U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Report No. 50-277/87-15 & 50-278/87-15

Docket No. 50-277 & 50-278

License No. DPR-44 & DPR-56

Licensee: Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

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

Inspection At: Delta, Pennsylvania

Inspection Conducted: April 25 to May 31, 1987

Inspectors: T. P. Johnson, Senior Resident Inspector
R. J. Urban, Resident Inspector
L. E. Myers, Resident Inspector

Reviewed By: Robert M. Gallo FOR 6/22/87
J. C. Linville, Chief, Reactor Projects Section 2A, Division of Reactor Projects — date

Approved By: Robert M. Gallo 6/22/87
R. M. Gallo, Chief, Projects Branch No. 2, Division of Reactor Projects — date

Inspection Summary: Routine, on-site regular and backshift resident inspection (156 hours Unit 2; 151 hours Unit 3) of accessible portions of Unit 2 and 3, operational safety, shutdown Order commitments, radiation protection, physical security, control room activities and demeanor, licensee events, surveillance testing, refueling and outage activities, maintenance, and outstanding items.

Results: One instance of licensed operator poor demeanor and one instance of an inattentive non-licensed operator were identified and reported by the licensee (4.1.1). The root cause of an operator initiated Unit 3 PCIS actuation was inadequate training compounded by a poor procedure (4.2). Poor performance by the contractor doing the control rod work resulted in a stop work order and skin contaminations (4.4.2, 9.2). The control of the storage of transient equipment is unresolved (5). LER 3-87-01 does not address the operator inattentiveness issue 1-1/2 hours prior to the Unit 3 March 17, 1987 scram (6.2.3). The licensee reported the discovery of a controlled substance (10.2) and a security watchman found asleep while at a Unit 3 drywell post.

DETAILS

1. Persons Contacted

B. L. Clark, Administrative Engineer
J. B. Cotton, Superintendent Plant Services
G. F. Dawson, Maintenance Engineer
A. A. Fulvio, Technical Engineer
J. C. Oddo, Nuclear Security Specialist
F. W. Polaski, Operations Engineer
D. P. Potocik, Senior Health Physicist
*D. C. Smith, Superintendent Operations
*D. M. Smith, Manager, Peach Bottom Atomic Power Station

Other licensee employees were also contacted.

*Present at exit interview on site and for summation of preliminary findings.

2. Plant Status

2.1 Unit 2

The unit began the inspection period with control rod blade exchanges in progress. This was completed on April 29, 1987. The control rod drive exchange began on April 30 and was completed on May 21, 1987 (see section 4.4.2). Other outage modification, testing, and maintenance work was performed during the period. At the end of the period, preparations for core reload were in progress (see section 4.4.3). Unit 2 remained in a cold condition, with the reactor mode switch in "refuel" position, as required by NRC Order dated March 31, 1987.

2.2 Unit 3

The unit was maintained in cold shutdown, with the reactor mode switch in "shutdown" position, during the inspection period. This was as required by NRC Order dated March 31, 1987.

3. Previous Inspection Item Update

3.1 (Closed) Inspector Follow Item (50-277/87-01-01; 50-278/87-01-01). Measurement control evaluation of licensee analytical results. The analyses from the licensee and Brookhaven National Laboratory were completed and a comparison was made. The results were satisfactory and the follow item is closed.

Split Sample Comparison
Peach Bottom Atomic Power Station

Sample Source	Chemical Parameter	Peach Bottom Value	BNL Value
	Results in parts per billion (ppb)		
Reactor	Chloride	52.6	55.0
		52.6	53.4
Feedwater	Iron	489	485
		490	500
	Copper	496	490
		506	490
	Nickel	497	490
		496	490
	Chromium	533	390*
		539	400*

*The chromium disagreement was due to a degenerated licensee standard. This was identified by the licensee during the combined inspection 50-277/87-01 and 50-278/87-01.

3.2 (Closed) Unresolved Item (278/86-20-02). 3B Standby Liquid Control system (SLCS) pump breaker compartment potential tampering. On October 17, 1986, at about 4:00 p.m., the licensee identified the 3B SLCS pump light extinguished in the control room caused by the apparent unauthorized removal of a breaker terminal strip. The event was reviewed in NRC Inspections 277/86-19, 278/86-20 and 277/86-24, 278/86-25 by the resident inspectors and a regional security specialist. The licensee completed their security investigation and which included interviewing all personnel who had access to the area. No information was obtained from the interviews that could assist in developing a plausible explanation for the removal of the terminal strip. The licensee has dispositioned the case to an inactive status. The inspector and a regional security specialist reviewed the licensee's investigation, and discussed it with licensee corporate security personnel. A March 9, 1987, licensee memo regarding the investigation was also reviewed. Although no cause for terminal strip removal was found, the unresolved item is considered closed based on the inspectors review of the licensee's investigation.

4. Plant Operations Review

4.1 Station Tours

The inspector observed plant operations during daily facility tours. The following areas were inspected:

-- Control Room
-- Cable Spreading Room
-- Switchgear and Battery Rooms
-- Reactor Buildings
-- Turbine Buildings
-- Radwaste Building
-- Recombiner Building
-- Pump House
-- Diesel Generator Building
-- Protected and Vital Areas
-- Security Facilities (CAS, SAS, Access Control, Aux SAS)
-- High Radiation and Contamination Control Areas
-- Shift Turnover

4.1.1 Control Room and facility shift staffing was frequently checked for compliance with 10 CFR 50.54 and Technical Specifications. The presence of a senior licensed operator and a Nuclear Operations Monitoring Team (NOMT) member in the control room were verified frequently.

