

May 3, 2006

Mr. Christopher M. Crane
President and CNO
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Exelon Generation Company, LLC
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SUBJECT: PEACH BOTTOM ATOMIC POWER STATION - NRC INTEGRATED
INSPECTION REPORT 05000277/2006002 AND 05000278/2006002

Dear Mr. Crane:

On March 31, 2006, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Peach Bottom Atomic Power Station Units 2 and 3. The enclosed inspection report documents the inspection results, which were discussed on April 21, 2006, with Mr. R. Braun 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 NRC-identified finding of very low safety significance (Green). The finding was determined to involve a violation of NRC requirements. Additionally, two licensee-identified violations, which were determined to be of very low safety significance, are listed in this report. However, because of the very low safety significance and because it was entered into your corrective action program (CAP), the NRC is treating this finding as non-cited violation (NCV) consistent with Section VI.A.1 of the NRC's Enforcement Policy. If you contest any NCVs in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at Peach Bottom.

Mr. Christopher M. Crane

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Sincerely,

/RA/

James Trapp, Chief
Reactor Projects Branch 4
Division of Reactor Projects

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

Enclosures: Inspection Report 05000277/2006002 and 05000278/2006002
w/Attachment: Supplemental Information

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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.: 05000277/2006002 and 05000278/2006002

Licensee: Exelon Generation Company, LLC

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

Location: Delta, Pennsylvania

Dates: January 1, 2006 through March 31, 2006

Inspectors: F. Bower, Senior Resident Inspector
D. Schroeder, Resident Inspector
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SUMMARY OF FINDINGS

IR 05000277/2006-002, 05000278/2006-002; 01/01/2006 - 03/31/2006; Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3; Post-Maintenance Testing.

The report covered a 3-month period of inspection by the resident inspectors. One Green finding, which was a non-cited violation (NCV), was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 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. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified Finding

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for not adequately testing the E-2 emergency diesel generator (EDG) air coolant auxiliary pump following shaft packing replacement. The post-maintenance test did not account for the higher pressure that occurs in the EDG cooling subsystem when the EDG is operating and the cooling system is pressurized by the attached cooling pump. PBAPS entered this performance deficiency into their corrective action program (CAP). Planned corrective actions include developing appropriate post-maintenance testing (PMT) prior to returning the air coolant auxiliary pump to service and developing human performance work practices for minor emergent maintenance activities.

The inspectors identified that a contributing cause of the finding was related to the human performance cross-cutting area. Specifically, the personnel specifying the PMT had an inadequate understanding of the air coolant auxiliary pump design and the pump's interrelationship with the EDG operation, although this information was available in the organization. Also, the inadequate review of previous testing of the pump packing replacements led to the development of an inadequate post-maintenance test for this instance of the E-2 EDG air coolant auxiliary pump shaft packing replacement.

This finding is greater than minor because it is associated with the procedure quality attribute of the Mitigating Systems cornerstone and affects the cornerstone objective to ensure the capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). This finding was determined to be of very low safety significance (Green) using Phase 1 of the SDP, since this condition prohibited by Technical Specifications (TS) was a finding that involved a loss of safety function for a safety system train that did not exceed the TS allowed outage time. (Section 1R19)

B. Licensee-Identified Violations

Two violations of very low safety significance (Green), which were identified by the licensee, were reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's CAP. The violations and corrective actions are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 2 began the inspection period at approximately 100 percent rated thermal power (RTP) until January 27, 2006, when power was reduced to 50% in response to a planned control rod sequence exchange, water box cleaning, and condensate pump thrust bearing replacement. The unit returned to full power on January 31, 2006, where it remained except for brief periods to support testing and rod pattern adjustments.

Unit 3 began the inspection period at approximately 100 percent RTP until January 20, 2006, when power was reduced to 55% for a planned water box cleaning and scheduled maintenance. The unit returned to full power on January 22, 2006, where it remained except for brief periods for the conduct of planned testing and rod pattern adjustments.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment (71111.04Q - 4 Samples)

Partial Walkdown

a. Inspection Scope

The inspectors performed four partial system walkdowns during this inspection period to verify system and component alignment and to note any discrepancies that could impact system operability. The partial walkdowns included verification of the alignment of selected portions of redundant or backup systems and risk-significant systems that were recently realigned following an extended system outage, maintenance, modification, or testing. The inspectors reviewed selected valve positions, electrical power availability, and the general condition of major system components. The partial walkdowns included the following systems:

- "A" Control Room Emergency Ventilation (CREV) During Maintenance on "B" CREV
- "B" Emergency Service Water (ESW) Pump and Emergency Cooling Water Pump During Maintenance on "A" ESW Pump
- Unit 3 High Pressure Coolant Injection (HPCI) During Maintenance on Unit 3 Reactor Core Isolation Cooling (RCIC)
- Unit 2 RCIC During Maintenance on Unit 2 HPCI

1R05 Fire Protection (71111.05Q - 9 Samples)Fire Protection - Toursa. Inspection Scope

