

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 85-33
85-30

Docket Nos. 50-277
50-278

License Nos. DPR-44
DPR-56

Priority -

Category C

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

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

Inspection At: Delta, Pennsylvania

Inspection Conducted: August 12 - 16, 1985

Inspectors: Jin W. Chung, Lead Reactor Engineer;

P. Bissett, Reactor Engineer

P. Phelan, Reactor Engineer

Approved by: C. J. Anderson, Chief
Plant Systems Section, EB

9-16-85
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Inspection Summary: Inspection on August 12 - 16, 1985 (Report Nos.
50-277/85-33; 50-278/85-30)

Areas Inspected: Routine, unannounced inspection of licensee's administrative controls; preventive and corrective maintenance programs; implementation of electrical maintenance; implementation of instrumentation maintenance; and facility tours. The inspection included 118 inspector-hours on-site by three region-based inspectors.

Results: Noncompliance: None.
Deviation: None.

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DETAILS

1.0 Persons Contacted

Anderson, C., Branch Engineer, Research and Testing
Blasy, R. Shift Superintendent
Brower, R. I&C Preventive Maintenance Engineer
Cobosco, L. Test Engineer, Surveillance Test Coordinator
Davenport, J. K., Maintenance Engineer
*Donell, T., QC Supervisor
DiAndrea, P., Foreman Elec-Group
Dalaary, P., 2nd Class Electrician
Eskmon, B., Lead QA Auditor
Foss, D., Engineering Maintenance Group
*Fleischmann, R. S., PBAPS Manager
*Fulvio, A., Technical Engineer
Geiger, B., PM Engineer
Hewell, L., H.P. Senior Technician
Hinkle, T. C., Maintenance
Jackman, G., Maint. Eng. - Cotabitic Corp.
Kemper, D. Maintenance Supervisor
*Mitmann, J. F., Maintenance Engineer
McDade, T., 1st Class Electrician
Mascitilli, F., Modification Supervisor
Mathews, C., Engineering Aid
Rogenmuser, J., Maintenance Operations Engineer
Spiko, S., Administrative Engineer
Valentino, F., Electrical Engineer
Voight, K., Nuclear Section Training Branch Coordinator
Weingard, R. I&C Engineer
Wilson, K. Maintenance
*Wilson, T. QA Supervisor
Young, D., Assist. Foreman Elec. Group, PECO
Yuill, S., Fire Protection Tech. Assist.

USNRC

*H. Williams, Resident Inspector

The inspector also held discussions with other licensee employees during the inspection, including operations, technical supports, and administrative personnel.

*Denotes those present at the exit meeting on August 16, 1985.

2.0 Administrative Controls for Maintenance Activities

Administrative Control procedures were reviewed to determine the licensee's program for implementing requirements associated with the corrective and preventive maintenance activities. The licensee's program was evaluated to assure that the program was consistent with the Technical Specifications, Regulatory Guide 1.33, ANSI N18.7-1972, and 10 CFR 50, Appendix B. Documents reviewed are listed in Section 7.0.

The inspection objectives were to ascertain that the following control procedures were established and implemented:

- Controls and approvals of station procedures;
- Controls of locked valves and jumpers;
- Preventive and corrective maintenance programs;
- Controls of materials and materials handling;
- Controls of documents and reviews;
- Surveillance procedures; and
- Housekeeping.

Within the scope of this inspection, no unacceptable conditions were identified.

3.0 Maintenance Programs

Programmatic aspects and implementation of maintenance activities were inspected to assure that:

- Administrative controls for routine and emergency maintenance were established;
- Safety-related maintenance versus non-safety-related maintenance were identified;
- Preventive maintenance program was established and implemented;
- Maintenance records were properly reviewed and stored;
- QA/QC holdpoints were established;
- Criteria and responsibilities were identified;
- Programmatic controls for post-maintenance testing were established;
- Programs for equipment controls and special processes were established; and
- Environmental Qualification (EQ) program was established.

3.1 Corrective and Preventive Maintenance Programs

A Computerized History and Maintenance Planning System (CHAMPS) was instituted to retrieve and track down activities associated with any maintenance activity.