Control room operator attentiveness, conduct and demeanor were reviewed periodically during tours. The NOMT reviewed this area continually during the inspection period. One instance of poor demeanor was noted and logged by the NOMT at 7:10 p.m., on May 4, 1987. The inspector noted this occurrence during a subsequent log review. The instance involved an outside shift supervisor who threw his hard hat on the control room floor. The shift supervisor went home sick after this event, and he was subsequently evaluated fit for duty by a medical evaluation. The inspector reviewed this event through discussions with the NOMT member who observed the occurrence, with the involved shift supervisor and other operators present at the time and with plant management. The item was also discussed during the May 15, 1987, meeting between PECo and the NRC. The inspector will review operator demeanor on a continuing basis.

At about 8:00 a.m., on May 13, 1987, the licensee informed the inspector that a non-licensed operator was found sleeping while on duty during "Z" shift (11:00 p.m. - 7:00 a.m.) on May 13, 1987. The observation was made during a plant management tour. These plant management tours are performed periodically during the "Z" shift in response to the NRC Shutdown Order of March 31, 1987. The operator was asleep in the Radwaste Control Room office. The licensee determined that this operator was not the "on shift" Radwaste Auxiliary Plant Operator, but rather an extra operator on shift performing blocking and permit writing duties. The operator was taking a break in the Radwaste Control Room when he fell asleep. The individual was

suspended consistent with PECo employee policies. The inspector reviewed the event by discussing it with plant management and by reviewing control room logs. In addition, this item was discussed at the May 15, 1987, meeting between PECo and the NRC.

4.1.2 The inspector frequently observed that selected control room instrumentation confirmed that instruments were operable and indicated values were within Technical Specification requirements and normal operating limits. ECCS switch positioning and valve lineups were verified based on control room indicators and plant observations. Observations included flow setpoints, breaker positioning, PCIS status, and radiation monitoring instruments.

4.1.3 Selected control room off-normal alarms (annunciators) were discussed with control room operators and shift supervision to determine if they were knowledgeable of alarm status, plant conditions, and that corrective action, if required, was being taken. In addition, the applicable alarm cards were checked for accuracy. The operators were knowledgeable of alarm status and plant conditions.

On May 13, 1987, the inspector noted that a seismic alarm had initiated apparently due to a momentary loss of power to the seismic panel. The licensee verified system operability. During the review of licensee actions, the inspector noted that annunciator alarm window #30C212L-5 was labelled: "OBE Exceeded - 5g". A review of the alarm card and the FSAR determined that the window should be labelled "OBE Exceeded - 0.5g". The licensee replaced the incorrect window label with a corrected one.

Subsequent seismic alarms occurred during the period May 28-31, 1987. The containment foundation seismic trigger (XT-7139A) actuated the system, resulting in seismic panel printouts from the triaxial time-history accelerographs. These printouts record acceleration (g) for specific frequency bands (1 to 32Hz) in each of the three axes. The recorded g's were primarily in the 28-32 Hz range. The licensee believes the cause of the alarms was welding induced electrical noise. The inspector discussed the alarms with operating shift personnel and the seismic system engineer. The inspector reviewed the seismic monitoring system alarm cards, system operating procedures, electrical prints and the accelerograph printouts. The licensee's review of the seismic system actuations are continuing. The inspector

will review these actions in a future inspection. No violations were identified.

4.1.4 The inspector checked for fluid leaks by observing sump status, alarms, and pump-out rates; and discussed reactor coolant system leakage with licensee personnel.

4.1.5 Shift relief and turnover activities were monitored daily, including periodic backshift observations, to ensure compliance with administrative procedures and regulatory guidance. No inadequacies were identified.

4.1.6 The inspector observed the main stack and both reactor building ventilation stack radiation monitors and recorders, and periodically reviewed traces from backshift periods to verify that radioactive gas release rates were within limits and that unplanned releases had not occurred. No inadequacies were identified.

4.1.7 The inspector observed control room indications of fire detection instrumentation and fire suppression systems, monitored use of fire watches and ignition source controls, checked a sampling of fire barriers for integrity, and observed fire-fighting equipment stations.

On May 13, 1987, the inspector noted that the Motor Driven Fire Pump (MDFP) had been out of service for maintenance, since April 30, 1987. Technical Specification (TS) 3.1.4.A.2 allows a seven day outage time with one fire pump out of service. If this seven day outage time is exceeded, a 31 day written report is required. TS 4.14.A.2 requires the Diesel Driven Fire Pump (DDFP) to be tested every 72 hours if the MDFP is out of service. The inspector verified that the required testing of the DDFP was being performed in accordance with procedure ST 6.17. Discussions with licensee engineers determined that the 31 day report required by TS 3.14.A.2 will be submitted to the NRC. The inspector also verified that the MDFP inoperability was correctly logged in the control room "LCO Log". The MDFP was returned to service on May 15, 1987. No violations were noted.

On May 19, 1987, at about 8:50 a.m., a worker in the control room bumped the cardox nozzle micro switch. The control room cardox hose reel became pressurized from the cardox tank located on the 116 foot level of the turbine building. The control room operators took action to depressurize the system. No carbon dioxide was released into the control room. The inspector discussed this control room cardox hose reel pressurization with control

room operators and fire protection engineers. The inspector verified actions were in accordance with procedure S.13.2.2.J, "Normal Operation of Cardox Hose Reels". The worker who inadvertently bumped the micro switch was re-instructed regarding exercising care when working around controls. No violations were noted.

4.1.8 The inspector observed overall facility housekeeping conditions, including control of combustibles, loose trash and debris. Cleanup was spot-checked during and after maintenance. Plant housekeeping was generally acceptable.

4.1.9 The inspector observed the shutdown nuclear instrumentation subsystems (source range and intermediate range monitors) and the reactor protection system to verify that the required channels were operable.

4.1.10 The inspector frequently verified that the required off-site electrical power startup sources and emergency on-site diesel generators were operable.

4.1.11 The inspector monitored the frequency of in-plant and control room tours by plant and corporate management. The tours were consistent with the commitments made in the April 6, 1987 licensee response to the NRC Order (March 31, 1987).

