



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406-1415

January 29, 2009

Mr. Charles G. Pardee  
Senior Vice President, Exelon Generation Company, LLC  
President and Chief Nuclear Officer, Exelon Nuclear  
4300 Winfield Rd.  
Warrenville, IL 60555

**SUBJECT: PEACH BOTTOM ATOMIC POWER STATION - NRC INTEGRATED  
INSPECTION REPORT 05000277/2008005 and 05000278/2008005**

Dear Mr. Pardee:

On December 31, 2008, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3. The enclosed integrated inspection report documents the inspection results, which were discussed on January 16, 2009, with Mr. William Maguire 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.

The report documents one self-revealing finding of very low safety significance (Green). This finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it is entered into your corrective action program (CAP), the NRC is treating the finding as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC 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, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC 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 enclosures, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS).

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Sincerely,

/RA/

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

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

Enclosures: Inspection Report 05000277/2008005 and 0500278/20008005  
w/Attachment: Supplemental Information

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Sincerely,  
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**ML090290339**

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 DRAFT REPORTS\PB 4TH QTR 2008\PBIR2008-005.REV2.DOC

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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.: 05000277/2008005 and 05000278/2008005

Licensee: Exelon Generation Company, LLC

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

Location: Delta, Pennsylvania

Dates: October 1, 2008 through December 31, 2008

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Reactor Projects Branch 4  
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Enclosure

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## SUMMARY OF FINDINGS

IR 05000277/2008005, 05000278/2008005; 10/01/2008 – 12/31/2008; Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3; Event Followup.

The report covered a three-month period of inspection by resident inspectors and announced inspections by a regional senior health physicist, three regional reactor inspectors, a senior operations engineer, and a senior project engineer. One self-revealing Green NCV was identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). 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 IMC 0305, "Operating Reactor Assessment Program," dated January 2009. 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.

### A. NRC-Identified and Self-Revealing Findings

#### **Cornerstone: Mitigating Systems**

Green. A self-revealing (Green) NCV of Technical Specification (TS) 5.4.1 was identified when operators inadequately implemented an abnormal operating (AO) procedure on two occasions. Specifically, an event where the Unit 2 Division II direct current (DC) electrical power subsystem was inoperable for longer than the allowed outage time specified in Unit 3 TS 3.8.4, resulted from PBAPS personnel not recognizing the existence of conflicting procedure guidance and the improper removal of a configuration control tool.

This finding is more than minor because it was associated with the human performance attribute of the Mitigating Systems Cornerstone, and impacted the cornerstone objective of ensuring the reliability of the Unit 2, Division II, DC electrical power subsystem to respond to initiating events, in that, one of its associated battery chargers was being supplied from a non-qualified alternating current (AC) power source. The inspectors concluded that this finding affected the Mitigating Systems Cornerstone and answered "No" to all relevant questions. Specifically, the supply of a non-qualified AC power source to the Unit 2, Division II DC electrical power system was a qualification issue confirmed not to result in a loss of functionality. Although the Unit 2, Division II DC electrical power system was inoperable for longer than its 12-hour TS allowed outage time, this qualification issue did not result in an actual loss of safety function. Therefore, this finding was considered to be of very low safety significance (Green).

The inspectors determined that this finding had a cross-cutting aspect in the area of human performance (work control component) because PBAPS personnel did not adequately coordinate work activities by incorporating actions to address: the impact of changes to the work scope or activity on the plant and human performance; nor the need to keep personnel apprised of the operational impact of work activities; and plant conditions that may affect work when conflicting procedures led to inadequate procedure adherence and the unplanned inoperability of the Unit 2 Division II DC electrical subsystem. [IMC 0305 aspect: H.3(b)]. (Section 4OA3.1)

### B. Licensee-Identified Violations

None.

## REPORT DETAILS

### Summary of Plant Status

Unit 2 began the inspection period shutdown in its 17<sup>th</sup> refueling outage (RFO) (2PR17). On October 19, 2008, the reactor was restarted and the unit was synchronized to the grid on October 20, 2008. On October 22, 2008, the unit was returned to 100 percent rated thermal power (RTP) where it remained until the end of the inspection period, except for brief periods to support planned testing and rod pattern adjustments.

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

### 1. **REACTOR SAFETY**

#### **Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

#### 1R01 Adverse Weather Protection (71111.01 – 1 System Sample)

##### .1 Preparation for Cold Weather Conditions

##### a. Inspection Scope

The inspectors performed a detailed review of PBAPS's and Exelon's written procedures for winter readiness and low temperatures to evaluate PBAPS's implementation of the adverse weather preparation procedures and compensatory measures for the affected conditions before the onset of adverse weather conditions. The inspectors selected Unit 2 and Unit 3 emergency diesel generator (EDG) rooms, and Unit 2 and Unit 3 emergency service water (ESW), and high pressure service water (HPSW) rooms. This selection constituted one sample.

The three plant systems listed above were walked down to verify the physical condition of the cold weather protection features, and to verify that they were monitored sufficiently to ensure they supported operability of the system, structure, or component (SSC) they protected. The inspectors also reviewed adverse weather procedures to ensure they were adequate to maintain readiness of essential systems.

##### b. Findings

No findings of significance were identified.

#### 1R04 Equipment Alignment (71111.04Q – 3 Partial 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 applicable operating procedures, walked down system components, and verified that selected breakers, valves, and support equipment were in the correct position to support system operation. The three systems reviewed were:

- Unit 3 Control Rod Drive Hydraulic System;
- Unit 3 'B' Residual Heat Removal (RHR) System with Unit 3 'A' RHR Out-of-Service (OOS); and
- 'A' ESW with 'B' ESW OOS.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05 – 5 Samples)

.1 Fire Protection – Tours

a. Inspection Scope

The inspectors reviewed PBAPS's Fire Protection Plan, Technical Requirements Manual (TRM), and the respective pre-fire action plan procedures to determine the required fire protection design features, fire area boundaries, and combustible loading requirements for the areas examined during this inspection. The fire risk analysis was reviewed to gain risk insights regarding the areas selected for inspection. The inspectors performed walkdowns of five areas to assess the material condition of active and passive fire protection systems and features. The inspection was also performed to verify the adequacy of the control of transient combustible material and ignition sources, the condition of manual firefighting equipment, fire barriers, and the status of any related compensatory measures. The following five fire areas were reviewed for impaired fire protection features:

- Diesel Generator Building, 127' Elevation (Fire Zone 132);
- Circulating Water Pump Structure (Fire Zone 144);
- Cable Spreading Room, Turbine Building, 150' Elevation (Fire Zone 78H);
- Unit 2 Reactor Recirculation Pump Motor Generator Set Room, Radwaste Building, 135' Elevation (Fire Zone 4C); and
- Unit 2 Reactor Building Closed Cooling Water Room, Radwaste Building, 116' Elevation (Fire Zone 4B).

b. Findings

No findings of significance were identified.



1R11 Licensed Operator Regualification Program (71111.11Q – 1 Sample).1 Resident Inspector Quarterly Reviewa. Inspection Scope

On October 20, 2008, the inspectors observed operators in PBAPS's simulator during licensed operator requalification training to verify that operator performance was adequate and that evaluators were identifying and documenting crew performance issues. The inspectors verified that performance issues were discussed in the crew's post-scenario critiques. The inspectors discussed the training, simulator scenarios, and critiques with the operators, shift supervision, and the training instructors. The evaluated scenario observed for this one sample involved the use of procedure:

- T-100, "SCRAM";
- T-101, "Reactor Pressure Vessel Control";
- T-102, "Primary Containment Control"; and
- T-117, "Level/Power Control."

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12 - 2 Samples)a. Inspection Scope

The inspectors evaluated PBAPS's work practices and follow-up corrective actions for SSCs and identified issues to assess the effectiveness of PBAPS's maintenance activities. The inspectors reviewed the performance history of SSCs and assessed Exelon'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 Exelon's corrective actions that were taken or planned, to evaluate whether the actions were reasonable and appropriate. The inspectors performed the following two samples:

- EOC Review and Risk Assessment Required for Safety/Relief Valves (SRVs) (IR 824920); and
- Evaluate Number 9 Bearing Vibration Action Levels (Action Request (AR) A1686873).

b. Findings

No findings of significance were identified.