The CHAMPS is maintained and updated for corrective and preventive maintenance work, including scheduling, status and disposition.

Station procedure, A-25 addressed the preventive maintenance program, and identified routine and periodic activities on plant equipment, including replacement parts. The corrective maintenance procedure was prescribed in the administrative procedure A-26, which detailed the initiation and disposition of the maintenance request.

When suspected maintenance work is identified, a Suspected Maintenance Request Form (SMRF) is generated. Should this SMRF be approved by Operations, a Maintenance Request Form (MRF) will be generated from the SMRF and entered into the CHAMPS. The MRF identifies the component and nature of the work to be done with a provision for operational verification after the maintenance work is completed.

Section 2 of the MRF requires identification of the post-maintenance testing and test procedure by the originator as per administrative procedure A-26A. When the maintenance work is completed, the post-maintenance testing has to be completed on an Operation Verification Form (OVF), which will become a part of the MRF package.

The MRF also has a QA/QC provision in Sections 2 and 4. Final disposition will be made by the operations department upon completion of the OVF.

The CHAMPS also maintains preventive maintenance information, including detailed component and system identifications and frequency of the PMs.

No unacceptable conditions were identified.

3.2 Equipment Controls

The station administrative procedure, A-26A establishes a program for releasing and returning to service plant equipment or systems undergoing maintenance activities. The program assures that the status of equipment and test, prior to returning to service, is documented in the MRF and CHAMPS.

No unacceptable conditions were identified.

3.3 Special Processes

A station program for controlling special processes was developed to identify and provide instruction for the activities. The program is prescribed in several procedures, including ignition source and combustible controls, welding, cleaning of fluid system components, and special testing requirements.

No unacceptable conditions were identified.

3.4 Housekeeping and Cleanliness

Station procedure A-30, "Plant Housekeeping Controls", delineated the station housekeeping practices, including housekeeping and work activities, snow and ice removal, plant conditions and periodic inspections. The procedure also identified personnel responsibilities that may effect the quality and operations of significant areas in the plant.

During a routine tour in the HPCI pump area, the inspector found several unacceptable conditions, which were subsequently corrected, as detailed in Section 7.0.

3.5 Post-Maintenance Testing

Generic letter 83-28, paragraph 3.2 requires that a licensee establish a post-maintenance testing program, and that the post-maintenance operability testing be conducted on all safety-related equipment.

The licensees' administrative control procedure, A-26A "Procedure for Corrective and Preventive Maintenance Using CHAMPS", requires that specific post-maintenance testing be specified in Section 2 of the MRF, as per Section 7.2.2.6 of the procedure.

The inspector reviewed the following MRFs and associated operations verification forms (OVFs) for post-maintenance testing:

- MRF #8501855, HPCI Lube Oil Piping, OVF, performed July 8, 1985.
- MRF #8301506, Unit 2 HPCI Discharge Test Return to Condensate Storage Tank, OVF, performed June 6, 1985.
- MRF #8301502, Unit 2 HPCI Pump Suction From Condensate Storage Tank, OVF, performed April 3, 1985.

The inspector concluded that the operation verification program for post-maintenance testing was consistent with the generic letter 83-28, and that its implementation was acceptable.

3.6 Environmental Qualification (EQ)

The licensee developed an Environmental Qualification program as per I&E Bulletin 79-01B, and implemented "Environmental Qualification Report for Peach Bottom Atomic Power Station Units 2 and 3" on June 28, 1985. The program included safety-related and nonsafety-related equipment and post-accident monitoring equipment, which are important to safety as defined in 10 CFR 50.49. The EQ report delineated and identified the following:

- (1) EQ design criteria,
- (2) EQ equipment and service conditions
- (3) Qualification testing and analysis,
- (4) Evaluation methodology,
- (5) Corrective action plans,
- (6) Associated maintenance and surveillance programs,
- (7) Replacement parts program
- (8) Detailed equipment list and records review
- (9) Specific EQ report on equipment.

The inspector reviewed the computer listing dated July 8, 1985. This printout identified specific components, systems, and EQ specifications, versus specific qualification of the components compared for each EQ parameter. The EQ parameters included operating time, temperature, pressure, relative humidity, radiation exposure and aging.