4.1.12 The inspector verified operability of selected safety related equipment and systems by in-plant checks of valve positioning, control of locked valves, power supply availability, operating procedures, plant drawings, instrumentation and breaker positioning. Selected major components were visually inspected for leakage, proper lubrication, cooling water supply, operating air supply, and general conditions. No significant piping vibration was detected. The inspector reviewed selected blocking permits (tagouts) for conformance to licensee procedures. Systems checked included the Unit 2 and 3 Standby Liquid Control Systems. No inadequacies were identified.

4.1.13 The inspector performed backshift tours of the facility on the following days:

-- April 28, 1987, 4:00 a.m. - 6:00 a.m.

-- May 7, 1987, 12:00 - 6:00 a.m.

4.2 Followup On Events Occurring During the Inspection

4.2.1 Unit 3 Containment Isolation

With Unit 3 in cold shutdown a half group III primary and secondary containment outboard isolation, and standby gas treatment system (SGTS) initiation occurred at 9:25 p.m. on May 14, 1987. The cause of the half group III isolation and SGTS initiation was due to a trip of the "B" RPS bus on overvoltage. The "B" RPS bus was being supplied by its alternate source (E134) due to an outage of its normal RPS motor generator supply (E234). The #3 offsite startup source had been returned to service and the operators were swapping offsite power supplies to return to a normal lineup. The E-1 diesel generator (DG) was supplying power to the E13 4KV vital bus and the E134 480 volt bus. The voltage adjust was set too high on the E-1 DG resulting in the overvoltage trip of the "B" RPS power supply. The licensee restored power to the RPS bus, reset the isolations, secured the SGTS and completed alignment of the 4KV buses. The licensee made an ENS call and informed the senior resident.

The inspector reviewed the control room logs and the computer alarm typer; and discussed the event with licensed operators and licensee engineers. The chief operator was performing procedure S.8.3.D.5, "Restoration Following Scheduled Outage of One Off-Site Startup Source". The procedure requires starting the DGs one at a time, and paralleling the DG with the offsite power sources. Initially the DG is the incoming power source. After picking up the bus, the DG now becomes the running power source for the paralleling operations. With the E-1 DG carrying the E-13 bus, the operator adjusted DG voltage in the wrong direction, causing an overvoltage condition resulting in the RPS "B" bus trip.

Based on discussions with the operator performing the evolution, the inspector determined that this was the first time he had performed the paralleling operation during startup source swap over. The operator stated that he got confused between the incoming and running voltmeters; and he inadvertently raised the DG voltage, causing an over voltage trip. The licensee identified enhancements to the procedure (S.8.3.D.5) to caution the operator regarding the differences in the incoming and running nomenclature.

The inspector reviewed the qualification manuals (cards) for Chief Operator and Reactor Operator. The inspector also discussed the training aspects of DG paralleling with off-site power sources with training department personnel. Based on this review, the inspector noted that the performance of this evolution was discussed in general terms. However, the performance or discussion of the specific steps of the procedure and the parallel operation was not done. The licensee intends to review these qualification cards for possible revision to incorporate additional requirements.

The licensee will submit an LER for this event. The inspector will review the LER, and the proposed revisions to the qualification card and to procedure S.8.3.D.5 in a future inspection. During the review of this event, no violations were noted.

4.3 Logs and Records

The inspector reviewed logs and records for accuracy, completeness, abnormal conditions, significant operating changes and trends, required entries, correct equipment and lock-out status, jumper log validity, conformance to Limiting Conditions for Operations, and proper reporting. The following logs and records were reviewed: Shift Supervision Log, Nuclear Operations Monitoring Team Log, Reactor Engineering Logs, Unit 2 Reactor Operator's Log, Unit 3 Reactor Operator's Log, Control Operator Log Book and STA Log Book, Night Orders, Radiation Work Permits, Locked Valve Log, Maintenance Request Forms, Temporary Circuit Modification Log, and Ignition Source Control Checklists. Control Room logs were compared with Administrative Procedure A-7, Shift Operations. Frequent initialing of entries by licensed operators, shift supervision, and licensee on-site management constituted evidence of licensee review. No unacceptable conditions were identified.

4.4 Refueling Outage Activities

4.4.1 Stop Work on Eastern Testing & Inspection, Inc.

At 2:30 p.m., on April 30, 1987, the licensee informed the inspector that Eastern Testing and Inspection, Inc., had been dismissed from the site because of apparent falsification of records. The licensee discovered the faulty records in an audit of the company's main offices at Pennsauken, NJ. Eastern was told to stop work and leave the site in the afternoon on April 27, 1987. Eastern was performing NDE work on "Q" and non-Q materials, and had been on-site since January 1987. The licensee indicated that the records involved in the

apparent falsification included: documentation of eye exams; calibration of thermometers; and penetration material batch certifications. The licensee is evaluating reporting requirements. The inspector discussed this stop work with licensee QA personnel and will follow this item in a future inspection.

4.4.2 Unit 2 Control Rod Drive (CRD) Work

The licensee began the scheduled 90 control rod drive (CRD) changeout and rebuild work activities on April 30, 1987. On May 3, 1987, Nuclear Operations QA initiated a stop work order. During the Control Rod Drive Exchange activity on Unit 2, QC and HP personnel observed a widespread lack of awareness and adherence to various Maintenance and Health Physics procedures by craft personnel associated with the exchange. The QC Supervisor determined that the continuation of the exchange activity would constitute a serious quality degradation and would not be in accordance with sound ALARA practices. In accordance with QADP-21, "Procedure for Direction of Stop Work of Quality-Related Activities", Revision 5, a Stop Work Directive was issued to the Maintenance Division, Supervising Engineer, for all Unit 2 CRD under-vessel change-out work.