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

The inspectors evaluated PBAPS's implementation of their 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 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 2 Hydraulic Control Unit – Replace O-Ring on 136 Filter Plug (WO C0226711);
- Unexpected Tap Changer Operation (WO A1683314);
- Unit 2 Main Generator Trip (IR 833280);
- 3 'A' Recirculation Pump Elevated Seal Temperatures (IR 849793); and
- Unit 2 Main Generator Bearing #9 Step Change in Vibration (IR 843290).

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - 6 Samples)a. Inspection Scope

The inspectors reviewed six 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, 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 TS, 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:

- Air Voids Identified in Various Unit 2 High Pressure Coolant Injection (HPCI) Lines (IR 827889);
- Unit 3 Local Power Range Monitor Detector 56-17A Not Returned to Service (IR 846997);
- Backseat Unit 3 Reactor Core Isolation Cooling (RCIC) Motor Operated Valve 3-13-016 (Work Order (WO) C0225126);
- Non-conforming Part Installed on HPCI Lubricating Oil Pressure Control Valve (IR 858390);

- Bracket on E-2 EDG Not Attached (IR 859069); and
- Unit 3 Main Turbine Seal Oil Pump Vibration Noise (IR 857087).

b. Findings

No findings of significance were identified.

1R18 Plant Modifications (71111.18 – 1 Sample)

.1 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed one temporary modification to verify that implementation of the modification 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; and plant walkdowns of accessible equipment. The following temporary modification was reviewed:

- ECR 08-00408, Disable Main Transformer Sudden Pressure Relay Trip Circuitry.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19 - 5 Samples)

a. Inspection Scope

The inspectors observed selected portions of post-maintenance testing (PMT) activities and reviewed completed test records. The inspectors observed whether the tests were performed in accordance with the approved procedures 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 the tested 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 five PMTs performed in conjunction with the following maintenance activities:

- Remove/Bench Test Diesel-Driven Fire Pump Relief Valve (WO R1087967);
- Troubleshoot Repair RHR Mini-flow Valve Transfer Switch (WO C0226921);
- Replace Pipe and Fittings on Containment Inerting Nitrogen Storage Tank (WO C0226081);
- 'A' ESW Booster Pump Tripped During Testing (WO A1691874); and
- Remove/Replace Unit 3 'B4' Feedwater Heater Dump Valve Controller (WO M1692304).

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities (71111.20 - 1 Sample)

.1 Peach Bottom Unit 2 Refueling Outage (RFO) 17 (P2R17)

a. Inspection Scope

The Unit 2 RFO (P2R17) was conducted from September 14, 2008 through October 20, 2008. During this inspection period, the inspectors performed the activities listed below to verify PBAPS's controls over outage activities:

- Refueling Activities - verified that PBAPS was using controls to ensure the location of the fuel assemblies were properly tracked and verified that procedures for foreign material control and retrieval were implemented on the refueling floor;
- Torus Closure - conducted a thorough walkdown of accessible torus areas above the suppression pool prior to reactor startup to verify that all debris, tools, and diving gear were removed (IRs 822698 and 824466);
- Drywell Closure - conducted a thorough inspection and walkdown of containment prior to reactor startup to identify remaining debris, tools, and equipment for removal (IRs 828230, 828235 and 828241);
- SRVs - reviewed the results of the post-removal lift test results and verified that the loss of system operability was documented in the CAP (IR 824034);
- Startup Preparations – reviewed the tracking of startup prerequisites;
- Startup Training - observed just-in-time training for one licensed operator crew. The training was focused on the impending startup of Unit 2 and covered plant conditions from the existing configuration through synchronization of the main generator to the grid. This was done in four discrete states: establishing normal makeup lineup, criticality, heat-up to 450 psig, and power escalation from 450 psig through generator synchronization;
- Startup and Ascension to Full Power Operation – observed selected activities including: criticality; portions of the plant heat-up, main generator synchronization to the grid; portions of the power ascension to full power operation; and
- Licensee Identification and Resolution of Problems - reviewed corrective action reports related to RFO activities to verify that PBAPS was identifying issues at the appropriate level and taking adequate corrective action.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 5 Samples)

a. Inspection Scope

The inspectors reviewed and observed selected portions of the following surveillance test (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 and observed included:

- ST-O-013-301-2, RCIC Pump, Valve, Flow and Unit Cooler Functional and In-Service Test [IST Sample];
- ST-N-080-900-2, Visual Examination of Drywell and Torus Surfaces;
- ST-O-023-200-2, HPCI Flow Rate at  $\leq$  175 PSIG Steam Pressure;
- ST-O-054-751-2, E-12 4KV Bus Undervoltage Relays and Loss-of-Coolant Accident Loop Functional Test; and
- SI3K-1G-TDR-A2C2, Automatic Depressurization System Time Delay Relay Test 2E-K33/34.

The inspectors verified that issues (IRs 826634, 826756 and 825976) identified during the surveillance testing were entered into the CAP.

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness**

1EP6 EP Drill Evaluation (71114.06 – 1 EP Training Sample)

a. Inspection Scope

On October 20, 2008, the inspectors observed the classification and communication aspects of an as-found scenario in the PBAPS simulator. The conduct of the simulator-based training evolution was evaluated in accordance with the guidance in NRC Inspection Procedure (IP) 71114.06, "Drill Evaluation." The inspectors verified that training exercise evaluators captured the results for calculation of the Drill and Exercise Performance (DEP) Performance Indicator (PI). The inspectors also verified that weaknesses or deficiencies were captured for the critique of the training exercise. The following simulated events were classified during this one training exercise:

- MS3 – Site Area Emergency, "Failure of Reactor Protection System."

The inspectors reviewed the evaluation, classification and notification of the observed simulated events to ensure they were accurate and timely.

b. Findings

No findings of significance were identified.

## 2. RADIATION SAFETY

### Cornerstone: Occupational Radiation Safety

#### 2OS1 Access Controls (71121.01 – 3 Samples)

##### a. Inspection Scope

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

##### Inspection Planning - Performance Indicators

The inspectors reviewed PIs for the Occupational Exposure Cornerstone. The inspectors also discussed and reviewed current performance, relative to the indicators, with Exelon personnel. (See 4OA1)

##### Plant Walkdowns, Radiation Work Permit Reviews, and Jobs in Progress Reviews

The inspectors walked down selected radiological controlled areas and reviewed housekeeping, material conditions, posting, barricading, and access controls to radiological areas. The inspectors made selective independent ambient radiation level measurements to verify radiological conditions.

The inspectors reviewed and discussed external and internal dose assessments since the previous inspection. The review also included the adequacy of evaluation of selected dose assessments, as appropriate, and included selected review of the program for evaluation of potential intakes associated with hard-to-detect radionuclides (e.g., transuranics). The inspectors reviewed the frequencies and magnitude of personnel contamination events and also reviewed the radiation dose consequences of the personnel contaminations. The inspectors evaluated the frequencies and magnitude of internal contaminations of personnel.

##### PI&R

The inspectors selectively reviewed self-assessments and audits, as applicable, since the previous inspection to determine if identified problems were entered into the CAP for resolution. The inspectors evaluated the database for repetitive deficiencies or significant individual deficiencies to determine if self-assessment activities were identifying and addressing the deficiencies. The inspectors reviewed radiological problem reports since the last inspection to identify radiation worker or radiation protection errors traceable to a similar cause. Corrective actions were reviewed, as appropriate.

##### b. Findings

No findings of significance were identified.

## 2OS2 ALARA Planning and Controls (71121.02 – 6 Samples)

### a. Inspection Scope

The inspectors conducted the following activities to determine if Exelon was properly implementing operational, engineering, and administrative controls to maintain personnel exposure as low as is reasonably achievable (ALARA). Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, applicable industry standards, and applicable station procedures.