Within the scope of this inspection, no unacceptable conditions were identified.

3.7 Preventive Maintenance and EQ

The Environmental Qualification Report (EQR) specifies lifetime of specific parts and components, and the replacement frequency of an aging part as a preventive measure. The EQ program was being incorporated into the preventive maintenance (PM) program. The EQ-driven PMs and MRFs during this outage were already entered into the CHAMPS, and two examples of the EQ-driven MRFs and PMs were reviewed as follows:

- Unit 3 HPCI Valve AO-3-23-042, MRF No. 8561720.
- Unit 3 SGTS SV-30452

Based on the review of the above documents and discussions with a PM engineer, the inspector determined that the EQ program was being incorporated with the station PM program and that no unacceptable conditions existed in this area.

4.0 Instrumentation and Controls Maintenance Activities

4.1 I&C Program/Implementation

The inspector reviewed randomly selected instrumentation implementing procedures and associated temporary procedure changes covering diesel generator and high pressure coolant injection system maintenance activities. This review verified that the applicable procedures conform with the criteria of both the applicable station and department administrative procedures, which included the following:

- Provision for administrative approvals for removing an item from service and returning it to service.
- Provision requiring that the latest approved drawings and instructions be used.
- Provision assuring that materials, parts and components are correct and suitable.
- Provision for assuring that TS required limiting conditions for operation are identified and satisfied during the calibration or repair period, including the verification of redundant system operability when required.
- Provision for the control of housekeeping during the maintenance effort.
- Provision for cleaning of safety-related systems or components during maintenance.

The inspectors also reviewed, on a sampling basis, records of preventive and corrective maintenance performed by I&C to verify the following:

- Maintenance activities were performed within the frequency as scheduled.
- Required administrative approvals were obtained prior to initiation of work activities.
- An appropriate approved procedure was used.
- Functional testing, adjustments and calibrations, as necessary, were completed prior to returning equipment to operation.
- Procedures and appropriate data sheets were properly completed.
- Appropriate reviews were completed.

- Records were assembled, stored and retrievable as part of the maintenance history.
- Qualified I&C personnel performed the maintenance activity.
- Acceptance criteria were met.

Preventive and corrective maintenance activities and associated Maintenance Request Forms were reviewed to verify that the above was accomplished.

The inspector also witnessed the performance of ST2.9.19A, "Calibration of LT/LIS 3-2-3-99A" to verify the following:

- An approved, up-to-date procedure was used.
- The procedure was adequately detailed to assure satisfactory performance.
- Operational personnel were notified prior to and upon completion of the test.
- Properly specified parts and materials were identified for the activity.
- Calibrated test equipment was used.
- Proper restoration of barriers and covers was accomplished.

The inspector reviewed the qualification records of two I&C technicians who performed maintenance work on safety-related instruments to verify that their experience levels and training were in accordance with the guidance of ANSI 18.1-1971 "Standard for Selection and Training of Personnel for Nuclear Power Plants." Discussions were held with two I&C technicians in reference to the performance of instrument calibrations and were found to be knowledgeable in this area.

The inspector also discussed briefly, the I&C training program with the Nuclear Section Training Branch Coordinator. The licensee is striving towards INPO accreditation of the I&C training program by the end of 1985.

The licensee's establishment of formal controls for vendor technical manuals is almost complete. The engineer responsible for the development of technical manual program controls informed the inspector that the program should be in place by the end of the year. Requests were previously sent to all applicable suppliers requesting an eval-

uation of the status of respective manuals presently possessed by the licensee. Once all replies have been received, the licensee plans to maintain two controlled copies of all the technical manuals on site. Various departments possessing uncontrolled copies will be supplied with a controlled index by which they will be able to verify the status of those manuals in their possession.

4.2 Findings

During the performance of ST 2.9.19A, as observed by the inspector, the I&C technicians noted an unexpected result following the completion of a procedural step. The technicians immediately stopped the test; notified the control room; and reverified that the previous steps had been executed correctly. After reviewing the procedure and evaluating the error with the I&C engineer, the cause of the error was determined. A Temporary Change Notice, including appropriate review and approval, were made to the procedure to correct the problem. The test was reinitiated and the test results were found to be within acceptable limits.