The inspectors reviewed PBAPS's Fire Protection Plan, Technical Requirements Manual, 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 then performed walkdowns of the following 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 documents reviewed for each section of this report are listed in the Attachment. The following nine fire areas were reviewed for impaired fire protection features:

- Circulating Water Structure (Fire Zone 144)
- Radiation Chemical Area/13Kv Switchgear Area, TBC-116 (Fire Zone 78C)
- Fan Room/Radwaste Building, Elevation 165' (Fire Zone 108A)
- Main Corridor, Unit 2, Turbine Building, Elevation 116' (Fire Zone 78B)
- Lube Oil Tank Room, Unit 2, Turbine Building (Fire Zone 88)
- Lube Oil Tank Room, Unit 3, Turbine Building (Fire Zone 89)
- Reactor Feed Pump Turbine (RFPT)/Chiller Area, Unit 2, Turbine Building (Fire Zone 102)
- RFPT/Chiller Area, Unit 3, Turbine Building (Fire Zone 78L)
- Unit 2 Refuel Floor Room, Reactor Building, Elevation 234' (Fire Zone 57)

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06 - 1 External Sample)External Floodinga. Inspection Scope

The inspectors reviewed PBAPS's external flood analysis for the Unit 2 and Unit 3 high pressure service water (HPSW) rooms. The inspectors used Design Basis Document (DBD) P-T-07, "External Hazards," to conduct this review. The inspectors walked down selected areas of the Unit 2 and Unit 3 HPSW rooms to verify external flooding design features were as described in DBD P-T-07 and USFAR, Section 12, "Structures and Shielding."

b. Findings

No findings of significance were identified.

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

The inspectors verified the readiness of the 3 "D" residual heat removal (RHR) heat exchanger by reviewing the performance test data records. The data collected by RT-O-010-660-3, "RHR Heat Exchanger Performance Test," was reviewed for problems or errors. The inspectors noted that this was a retest and additional heat exchanger temperature instrumentation was added for the performance of this test. The permanently installed instrumentation had previously yielded inconclusive test results. The inspectors reviewed Issue Reports (IRs) 449561 and 307538 that entered issues related to the test equipment adequacy into the CAP. The inspector also reviewed the analysis of the test data that was documented in RT-X-010-661-3, "RHR Heat Exchanger Performance Calculation Test." The inspectors verified that the heat exchanger thermal performance exceeded the design basis criteria established in engineering analysis PM-0589, "RHR Heat Exchanger Performance Evaluation."

b. Findings

No findings of significance were identified.

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

On February 27, 2006, the inspectors observed operators in the plant's simulator during licensed operator requalification training to verify that operator performance was adequate and that evaluators were identifying and documenting crew performance problems. The inspectors also verified that performance errors were discussed in the crew's post-scenario critiques. The inspectors focused on the control room supervisor's satisfactory completion of critical tasks, including proper and timely identification and classification of emergencies. The inspectors also evaluated whether the operators adhered to the emergency operating procedures. The inspectors discussed the training, simulator scenarios, and critiques with the operators, shift supervision, and the training instructors. The two scenarios observed for this one sample are listed below:

- Safety/Relief Valve (SRV) Open and Three Rods Stuck
- Loss of Main Condenser Vacuum and an Electrical Anticipated Transient without Scram

d. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12Q - 2 Samples)Routine Maintenance Effectiveness Issuesa. Inspection Scope

The inspectors reviewed the follow-up actions for issues to assess the effectiveness of PBAPS's maintenance activities. The review included items such as: (1) appropriate work practices; (2) identifying and addressing common cause failures; (3) scoping in accordance with 10 CFR 50.65(b) of the Maintenance Rule (MR); (4) characterizing reliability issues for performance; (5) trending key parameters for condition monitoring; (6) charging unavailability for performance; (7) classification and reclassification in accordance with 10 CFR 50.65(a)(1) or (a)(2); and (8) appropriateness of performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2) and/or appropriateness and adequacy of goals and corrective actions for SSCs/functions classified as (a)(1). The items reviewed included the following:

- IR 256909 and IR 471829, One Pit on the Unit 2 Torus Shell near Engineering Established Design Valve
- IR 431095, Unit 2 Electro Hydraulic Control System for the Main Turbine

The inspectors verified that the licensee entered issues regarding the Unit 2 torus inspection scope and records into the CAP (IRs 474783 and 474922).

