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REGION 1

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Report No. 50-293/84-23

Docket No. 50-293

License No. DPR-35 Priority -- Category C

Licensee: Boston Edison Company

800 Boylston Street

Boston, Massachusetts 02199

Facility Name: Pilgrim Nuclear Power Station

Inspection Conducted: July 23, 1984 - August 27, 1984

Inspectors: for J. E. Tripp
J. Johnson, Sr. Resident Inspector — 9/11/84 Date

for J. E. Tripp
M. McBride, Resident Inspector — 9/11/84 Date

for J. E. Tripp
G. Meyer, Project Engineer — 9/11/84 Date

Approved By: J. E. Tripp
L. Tripp, Chief, Reactor Projects Section 3A, Projects Branch No. 3 — 9/11/84 Date

Inspection Summary:
Inspection on July 23 - August 27, 1984 (Report No. 50-293/84-23)

Areas Inspected: Routine unannounced safety inspection of plant operations including followup of previous findings, operational safety verification, followup on plant events and LERs, a review of surveillance and maintenance activities, a review of Performance Improvement Program milestones and a review of piping system nondestructive examinations. The inspection involved 254 inspector-hours by two resident inspectors and one project engineer.

Results: One violation was identified (Failure to measure battery cell specific gravity as required by Technical Specifications and a station procedure, Paragraph 5.B).

DETAILS

1. Persons Contacted

Within this report period, interviews and discussions were conducted with members of the licensee (and contractor) staff and management to obtain the necessary information pertinent to the subjects being inspected.

2. Followup on Previous Inspection Findings

a. (Closed) Unresolved Item (81-07-03). Review high range noble gas monitor conversions from R/hr to Ci/sec. This item has been reviewed during NRC inspections 81-14, 81-21, and 83-02. Procedures for converting the monitor readings (R/hr) to radioactivity discharge rate (Ci/sec) were found acceptable. This item is closed.

b. (Closed) Follow Item (81-21-10). Review procedures relating to post accident sample analysis capability and provisions to minimize personnel exposure. These procedures were reviewed in NRC Report 83-02 and determined to be acceptable on an interim basis until the long term post accident sampling system is installed. This item is closed.

c. (Closed) Follow Item (81-21-11). Review licensee whole body counter calibration procedure. This item is closed based on the whole body counter review documented in section 3.0 of Inspection Report 50-293/84-14.

d. (Closed) Unresolved Item (82-22-01) Review reportability of RCIC high steam flow alarm on August 17, 1982. The licensee issued LER No. 82-38 on September 16, 1982. A followup LER, No. 82-38/03X-1, was submitted on June 24, 1983 describing the cause as air bound sensing lines. The licensee's investigation revealed a leaking connection that was repaired on October 22, 1982. This item is closed.

e. (Closed) Violation (83-08-01). Failure to audit environmental program. The inspector reviewed Audit No. 83-19, Radiological Environmental Monitoring Program, dated June 21, 1983. Also, the inspector reviewed the quality assurance audit log which showed that the 1984 environmental program audit (84-23) had been performed in July, and that the report had not been issued as yet. Also, the quality assurance audit section now has an administrative requirement to audit the environmental program on an annual frequency. This item isclosed.

f. (Closed) Follow Item (83-18-01). Review licensee's actions to periodically verify proper operation of control room annunciation from the high level alarms on the Drywell Leak Detection Monitor (C-19). The licensee has revised procedure No. 7.4.17 to require verification of proper operation for both local and control room annunciation. This is performed quarterly with instrument calibration and documented on form CH-34.A. This item is closed.

g. (Closed) Follow Item (83-21-03). Tracking of audits of Technical Specification surveillance requirements. A prior inspection noted that auditing of surveillance requirements was performed during the various audits of functional areas, but that the requirements were not being reviewed separately to ensure thorough coverage. The inspector reviewed quality assurance audit section memorandum QPI-3933 dated February 7, 1984 which established an audit matrix of all surveillance requirements to be reviewed during a 4 year period. The inspector reviewed the matrix to confirm that the audit information from the last two years had been included. This item is closed.

h. (Closed) Follow Item (83-21-04). The licensee did not have administrative guidance regarding followup of the corrective actions recommended by joint utility management audits. The inspector reviewed a draft Nuclear Operations Procedure, Annual Independent Review of BECo's QA program. The inspector concluded that this procedure provided the necessary administrative guidance. This item is closed.

i. (Open) Unresolved Item (84-17-02). Review licensee evaluation of dye penetrant indications on control rod drive collet housings. During the current outage, the licensee has inspected seventy-five control rod drives. Two types of collet housings were installed on these drives, an old style housing known to be susceptible to cracking and a new style thought to be resistant to cracking.