5.0 Electrical Maintenance

5.1 Administrative Controls and Procedures

The inspector reviewed the licensees' programs by review of administrative procedures, and verified that the program was fully implemented for safety-related maintenance activities in accordance with the licensee commitments and regulatory requirements. The inspection was focused on the following items:

Corrective Maintenance

- responsibilities that form the basis for determining the activity as safety or non-safety-related have been included;
- appropriate inspection hold points were included;
- methods and responsibilities have been designated for performing functional testing of components and systems following maintenance work;
- causes of failures were evaluated and adequate corrective maintenance was taken;
- considerations to radiological hazards were included;
- provisions for fire protection, cleanliness, and housekeeping were included; and
- supplementary reference material was listed.

Preventive Maintenance

- procedures specified were adequate to control the scope of the maintenance;
- administrative approvals and tag-outs were included;
- QC hold points were established where required; and
- measuring and test equipment were identified.

The following procedures were reviewed:

- (1) HPCI Pump and Gear Box Assembly Maintenance, M-23-2, Rev. 3, May 1, 1981.
- (2) HPCI Turbine Examination, M-23.17, Rev. 1, Nov. 13, 1981.
- (3) HPCI Motor Operated Vacuum Breaker Isolation Valves (VRV - 140 A, B, C, D) M-23.19, Rev. 2.
- (4) Routine Inspection of Diesel Generators S.8.4.E, Rev. 2, Sept. 1, 1977.
- (5) Diesel Generator Maintenance, M-52.1, Rev. 5, May 1, 1983.
- (6) Diesel Engine Maintenance, M-52.2, Rev. 16, Aug. 2, 1984.
- (7) DG Current Transformer Replacement, M-52.4, Rev.2, July 9, 1985.
- (8) DG Cylinder Liner Replacement, M-52.11, Rev. 1, July 12, 1985.
- (9) 125 VDC Equipment Maintenance, M-52.1, Rev. 4, Oct. 27, 1982.
- (10) 125 VDC and 24 VDC Battery Corrective Maintenance M-52.3, Rev. 3 Nov. 14, 1980.
- (11) Battery Charger Maintenance, M-52.4, Rev. 2, Jan. 18, 1979.
- (12) Administrative Procedure for Reporting Fire System Impairments, A-12.3.
- (13) Control of Combustibles, A-12.2, Rev. 3, June 29, 1984.
- (14) Ignition Source Control Procedure, A-12, Rev. 4, Oct. 10, 1982.

No unacceptable conditions were identified.

5.2 Safety-Related Maintenance Activities

The inspector reviewed randomly selected corrective and preventive safety-related maintenance activities to verify the following:

- Proper operational personnel had been notified and clearance obtained.
- Appropriate maintenance work requests were issued.
- Latest approved procedures, drawings and instructions were used.
- Qualified test equipment and tools were used.
- Functional testing was performed prior to returning equipment of service.
- Required administrative approvals were obtained prior to initiating work.
- Acceptance criteria was met.
- Qualified personnel performed the work.
- Inspection personnel signed off at the designated steps.
- Trending analysis was performed.

The following corrective and preventive maintenance documentation was reviewed:

- (1) Maintenance Request Form (MRF) #8401409, dated March 10, 1984.
- (2) MRF # 8407049, dated Nov. 2, 1984.
- (3) MRF # 8301686, dated July 25, 1983.
- (4) MRF # 8406991, dated Oct. 21, 1984.
- (5) MRF # 8408383, dated Jan. 1, 1985.
- (6) MRF # 8404039, dated June 2, 1984.
- (7) MRF # 8408224, dated Dec. 26, 1984.
- (8) MRF # 8400153, dated Jan. 19, 1984.
- (9) MRF # 8401122, dated Nov. 7, 1984.
- (10) MRF # 8302937, dated Dec. 22, 1983.

Findings

At 10:00 a.m., on August 12, 1985, low pressure coolant injection (LPCI) valve, MO-2-10-154A, (closed for a surveillance test) was stroke-tested in order to meet the TS requirements of 4.5.F., and the valve failed to open.