#### Verification of Dose Estimates and Exposure Tracking Systems

The inspectors reviewed the exposure tracking system to evaluate the level of detail, and exposure report timeliness. The inspectors reviewed collective radiation exposure for various radiation work permits and reviewed available post-job reviews.

The inspectors selectively reviewed exposure results achieved, for various tasks including: refueling activities, reactor vessel disassembly and re-assembly; reactor cavity decontamination; control rod drive work activities; in-service inspection; scaffolding; moisture separator re-heater work; and various valve work activities, including main steam isolation valves. The inspectors compared the intended dose established in ALARA plans for the work activities with that accrued for the work. The inspectors reviewed post-job evaluations and bases for additional exposures sustained for selected work activities. The inspectors also evaluated actual person-hours completed versus that estimated during conduct of initial ALARA reviews.

#### Source-Term Reduction and Control

The inspectors evaluated Exelon's efforts to reduce radiation exposure including modified reactor shutdown and reactor coolant clean-up practices. The inspectors reviewed changes in plant source term. The inspectors reviewed source term controls and radiation exposure mitigation for reactor cavity drain-down. The inspectors discussed preliminary Exelon reviews of Unit 2 chemistry controls for shut-down. The inspectors reviewed and discussed efforts to reduce inputs to the source term including recent industry program assessments. The inspectors reviewed previous outage historical records for source term following shutdown.

#### PI&R

The inspectors selectively reviewed applicable self-assessments, audits, and special reports related to the ALARA program since the last inspection. (See Section 4OA2)

### b. Findings

No findings of significance were identified.

### **Cornerstone: Public Radiation Safety**

#### **2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems (71122.01 – 1 Sample)**

##### **a. Inspection Scope**

The inspectors selectively reviewed 2007 and 2008 public radiological dose projections. The inspectors evaluated methodology and evaluated adequacy of dose projections and conformance with the Offsite Dose Calculation Manual (ODCM).

The inspectors selectively reviewed testing of safety and non-safety related ventilation systems used for effluent dose control relative to criteria contained in TSS, surveillance procedures, and the ODCM.

The inspectors selectively reviewed ground water monitoring results and Exelon implementation of the industry ground water monitoring initiative.

##### **b. Findings**

No findings of significance were identified.

#### **4. OTHER ACTIVITIES**

#### **4OA1 PI Verification (71151 – 14 Samples)**

### **Cornerstone: Mitigating Systems**

#### **.1 Mitigating Systems PIs (10 Samples)**

##### **a. Inspection Scope**

The inspectors reviewed a selected sample of PBAPS's information submitted for the five Mitigating Systems PIs listed below to assess the accuracy and completeness of the data reported to the NRC for these PIs. The PI definitions and the guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Indicator Guideline," Revision 5, and Exelon procedure LS-AA-2200, "Mitigating System Performance Index Data Acquisition and Reporting," Revision 2, were used to verify that procedure and reporting requirements were met. The inspectors reviewed raw PI data collected between July 2007 and July 2008 and compared graphical representations from the applicable PI report(s) to the raw data to verify the data was included in the report. The inspectors also examined a selected sample of operations logs, licensee event reports (LERs), CAP records, equipment clearances, and Maintenance Rule data to verify the PI data was appropriately captured for inclusion into the PI report and that the individual PIs were correctly calculated.

- HPCI System, Unit 2 and Unit 3;
- RCIC System, Unit 2 and Unit 3;
- EDGs, Unit 2 and Unit 3;
- RHR System, Unit 2 and Unit 3; and
- Cooling Water [ESW and HPSW] Systems, Unit 2 and Unit 3.



The inspectors verified that minor discrepancies identified during this inspection were entered into the licensee's CAP (IRs 834465 and 834065).

b. Findings

No findings of significance were identified.

.2 Review of Safety System Functional Failures (SSFFs) PIs (2 Samples)

a. Inspection Scope

The inspectors reviewed PBAPS's submittals for the SSFFs PIs for both Units 2 and 3. For the functional failures, the inspectors looked at the period from the July 2007 through September 2008. The PI definitions and the guidance contained in NEI 99-02, "Regulatory Assessment Indicator Guideline," Revision 5, and Exelon procedure LS-AA-2080, "Monthly Data Elements for NRC Safety System Functional Failures," Revision 4, were used to verify that procedure and reporting requirements were met.

The inspectors reviewed LERs issued during the referenced time frame for SSFFs. The LERs reviewed are listed in the Attachment. The inspectors also compared graphical representations from the most recent PI report to the raw data to verify that the data was correctly reflected in the report.

b. Findings

No findings of significance were identified.

.3 Occupational Exposure Control Effectiveness (1 Sample)

**Cornerstone: Public Radiation Safety**

a. Inspection Scope

The implementation of the Occupational Exposure Control Effectiveness PI Program was reviewed. Specifically, the inspectors selectively reviewed CAP records for occurrences involving high radiation areas, very high radiation areas, and unplanned personnel radiation exposures over the past four complete quarters in this area. The inspectors also selectively reviewed radiation work permit entries indicating greater than 100 millirem. The review was against the applicable criteria specified in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5. The purpose of this review was to verify that matters that met NEI criteria were recognized and identified as PI occurrences.

b. Findings

No findings of significance were identified.

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

**Cornerstone: Public Radiation Safety**

a. Inspection Scope

The implementation of the RETS/ODCM PI was reviewed. Specifically, the inspectors selectively reviewed CAP records and projected monthly and quarterly dose assessment results due to radioactive liquid and gaseous effluent releases for the past four complete quarters. The inspectors also reviewed the 2007 Annual Effluent Release Report. The review was against the applicable criteria specified in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5. The purpose of this review was to verify that matters that met NEI criteria were recognized and identified as Performance Indicator occurrences.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (PI&R) (71152 – 4 Samples)

.1 Semi-Annual Review to Identify Trends (1 Semi-annual Resident Inspector Sample)

a. Inspection Scope

The inspectors reviewed lists of CAP items to identify trends (either NRC or licensee identified) that might indicate the existence of a safety issue. First, the inspectors reviewed a list of approximately 950 open action requests (ARs) that were generated when CAP issues were entered into the PIMS work management system. The inspectors also reviewed a list of approximately 7,600 IRs that PBAPS initiated and entered into the CAP action tracking system (Passport) from June 1, 2008 through December 1, 2008. The list was reviewed and screened to complete the required semi-annual PI&R trend review. A sample of 24 Passport IRs were selected from the list and reviewed in more detail to verify whether the issues were adequately identified and evaluated, and that corrective actions were planned. The inspectors evaluated the IRs against the requirements of Exelon procedure, LS-AA-125, and 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action."

b. Findings and Observations

No findings of significance were identified.

During the review of the backlog of ARs in the PIMS work management system, the inspectors noted that the oldest item had an origination date in 1997. The inspectors observed that approximately 20 percent of the items were more than three years old. The scheduled due dates for 40 percent of the ARs were either overdue or had not been assigned. The inspectors noted that none of these ARs represented an immediate safety issue. However, PBAPS recognized that the administrative control of these ARs could be improved and IR 864759 was initiated to capture this issue in the CAP.

From the review of the IRs, the inspectors noted PBAPS had identified adverse trends in the areas of foreign material events, configuration control standards, and electrical systems reliability. The inspectors noted that the following common cause analyses were appropriately initiated to investigate these trends (IRs 836406, 823199, 794867 and 837594). Also, the site's Nuclear Oversight organization identified an adverse trend associated with minor fire events that was documented in IR 823252. The inspectors considered two spent fuel pool related issues (IR 822542 and 853625) to be precursors of an adverse trend of fuel handling errors.

The review of the selected sample of IRs also identified the following issues that had been appropriately elevated to receive root or apparent cause evaluations: ESW piping corrosion and leaks (IR 798807); tritium found in unexpected locations (IRs 808183 and 808191); unexpected loss of one offsite power source (IR 811332) and, mispositioning of a 250 Volt DC system disconnect switch (IR 820443).

Based on the review of the selected sample, the inspectors concluded that PBAPS was: appropriately identifying and entering the issues into the CAP, properly evaluating the identified issues, and actively identifying adverse trends before they became more safety significant problems. The inspectors also noted that the PBAPS planned to enhance the administrative controls for the backlog of CAP items in the work management process.