Twenty-seven drives with old style housings have been inspected. Ten housings were rejected for dye penetrant indications at various locations and will not be reused. Twenty-four drives with old style housings in the reactor have not been inspected. The licensee plans to examine these housings prior to startup.

Forty-eight drives with new style housings have been inspected. Four were rejected for penetrant indications near the housing attachment welds. Indications on three of the housings were cleared by the grinding. The licensee is evaluating the depth of these indications and expects to confirm that they were surface defects.

The penetrant indication on the remaining new style housing went through wall. General Electric is testing and evaluating this housing. The licensee is considering issuing a licensee event report (LER) describing the indication.

On August 1, 1984, the inspector noted a disagreement between the results of two penetrant tests on the housing of control rod drive No. 8321. A test conducted on July 19, 1984 and attached to Nonconformance Report No. 84-100 rejected the housing, based on indications at various locations on the housing. A second test conducted by a different testing contractor on July 20, 1984 accepted the housing. No penetrant indications were recorded on the second test data sheet.

The individual conducting the second test stated that he noted penetrant indications on the housing but did not record the indications or reject the housing, based on conversations with a supervisor. The individual also stated that he used general acceptance criteria specified in testing company procedures rather than the acceptance criteria in the licensee's procedures.

At the exit interview, the licensee stated that the acceptance criteria used for all of the penetrant tests of the collet housings had been reviewed and that all housings with observed penetrant indications had been rejected. The licensee also stated that the contractor test acceptance criteria were equivalent to the licensee's acceptance criteria.

The differing test results were further reviewed during NRC Inspection 50-293/84-21. No violations were identified.

This item remains open pending completion of the licensee's collet housing inspection.

3. Operational Safety Verification

a. Scope and Acceptance Criteria

The inspector observed control room operations, reviewed selected logs and records, and held discussions with control room operators. The inspector reviewed the operability of safety related and radiation monitoring systems. Tours of the reactor building, turbine building, station yard, switchgear rooms, SAS, cable spreading room, battery rooms, intake structure, and control room were conducted. Tours of the drywell and the inside of the torus were also included in this review. Observations included a review of equipment condition, security, housekeeping, radiological controls, and equipment control (tagging); in addition, records of radioactive liquid and gaseous releases from the station were reviewed.

These reviews were performed in order to verify conformance with the facility technical specifications and the licensee's procedures.

b. Findings

(1) On July 27, 1984 the inspector reviewed the licensee's system for valve identification. In conjunction with previous INPO findings, the licensee has decided to re-label all valves in the plant. A computerized label machine has been purchased and a licensed operator assigned to the job.

The inspector noted that the labeling results should provide better information to operators. The inspector noted during station tours that some labels that were being affixed to walls were falling off. This was brought to the attention of the licensee. The inspector had no further questions in this area at this time. This area will be followed as an Open Item (84-23-02).

(2) On August 7, 1984, at 8:00 a.m., the inspector observed one of the monitors at the main gate to malfunction. The guards at the access point were not aware of the malfunction, but immediately took the monitor out of service when notified by the inspector. The licensee stated that compensatory measures would be taken at both the main and secondary access points until a method of assuring monitor operability was implemented.

Following discussions with the inspector on August 9, 1984, the licensee strengthened the compensatory measures. No violations were identified.

(3) On August 17, 1984, the inspector reviewed Onsite Review Committee (ORC) meeting minutes in order to verify that the quorum, documentation, and subjects were in accordance with the Technical Specifications. Minutes for meetings No. 84-61, and 84-63 through 84-75, were reviewed. These meetings were held between June 20, 1984, and July 25, 1984 and included review of procedure changes, audit and inspection findings, in plant trouble reports, plant design changes, temporary modifications, and proposed Technical Specification changes.