The craft and supervisory personnel were retrained, the Stop Work Directive was lifted, and work recommenced on May 4, 1987. However, the CRD under vessel work was stopped on May 8, 1987, when PECo terminated the employment of the subcontractor performing control rod drive (CRD) exchange work on Unit 2 at about 4:00 p.m. The basis for this termination was continued poor performance by the union millwrights and boilermakers. These subcontractors were under the supervision of GE who had the contract for the CRD under vessel work as well as the CRD rebuild work. The day shift subcontractors were escorted offsite at about 6:00 p.m., on May 8, 1987. Apparently, one or more of the workers contacted the news media with respect to several worker contaminations associated with the CRD work. The worker contaminations were associated with poor HP practices including the tearing of the protective rainsuits during the under vessel work (see section 9 of this report). PECo restarted the work with a different contractor supervised by PECo maintenance personnel on May 11, 1987.

Selected portions of all phases of the CRD work were witnessed by the inspectors including: disconnecting and removing the CRD, CRD movement to the transfer cask at the drywell hatch, HP surveys, CRD transport from the

Unit 2 drywell to the 195 foot elevation of the Unit 3 Reactor Building, CRD flush cage operations, CRD rebuild and leak testing, and CRD reinstallation. RWPs were reviewed periodically throughout the work. The inspector also reviewed the stop work order dated May 3, 1987, and discussed it with QA/QC personnel.

The inspector reviewed the following procedures associated with the CRD exchange and witnessed various steps in the procedures.

-- M-3.1, "Control Rod Drive Replacement", Rev. 19, 4/9/87,

-- M-3.4, "Control Rod Drive Repair", Rev. 13, 4/9/87.

-- M-3.10, "Control Rod Leak Test", Rev. 3, 4/4/87.

-- SP-1015, "Administrative Controls for Returning the Unit 2 CRD Hydraulic Control Units to Service", Rev. 1.

-- S.4.2.B.1, "Valving a CRD and HCU In Service & Flushing, When Maintenance Has Been Performed", Rev. 1.

-- S.4.2.G.4, "Returning A CRD To Service & Flushing when the CRD is in the Fully Withdrawn (48) Position", Rev. 1.

-- FH-66, "Control Rod Blade Latching & Blade Guide Seating Verification Procedure", Rev. 1.

No violations were noted.

4.4.3 Unit 2 Core Reload Preparations

Discussions were held on May 19 and 20, 1987, with plant and corporate management regarding Unit 2 core reload activities. The licensee performed a Kepner-Tregoe analysis and concluded that core reload should be performed in the near term rather than waiting for completion of the NRC Order recovery plan actions. In a letter dated May 29, 1987, the licensee committed to expand the Nuclear Operations Monitoring Team overview and observation of core reload activities. In addition, activities which have the potential for draining the vessel will be minimized.

The inspector will review the revised procedures and the NOMT involvement in fuel load activities in a future inspection.

4.4.4 Emergency Cooling Water Pump, Piping and Supports Inspection

During a routine control room tour on May 20, 1987, the inspector noticed that the emergency cooling water (ECW) pump was tagged out of service. The ECW system, in conjunction with the high pressure service water system and emergency service water system, provides an on-site heat sink so that the reactors can be shutdown if the Conowingo Pond is lost, either due to loss of the Conowingo Dam or a flood condition.

The inspector questioned a licensed control room operator concerning the out of service ECW pump. He stated that the ECW pump was out of service because its emergency bus power supply was blocked. He also stated that there was some damage of the ECW pump base and pipe supports found during an inservice inspection (ISI). The inspector contacted the ISI engineer to discuss the findings of their ECW inspection which was conducted on May 13, 1987. Three rigid hanger supports, one guide support, the pump support concrete base pad and the packing between the wall and pipe exiting the emergency cooling tower structure were all damaged.

After reviewing "Corporate Support Examination Check Off List Data Sheets" for the damaged components, the inspector determined the specific damage to be: 1) two bent Hilti bolts anchoring the ECW pump to the floor; 2) a broken concrete pad and unsatisfactory Hilti anchoring for support 48HB-H58; 3) unsatisfactory Hilti anchoring due to cracked concrete for support 48HB-H59; 4) three nuts not in contact with the base plate and a bent rear brace for support 48HB-S20; 5) unsatisfactory welds due to lack of fusion for several lugs for support 48HB-H60; and, 6) damaged packing between the pipe and wall where the pipe exits emergency the cooling tower structure.

The last time an ISI of the ECW system was conducted was at the end of the first ten year ISI interval (1984-1985 outage). However, that ISI was done in accordance with the 1974 edition of the ASME Boiler and Pressure Vessel Code, Section XI. Under the 1974 Code, class 3 supports (ECW supports) were not examined individually, but only as part of the overall system pressure test.

The current ISI performed during this second ten year interval was conducted in accordance with the 1980 version of the ASME Boiler and Pressure Vessel Code, Section XI. In this edition, class 3 components are subject to the same inspection requirements as class 1 components (i.e., each support is examined individually and in detail).

The ISI engineer stated that the first ISI of the ECW system did not identify any obvious damage to the ECW pump support base or support 48HB-H58. The remaining supports were probably not examined due to their location. Therefore, the ECW system was most likely damaged sometime after early 1985, and most likely by one or more water hammer events. The only time the system experiences full flow is during performance of surveillance test (ST) 13.21, "Emergency Cooling Water Pump, Emergency Cooling Tower Fans, ESW Booster Pump Operability", and during performance of surveillance test (ST) 13.23, "Emergency Cooling M. O. Valve Functional (ISI)". ST 13.21 is performed once per cycle and ST 13.23 is performed quarterly.

The inspector also had discussions with the system engineer responsible for the ECW system. On May 20, 1987, the inspector accompanied the system engineer on a tour of the emergency cooling tower structure to assess the damage reported by the ISI group. The inspector confirmed the reported damage.