Emergency Diesel Generator (EDG) E3 was inoperable at that time for six-days of scheduled preventive maintenance work. With an inoperable EDG, TS 4.5.F.1 requires that all LPCI and containment cooling subsystems be demonstrated operable on a daily basis. Otherwise, an orderly shutdown is required per TS 3.5.F.1 and the reactor has to be placed in the cold shutdown condition within 24 hours. To meet the surveillance requirement of TS 4.5.F.1 with E3 EDG inoperable, LPCI operability test was conducted and the MOV 154A was to be opened for the stroke test. The valve failed to open on Unit 2. At approximately 9:40 p.m. on August 12, 1985, an orderly shutdown was commenced as required by TS.

Subsequent inspection of the valve indicated that the valve yoke nut dropped approximately 6" from its normal position. The licensee disassembled the limitorque and found the upper bearing and lock nut damaged. On August 14, 1985, under MRF # P506032, the upper bearing and the nut were replaced. With the E3 EDG in operable status, Unit 2 reactor was made critical at approximately 6:45 a.m., August 15, 1985.

The root cause of the failure is being investigated jointly with the vendor. The yoke nut of the MO-2-10-154B valve, a similar valve, was visually inspected, no damage was observed.

The inspector was concerned with 1) failure cause, 2) generic implication and 3) preventive measures to preclude recurrence. The licensee stated that the inspector's concerns would be investigated for this type of valve.

This is an unresolved item pending licensee's actions and resolution on this item and subsequent NRC:RI inspection (50-277/85-33-01, 50-278/85-30-01).

5.3 Witnessing of In-Progress Maintenance Activities

The performance of corrective maintenance activities was witnessed to verify that:

- Proper instructional procedures were available and used;
- Qualified test equipment and tools were used;

- Proper restoration of barriers and covers was accomplished; and
- Post-Maintenance testing was conducted.

On August 12-13, 1985, the inspector witnessed a portion of the preventive maintenance conducted on the E3 Emergency Diesel Generator (EDG). Due to the extent and nature of the work, two security guards were stationed to control and monitor the personnel traffic in and out of the E3 EDG room. The inspector noted that several outside contractors were working on the premises and were using vendor manuals, specifications, and drawings. During the course of the work, one dedicated QC inspector was continuously monitoring the in-progress work activities.

At 5:00 p.m., on August 14, 1985, the inspector witnessed a portion of the acceptance test at rated output. A licensee QC inspector also monitored the test.

No unacceptable conditions were identified on the EDG E3 activities.

The licensee was committed to modify the unit 3 HPCI system to meet the Appendix R and 10 CFR 50.48 requirements. The modification to install an alternate control station (ACS) outside the control room was completed by Bechtel, per modification package No. 1353A. Bechtel turned the system over to the field engineer, and the control/transfer logic test was in-progress. The inspector observed that engineers were using calibrated instruments and instruction sheets with proper wiring diagrams.

No unacceptable conditions were observed.

5.4 Maintenance Personnel Qualification

The inspector reviewed the qualifications of two electrical technicians who routinely perform maintenance on safety-related equipment and verified that the individuals level of experience and training were commensurate with the type and degree of work being done. The training and qualification programs were reviewed for the following:

- Training was kept up to date to reflect plant modifications and procedure changes.
- Two years of working experience were required in their speciality.
- A minimum of one year of related technical training was required.

- Training programs were scheduled and planned. This training included reviewing text material, attending lectures and taking frequent examinations.
- Technicians were well versed with the equipment being worked on.
- Supplementary and reference material was easily accessible.
- A retraining program was implemented.

No unacceptable conditions were identified.

6.0 Quality Assurance and Control

The inspector discussed QA/QC involvement in the corrective and preventive maintenance programs. The station had two separate QA and QC departments, both reporting to an offsite organization.

The Suspected Maintenance Request Form (SMRF) which could be initiated by Quality Control personnel and accepted by operations, would become a Maintenance Request Form (MRF) with a new identification numbering sequence and would then be entered into CHAMPS. The QC department had an unlimited access to the CHAMPS.