.2 Annual Sample – Review of Licensee's Common Cause Analysis of Adverse Trend in 'Documentation' Cross-Cutting Aspect (1 Sample)

a. Inspection Scope

The inspectors reviewed Exelon's common cause analysis of an adverse trend associated with the 'Documentation' cross-cutting aspect. This cross-cutting aspect is described in NRC Manual Chapter 0305, Section 06.07.c, paragraph H.2(c)., and states, in part, that licensee resources such as accurate and up-to-date design documentation and procedures are available and adequate to assure nuclear safety. Two recent NRC team inspection reports (NRC Component Design Basis Inspection (CDBI) Report (2008-007) issued May 21, 2008, and NRC Inspection Report (2008-006), related to security, issued June 25, 2008) documented NCVs involving this 'documentation' cross-cutting aspect. In the CDBI report, the NRC inspection team determined that PBAPS's failure to use appropriate inputs in design calculations related to the automatic load tap changer controller resulted in incorrectly set timers on the load tap changers. In the security report, the NRC inspection team identified three findings of very low significance (Green) which were determined to involve violations of NRC requirements. In response to these NRC-identified issues, PBAPS conducted an analysis to determine whether there were any common causes associated with the "Documentation" cross-cutting aspect.

The inspectors assessed the licensee's analysis of the adverse trend in order to verify that PBAPS staff was identifying issues at an appropriate threshold and entering them into their CAP. The inspectors also assessed whether the planned or completed corrective actions were appropriate.

b. Findings and Observations

No findings of significance were identified.

The inspectors reviewed the common cause analysis (generated in response to PBAPS IR 785645) and concluded the licensee's PI&R activities related to this cross-cutting issue were appropriate. To provide more data for evaluation, the licensee expanded their review scope to go back as far as January 2007. This broader search captured two additional issues (one of these issues was NRC-identified; the other was self-revealing) with a 'Documentation' aspect. In addition, the licensee reviewed lower tiered issues that involved poor document quality since January 2007. This review identified 16 items which involved either poor quality in existing documents or weaknesses in documents prepared within the last two years.

The licensee identified that 1) the cause of errors in non-historical documents was inadequate management enforcement of acceptable technical human performance associated with document reviews; and 2) the cause for errors in historical documents was primarily due to historical weaknesses in the procedures such as a lack of details or a confusing format.

The inspectors determined the licensee implemented appropriate corrective actions for each identified cause. For example, to address inadequate technical review of documents, facility management reinforced expectations for station qualified reviewers. To correct existing deficiencies in historical documents, the facility instituted an action item to track whether procedure revision backlog goals were being achieved. In addition, the licensee will conduct an effectiveness review to assess whether management's intervention has been effective in preventing recurrence of procedure quality issues.

.3 Annual Sample – Review of Corrective Actions to Address Recurring Problems with Unit 3 Degraded Recirculation Pump Shaft Seals (1 Sample)

a. Inspection Scope

The inspectors performed a focused review of the actions taken and planned in response to recurring problems regarding the Unit 3 degraded recirculation pump shaft seals. The review included events that occurred between October of 2003 and June of 2008. The inspectors reviewed causal evaluations contained in the associated condition reports, the root cause report, corrective actions taken and planned, and relevant operating experience. The inspectors also interviewed system engineers and performed a walk down of the control room panels with reactor operators to review data acquisition methods and previous data taken.

b. Findings and Observations

No findings of significance were identified.

The licensee determined the most likely cause of the recirculation pump seal temperature excursions was inadequate venting of the pumps. The licensee planned to install vent valves during the next RFO in November of 2009, in order to achieve adequate venting of the pump casing. The licensee implemented an adverse condition

monitoring plan to assist control room operators in responding to recirculation pump seal temperature excursions. The plan included increased monitoring of recirculation pump seal pressures and temperatures, and contingency actions for reducing recirculation pump speeds in the event that the temperature increases occurred. The inspectors determined that the licensee adequately identified the cause of the temperature excursion and was adequately implementing an adverse condition monitoring plan until the vent valves are installed in 2009.

.4 Annual Sample – RHR Heat Exchanger (HX) (Shell) to HPSW (Tube) Leak (1 Sample)

a. Inspection Scope

The inspectors reviewed the actions taken by Exelon at PBAPS to initiate a program to address a shell-to-tube leak in a Unit 2 RHR HX. The leak was identified in February 2007, during the performance of RT-O-010-630-2 test evolutions. The acceptance criterion was no (0) leakage.

b. Findings and Observations

No findings of significance were identified.

This condition was first identified in February 2007. The licensee documented the problem in an AR (IR 594481) for review and resolution. An evaluation and assessment was performed to establish the operability of the component. Exelon concluded the HX was operable to perform its safety function despite the observed leak. Additionally, a review of other RHR HXs was initiated to determine the state of their leak tightness. Based on these reviews and evaluations, the licensee initiated a program of repair and replacement of the floating heads on the RHR. The replacement of the floating heads on the HX 2 'D' and 3 'D' was completed in January – February 2007, and for 3 'D' in January - February 2008. For other HXs, the repair and replacement program was on schedule and head replacements are planned as replacement heads and work/maintenance opportunities are available, with input regarding ALARA considerations. In the interim the other HXs are monitored for performance and operability. The inspector determined that the licensee's follow-up of the deficiency was acceptable and the corrective actions were adequate.

.5 Identification and Resolution of Problems (71121.01, 71121.02, 71122.02, 71151)

a. Inspection Scope

The inspectors reviewed ARs to evaluate Exelon's threshold for identifying, evaluating, and resolving problems, including identifying and implementing effective corrective actions. The review included a check of possible repetitive issues such as radiation worker or radiation protection technician errors. The following documents were reviewed:

- IRs (681737, 689356, 723717, 744571, 780191, 779929, 793523, 801457, 801463, 806706, 816834, 827949, 795463, 795467, 818517, 836820, 834848, 788374, 805361, 805826, 809026, 809924, 809927, 814380, 816537, 828626, 84941, 841288, 832412).

This review was against the criteria contained in 10 CFR 20, TSs, and applicable station procedures.

b. Findings

No findings of significance were identified.

.6 Routine 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 and human performance issues for follow-up, the inspectors performed routine screening of issues entered into PBAPS's CAP. The review was accomplished by selectively reviewing copies of IRs and accessing PBAPS's computerized database.

b. Findings

No findings of significance were identified.

4OA3 Event Followup (71153 – 1 Sample)

.1 Personnel Performance – Mispositioning of Unit 2, 250 Volt Direct Current (VDC) Disconnect

a. Inspection Scope

The inspectors reviewed CAP documents (IR 820443) and discussed the events surrounding the mispositioning of a Unit 2, Division II, 250 VDC disconnect switch. The inspectors also reviewed AO procedure 57B.9-2, "Transfer of 125V Battery Charger 2DD03 to Alternate Power and Return to Normal," and HU-AA-104-101, "Procedure Use and Adherence."

b. Findings

Introduction: A self-revealing (Green) NCV of TS 5.4.1 was identified when operators inadequately implemented an AO procedure on two occasions. Specifically, an event where the Unit 2, Division II, DC electrical power subsystem was inoperable for longer than the allowed outage time specified in Unit 3 TS 3.8.4 resulted from PBAPS personnel not recognizing the existence of conflicting procedure guidance and the improper removal of a configuration control tool.

Description: Unit 3 TS 3.8.4, "DC Sources-Operating," requires the operability of two independent divisions of DC power from both Units 2 and 3. Each division consists of two 125 Volt (V) DC batteries that are normally connected in series. Each battery supplies its own 125 VDC bus and a 250 VDC bus that is common to the division. To be operable, each 125 VDC battery must have one charger that is exclusively associated with that battery. The chargers are supplied from 480 V AC motor control centers that are connected to an independent emergency 4 kV AC emergency bus. The two Unit 2 DC divisions are required to supply control power to two of the four Unit 3, 4 kV buses

and to supply control power to two of the four common EDGs. An exception to the operability requirements for the Unit 2 Division II DC electrical power subsystem is allowed to consist of only the 125 VDC battery B, an associated charger, and the corresponding control equipment and interconnecting cabling supplying 125 VDC power to the associated bus. This exception is allowed only if all 250 VDC loads are removed from the associated bus. Therefore, the Unit 2 Division II DC electrical power subsystem could remain operable with the 2D battery disconnected from the 2B battery.

