severity Level 4 Issue
IR 1118428, Level 4 Event Refuel Bridge Stopped by Spotter
IR 1114880, Fuel Handling Distraction for Bridge Crew
IR 1120671, Screening Criteria for Fuel Handling Human Performance
IR 1120248, Number of Management Fuel Handling Observations LTA
IR 1114828, Level 4 Event - Refuel Bridge Stopped by Spotter to Avoid Collision with CSI Sub
IR 1114880, Fuel Handling Distraction for Bridge Crew
IR 1117645, Level 3 Fuel Handling Issue
IR 1117271, Changed Plan Inserts Error Likely Situation to Fuel Handling
IR 1118645, Fuel Handling Distraction Roll up IR
IR 1118620, Fuel Handling Severity Level 4 Issue
IR 1118008, RCWP Safety Issue - Fuel Handling Severity Level 4 Issue
IR 1117953, Communication Less than Adequate - Fuel Handling Severity Level 4 Issue
IR 1115051, Fuel Handling Severity Level 4 Issue
IR 1115104, Fatigue Assessment Performed
IR 1115108, Fatigue Assessment Performed
IR 1115110, Fatigue Assessment Performed
IR 1115112, Fatigue Assessment Performed
IR 1119282, Fuel Handling Severity Level 4 Issue
IR 1119147, Fuel Handling Severity Level 4 Issue
IR 1118942, Fuel Handling Severity Level 4 Issue

IR 1118941, Fuel Handling Severity Level 4 Issue
IR 1118829, Refuel Bridge Crabbing
IR 1128280, Reactor Services East Crew Clock Resets
IR 1121717, EP-AA-120 Review, Groundwater Observed Entering Units 2 and 3
IR 1121709, EP-AA-120 Review, Unit 2 TB Evacuated Due to Paint Fumes
IR 1120527, Paint Fumes/Mist in Unit 2 TB
Emergency Notification (EN) 46299, Offsite Notification Due To TB Evacuation
IR 1116623, ESW "CHK-2-33-514" Failed ST-O-033-400-2
IR 1116525, More Than 25% of Sirens OOS, EPPI and NRC Reportable
Emergency Notification (EN) 46269, Sirens Unavailable Due To Inclement Weather
IR 1115496, Loss of 3SU
IR 1115529, Relays Found Tripped After 3SU Failure
IR 1115562, Enhancement for Loss of 3SU

Section 40A5: Other Activities

IR 1129794, NRC Level IV NCV 1-2009-046: Vendor PHQ FFD Omission

Calculations and Evaluations

PBAPS Input for Resolution of NRC URI Concerning Vital Bus Degraded Voltage Protection,
dated July 14, 2009

Issue Report

IR 1119440

Design & Licensing Bases

GL 79-36, Adequacy of Station Electric Distribution Systems Voltages
PBAPS Amendment Nos. 97/99
PBAPS Amendment Nos. 143/145
PBAPS Amendment Nos. 230/235

Miscellaneous

SI3K-54-E13-XXCE, Calibration Check of E13 Undervoltage Relays, Rev. 14
TIA 2009-007, Peach Bottom Atomic Power Station Licensing Basis for Degraded Grid Relays,
dated Sept. 29, 2010 (ML102710178)

LIST OF ACRONYMS

AL	Administrative Letter
ALARA	As Low As Reasonably Achievable
ACMPS	Adverse Condition Monitoring Plans
ADAMS	Agency-wide Documents Access and Management System
AR	Action Request
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CDBI	Component Design Bases Inspection
CFR	Code of Federal Regulations
CRs	Condition Reports
CS	Core Spray
CSI	Core Spray Inspection
DBD	Design Basis Document
DEP	Drill and Exercise Performance
DRS	Division of Reactor Safety
ECCS	Emergency Core Cooling System
ECR	Engineering Change Request
ED	Electronic Dosimeter
EDG	Emergency Diesel Generator
EOC	Extent-of-Condition
EPD	Electronic Personal Dosimeter
ESW	Emergency Service Water
FPP	Fire Protection Plan
FSAR	Final Safety Analysis Report
FW	Feedwater
GL	Generic Letter
GNF	Global Nuclear Fuel
GPI	Groundwater Protection Initiative
HRA	High Radiation Area
HX	Heat Exchanger
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Issue Report
ISFSI	Independent Spent Fuel Storage Installation
ISI	Inservice Inspection
IST	Inservice Test
IVVI	In-Vessel Visual Inspection
LAR	License Amendment Request
LLOCA	Large Loss of Coolant Accident
LOCA	Loss of Coolant Accident
LOOP	Loss of Off-site Power
LSRO	Limited Senior Reactor Operator
LTC	Load Tap Changer
MDA	Minimum Detectable Activity
MPT	Main Power Transformer
MSIV	Main Steam Isolation Valve
MT	Magnetic Particle Testing

NCV	Non-cited Violation
NDE	Non-Destructive Examination
NEI	Nuclear Energy Institute
NETCo	Northeast Technology Corporation
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
NVLAP	National Laboratory Accreditation Program
OD	Operability Determination
ODCM	Offsite Dose Calculation Manual
OI	Office of Investigation
OOS	Out-of-Service
ORAM	Outage Risk Assessment Management
OTDM	Operational and Technical Decision Making
PARS	Publicly Available Records
PBAPS	Peach Bottom Atomic Power Station
PCM	Personnel Contamination Monitors
PDI	Performance Demonstration Initiative
PI	Performance Indicator
PIM	Plant Issues Matrix
PI&R	Problem Identification and Resolution
PM	Portal Monitors
PMT	Post-Maintenance Testing
RCA	Radiological Controlled Area
RCS	Reactor Coolant System
RCIC	Reactor Core Isolation Cooling
RFO	Refueling Outage
RHR	Residual Heat Removal
RPS	Reactor Protection System
RTP	Rated Thermal Power
RWP	Radiation Work Permit
SAM	Small Article Monitors
SBO	Station Blackout
SDP	Significance Determination Process
SE	Safety Evaluation
SER	Safety Evaluation Report
SFP	Spent Fuel Pool
SBGTS	Standby Gas Treatment System
SL	Severity Level
SSCs	Structures, Systems and Components
SRAs	Senior Reactor Analysts
STs	Surveillance Tests
TB	Turbine Building
TCCP	Temporary Configuration Change Program
TIA	Task Interface Agreement
TI	Temporary Instruction
TLD	Thermoluminescent Dosimeter
TRM	Technical Requirements Manual
TS	Technical Specifications
TSC	Technical Support Center
TYRA	Three Year Rolling Average
UFSAR	Updated Final Safety Analysis Report

URI	Unresolved Item
UT	Ultrasonic Testing
VHRA	Very High Radiation Area
VDC	Volts Direct Current
WANO	World Association of Nuclear Operators
WO	Work Order