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 - 7 Samples)a. Inspection Scope

The inspectors reviewed PBAPS's planning and risk management actions for planned and emergent work activities to assess PBAPS's management of overall plant risk. The activities selected were based on plant maintenance schedules and systems that contributed to risk. As applicable, the inspectors reviewed PBAPS's probabilistic safety assessment risk evaluation results forms. The inspectors compared the risk assessment results and the risk management actions against the requirements of 10 CFR 50.65(a)(4) and the information in Regulatory Guide 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants," and Procedure WC-AA-101, "On-line Work Control Process." The inspectors verified that risk assessments were performed when required and appropriate risk management actions were identified. The inspectors

also reviewed control room operating logs, walked down protected equipment and maintenance locations, and interviewed personnel. These reviews were performed to determine whether PBAPS properly assessed and managed plant risk and performed activities in accordance with applicable Technical Specifications (TS) and work control requirements. The following seven planned and emergent work order (WO) activities were reviewed:

- Work Order (WO) C0215935, "A" Emergency Service Water Pump and Unit 3 Reactor Core Isolation Cooling
- WO C0213501, Replace Rod Select Matrix Module, Unit 3
- WO C0216506, Replace E-3 Emergency Diesel Generator Exhaust System Gaskets
- WO C0213500, Replace Rod Select Matrix Module, Unit 2
- WO R090746301, Unit 2 "A" Reactor Building Closed Cooling Water (RBCCW) Heat Exchanger Cleaning
- Action Report (AR) M1552106/Issue 454957, Broken Wire on E-4 EDG Start Circuit Relay
- WO C020451401, Replace Emergency Service Water HV 3-33-518

b. Findings

No findings of significance were identified.

1R14 Operator Performance During Non-Routine Evolutions and Events (71111.14 - 2 Samples)

a. Inspection Scope

The inspectors reviewed selected applicable plant records, corrective action documents and approved procedures while evaluating the performance of operations and engineering personnel in response to non-routine evolutions. The inspectors assessed personnel performance to determine what occurred and how the operators responded, and to determine if plant personnel's response was in accordance with plant procedures and training. The following non-routine evolutions were observed or reviewed:

- The inspectors reviewed an event that occurred on January 1, 2006, that involved the Unit 2 control rod drive (CRD) system flow transmitter failing by drifting low. The failure of the flow transmitter resulted in an increase in actual CRD flow as the flow control valve opened in an attempt to compensate for the low indicated CRD system flow. This condition was not immediately identified. Subsequently, the operating crew identified that the core thermal power (CTP) had increased, at the time of discovery of the CRD flow transmitter failure, but was less than licensed CTP. To maintain margin to the licensed power limit, operators reduced CTP by an additional 5 megawatts (Mw) while the impact of this condition was evaluated. This reduction was made to avoid potential overpower conditions that could result from increased CRD system flow. Initially, operators did not consider whether an actual overpower condition had occurred after the flow transmitter

failure and prior to the discovery of the failed CRD flow transmitter. After this potential was identified, PBAPS conducted a prompt investigation (IR 438441). The prompt investigation identified an additional 1.38 Mw thermal of available margin and concluded that no actual overpower condition occurred.

- The inspectors reviewed an event that occurred on February 13, 2006, during the performance of a slow start and full load surveillance test of the E-3 EDG. The testing rendered the E-3 EDG inoperable and required entry into TS 3.8.1, Condition B. This condition requires the performance of TS surveillance requirement (SR) 3.8.1.1 within one hour. Following the E-3 EDG start and synchronization, operators failed to remember to complete the required TS SR 3.8.1.1. Approximately three hours later at the conclusion of the EDG surveillance test, the operators remembered that the SR was not completed and the SR was promptly completed satisfactorily. PBAPS conducted a prompt investigation (IR 453559). This licensee-identified violation is documented in Section 4OA7 of this report.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - 5 Samples)

b. Inspection Scope

The inspectors reviewed five issues that were selected based on risk insights to assess the technical adequacy of the evaluations, the use and control of compensatory measures, and compliance with the licensing and design bases. As applicable, associated adverse condition monitoring (ACM) plans, engineering technical evaluations (TE) and operational and technical decision making (OTDM) documents were also reviewed. The inspectors verified these processes were performed in accordance with the applicable procedures listed in the Attachment. The inspectors used the Technical Specifications, Technical Requirements Manuals, the Updated Final Safety Analysis Report, and associated Design Basis Documents as references during these reviews. The issues reviewed included:

- Unit 2 HPCI Steam Trap Malfunction (IR 391237-02)
- 3 "D" RHR High Pressure Service Water Train Low Flow (IR 388447-02)
- Evaluation of Control Rod Drive Flow Transmitter Failure Impact on Core Thermal Power (IR 438441-02)
- Unit 2 Torus Corrosion Remediation (IR 438661)
- High CRD Temperature Impact on Scram Times (IR 472902)

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19 - 7 Samples)a. Inspection Scope

The inspectors observed portions of post-maintenance testing activities in the field and reviewed selected test data at the job site. 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 verify 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 evaluate whether the acceptance criteria were satisfied. The inspectors reviewed seven post-maintenance tests performed in conjunction with the following maintenance activities:

- WO R1011164-01, Unit 3 Hydraulic Control Units 30-30, 22-43, and 22-27
- WO R0707215, Unit 2 HPCI Suction Pressure Switch Calibration
- WO R1012752, Unit 3 "B" RHR Loop Pump, Valve, Flow, and Unit Cooler Functional and Inservice Test
- WO R0907463, Unit 2 "A" RBCCW Heat Exchanger Clean Cooler and Test Tubes
- WO R1015909, Unit 3 "B" Repair of Main Steamline (MSL) High Flow Instrument
- WO C0216506, Replace E-3 EDG Exhaust System Gaskets
- AR A1499650, E-2 EDG Air Coolant Auxiliary Pump

b. Findings

Introduction: The inspectors identified a Green non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for not adequately testing the E-2 EDG air coolant auxiliary pump following shaft packing replacement.