The inspector questioned the licensee regarding two areas: 1) the backlog of in plant trouble reports, Failure and Malfunction Reports (F&MRs), and 2) the backlog of Temporary Modifications. The licensee explained that the review of older F&MRs was a summary type of review to ensure followup of all resulting actions and that immediate review, reporting, and corrective actions had been previously performed. An arbitrary limit had been imposed on the number of these reports that could be reviewed in one meeting while clearing up the backlog which includes 10 reports dating back to 1982.

The licensee also stated that the list of (twenty-six) Temporary Modifications which have been installed for greater than six months was being reviewed monthly by ORC to raise the level of awareness that actions to disposition them were needed. The licensee stated that the process was being changed to alleviate an unnecessary burden on ORC and that the ORC's role would be directed toward safety review of the Temporary Modification vice actions for their disposition.

The inspector had no further questions. No violations were identified.

(4) On August 10, 1984, the inspector held discussions with licensee representatives regarding a recent complaint by workers (to the local U.S. Department of Labor, OSHA, office) of industrial safety hazards in the drywell. Items of concern included falling hazards, exposure to falling objects, unsupported ladders, tripping hazards, and limited egress.

The licensee and its principal contractors (General Electric Company and Bechtel Power Corporation) have supervisory personnel assigned to conduct tours of the drywell and ensure that working conditions are safe. The licensee safety representative determined that there was a problem with electrical cords, leads, and hoses in walkways not elevated or protected well enough on the 41 foot elevation and effected immediate corrective actions. Drywell inspection reports are prepared by the G.E. project manager and submitted to the licensee's management. Joint inspections are made by the GE safety engineer and a licensee representative.

The inspector has also conducted tours of the drywell and determined that conditions appeared satisfactory provided that workers were careful. General plant conditions will be reviewed during routine inspections of the facility (Open Item 84-23-03).

4. Followup on Events and Nonroutine Reports

a. Events

(1) Between July 20 and August 14, 1984, the licensee contacted the NRC Operations center several times via the ENS telephone line to report dye penetrant indications on collet housings. These indications are discussed in Section 2 of this report. No violations were identified.

(2) On July 26, 1984, a section of the reactor building refueling floor exhaust ventilation duct on the 91 foot elevation was observed to be collapsed. The inspector held discussions with personnel, observed the damaged duct, and reviewed logs and records. Workers were in the process of making planned adjustments to ventilation dampers while preparing to shift to a temporary HEPA filter unit for drywell ventilation. The licensee's investigation revealed two sources of problems: 1) the ventilation damper controls may not have operated properly, and 2) the vacuum breakers at the exhaust fans did not operate properly.

The licensee repaired the damaged duct, inspected other sections and found no additional damage, and has initiated trouble shooting and testing of the dampers and vacuum breakers. These actions are being tracked for completion prior to reloading the fuel.

No violations were identified. However, the inspector did identify an inconsistency in the FSAR, Section 7.12.4.3, regarding power supplies for the refueling floor vent monitors. On August 22, 1984, the licensee issued an Engineering Service Request No. A183 to resolve this inconsistency. The inspector had no further questions.

(3) On August 16, 1984, the licensee identified chloride contamination in the A Reactor Building Closed Cooling Water (RBCCW) system at a level of 1000 ppm. The heat exchanger was taken out of service and the RBCCW system chloride concentration reduced by feed and bleed methods.

The inspector reviewed the licensee's actions and verified that fuel pool cooling (the only safety related heat load in this plant condition) was adequately maintained. At the conclusion of this inspection period, the licensee had identified a leaking tube in the A RBCCW heat exchanger and was in the process of repairing it. The inspector had no further questions at this time. No violations were identified.

(4) On August 18, 1984, at 2:00 p.m., a worker dismantling a control rod drive (CRD) in the CRD repair room received an unanticipated radiation dose to his fingers of approximately one rem when he picked up a small, highly radioactive metal chip. Work in the repair room was suspended after the incident and while the licensee investigated the matter.