On September 18, 2008, during the 2PR17, PBAPS performed maintenance on a 4 kV bus that supplied the normal source of AC power to 2D battery charger (2DD003). In preparation for the 4 kV bus maintenance, PBAPS partially performed AO procedure 57B.9-2, "Transfer of 125V Battery Charger 2DD03 to Alternate Power and Return to Normal." To maintain the Unit 2, Division II, DC electrical power subsystem operable, Section 4.1 of the AO procedure: 1) removed the 250 VDC loads from the Division II; 2) connected an alternate (temporary) non-qualified source of power to the 2D battery charger; and 3) opened the 250 volt DC disconnect (29-1802) between the 2D battery and the 250 VDC bus. The disconnect switch was required to be open, to separate the 2B and 2D batteries, because the 2D battery was considered inoperable with the non-qualified temporary power tied into the 2DD003 battery charger. Specifically, AO 57B.9-2, Steps 4.1.28 and 4.1.29 instructed operators to open disconnect switch 29-1802 and attach an equipment status tag (EST) to switch 29-1802 stating "29-1802 open in accordance with AO 57B.9-2."

On September 18 and 19, testing was satisfactorily performed on the 2D battery in accordance with ST procedure ST-M-57B-744-2, "Unit 2D 125/250 VDC Battery Service Test." The ST was partially completed in a manner that left disconnect switch 29-1802 open with a second EST hanging that stated, "Disconnect open in accordance with ST-M-57B-744-2."

Later on September 19, accelerated testing elsewhere in Unit 2 required the movement of a 250 VDC motor-operated valve that was powered from the Division II DC electrical power subsystem. This required making the Division II DC subsystem inoperable. The appropriate TS action statements were entered. ST procedure, ST-M-57B-744-2 was partially performed to close disconnect switch 29-1802. Partial performance of the ST was in conflict with the existing partially performed AO procedure. The partial ST procedure directed the removal of one of the two hanging ESTs. However, when personnel found two ESTs, both were removed. This removed a configuration control tool and removed a barrier to a human performance error. The inspector also noted that this was the first instance where station procedures were not properly followed. Specifically, adherence to AO 57B.9-2 was violated when 29-1802 was closed and its EST was removed even though the partially performed AO procedure (steps 4.1.28 and 4.1.29) required disconnect switch 29-1802 to be opened with the corresponding EST attached (first performance deficiency).

After the movement of the 250 VDC motor-operated valve, PBAPS personnel wanted to return the Division II DC electrical power subsystem to an operable condition. However, PBAPS did not recognize that the non-qualified source of AC power remained connected to the 2D battery charger. ST, ST-M-57B-742-2, "Unit 2B 125/250 VDC Battery Service Test," was partially completed to reopen disconnect switch 29-1802. Subsequently, testing of the 2B battery was completed by performing a second copy of ST-M-57B-744-2. On September 20, during the restoration process following the 2B battery test,

disconnect switch 29-1802 was closed. With the non-qualified source of AC power connected to the 2D battery charger, the Division II DC electrical power subsystem was rendered inoperable. Therefore, this was the second and more significant instance where station procedures were not properly followed. Specifically, adherence to AO 57B.9-2 was violated when 29-1802 was closed even though the partially performed AO procedure (steps 4.1.28 and 4.1.29) required disconnect switch 29-1802 to be opened with the corresponding EST attached (second performance deficiency). The inspectors noted the work control aspects of this issue, in that, work activities were not appropriately coordinated and personnel were not kept apprised of work status and the operational impact of work activities.

Improperly closing disconnect switch 29-1802 on September 20 resulted in the Unit 2, Division II DC electrical power subsystem being inoperable for longer than the outage time allowed by Condition B of Unit 3 TS 3.8.4. This condition went undetected until approximately 17 hours later on September 21 when Unit 3 was found to be approximately five hours into the shutdown action statement required by TS 3.8.4, Condition D. The disconnect switch was reopened and operability was restored before maneuvering of the plant was required.

Analysis: The inspectors concluded the finding was more than minor because it was associated with the human performance attribute of the Mitigating Systems Cornerstone, and impacted the cornerstone objective of ensuring the reliability of the Unit 2, Division II DC electrical power subsystem to respond to initiating events, in that, one of its associated battery chargers was being supplied from a non-qualified AC power source. Traditional enforcement does not apply since there were no actual safety consequences or potential for impacting the NRC's regulatory function, and the finding was not the result of any willful violation of NRC requirements. The inspectors completed a significance determination of this issue using IMC 0609, "SDP," Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." The inspectors concluded that this finding affected the Mitigating Systems Cornerstone and answered "No" to all relevant questions. Specifically, the supply of a non-qualified AC power source to the Unit 2, Division II, DC electrical power system was a qualification issue confirmed not to result in a loss of functionality. Although the Unit 2, Division II, DC electrical power system was inoperable for longer than its 12-hour TS allowed outage time, this qualification issue did not result in an actual loss of safety function. Therefore, this finding was considered to be of very low safety significance (Green).

The inspectors determined that this finding had a cross-cutting aspect in the area of human performance (work control component) because PBAPS personnel did not adequately coordinate work activities by incorporating actions to address: the impact of changes to the work scope or activity on the plant and human performance; nor the need to keep personnel apprised the operational impact of work activities; and plant conditions that may affect work when conflicting procedures led to inadequate procedure adherence and the unplanned inoperability of the Unit 2 Division II DC electrical subsystem. [IMC 0305 aspect: H.3(b)]

Enforcement: TS 5.4.1, "Procedures," requires that procedures shall be established and implemented covering the activities in Regulatory Guide (RG) 1.33. RG 1.33, Appendix A, Section E, requires procedures for correcting abnormal or off-normal conditions. Abnormal operating procedure 57B.9-2, Section 4.1, provided instructions to transfer



battery charger 2DD003 to an alternate (unqualified) source of AC power. Steps 4.1.28 and 4.1.29 instructed operators to open disconnect switch 29-1802 and attach an EST to switch 29-1802. Separately, AO 57B.9-2, Section 4.2 provided instructions for the subsequent transfer of battery charger 2DD003 to its normal (qualified) AC source. Specifically, step 4.2.17 instructs operators to operators to close disconnect switch 29-1802 and remove the EST.

Contrary to the above, on two occasions, on September 19 and 20, 2008, operators closed disconnect switch 29-1802 while Section 4.1 of AO 57B.9-2 was in effect to keep the switch tagged in the open position. At the time, Section 4.2 of AO 57B.9-2 had not been authorized to: restore the battery charger to its normal AC source; close disconnect switch 29-1802; and remove the EST. On September 20 and 21, improperly closing disconnect switch 29-1802 resulted in the Unit 2, Division II electrical power subsystem being inoperable longer than the outage time allowed by Condition B of Unit 3 TS 3.8.4. Corrective actions included reopening the disconnect switch to restore operability before maneuvering of the plant was required. Because this violation was of very low safety significance (Green) and was documented in PBAPS's CAP as IR 820443, this finding is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy, NUREG-1600: **NCV 05000277/2008005-01; 05000278/2008005-01, "Incorrect Performance of Procedure Step Resulted in Inoperability of a DC Bus for Longer than the TS Allowed Outage Time."**

#### 4OA5 Other Activities

##### .1 Quarterly Resident Inspector Observations of Security Personnel and Activities

###### a. Inspection Scope

During the inspection period the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status reviews and inspection activities.

###### b. Findings

No findings of significance were identified.

##### .2 Independent Spent Fuel Storage Installation Radiological Controls (60855.1)

###### a. Inspection Scope

The inspectors selectively reviewed implementation of applicable license conditions associated with module temperature control and instrumentation surveillance.