The QC department had approximately 30 QC inspectors, mostly contractors, whose qualifications were certified by the QC supervision. The inspector reviewed the quality control monitoring schedule for the month of August, 1985, and a Nonconformance Report (NR) # P84-033. The QC monitoring schedule included housekeeping and cleanliness inspection of various areas in the vital areas. A licensee representative stated, and the inspector verified, that a dedicated QC inspector was assigned to #3 EDG maintenance work. Two randomly selected QC inspectors were interviewed for their qualifications.

No unacceptable conditions were identified.

7.0 Facility Tours

The inspectors conducted "walk-through" inspections of selected plant facilities and observed work-in-progress to verify that facility operation was in accordance with the station procedures and Technical Specification requirements. The areas inspected included;

- Control Room
- Emergency Diesel Generators
- Reactor Building closed Cooling Rooms

- Battery rooms
- HPCI pump rooms
- Switchgear rooms

Findings

The inspector noted that the valves were identified by white plastic tags which were made of temperature-oil resistant materials and were coded by computer-coded identification bars. The locked-valves were also color-coded to indicate the normal valve position status.

In general, housekeeping and cleanliness controls were consistent with the station procedures, except for the following examples:

- At 6:00 p.m. on August 12, 1985, the normally clean step-off pad at the entrance of the Unit 2 HPCI pump room was found to be dirty with mud and water, an indication of apparent contamination. Health physics personnel were informed of the finding, and a contamination wipe-test was performed at 1845 with a beta-gamma reading of 500 DPM/100cm². The step-off pad was cleaned, and the item was closed.
- The inspector observed on August 12, 1985 that one small valve handle was on the floor of the Unit 2 HPCI pump room and several small valve handles were missing. A small unidentified water leak was found in the HPCI pump room and hand-written procedures and test jumpers were scattered around the HPCI pump. The licensee was informed of the findings. The inspector toured the area again on August 14, 1985 at 1:00 p.m., and found the area clean and the test wires removed.

8.0 Other Documents Reviewed

8.1 Administrative Control Procedures

- (1) A-1, Administrative Procedure for Preparation and Approval of Administrative procedures, Revision 5, May 1, 1985.
- (2) A-2, Administrative Procedure for control and use of Documents, Revision 27, January 7, 1985.
- (3) A-3 Procedure for Temporary changes to Approved Procedures, Revision 7, January 7, 1985.
- (4) A-8, Procedure for Controls of Locked Valves, Revision 5, March 14, 1983.

- (5) A-19, Administrative Procedure for Preparation and Distribution of Maintenance procedures, Revision, 13, January 9, 1981.
- (6) A-25, Preventive Maintenance Program, Revision 2, December 30, 1983.
- (7) A-26A, Procedure for Corrective and Preventive Maintenance using CHAMPS, Revision 2, February 21, 1985.
- (8) A-26, Procedure for Corrective Maintenance, Revision 24, January 4, 1985.
- (9) A-27, Procedure for Material Control System, Revision 13, August 11, 1984.
- (10) A-28, Cleaning of Fluid Systems Components, Revision 0, June 5, 1978.
- (11) A-29, Procedure for the Review and Implementation of Amendments to the Technical Specification, Revision 1, January 9, 1985.
- (12) A-30, Plant Housekeeping Controls, Revision 4, June 10, 1981.
- (13) A-32A, Procedure for the Review, Approval, and Implementation of Temporary or Permanent Setpoint or Range Changes, Revision 3, February 17, 1982.
- (14) A-36, Periodic Review of Procedures, Revision 7, August 20, 1984
- (15) A-41, Procedures for Control of Safety Related Equipment, Revision 2, August 31, 1982.
- (16) A-42, Jumper Log Procedure, Revision 9, April 22, 1985.
- (17) A-43, Surveillance Testing System, Revision 17, October 19, 1983.

9.0 Unresolved Items

Unresolved items are matters about which more information is required to determine if it is a violation, a deviation or acceptable. An unresolved item is discussed in paragraph 5.2.

10.0 Exit Meeting

The inspector met with the licensee representatives denoted in paragraph 1 on August 16, 1985, and summarized the purpose, scope and findings of the inspection.

At no time during this inspection was written material provided to the licensee by the inspector.