The inspector discussed the preliminary licensee evaluation with health physics personnel and interviewed two of the four individuals who were present in the repair room on August 18, 1984.

These discussions indicate that the worker picked up the chip after seeing a health physics technician point to it. The health physics technician was preparing to dispose of the chip at the time and yelled at the worker, who then threw the chip on the floor (or in a flush tank).

The licensee estimated that the chip had a contact dose rate of approximately one thousand rems per hour, based on a thermoluminescent dosimeter study. A time-motion study indicated that the worker held the chip for a maximum of three seconds.

Findings regarding this incident will be documented in NRC:Region I specialist Inspection Report No. 50-293/84-25.

(5) The inspector reviewed the licensee's actions regarding routine personnel access controls and unrelated instances of contractor personnel attempting to enter the site with controlled substances on August 9, 21, and 28, 1984. The licensee's actions were determined to be acceptable.

b. Review of Licensee Event Reports (LERs)

LERs submitted to the NRC:Region I office were reviewed to verify that the details were clearly reported and that corrective actions were adequate. The inspector also determined whether generic implications were involved and if on site followup was warranted. The following report was reviewed.

No.	Subject
84-09	HFA Relay hot and smoking

The followup of this event is described in NRC Report 84-17. Long term corrective actions include generic replacement of these relays in conjunction with NRC Bulletin 84-02. As of the end of this inspection period the licensee had completed replacement of 246 HFA relays with new GE Century series relays.

The inspector also held discussions with the licensee regarding the observation of slight film on the new replacement relay cover glass after a period of energization. In a letter from General Electric (GE) Company to the licensee dated August 6, 1984, GE has initiated tests to monitor any evidence of contact resistance degradation and has recommended that the licensee check contact resistance monthly.

The inspector referred this information regarding the generic implication to NRC:Region I and IE headquarters personnel. Proper operation of these relays will continue to be reviewed during future inspections of the facility.

c. Other Non-routine Reports

The inspector also followed up on the following two reports:

-- Special Report regarding an inoperable fire pump, and
-- 10CFR21 Report regarding faulty analog trip cabinets.

The faults in the analog trip units consisted of cuts in electrical conductor insulation during stripping of the cable jackets near terminations. The licensee has replaced all cables exhibiting the defect and has notified the vendor and the NRC (BECo letter dated July 13, 1984).

No violations were identified during this reveiw.

5. Surveillance Testing

a. Testing Observed

The inspector reviewed the licensee's actions associated with surveillance testing in order to verify that the testing was performed in accordance with approved station procedures and the facility Technical Specifications.

The following tests were observed:

-- 250 volt battery rated load discharge test on August 7, 1984, and

-- Post preventive maintenance testing on the B Emergency Diesel Generator (EDG) on August 21, 1984.

b. Findings

(1) The inspector observed preparations for, the conduct of, and restoration from the once-per-operating cycle rated load discharge test of the station 250 volt d.c. battery bank on August 7, 1984. The inspector reviewed test and measuring equipment, the resistance load path, and the condition of the battery. Two problems were identified. First, the licensee representative conducting the test failed to follow a requirement (procedure No. 8.9.8) Battery Rated Load Discharge Test, Rev. 6, Section VI.A) to take initial specific gravity and voltage readings on each cell after isolation of the battery from the charger and distribution bus. Second, the specific gravity of each cell was not being measured and recorded after the rated discharge. The licensee's practice was to wait to take the specific gravity measurements following the recharge and just prior to return to service.

On August 17, 1984, the licensee made a temporary change to Procedure No. 8.9.8 to include specific gravity measurements following the discharge as required by the T.S. The licensee's procedure No. 8.9.8 is applicable to the A and B train 125 volt d.c. batteries, the 24 volt batteries, and the 125 volt d.c. switchyard battery and had not required this measurement to be taken or recorded in the past.

The failure to measure and record station battery cell specific gravity in accordance with procedure 8.9.8 and T.S. 4.9.A.2.c is a violation (84-23-01).