###### b. Findings

No findings of significance were identified.

.3 Implementation of Temporary Instruction (TI) 2515/176 – EDG TS Requirements Regarding Endurance and Margin Testing

a. Inspection Scope

The objective of TI 2515/176, “EDG TS Surveillance Requirements Regarding Endurance and Margin Testing,” was to gather information to assess the adequacy of nuclear power plant EDG endurance and margin testing as prescribed in plant-specific TS. The inspectors reviewed EDG ratings, design basis event load calculations, surveillance testing requirements, and EDG vendor’s specifications and gathered information in accordance with TI 2515/176.

The inspectors’ assessment and information gathered while completing this TI was discussed with licensee personnel. This information was forwarded on to the Office of Nuclear Reactor Regulation for further review and evaluation.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On January 16, 2009, the resident inspectors presented the inspection results to Mr. W. Maguire and other PBAPS staff, who acknowledged the findings. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

4OA7 Licensee-Identified Violations

None.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Exelon Generation Company Personnel

W. Maguire, Site Vice President  
 G. Stathes, Plant Manager  
 J. Armstrong, Regulatory Assurance Manager  
 E. Flick, Engineering Director  
 L. Bunner, Work Management Director  
 L. Lucas, Chemistry Manager  
 R. Franssen, Operations Director  
 R. Holmes, Radiation Protection Manager  
 D. DeBoer, Acting Security Manager  
 T. Wasong, Training Director

#### NRC Personnel

F. Bower, Senior Resident Inspector  
 M. Brown, Resident Inspector  
 S. Chaudhary, Reactor Inspector  
 T. Fish, Senior Operations Engineer  
 R. Fuhrmeister, Senior Project Engineer  
 G. Johnson, Reactor Inspector  
 H. Jones, Reactor Inspector  
 R. Nimitz, Senior Health Physicist

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

#### Opened

None.

#### Opened/Closed

05000277; 278/2008005-01	NCV	Incorrect Performance of Procedure Step Resulted in Inoperability of a DC Bus for Longer than the TS Allowed Outage Time (Section 4OA3.1)
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#### Closed

None.

#### Discussed

None.

## **LIST OF DOCUMENTS REVIEWED**

### **Section 1R01: Adverse Weather Protection**

RT-0-040-630-2, Winterizing Procedure

MA-PB-1003, Winter Readiness and Storm Response Guidelines for the Peach Bottom Facility

### **Section 1R04: Equipment Alignment**

COL 3.1.A-3, Revision 15, Control Rod Drive Hydraulic System Startup

COL 10.1.A-3B, Revision 4, Residual Heat Removal System Setup for Automatic Operation  
Loop B

COL 33.1.A-2, Revision 22, Emergency Service Water System (Unit 2 and Common)

COL 10.1.B-3, Revision 4, RHR Common Valve

### **Section 1R05: Fire Protection**

PF-132, Revision 5, Prefire Strategy Plan, Diesel Generator Building, Elevation 127'

PF-144, Revision 3, Prefire Strategy Plan, Circulating Water Pump Structure

PF-78H, Revision 4, Prefire Strategy Plan, Cable Spreading Room, Turb. Building, Elevation  
150'

PF-4C, Revision 6, Prefire Strategy Plan, Unit 2 Reactor Recirculation Pump Motor  
Generator Set Room, Radwaste Building 135' Elevation

PF-4B, Revision 3, Prefire Strategy Plan, Unit 2 Reactor Building Closed Cooling Water  
Room, Radwaste Building, 116' Elevation

### **Section 1R12: Maintenance Effectiveness**

ER-AA-340-1001, GL 89-13 Program Implementation Instructional Guide

ER-AA-340, GL 89-13 Program Implementing Procedure

ER-AA-5004-1000, Raw Water Corrosion Program Guide

IR 824173, RV-2-02-071J Failed ST-M-016—220-2

IR 823195, Valve Leaks Through

IR 824034, Summary of As-Found Lift Tests for SRVs/SVs at Wyle Labs

IR 826813, SRV-71J Leaking 10 Drops per Minute

IR 836120, SRV-71D Tailpipe Reading Low Out-of-Spec

IR 680967, 3 SRV/SV "As-Found" Lifts Not Within the TS Required +/- 1%

AR A1686873, Evaluate Number 9 Bearing Vibration levels

IR 843290, U2 Main Generator Bearing #9 Step Change in Vibration

IR 852360, Questions around U2 Main turbine Gen bearing #9 Monitoring

Adverse Condition Monitoring Plan (ACMP) – U2 Main Generator No. 9 Vibration

Operational and Technical Decision Making (OTDM) Process – Operation of Unit 2 Generator  
with current trend in Main Generator #9 Vibration

PORC Meeting 08-22, OTDM and ACMP for Unit 2 Generator #9 Bearing Vibration

### **Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

AR A1684543, Steam Leak on HCU 14-27

IR 834650, Steam Leak on HCU 14-27

IR 835242, EOC for IR 834650

IR 835245, EOC for IR 834650

IR 833280, Unit 2 Main Generator Trip  
AR A1684046, Unit 2 Main Generator Trip  
WO C0226667, Install Monitoring Equipment / TCCP 08-00408  
IR 849793, 3 'A' Recirc PP Elevated Seal Temperatures  
IR 850266, 3 'A' Recirc Seal Temperature Rise  
IR 687330, Unplanned Downpower in Response to 3 'A' Recirc Seal Hi Temp  
Adverse Condition Monitoring Plan – 3 'A' (B) Recirc Pump Seal Unstable Seal Temperature  
and Pressure Post P3R16 Startup  
Control Room eSOMS Logs – 11/24/08 to 11/28/08  
IR 843290, Unit 2 Main Generator Bearing #9 Step Change in Vibration  
AR A1686873, Evaluate Number 9 Bearing Vibration Action Levels  
WO C0226828, Connect Test Equipment per Engineering  
Adverse Condition Monitoring Plan, Unit 2 Main Generator #9 Bearing Vibration, Revision 2  
IR 843420, Unit 2 Turbine #9 Upper Bearing Temperature Reading Low  
IR 852360, Questions Around Unit 2 Main Turbine Gen Bearing #9 Monitoring  
IR 854427, Install Temp Camera for Number 9 Bearing

### **Section 1R15: Operability Evaluations**

IR 827889 – Air Voids Identified in Various Unit 2 HPCI Lines – 2PR17  
WO C0225955 – NDE: UT Exam Unit 2 HPCI Piping For Air Voids  
IR 831432, Unit 3 HPCI Discharge High point Gas accumulation EOC  
IR 332355-42, Hydraulic Transient Modeling of Event  
IR 831467, Additional HPCI UT Inspections Required  
Clearance 08000815, HPCI Water Side Clearance  
WO C0225126, MO-3-13-016 Backseat/torque Packing  
AR A1665469, MO-3-13-016, Has a Small Packing Leak  
AR A1665469, Evaluation 5, Provide PMT Waiver for W/O C0225126  
Information Notice 87-40, Backseating Valves Routinely to Prevent Packing Leakage  
IR 837896, Backseat Valves not Documented on List  
IR 844985, Unit 2 LPRM Detectors Not Returned to Service  
IR 771770, Unit 2 LPRM Detector 48-09A Should be Returned to Service  
SO 60A.7.A-2, LPRM Bypassing  
IR 859069, Support Bracket on line near RTV-0-52G-623B not attached  
SO 60A.7.A-3, LPRM Bypassing  
IR 858390, Fisher Part 21 Notice on PCV-4544 Diaphragm  
IR 858392, Fischer Part 21 Notice on PCV-5544 Diaphragm  
AR A1691301, Unit 3 Main Seal Oil Pump Vibration Noise  
Adverse Condition Monitoring Plan, Main Seal Oil Pump (30P019) Leakage and Cavitation  
Noise, Revision 1, dated December 18, 2008