Description: Prior to December 22, 2005, the E-2 EDG air coolant auxiliary pump was isolated and removed from service. In this condition, the pump could not supplement circulation in the coolant subsystem. The air coolant auxiliary pump is a support system that can be removed from service without impacting the operability of the associated EDG.

On December 22, 2005, the E-2 EDG air coolant auxiliary pump was unisolated and returned to service following replacement of its shaft packing. The December 22, 2005, post-maintenance testing (PMT) ran the E-2 EDG air coolant auxiliary pump without the E-2 EDG in operation. Without the EDG in operation, the air coolant auxiliary pump shaft packing leakage was acceptable. However, the packing was not subjected to the higher pressures developed in the cooling subsystem by the shaft-driven coolant pump when the EDG is operated.

On December 27, 2005, while preparing for a surveillance test of the E-2 EDG, an equipment operator identified that approximately 10 gallons of water had leaked in the

vicinity of the cooling subsystem. Subsequent investigation determined that the water was due to pump shaft leakage associated with the E-2 EDG air coolant auxiliary pump. The investigation determined that the high rate of packing leakage occurred when the packing was subjected to the higher coolant subsystem pressure developed by the shaft-driven coolant pump when the E-2 EDG was run earlier in the day.

An investigation conducted by PBAPS personnel concluded that an inadequate PMT, specified for the pump shaft packing replacement, did not identify that a high rate of packing leakage would occur with the EDG in operation. Therefore, the shaft packing was not subjected to the higher coolant subsystem pressure that caused the high rate of packing leakage. Specifically, the PMT specified and performed was inadequate since with the additional seal water pressure applied to the pump packing area when the E-2 EDG was in service caused approximately a 10 gallons per hour packing leak. This rate of packing leakage was estimated to potentially limit operation of the E-2 EDG to five hours.

Analysis: PBAPS's inadequate test following maintenance to replace the E-2 EDG air coolant auxiliary pump shaft packing valve is considered a performance deficiency since PBAPS is required to properly test systems in accordance with 10 CFR 50, Appendix B, Criterion XI, "Test Control." This finding is greater than minor because it is associated with the procedure quality attribute of the Mitigating Systems cornerstone and affects the cornerstone objective to ensure the capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). This finding was determined to be of very low safety significance (Green) using Phase 1 of the SDP, since this condition prohibited by TS was a finding that involved a loss of safety function for a safety system train that did not exceed the TS allowed outage time.

The inspectors identified that a contributing cause of the finding was related to the human performance cross-cutting area. Specifically, the personnel specifying the PMT had an inadequate understanding of the air coolant auxiliary pump design and the pump's interrelationship with the EDG operation, although this information was available in the organization. Also, the inadequate review of previous testing of the pump packing replacements led to the development of an inadequate post-maintenance test for this instance of the E-2 EDG air coolant auxiliary pump shaft packing replacement.

Enforcement: 10 CFR 50, Appendix B, Criterion XI, "Test Control," requires that a test program shall be established to assure that all testing required to demonstrate that components will perform satisfactorily in service is identified and performed. Contrary to the above, on December 22, 2005, the PMT identified and performed prior to returning the E-2 EDG air coolant auxiliary pump to service was inadequate to demonstrate that the air coolant auxiliary pump would perform satisfactorily in service. Specifically, the PMT performed was not adequate since with the additional seal water pressure applied to the pump packing area, with the E-2 EDG in service, caused an approximately 10 gallons per hour packing leak. PBAPS estimated that this packing leak could limit E-2 EDG operation to five hours. Because this finding is of very low safety significance and has been entered into PBAPS's CAP (Condition Report) (CR) 437007, this violation is being treated as an NCV, consistent with section VI.A.1 of the NRC Enforcement Policy.