The licensee has initiated maintenance request forms (MRFs) for each of the damaged items so that they can be repaired. Engineering is also performing an evaluation of the damage to the ECW system to determine cause, significance, corrective action, etc. The inspector also requested to be present the next time ST 13.23 is performed to visually inspect the ECW piping during full flow initiation. The ECW pump piping and supports damage will remain unresolved pending resolution of the above areas (UNR 277/87-15-01).

4.4.5 Unit 2 Erosion/Corrosion Inspections

NRC Inspection 277/87-07, 278/87-07 reviewed the PECo erosion/corrosion induced wall thinning program. The licensee has performed inspections of the "suspect" areas on Unit 2 with the following partial piping replacement required:

Area #	Description/Piping Replaced
7	RCIC steam drains - replace 10 feet of piping
8	RFPT steam drain and HP/LP stop valve drains - 75 feet and 50 feet of piping replaced
11	Offgas recombiner steam supply drain - 2 feet of piping replaced
12	Extraction steam drains - 5 feet of piping replaced

The inspector reviewed the licensee's findings and discussed them with licensee engineers. All identified piping will be replaced prior to Unit 2 restart.

No violations were noted.

4.5 Engineered Safeguards Features (ESF) System Walkdown

The inspector performed a detailed walkdown of portions of the emergency diesel generators (DGs) in order to independently verify the operability of the four emergency diesel generators for Units 2 and 3. The DG walkdown included verification of the following items:

-- Review of documents listed in Attachments 2 and 3.

-- Inspection of system equipment conditions.

-- Confirmation that the system check-off-list (COL) and operating procedures are consistent with plant drawings.

-- Verification that system valves, breakers, and switches are properly aligned.

-- Verification that instrumentation is properly valved in and operable.

-- Verification that valves required to be locked have appropriate locking devices.

-- Verification that control room switches, indications and controls are satisfactory.

-- Verification that surveillance test procedures properly implement the Technical Specifications surveillance requirements.

Overall, the inspector determined that three (E-1, E-2, E-3) of the four DGs were operable. The E-4 DG was blocked during the inspector's review for replacement of its scavanging (roots) air blower unit (see section 8). The inspector did not identify any equipment or drawing deficiencies, although several surveillance test procedural problems were identified. The inspector determined that the following three deficiencies required further review: (1) steps 1 and 12 of surveillance test (ST) 8.1 were not preceded by an asterisk even though they are Technical Specification related requirements, (2) there are no specific steps in ST 8.1 or 8.1.3 verifying the operability of the ESW pumps, and (3) step 12 of ST 8.1 and step 9 of ST 8.1.3 do not specifically identify the rated load requirement to satisfy Technical Specifications.

With regard to the first deficiency, Technical Specification 4.9.A.1.a states in part that each emergency diesel generator shall be run once per month at rated load for one hour and the starting air compressors shall be checked for operation and their ability to recharge air receivers. Steps 1 and 12 of procedure ST 8.1 address these specifications. However, they are not preceded by an asterisk to flag their importance as Technical Specification requirements. These same steps in ST 8.1.3 (daily DG test) are preceded by asterisks.

The second deficiency addresses the operability of the emergency service water (ESW) pumps. The emergency diesel generators need cooling water within about three minutes of starting, either from one of the two ESW pumps or the emergency cooling water (ECW) pump. There is a step in ST 8.1 and 8.1.3 that checks for the start of the ECW pump, but there is not a similar step for the ESW pumps.

The third deficiency concerns the rated load of the emergency diesel generator. Step 12 of ST 8.1 and step 9 of ST 8.1.3 do not specify the rated load. Step 11 of ST 8.1 and step 8 of ST 8.1.3 instruct the operator to load the emergency diesel generator to between 2500 KW and 2700 KW. The data log in these STs state that the acceptable range for generator watts is 2550 KW to 2650 KW. A specific number or range for generator wattage is needed in steps 12 and 9 of ST 8.1 and 8.1.3, respectively, consistent with the acceptable range specified in the data log.

The above three items and the inspector's remaining deficiency list were discussed with the system engineer for the emergency diesel generators and the assistant operations engineer for appropriate action. The inspector will follow licensee actions to correct these deficiencies.

4.6 NRC Order Suspending Power Operation Dated March 31, 1987

The inspector reviewed the licensee response to the NRC Order and verified actions taken during NRC Inspection 277/87-09 and 278/87-09. The continuing commitments were also reviewed during this inspection. Items checked included:

-- The 24 hour Nuclear Operations Monitoring Team (NOMT) continuous coverage of control room activities.

-- The increased frequency of backshift and weekend management tours.

-- The administrative block of both unit's reactor mode switches.

-- The hourly performance of ST 9.32-2 and 3, "Reactor Cold Shutdown Data Log".

-- NOMT and Shift Superintendent periodic reports to QA and plant management.

In addition to the above items, PECo replaced the Peach Bottom Plant Manager on May 6, 1987.

No unacceptable conditions were noted.

5. IE Information Notice No. 80-21

The inspector reviewed the licensee's programs for the storage of transient equipment in safety-related areas. IE Information Notice No. 80-21, "Anchorage and Support of Safety-Related Electrical Equipment", was issued on May 16, 1980. This Notice also included non-seismic ancillary items (such as gas bottles, dollys, scaffolding, work and tool cribs, etc.) that could potentially dislodge, impact, and damage safety related equipment during a seismic event.

The licensee response to the Notice included a June 27, 1980 letter; a March 30, 1981 memo; and PORC review. These reviews only addressed the installed safety related electrical equipment and not the transient storage of equipment.

Current licensee administrative procedures addressing the storage of transient equipment include:

-- A-30, "Housekeeping Controls", Rev. 5, April 14, 1987.

-- MA-28, "Control of Scaffold and Structures", Rev. 0, April 23, 1986.

-- SWI-40, "Inspection and Use of Scaffolds".

The inspector reviewed these documents and discussed implementation with licensee personnel.