### **Section 1R18: Plant Modifications**

ECR 08-00408, Disable Main Transformer Sudden Pressure Relay Trip Circuitry  
OP-AA-106-101-1005, Quarantine of Areas, Equipment and Records  
IR 833280, Unit 2 Main Generator Trip  
WO C0226667, Install Monitoring Equipment/ TCCP 08-00408  
WO C0226721, 20G001: Modifications to Sudden Pressure Relays

### **Section 1R19: Post-Maintenance Testing**

WO R1087967, RV-0-37D-0451 – Remove/Bench Test Relief Valve  
 ST-O-37D-370-2, Diesel Driven Fire Pump Operability Test performed 11/7/08  
 WO R1114271, 00P063 (11/08) – PM: Fire Pump’s “Diesel Engine”  
 AR A1687919, E124-R-C Breaker tripped during testing  
 WO C0226921, Troubleshoot/Repair Transfer Switch  
 WO R1087749, MO-3-10-16A Power Supply Check  
 RT-O-010-750-3, MO-3-10-16A Power Supply Operational Check performed on 11/20/08  
 WO M1692304, Tune LC-3041B to optimize performance  
 IR 860095, Unit 3 4B Heater Drain Valve Not Controlling Level  
 IR 861583, Unit 3 B4 FWH Dump Valve Open – Approx 7 MWE Reduction  
 IR 860111, Unit 3 4B FWH Dump Valve Sticking  
 IR 860115, Unit 3 B4 Feedwater Heater High Level  
 WO A1691874, ‘A’ ESW Booster Pump Tripped During Testing  
 ST-O-033-310-2, ESW Booster and ECW Pump and Valve Functional Inservice Test  
 WO R1119828, ESW Booster/ECW PP/VLV Functional IST (Retest)  
 WO R1086164, ESW Booster/ECW PP/Vlv Functional IST

### **Section 1R20: Refueling and Other Outage Activities**

IR 822698, NOS ID: IST Safety Function Error in HPCI Stayfull MOD  
 IR 824466, J-400 Has Missing Screws on Cover in Torus Proper  
 IR 828230, 2GE066 Drip Pan Has a Leak  
 IR 828235, HV-2-16A-2317OC is Missing Handwheel  
 IR 828241, Unit 2 Drywell Deficiencies Identified During NRC Walk Down  
 IR 824034, Summary of As-Found Lift Tests for SRVs/SV at Wyle Labs  
 IR 824459, Final FME Torus Proper Walk Down Results

### **Section 1R22: Surveillance Testing**

ST-O-054-751-2, E12 4KV Bus Undervoltage Relays and LOCA Loop Functional Test  
 WO R1047138, E12 4KV Undervoltage Relays/LOCA LOOP (Sec 6.6)  
 IR 828325, ST-O-054-751-2 Step 6.6.19 UNSAT  
 WO C0226554, Investigate Issue with E12 Bus Logic  
 Drawing E-47, Sheet 2  
 ST-O-013-301-2, Revision 34, RCIC Pump, Valve, Flow and Unit Cooler Functional and  
 In-Service Test (Performed 10/20/08)  
 WO R1105019, RCIC Pump Valve and Flow/ Cooler IST  
 SI3K-1G-TDR-A2C2, ADS Time Delay Relay Test 2E-K33/34  
 WO R1060484, Cal/Fun ADS Low WTR Time Delay 2E-K33/34A

### **Section 4OA1: Performance Indicator (PI) Verification**

NEI 99-02, “Regulatory assessment Indicator Guideline,” Revision 5  
 Exelon Procedure LS-AA-2200, “Mitigating System Performance Index data Acquisition and  
 Reporting,” Revision 2  
 “PBAPS Mitigating Systems Performance index Basis Document,”  
 Revision 2  
 EC 367959, Technical Evaluation – Evaluation of the Potential Impact of Peach Bottom Unit 3  
 As-Found S/RV & SV Lift Setpoints Identified During RFO 16  
 Licensee Event Report (LER) 3-07-01, Laboratory Analysis Identified Safety Relief Valves and  
 Safety Valve Set Point Deficiencies

MSPI Deviation Reports:

July 2007 Unit 2 and Unit 3 RHR/HPSW  
July 2007 Unit 2 and Unit 3 EDGs  
July 2007 Unit 2 and Unit 3 HPCI  
July 2007 Unit 2 and Unit 3 RCIC  
August 2007 Unit 2 and Unit 3 RHR/HPSW  
August 2007 Unit 2 and Unit 3 ESW  
August 2007 Unit 2 and Unit 3 EDGs  
August 2007 Unit 2 and Unit 3 HPCI  
August 2007 Unit 2 and Unit 3 RCIC  
September 2007 Unit 2 and Unit 3 RHR/HPSW  
September 2007 Unit 2 and Unit 3 ESW  
September 2007 Unit 2 and Unit 3 EDGs  
September 2007 Unit 2 and Unit 3 HPCI  
September 2007 Unit 2 and Unit 3 RCIC  
October 2007 Unit 2 and Unit 3 RHR/HPSW  
October 2007 Unit 2 and Unit 3 ESW  
October 2007 Unit 2 and Unit 3 EDGs  
October 2007 Unit 2 and Unit 3 HPCI  
October 2007 Unit 2 and Unit 3 RCIC  
November 2007 Unit 2 and Unit 3 RHR/HPSW  
November 2007 Unit 2 and Unit 3 ESW  
November 2007 Unit 2 and Unit 3 EDGs  
November 2007 Unit 2 and Unit 3 HPCI  
November 2007 Unit 2 and Unit 3 RCIC  
December 2007 Unit 2 and Unit 3 RHR/HPSW  
December 2007 Unit 2 and Unit 3 ESW  
December 2007 Unit 2 and Unit 3 EDGs  
December 2007 Unit 2 and Unit 3 HPCI  
December 2007 Unit 2 and Unit 3 RCIC  
January 2008 Unit 2 and Unit 3 RHR/HPSW  
January 2008 Unit 2 and Unit 3 ESW  
January 2008 Unit 2 and Unit 3 EDGs  
January 2008 Unit 2 and Unit 3 HPCI  
January 2008 Unit 2 and Unit 3 RCIC  
February 2008 Unit 2 and Unit 3 RHR/HPSW  
February 2008 Unit 2 and Unit 3 ESW  
February 2008 Unit 2 and Unit 3 EDGs  
February 2008 Unit 2 and Unit 3 HPCI  
February 2008 Unit 2 and Unit 3 RCIC  
March 2008 Unit 2 and Unit 3 RHR/HPSW  
March 2008 Unit 2 and Unit 3 ESW  
March 2008 Unit 2 and Unit 3 EDGs  
March 2008 Unit 2 and Unit 3 HPCI  
March 2008 Unit 2 and Unit 3 RCIC  
April 2008 Unit 2 and Unit 3 RHR/HPSW  
April 2008 Unit 2 and Unit 3 ESW  
April 2008 Unit 2 and Unit 3 EDGs  
April 2008 Unit 2 and Unit 3 HPCI  
April 2008 Unit 2 and Unit 3 RCIC  
May 2008 Unit 2 and Unit 3 RHR/HPSW

May 2008 Unit 2 and Unit 3 ESW  
 May 2008 Unit 2 and Unit 3 EDGs  
 May 2008 Unit 2 and Unit 3 HPCI  
 May 2008 Unit 2 and Unit 3 RCIC  
 June 2008 Unit 2 and Unit 3 RHR/HPSW  
 June 2008 Unit 2 and Unit 3 ESW  
 June 2008 Unit 2 and Unit 3 EDGs  
 June 2008 Unit 2 and Unit 3 HPCI  
 June 2008 Unit 2 and Unit 3 RCIC  
 July 2008 Unit 2 and Unit 3 RHR/HPSW  
 July 2008 Unit 2 and Unit 3 ESW  
 July 2008 Unit 2 and Unit 3 EDGs  
 July 2008 Unit 2 and Unit 3 HPCI  
 July 2008 Unit 2 and Unit 3 RCIC

IRs:

IR 834065, NRC Identified Issues during a Review of MSPI Records  
 IR 834465, NRC Identified an Issue with the ESW MSPI Unavailability

Additional IRs:

759816	660599	738286	760597	692752
707459	720392	669887	751478	7690326
698210	691502	659670	374445	683887
686039	695659	778265	678935	651711
666965	675386	774144	667371	
667470	681571	758776	765997	

**Section 40A2: Identification and Resolution of Problems**

Licensee Documents

Adverse Condition Monitoring Plan for the Unit 3 Recirculation Pump Seal Unstable Seal  
 Temperatures and Pressures Post-P3R16 Startup, Revision 4  
 Flowserve Peach Bottom Seal Inspection Report

Issue Reports (IRs)

IR 687330, Unplanned Downpower in Response to 3<sup>a</sup> Recirc Seal High Temperature  
 IR 686165, Received 'Recirc Pump Motor High Temperature' Alarm on Unit 3  
 IR 781735, Fire Watch Did Not Go Into Unit 2 TB Vent Panel Area  
 IR 798807, Perform a RCA for the ESW Piping Issues  
 IR 820443, 250 Volt DC Disconnect Found Closed During AO 57B.9-2  
 IR 801512, Security Work Hour Deviation  
 IR 807147, Bumping of Structural Steel Results in ½ Scram on Unit 2  
 IR 808183, Evaluation for Well #4 Tritium Increase – ACE  
 IR 808191, Evaluation of Unit 1 Containment Tritium – ACE  
 IR 819190, Light Weight Handling Pole Section Fell into RPV  
 IR 822097, 2<sup>nd</sup> Fire Event FME Air Bag – 2 'A' Main Turbine Extraction Line  
 IR 822542, Mis-oriented Fuel Bundle in Fuel Pool



IR 853625, Incorrect Pins Were Removed & Inspected on Fuel Bundle JLM63  
IR 811332, Cause for CB #3435 Trip During #1 Trans Failure Unknown  
IR 823252, NOS ID: Inadequate Cas to Adverse Trend in Fire Events  
IR 836406, Foreign Material Common Cause of P2R17  
IR 785645, Adverse NRC Cross-cutting Aspect Trend  
IR 790454, Adverse Trend in PBAPS Drill and Exercise performance (DEP)  
IR 794867, CCA for Site Configuration Control Standards  
IR 799571, Negative Human Performance Trend in Security  
IR 812227, Station Event Free Clock Reset – Industrial Safety Trend  
IR 823199, Investigate Failure of FME Control on the Turbine Deck 165'  
IR 824716, Summary of OPS Related HU Outage Issues  
IR 829937, Common Cause Analysis of 2R17 Major Equipment Maintenance  
IR 837594, Potential Adverse Trend in Electrical Systems Reliability  
IR 799684, #1 Transformer Fire  
IR 554178, Replace 2 'C' RHR HX Floating Head Assembly  
IR 594481, RHR to HPSW Leakage Rate Greater than Acceptance Criteria  
IR 694879, 3 'A' RHR HX - RHR (SHELL) to HPSW (TUBE) Leak  
IR 694887, 3 'C' RHR HX – Potential RHR to HPSW Leak  
IR 864759, "Aged" PIMS ARs Generated from CAP

#### Action Requests

AR A1578288, Increased Leak Rate for 3 'D' HX  
AR A1591783, Replace 2 'D' RHR HX Floating Head Assembly

#### Work Orders

WO C0219318, Remove Lower Shell Head, Remove Floating Head and Install a Replacement Floating Head on 3 'D' RHR HX  
RP-AA-401, ALARA Plan for WO C0219318  
WO C0221745, Remove Lower Shell Head, Remove Floating Head and Install a Replacement Floating Head on 2 'D' RHR HX  
RP-AA-401, ALARA Plan for WO C0221745

#### **Section 4OA3: Event Followup**

NOM-C-7.1, "Procedure Use," Revision 2  
HU-AA-104-101, "Procedure Use and Adherence," Revision 3

#### **Section 4OA5: Implementation of Temporary Instruction (TI) 2515/176 – Emergency Diesel Generator Technical Specification Surveillance Requirements Regarding Endurance and Margin Testing**

#### Completed Surveillance Procedures

ST-O-052-701-2, E1 Diesel Generator 24 Hour Endurance Test, completed January 18, 2007 (Revision 16)  
ST-O-052-702-2, E2 Diesel Generator 24 Hour Endurance Test, completed November 13, 2007 (Revision 16) and January 14, 2006 (Revision 14)

ST-O-052-703-2, E3 Diesel Generator 24 Hour Endurance Test, completed August 16, 2006 (Revision 15) and December 20, 2006 (Revision 15) and December 26, 2006 (Revision 15)

ST-O-052-704-2, E4 Diesel Generator 24 Hour Endurance Test, completed June 17, 2005 (Revision 13) and October 30, 2007 (Revision 15)

#### Procedures

ST-O-052-701-2, Revision 17, E1 Diesel Generator 24 Hour Endurance Test  
 ST-O-052-702-2, Revision 17, E2 Diesel Generator 24 Hour Endurance Test  
 ST-O-052-703-2, Revision 16, E3 Diesel Generator 24 Hour Endurance Test  
 ST-O-052-704-2, Revision 15, E4 Diesel Generator 24 Hour Endurance Test  
 RT-O-052-252-2, Revision 25, E2 Diesel Generator Inspection Post-Maintenance Functional Test  
 SE-11, Revision 13, Loss of Offsite power

#### Calculations

PE-0123, Revision 1, Diesel Generator Load Profiles and System Voltage Regulation Study – Report  
 PR-0166, Revision 8, Emergency Diesel Generator Loading for Cases Defined by UFSAR

#### Other Documents

Updated Final Safety Analysis Report, Section 8.5, Standby AC Power Supply and Distribution Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Amendment Nos. 173 and 176 to Facility Operating License Nos. DPR-44 and DPR-56  
 Technical Specifications Section 3.8, Electrical Power Systems  
 PECO Letter dated April 15, 1991, Peach Bottom Atomic Power Station Units 2 and 3, Response to March 12, 1991 Meeting on Emergency Diesel Generators  
 PECO Letter dated January 31, 1992, Peach Bottom Atomic Power Station Units 2 and 3, Technical; Specification Change Request 88-08  
 PECO Letter dated June 7, 1995, Supplement to TSCR 93-16 Conversion to Improved Technical Specifications  
 Peach Bottom Atomic Power Station, Units 2 and 3, - Issuance of Amendment RE: Diesel Generator Surveillance (TAC Nos. MC3593 and MC 3594) – ML050340096

### **LIST OF ACRONYMS**

AC	Alternating Current
ADAMS	Agency-wide Documents Access and Management System
ALARA	As Low As is Reasonably Achievable
AO	Abnormal Operating
AR	Action Requests/Assignment Reports
CAP	Corrective Action Program
CDBI	Component Design Basis Inspection
CFR	Code of Federal Regulations
DBDs	Design Basis Documents
DC	Direct Current

DEP	Drill and Exercise Performance
EDG	Emergency Diesel Generator
EOC	Extent-of-Condition
EST	Equipment Status Tag
ESW	Emergency Service Water
HPCI	High Pressure Coolant Injection
HPSW	High Pressure Service Water
HX	Heat Exchanger
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Issue Report
LER	License Event Reports
NCV	Non-cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OOS	Out-of-Service
OTDM	Operational and Technical Decision Making
PARS	Publicly Available Records
PBAPS	Peach Bottom Atomic Power Station
PMT	Post-Maintenance Testing
RCIC	Reactor Core Isolation Cooling
RG	Regulatory Guide
RHR	Residual Heat Removal
PI	Performance Indicator
PI&R	Problem Identification and Resolution
RCIC	Reactor Core Isolation Cooling
RFO	Refueling Outage
RG	Regulatory Guide
RHR	Residual Heat Removal
RTP	Rated Thermal Power
SDP	Significance Determination Process
SRVs	Safety/Relief Valves
SSC	System, Structure, or Component
SSFFs	Safety System Functional Failures
STs	Surveillance Tests
TI	Temporary Instruction
TRM	Technical Requirements Manual
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
VDC	Volt Direct Current
WO	Work Order