Planned corrective actions identified in Issues 437007 and 359000-13-02 include assessing the need for additional human performance tools and work practices for minor maintenance activities: **NCV 05000278/2006002-01, Inadequate Post-Maintenance Testing of the E-2 EDG Air Coolant Auxiliary Pump.**

1R22 Surveillance Testing (71111.22 - 6 Samples)

a. Inspection Scope

The inspectors reviewed and/or observed portions of surveillance tests, 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 the design basis functions. The surveillance tests reviewed and observed included:

- ST-O-052-153-3, E-3 Diesel Generator (DG) Simulated Unit 3 Emergency Core Cooling System (ECCS) Signal Auto Start with Offsite Power Available
- ST-M-037-352-2, Unit 2 Standby Gas Treatment Filter Train "B" Deluge System Nozzle and Piping Inspection
- ST-O-014-301-3, Unit 3 Core Spray Loop "A" Pump, Valve, Flow, and Cooler Functional and Inservice Test (IST)
- ST-O-013-301-3, Unit 3 RCIC Pump, Valve, Flow, and Unit Cooler Functional and In-service Test (IST)
- ST-O-020-560-2 & 3, Reactor Coolant Leakage Test - Units 2 & 3 (RCS)
- ST-O-052-152-3, E-2 DG Simulated Unit 3 ECCS Signal Auto Start with Offsite Power Available

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23 - 1 Sample)

h. Inspection Scope

The inspectors reviewed one temporary modification to verify that implementation of the modifications 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 structures, systems or components (SSCs) had not been degraded through these modifications. The inspectors verified the modified equipment alignment through control room instrumentation observations, Updated Final Safety Analysis Report (UFSAR), drawings, procedures, and work order reviews, and plant walkdowns of accessible equipment. The following temporary modification was reviewed:

- WO C0215523/AR A1536814, 3 "A" Recirculation Pump Seal Temporary Pressure Monitoring Equipment Installation

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06 - 2 Samples)

The inspectors conducted these inspections to assess personnel performance in drills and to verify PBAPS's critique of classification, notification and protective action recommendation (PAR) development.

.1 Training Drill

a. Inspection Scope

On January 10, 2006, the inspectors observed selected portions of a full scale drill in both the control room simulator and in the technical support center (TSC). The drill scenario simulated an aircraft crash event at the inner screen structure and emergency pump facility, and a reactor event. The simulated reactor event started with a reduction of flow to the core and progressed until the three barriers, fuel cladding, reactor coolant system and containment, were lost. The inspectors observed licensed operator adherence to the emergency plan implementing procedures, the response to simulated degraded plant conditions, and the classification and notification of the simulated events. The inspectors also observed the transition of responsibility for the emergency response organization (ERO) from the shift manager in the simulated control room to the emergency director in the TSC. The inspectors observed selected portions of PBAPS's critique of the drill to evaluate PBAPS's identification of weaknesses and deficiencies. The inspectors also reviewed the drill critique report and issues entered into the corrective action program. The inspectors verified the identification of issues by comparing PBAPS's identified issues against the inspectors' observations.

.2 Simulator-Based Training Exercise

i. Inspection Scope

The inspectors observed one simulator-based emergency plan training exercise on March 21, 2006, to identify any weaknesses and deficiencies in classification, notification, and PAR development activities. The inspectors verified that event classification and notifications were done in accordance with EP-AA-1007, Exelon Nuclear Radiological Emergency Plan Annex for Peach Bottom Atomic Power Station. The inspectors also attended PBAPS's critique of the exercise to compare any inspector-observed weakness with those identified by the licensee in order to verify whether PBAPS was properly identifying problems. The following simulated events were classified during this training exercise:

- HA5 - Alert, Destructive Earthquake > 0.05 g (Operating Basis Earthquake)
- HU5 - Unusual Event, Destructive Earthquake > 0.01 g

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 - 6 Samples)

Cornerstone: Initiating Events

a. Inspection Scope

The inspectors sampled PBAPS's submittals for the three initiating events (IE) cornerstone Performance Indicators (PIs) listed below for Units 2 and 3. Specifically, the inspectors looked at the period from the fourth quarter 2004 to the fourth quarter 2005, to assess the accuracy and completeness of the NRC PI data. To verify the accuracy of the IE PI data reported during that period, the information reviewed was compared against the criteria, PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Indicator Guideline," Revision 3, for each of the following IE PIs:

- Unit 2 and Unit 3 Unplanned Scrams
- Scrams with Loss of Normal Heat Removal
- Unplanned Power Reductions

The information and records reviewed included licensee event reports (LERs), NRC inspection reports and selected portions of the operations logs and the raw PI data. The inspectors discussed the methods for compiling and reporting the PIs with cognizant engineering and regulatory assurance personnel. The inspectors also compared the graphical representations from the most recent PI report to the raw data to verify that the data was correctly reflected in the report.

The inspectors verified that issues associated with auditing these IE PIs were entered into the CAP (IR 448629).

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

Review of Items Entered into the Corrective Action Program

As required by Inspection Procedure 71152, Identification and Resolution of Problems, and in order to help identify repetitive equipment failures, human performance issues or program issues for follow-up, the inspectors performed routine screening of issues

Enclosure

entered into PBAPS's CAP. This review was accomplished by selectively reviewing copies of IRs, attending daily screening meetings, and accessing PBAPS's computerized database.

4OA3 Event Followup (71153)

The inspectors reviewed the following LERs to verify the accuracy of the LERs, the appropriateness of the corrective actions, and to determine whether violations of requirements or generic issues existed.