The storage of transient equipment in the 4KV switchgear rooms was the issue of an unresolved item (277/86-25-11) during the NRC PRA team inspection in December 1986. The unresolved item remains open.

The inspector toured the plant (both units were shutdown) on May 21, 1987, and noted the following transient items that could possibly move during a seismic event:

-- Numerous mobile work carts

-- Numerous gas bottles

-- Several fire water hose reel carts

-- Radwaste barrels

-- Maintenance tool cages

-- Grounding breakers

The inspector discussed this item with the licensee. The licensee is currently addressing the previously identified unresolved item and has expanded the item to include all transient type storage. The item remains unresolved pending the completion of licensee actions.

6. Review of Licensee Event Reports (LERs)

6.1 LER Review

The inspector reviewed LERs submitted to the NRC to verify that the details were clearly reported, including the accuracy of the description and corrective action adequacy. The inspector determined whether further information was required, whether generic implications were indicated, and whether the event warranted on-site followup. The following LER's were reviewed:

LER No. LER Date Event Date	Subject
2-86-16, Rev. 1 February 4, 1987 July 9, 1986	HPCI system failure due turbine electro-hydraulic controls
*2-87-03 April 27, 1987 March 28, 1987	PCIS Group II isolation

*2-87-04 May 7, 1987 April 7, 1987	Partial PCIS Group III isolation and half scrams caused by loss of the #3 offsite power source
2-87-05 May 14, 1987 April 7, 1987	LLRT results exceeding Appendix J values
*3-87-01 April 16, 1987 March 17, 1987	Auto scram on high flux due to turbine EHC problems
*3-87-02 April 24, 1987 March 25, 1987	Auto scram on low reactor water level during EHC troubleshooting
*3-87-03 April 29, 1987 March 31, 1987	PCIS Group II shutdown cooling isolation
3-87-04 May 1, 1987 April 2, 1987	MSIV 80D LLRT failure
3-87-05 May 5, 1987 April 6, 1987	PCIS Group II isolation for RWCU during surveillance testing

6.2 LER On-Site Followup

For LERs selected for on-site followup and review (denoted by asterisks above), the inspector verified that appropriate corrective action was taken or responsibility assigned and that continued operation of the facility was conducted in accordance with Technical Specifications and did not constitute an unreviewed safety question as defined in 10 CFR 50.59. Report accuracy, compliance with current reporting requirements and applicability to other site systems and components were also reviewed.

6.2.1 LER 2-87-03 concerns a PCIS Group IIB isolation that occurred on Unit 2 during the refueling outage. The event was reviewed in NRC Inspection 277/87-10; 278/87-10. No inadequacies were noted relative to this LER.

6.2.2 LER 2-87-04 concerns a PCIS Group III that occurred on both units on April 7, 1987, when the #3 offsite power source was lost due to protective relay switching in the 220KV grid. This event was reviewed in NRC Inspection 277/87-10; 278/87-10.

6.2.3 LER 3-87-01 concerns an automatic high flux scram on Unit 3 on March 17, 1987, caused by turbine EHC induced control valve fluctuations. The event and associated troubleshooting activities were reviewed in NRC Inspection 277/87-10; 278/87-10. In addition to the LER, the inspector also reviewed the associated ISEG Event Report No. 27 and the Upset Report. The licensee determined that the most probable root cause of the scram was mechanical failure of the EHC cabinet internal cooling fans. The intermittent running of these fans induced radio frequency electrical noise causing the EHC system turbine control valves to cycle. This valve cycling then caused reactor pressure spikes and a high flux scram. The inspector noted that the LER did not address the operator inattentiveness issue associated with not responding to control room indications for one and a half hours prior to the scram. However, the Upset and Event Reports did address this inattentiveness issue. The inspector discussed this concern with licensee management. The licensee intends to resubmit the LER when the final root cause determination is made. The licensee indicated that they will also address the inattentiveness issue for this scram in that revised LER. The inspector had no further questions at this time.

6.2.4 LER 3-87-02 concerns an automatic reactor scram on low level on March 25, 1987, during EHC troubleshooting. The root cause was determined to be a personnel error by a test engineer during troubleshooting activities. The event and related troubleshooting activities were reviewed in NRC Inspection 277/87-10 and 278/87-10. The licensee has committed to reviewing their troubleshooting activities to ensure personnel with the required expertise are present. There were no inadequacies relative to this LER.

6.2.5 LER 3-87-03 concerns a Group IIB containment isolation of shutdown cooling on March 31, 1987. This event is the subject of a violation (278/87-10-04) associated with failure to follow the system operating procedures. The LER concludes that the cause of the isolation was empty shutdown cooling piping compounded by procedural inadequacies. The licensee intends to revise the operating procedure (S.3.2.C.1). The violation remains open pending licensee response and subsequent NRC review.

7. Surveillance Testing

The inspector observed surveillance tests to verify that testing had been properly scheduled, approved by shift supervision, control room operators were knowledgeable regarding testing in progress, approved procedures were being used, redundant systems or components were available for service as required, test instrumentation was calibrated, work was performed by qualified personnel, and test acceptance criteria were met.

A review of the completed surveillance tests in Attachment 3 was performed.

No inadequacies were identified.

8. Maintenance

For the following maintenance activities the inspector spot-checked administrative controls, reviewed documentation, and observed portions of the actual maintenance:

Maintenance Procedure/ Document	Equipment	Date Observed
SP-979/MOD 1140	Unit 3 Spent Fuel Pool Reracking	May 11, 1987
MOD 1419	Unit 2 Rosemount Transmitters	May 14, 1987
M-3.1	Unit 2 Control Rod Exchange	Various
M-52.5	E-4 DG Roots Air Blower	May 21, 1987

Administrative controls checked included maintenance request forms (MRFs), blocking permits, fire watches and ignition source controls, item handling reports, QC involvement, plant conditions, TS LCOs, equipment turnover information, and post maintenance testing. Documents reviewed included maintenance procedures, material certifications RWPs, MRFs, and receipt inspections.