.1 (CLOSED) LER 05000278/2005003-00, Residual Heat Removal System Small Bore Piping Leak Due to Weld Deficiency

On September 20, 2005, licensed operations personnel determined that a small amount of reactor coolant system (RCS) pressure boundary leakage existed at Unit 3. This determination was made based on review of a primary containment inspection performed subsequent to a reactor shutdown on September 19, 2005, for a refueling outage. The RCS pressure boundary leakage was determined to exist on a one-inch equalizing line for the "A" RHR injection sub-system testable check valve located within the normally inaccessible primary containment. The leak was at a pipe coupling socket weld. The leak was determined to exist since the fourth quarter of 2003. The peak containment unidentified leakage rate totaled approximately 1 gpm during the operating cycle. The weld crack was caused by a lack of fusion during the weld fabrication. The welded joint was replaced and tested before the "A" sub-system of shutdown cooling was placed in service during the Unit 3 refueling outage. The extent-of-condition evaluation included inspections of socket-welded couplings in the equalizing lines for both the 3 "A" and 3 "B" RHR injection sub-systems' testable check valves. PBAPS plans to replace or non-destructively examine the socket welds in the similar Unit 2 "A" and "B" RHR injection sub-systems testable check valves' equalizing lines during the fall 2006 refueling outage. One corrective action identified in the LER included consideration of enhanced programmatic strategies to identify small bore piping degraded welds. Based on the results of the cause analysis, PBAPS concluded that these enhancements are not warranted. PBAPS entered this event into the CAP as IR 375299. The enforcement aspects of this finding are discussed in Section 4OA7. This LER is closed.

.2 (CLOSED) LER 05000277/2005003-00, E-2 Emergency Diesel Generator Technical Specification Required Actions Not Performed

On December 27, 2005, at approximately 2030 hours, while preparing for a surveillance test of the E-2 emergency diesel generator (EDG), an equipment operator identified that approximately 10 gallons of water had previously leaked in the vicinity of the E-2 EDG cooling subsystem. The leakage was determined to be pump shaft packing leakage associated with the E-2 EDG air coolant auxiliary pump. The leak rate was later determined to be approximately 10 gallons per hour, but existed only when the E-2 EDG was operating. This leak rate resulted in inoperability of the E-2 EDG. It was determined that the E-2 EDG air coolant auxiliary pump had been returned to service on December 22, 2005, following the pump packing maintenance post-maintenance test

(PMT). However, as a result of weaknesses in the PMT, the high rate of pump shaft packing leakage was not identified. As a result of the unknown inoperability on December 22, 2005, the Required Actions for TS 3.8.1, Condition B for one EDG being inoperable were not performed. It was determined that a condition prohibited by TS occurred when Required Actions B.2 and B.4.2 were not performed. The unknown inoperability of the E-2 EDG between December 22, 2005 and December 27, 2005, was the result of a less than adequate PMT when the air coolant auxiliary pump was returned to service on December 22, 2005. The air coolant auxiliary pump was removed from service, thereby allowing the E-2 EDG to be declared operable on December 28, 2005, at approximately 1815 hours. There were no actual safety consequences associated with this event. The enforcement aspects of this finding are discussed in Section 1R19. This LER is closed.

4OA6 Meetings, Including Exit

.1 Exit Meeting Summary

On April 21, 2006, the resident inspectors presented the inspection results to Mr. R. Braun 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

The following findings of very low safety significance (Green) were identified by Exelon and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as non-cited violations.

- TS 3.4.4, Reactor Coolant System (RCS) Operational Leakage, requires RCS operational leakage shall be limited to no pressure boundary leakage. On September 20, 2005, during a planned primary containment inspection following the Unit 3 reactor shutdown for a refueling outage, PBAPS personnel identified RCS pressure boundary existed. Specifically, the leakage was determined to be from a cracked weld at a socket-welded pipe coupling in the one-inch equalizing piping for the "A" residual heat removal (RHR) loop testable air-operated check valve (AO-46A). The weld crack was caused by a lack of fusion during the weld fabrication. It is suspected that the leak initiation corresponded with an increasing trend in drywell unidentified leakage that was first observed in December 2003. The maximum unidentified leakage measured during the cycle was approximately one gallon per minute (gpm). This issue (IR 375299) was placed in the corrective action program and the "A" RHR train was declared inoperable until the socket-welded pipe couplings in the equalizing piping could be replaced. Similar pipe couplings were also replaced in the equalizing piping for the redundant "B" RHR loop testable air-operated check valve (AO-46B). This finding was of very low safety significance because it does not represent a loss of coolant accident initiator because the leakage did not exceed any of the allowable Technical Specifications' limits for RCS operational leakage.

- With one EDG inoperable, TS 3.8.1, AC Sources - Operating, Condition B, requires the performance of TS surveillance requirement (SR) 3.8.1.1 within one hour. TS SR 3.8.1.1 requires verification of correct breaker alignment and indicated power availability for each operable offsite power circuit. On February 13, 2006, TS 3.8.1, Condition B, was not met during the performance of a slow start and full load surveillance test of the E-3 EDG. Specifically, as documented in report Section 1R14, the surveillance testing rendered the E-3 EDG inoperable, but TS SR 3.8.1.1 was not performed within one hour as required by TS 3.8.1, Condition B. Once TS 3.8.1, Condition B was identified as not met, operators promptly completed TS SR 3.8.1.1 satisfactorily. Subsequently, PBAPS conducted a prompt investigation and placed this issue in their corrective action system (IR 453559). This finding was of very low safety significance because this condition prohibited by TS was a licensee-identified violation that involved a loss of safety function for a safety system train that did not exceed the TS allowed outage time.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Exelon Generation Company personnel

R. Braun, Site Vice President
J. Grimes, Plant Manager
C. Behrend, Engineering Director
D. Foss, Senior Regulatory Engineer, Regulatory Assurance
D. Lewis, Operations Director
J. Armstrong, Regulatory Assurance Manager
S. Taylor, Manager, Radiation Protection
G. Stathes, Maintenance Director
A. Wasong, Training Director

NRC personnel

J. Trapp, Branch Chief, DRP, Branch 4
T. Valentine, Assistant Project Manager, NRR

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000278/2006002-01	NCV	Inadequate Post-Maintenance Testing of the E-2 EDG Air Coolant Auxiliary Pump (Section 1R19)
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Closed

05000278/2005003-00	LER	Residual Heat Removal System Small Bore Piping Leak Due to Weld Deficiency (Section 4OA3)
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05000277/2005003-00	LER	E-2 Emergency Diesel Generator Technical Specification Required Actions Not Performed (Section 4OA3)
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Discussed

None.

LIST OF DOCUMENTS REVIEWED

Section 1R05: Fire Protection

PF-144, Fire Zone 144, Circulation Water Structure
PF-78C, Fire Zone 78C, Rad Chem Area/13Kv Switchgear Area
PF-78B, Fire Zone 78B, Main Corridor T-2-116
PF-108A, Fire Zone 108A, Fan Room/Radwater Building, 165' Elevation

Section 1R06: Flood Protection Measures

Design Baseline Document (DBD) P-T-09, "Internal Hazards"
A-C-134-6, Control of Hazard Doors/Hatches and Penetrations at Peach Bottom Atomic Power Station
T-103, Secondary Containment EOP
Alarm Response Card 323 E-5, 3 "A" RHR Pump Room Flood
Alarm Response Card 325 E-5, 3 "B" RHR Pump Room Flood
Alarm Response Card 324 C-5, 3 "C" RHR Pump Room Flood
Alarm Response Card 326 E-5, 3 "D" RHR Pump Room Flood
UFSAR Section 12.2.1 e., "Flooding"

Section 1R07: Heat Sink Performance

Action Request (AR) A1537697, Re-Test 3 "D" RHR HX with Temporary Instrumentation
Work Order (WO) C0216099, Install Monitoring Equipment for 3 "D" RHR Heat Exchanger
Issue Report (IR) 314602, 3 "D" RHR Hx - Invalid Thermal Performance Test Data

Section 1R12: Maintenance Effectiveness

ER-AA-310-1004, Maintenance Rule - Performance Monitoring
ABB Impell Technical Report "Philadelphia Electric Company Structural Analysis of the Peach Bottom Torus Shell and Vent System for the Effects of Local and Global Corrosion," Report No. 03-0670-1360, Revision 0, dated November 1991
ABB Impell Calculation 0670-077-001, "Permissible Defect or Pit Size," Revision 2, dated November 15, 1991
Safety Evaluation for Proposed Alternatives to ASME Section XI Requirements for Containment Inservice Inspection, Peach Bottom Atomic Power Station, Units 2 and 3 (TAC NOs. MA4973 and MA4974), dated September 17, 1999
PECO Energy Letter, dated November 11, 1998, regarding Peach Bottom Atomic Power Station, Units 2 and 3 Response to Generic Letter 98-04, "Potential for Degradation of the Emergency Core Cooling System and the Containment Spray System After a Loss-of-Coolant Accident Because of Construction and Protective Coating Deficiencies and Foreign Material in Containment"
MPR-2829, Revision 0, "Peach Bottom Units 2 & 3, Torus Pitting Inspection Evaluation Criteria," Exelon Contract No. 01002589, Release 00002
Specification No. NE-291, Specification for Inservice Inspection Program for First Interval, Class MC, Primary Containment