No inadequacies were identified.

9. Radiation Protection

9.1 Routine Checks

During the report period, the inspector examined work in progress in both units, including health physics (HP) procedures and controls, dosimetry and badging, protective clothing use, adherence to radiation work permit (RWP) requirements, radiation

surveys, radiation protection instruments use, and handling of potentially contaminated equipment and materials.

The inspector observed individuals frisking in accordance with HP procedures. A sampling of high radiation doors was verified to be locked as required. Compliance with RWP requirements was verified during each tour. RWP line entries were reviewed to verify that personnel had provided the required information and people working in RWP areas were observed to be meeting the applicable requirements. No unacceptable conditions were identified.

9.2 Control Rod Drive Exchange and Rebuild Work

There were several incidents of skin contamination involving contract worker exchange of control rod drives (CRD) in the drywell of Unit 2. The skin contaminations were the result of poor practice in removing protective clothes. Quality Assurance (QA) issued a stop work order for the exchange of CRDs based upon work deficiencies on May 3, 1987. The workers were retrained on the exchange and use of protective clothes; the work was then resumed. Work deficiencies and skin contaminations continued. On May 8, 1987, the workers were replaced by another contractor and they were trained for the exchange work. The newly trained workers resumed the exchange of CRDs without incident on May 11, 1987. The exchange work continued until completion with no further incidents.

The inspector reviewed the RWPs for the work, the Health Physics Deficiency Reports (HPDR), HP logs, and discussed the events with HP supervisors.

The skin contaminations were also reviewed by a regional based radiation specialist in NRC Inspection 277/87-13; 278/87-13. There was no significant intake of radioactive material and each worker was successfully decontaminated.

10. Physical Security

10.1 Routine Checks

The inspector monitored security activities for compliance with the accepted Security Plan and associated implementing procedures, including: operations of the CAS and SAS, checks of vehicles on-site to verify proper control, observation of protected area search procedures and access control, badging procedures on selected shifts, inspection of physical barriers and alarm systems, checks on control of vital area access, compensatory measures, and escort procedures. No inadequacies were identified.

The inspector reviewed the security shift manning for all three shifts for May 1, 1987. The inspector reviewed time sheets and shift schedules, discussed the shift organization and manning with security supervision, and reviewed the security plan and implementing procedural requirements. The minimum number of armed guards and watchmen was verified to be present. The inspector did note that security procedure PP-16 requires a revision to reflect current security manning. The inspector questioned security supervision with regard to this item and the licensee stated that a revision was currently being processed. The inspector will review the revised PP-16 in a future inspection.

10.2 Controlled Substance Discovery

Approximately 30 grams of suspected marijuana substance in a pouch was found onsite by licensee personnel at about 3:30 p.m. on May 6, 1987. The substance fell out of a pocket when a contractor employee was putting on a jacket. An HP technician noted the substance when it fell to the floor in Unit 2. Apparently, the contractor technician had put on the wrong jacket as the jacket label indicated it was not his. The HP technician called security, and the site security supervisor recovered the jacket and the substance. At 9:00 a.m. on May 7, 1987, the licensee interviewed the contractor employee whose name was on the jacket label. The owner of the jacket, a Catalytic laborer, admitted that the substance belonged to him, and said that he accidentally brought it onsite. The licensee terminated the employee. The senior resident inspector was informed. The licensee's investigation was reviewed and this item was discussed with licensee security personnel. The inspector had no further questions at this time.

10.3 Security Watchman Asleep On May 29, 1987

A plant auxiliary operator (AO) and a Shift Superintendent found a security watchman asleep at the Unit 3 drywell access at 3:35 a.m., on May 29, 1987. The watchman was escorted offsite by the sergeant of the guards, and his employment was suspended pending investigation. A security search of the Unit 3 drywell area found no abnormalities. The watchman had been working 12 hour shifts for six consecutive days. The contractor attempts to limit working hours to 60 hours in a pay period (i.e., seven days). However, there is no formal overtime policy in place by the security contractor. The following is a sequence of events of the incident (all times on May 29, 1987):

-- 2:00 a.m. - Watchman assumes Unit 3 drywell post

-- 3:12 a.m. - Roving fire watch noted watchman was attentive

-- 3:15 a.m. - Radio check noted watchman alert

-- 3:45 a.m. - AO found watchman asleep

-- 4:12 a.m. - PECo security management notified

-- 4:29 - 5:29 a.m. - Unit 3 drywell inspected, no abnormalities

-- 4:35 p.m. - ENS call per 10 CFR 50.72

-- 5:27 p.m. - ENS call per 10 CFR 73.71

The watchman was compensating for an unlocked containment drywell door and locked high radiation (greater than 1000 mrem/hr) surveillance of Technical Specification 6.13.1.b.

In addition, a regional specialist will review this event in a future inspection. The item remains unresolved (UNR 277/87-15-02).

11. In-Office Review of Public and Special Reports

The inspector reviewed the following:

-- Annual Radiation Dose Assessment Report No. 2; April 29, 1987

-- Semi-Annual Effluent Releases Report No. 22, Rev. 1, July 1 to December 31, 1987; May 8, 1987.

-- Peach Bottom Atomic Power Station Unit No. 1, 1986 Annual Decommission Report No. 14; April 24, 1987.

No unacceptable conditions were noted.

12. Unresolved Items

Unresolved items are items about which more information is required to ascertain whether they are acceptable violations or deviations. Unresolved items are discussed in 4.4.4, 5, and 10.3.

13. Management Meetings

13.1 Preliminary Inspection Findings

A verbal summary of preliminary findings was provided to the Manager, Peach Bottom Station at the conclusion of the inspection. During the inspection, licensee management was periodically notified verbally of the preliminary findings by the resident inspectors. No written inspection material was provided to the licensee during the inspection. No proprietary information is included in this report.