Specification No. NE-047, Specification for Torus Underwater Inspection and Repair at Peach Bottom Atomic Station
Procedure ER-PB-310-1010, Revision 3, Attachment 5, Peach Bottom Maintenance Rule Coatings Monitoring Program
Action Request (AR) A1445059, Document the Results of the 2R15 Torus Pit Depth Inspection
AR A1545908, New MPR Torus Pit Evaluation's Regulatory Impact
Electrohydraulic Control and Turbine Supervisory Instrumentation Maintenance Rule Bases Issue (IR) 00437725, Torus Sample Indicates Inleakage from Conowingo Pond Source.
IR 00461541, Create P3R16 PIMS Action Request for ISI Planning
IR 00256909, One Pit on Torus Shell Near Engineering Established Design Value
IR 00438794, Unit 2 Torus Remediation Work
IR 00456534, Unit 2 Torus Pitting Remediation Work
IR 00310857, Future Torus Issues (Identified Work/Inspections) LTA
IR 00256885, Unable to Perform VT-3 Inspection of Submerged Area of Unit 2 Torus
IR 00337636, Torus Inspection & Coating Requirements in Excess of 2006 Goals
IR 00431095, Breaker Did Not Close During Performance of RT-O-01D-428-2
IR 00194445, 3 "A" EHC Pump Failed to Develop Discharge Pressure
IR 00257131, Unit 2 "A" EHC Pump Breaker Tripped on Magnetics During Start
IR 00228497, Unit 2 "A" EHC Pump Failed to Develop Discharge Press
IR 00448269, 2AP017 EHC Pump Failed to Start During RT-O-01D-426-2

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants"
Regulatory Guide 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants"
HV-AA-1272, Technical Task Risk/Rigor Assessment, Pre-job Brief, Independent Third Party Review and Post-job Brief
C0213501, Replace Rod Select Matrix Module, Unit 3
PB ECR 05-00217, Rev. 1, Effect of ESW Line Stop Installation Activities on System Availability
PB ECR 05-00159, Rev. 2, Install Line Stop Hardware to Replace ESW 518 Valve

Section 1R15: Operability Evaluations

CC-AA-309-101, Engineering Technical Evaluations
LS-AA-105, Operability Determinations
OP-AA-108-111, Adverse Condition Monitoring and Contingency Planning
OP-AA-106-101-1006, Rev. 2, Operational and Technical Decision Making Process
IR 438792 IR 310857
IR 438794 IR 256885
IR 437725 IR 256909
IR 337636 AR A1445059
IR 391237 WO C0215866
A 1537966
Specification NE-047, Torus Underwater Inspection and Repair at Peach Bottom Atomic Power Station, Revision 5

Section 1R19: Post-Maintenance Testing

ST-R-003-485-3, CRD Scram Insertion Timing of Selected Control Rods
A 1537163
IR 444110
RO 707215
SI2P-23-97-ABC 2, Calibration Check of HPCI Pump and Turbine Pressure Switches PS 2-23-97 A and B, PS 2-23-84, and PS 2-23-84-1
ECR PB 05-00495, Evaluate Replacement S.O.R. Switch for PS 3-23-084-1
A 1535153
IR 383769
A 1379685
SI 3A-2-MSL-B1FQ, Functional Test Main Steam Line High Flow Instruments of RPS "B" Card File
ST-O-010-306-3, "B" RHR Loop Pump, Valve, Flow, and Unit Cooler Functional and Inservice Test

Section 1R22: Surveillance Testing

ST-M-037-352-2, SBTG Filter Train "B" Deluge System Nozzle and Piping Inspection
ST-O-013-301-3, RCIC Pump, Valve, Flow and Unit Cooler Functional and In-service Test
A1435964
IR 449881
A1550110
ST-O-052-152-3, E-2 Diesel Generator Simulated Unit 3 ECCS Signal Auto Start with Offsite Power Available

Section 1EP6: Drill Evaluations

Peach Bottom Atomic Power Station January 10, 2006, Integrated Drill Report dated February 9, 2006

Section 4OA1: Performance Indicator (PI) Verification

EP-AA-125-1001, EP PI Guidance
EP-AA-125-1002, ERO Performance, PI Guidance
EP-AA-125-1003, ERO Readiness, PI Guidance
EP-AA-125-1004, Emergency Response Facilities and Equipment PI Guidance

LIST OF ACRONYMS

ADAMS	Agency-wide Documents Access and Management System
AR	action report
CAP	corrective action program
CFR	Code of Federal Regulations
CR	condition report
CRD	control rod drive
CREV	control room emergency ventilation
CTP	core thermal power
DBD	Design Basis Document
ECCS	emergency core cooling system
EDG	emergency diesel generator
ERO	emergency response organization
ESW	emergency service water
HPCI	high pressure coolant injection
HPSW	high pressure service water
IR	issue report
IE	initiating events
LER	licensee event report
Mw	megawatts
NCV	non-cited violation
NRC	Nuclear Regulatory Commission
PAR	protective action recommendation
PBAPS	Peach Bottom Atomic Power Station
PI	performance indicator
PMT	post-maintenance testing
RBCCW	reactor building closed cooling water
RCIC	reactor core isolation cooling
RCS	reactor coolant system
RFPT	reactor feed pump turbine
RHR	residual heat removal
RTP	rated thermal power
SDP	significance determination process
SSCs	structures, systems, or components
SR	surveillance requirement
SRV	safety/relief valve
TS	Technical Specification
TSC	Technical Support Center
UFSAR	Updated Final Safety Analysis Report
WO	work order