13.2 NRC Region 1/PECo Management Meeting on May 15, 1987

On May 15, 1987, a management meeting was held at the Peach Bottom Station. At this meeting, PECo discussed the status of the PECo actions in response to the NRC Order and "Peach Bottom Enhancement Program (PBEP). The PBEP is designed to improve the short and long term safety, reliability, and operating effectiveness at Peach Bottom. The licensee discussed the preliminary findings of the MAC investigation, detailed the proposed aspects of the recovery plan, updated the status of the NOMT, and discussed future plans including training programs. A list of meeting attendees is included in Attachment 1 to this inspection report.

The inspector will continue to follow the response to the Order and the implementation of the PBEP.

ATTACHMENT 1
PECo/NRC Meeting

May 15, 1987

NRC Attendees

T. P. Johnson, SRI, PBAPS
R. M. Gallo, Branch Chief Project Branch 2, Region I
W. F. Kane, Director, Division of Reactor Projects, Region I
W. V. Johnston, Acting Director, Division of Reactor Safety, Region I
J. C. Linville, Section Chief, PB2, DRP, Region I
R. E. Martin, NRC Project Manager, USNRC/NRR
G. West, Jr., Engineering Psychologist, USNRC/NRR
L. E. Myers, Resident Inspector, PBAPS
R. J. Urban, Resident Inspector, PBAPS

State of Maryland Attendees

W. Bouta, Engineer, State Department of Health
P. Perzynski, Staff, State Department of Health
Thomas Magette, Administrator, Nuclear Evaluations, MD Power Plant Research Program

State of Pennsylvania Attendees

W. Dornsife, Chief, Division of Nuclear Safety, PA Department of Environmental Resources
S. Maingi, Nuclear Engineer, PA Department of Environmental Resources

PECo Attendees

Dr. W. F. Hushion, Medical Director
G. M. Leitch, Manager, Nuclear Generation Department
E. J. Bradley, Associate General Counsel
J. W. Gallagher, Vice President, Nuclear Operations
J. S. Kemper, Senior Vice President, Engineering and Production
D. M. Smith, Manager, Peach Bottom Atomic Power Station
A. J. Weigand, Vice President, Electric Production
R. H. Moore, Superintendent Nuclear Operations QA Division
J. B. Cotton, Superintendent, Plant Services
D. C. Smith, Superintendent, Operations
M. J. Mulligan, Clinical Psychologist, Consultant to Medical Department
R. W. Bulmer, Superintendent Nuclear Training
T. J. Niessen, Assistant Operations Engineer
F. W. Polaski, Operations Engineer
W. R. Taylor, Manager, Corporate Communications
C. J. McDermott, Manager, Public Information
R. H. Logue, Assistant to Manager, Nuclear Support Department
W. M. Alden, Engineer-In-Charge, Licensing Section
J. E. Winzenried, Staff Engineer, Enhancement Program
J. Johanson, Enhancement Program

Others

H. R. Abendroth, Senior Engineer, Atlantic Electric
M. A. Phillips, Senior Engineer, Public Service Electric & Gas
C. D. Schaefer, Electrical Operations, Delmarva Power
C. W. Thayer, Management Analysis Company

ATTACHMENT 2

Documents Reviewed for Diesel Generator ESF Walkdown

1. Peach Bottom Atomic Power Station Units 2 & 3, Technical Specifications

2. System Procedure S.8.4.A.E1, "Diesel Generator Operation - E1 Diesel Generator (Check Off List)", Rev. 6, dated 11/13/86

3. P&ID M377, Sheets 1, 2 & 3, "Diesel Generator Auxiliary Systems", (starting air, air coolant and jacket coolant, and lube oil systems)

4. P&ID M385, "Diesel Engine Boiler Building, Shop and Warehouse Temperature Control Diagram (EDG ventilation supply system)

5. P&ID M323, "Fuel and Diesel Oil System"

6. Peach Bottom Atomic Power Station Units 2 & 3, Updated Final Safety Analysis Report

ATTACHMENT 3

Surveillance Tests Reviewed for Diesel Generator ESF Walkdown

1. ST 8.1, "Diesel Generator Full Load Test," Rev. 23, for dates 4/8/87 and 4/11/87 (TS 4.9.A.1.a, 3.9.A.2)

2. ST 8.1.1, "Diesel Fuel Quantity Report," Rev. 4, for dates 3/31/87 and 4/6/87 (TS 4.9.A.9.c, 4.14.A.1.e.1)

3. ST 8.1.2, "Diesel Fuel Sample", Rev. 7, for date 3/10/87 (TS 4.9.A.1.d)

4. ST 8.1.2.A, "Diesel Fuel Sample Analysis", Rev. 0, for dates 3/10/87 (TS 4.9.A.1.d)

5. ST 8.1.3, "Daily Diesel Generator Full Load Test", Rev. 13, for dates 3/30/87 and 3/31/87 (TS 4.5.F.1, 3.9.B.1)

6. ST 8.1.4.A,B,C,D, "E1, E2, E3, E4 Diesel Generator Inspection," Rev. 1, for dates 7/29/86, 10/31/86, 7/29/86 and 11/20/86 (TS 4.9.A.1.e, 4.14.A.1.e.3)

7. ST 8.1.6, "Diesel Generator Annual Inspection Post Maintenance Test", Rev. 13 & 15 for dates 12/10/86, 10/4/86, 9/28/86, 10/29/86 and 11/20/86

8. ST 8.1.7, "Diesel Fuel Sample, Main Tank", Rev. 3 for date 3/10/87 (TS 4.14.A.1.e.2)

9. ST 11.6.2.3 "Diesel Generator Simulated Auto Actuation and Load Acceptance for Units 2 & 3," Rev. 8, for dates 6/13/85, and 2/7/86 (TS 4.9.A.1.b)