(2) On August 21, 1984, the inspector observed testing of the B EDG following preventive maintenance. Two problems were noted. First, the procedure, 8.9.1, Revision 14, incorrectly specified to load the EDG to 2600 KV vice 2600 KW. This typographical error was brought to the attention of the Watch Engineer who stated that it would be corrected. Secondly, the EDG output current meter in the control room indicated zero amperes at the start, and while the EDG was at rated load (2600 KW). Following discussions with operations and electrical maintenance personnel, the inspector determined that the test switch for the output current transformer had been inadvertently left opened following previous equipment calibration. The inspector had no further questions at this time since this switch had no effect on the EDG operability.

6. Maintenance/Modification Activities

a. Scope

The inspector reviewed the licensee's actions associated with maintenance and modification activities in order to verify that they were conducted in accordance with station procedures and the facility Technical Specifications. The inspector verified for selected items that the activity was properly authorized and that appropriate radiological controls, equipment control tagging, and fire protection were being implemented.

The items/documents reviewed included the following:

-- Maintenance Request (M.R.) 84-183; Repair Damaged Reactor Building Ventilation Duct.

-- M.R. 83-46-547; Inspect and Test 250 volt Battery

-- M.R. 84-45-173; Replace HFA Relay 5AK5A

-- M.R. 83-45-255; Repair LPRMs as necessary due to Damage from Under Vessel Work

-- Installation of Enclosures near the West CRD Hydraulic Control Unit Bank

b. Findings

(1) M.R. 84-183 was issued to repair the damaged reactor building ventilation duct. This M.R. described the system as safety related and specified that the repair be performed by Bechtel personnel in accordance with station procedure No. 3.M.1-11. The inspector reviewed this procedure and noted that it is not really a procedure but provides guidance on the type of activities that do not require a specific procedure.

Following discussions with the licensee's staff engineer, the inspector determined that the repair was within the skills of the craftsmen assigned with the exception of procurement activities. The inspector reviewed the procurement specification (which was approved by both the licensee's engineering and quality assurance departments) and the Bechtel receiving instructions and reports for the replacement sheetmetal and supports. Following discussions with the Bechtel Project Field QC Engineer (regarding verifications that coatings and preservatives were "as specified") and the licensee's QA Engineer, the inspector determined that the quality requirements specified by the procurement specification were met.

No violations were identified during this review.

(2) The inspector observed work in progress to install a replacement Century series HFA relay 5AK5A in the high pressure scram circuit in accordance with M.R. 84-45-173. The inspector verified that the final wiring was in accordance with the as found wiring as shown on the GE Special Process Control Sheet No. 1D-1 and that the connections were tightened with a torque wrench as specified in GE Traveler HFA REP-01, Rev. 1. The inspector also verified that the pickup voltage documented on the relay data sheet was within the range specified in GE SIL No. 44, Supplement 4 and forwarded by NRC IEB 84-02. No violations were identified.

(3) The inspector reviewed licensee actions following inadvertent damage to an electrical conduit in the Reactor Building. The conduit runs underneath the west control rod drive hydraulic control units (HCU) and was penetrated during installation of floor support bolts for an enclosure.

A contractor QA representative stated that the contents of the conduit were initially identified by licensee drawings as abandoned cables. The accuracy of the drawings was verified by pressurizing the conduit with air and observing exhaust in appropriate junction boxes. A boroscopic examination of the conduit penetration was conducted and no cable damage observed.

The contractor QA representative stated that the hole in the conduit has been plugged and a nonconformance report on the incident closed out. The inspector had no further questions. No violations were identified.

7. Performance Improvement Program (PIP) Implementation

On August 1, 1984, the inspector met with a licensee representative to review the status of PIP Rev. 2 milestones planned for completion in July, 1984. These items are described below.

-- III.3.A.2.3 (MAC 4); Final Completion Report regarding the update of equipment lists. Nuclear Engineering Department memorandum NED 84-529 documents this report. The inspector reviewed copies of the revised lists (E212 electrical, M199 mechanical, and a sample of M260-1 instrumentation). These lists have been updated to incorporate previously open plant design changes for prioritized safety-related systems.

-- III.3.B.3 (MAC 5); Final Completion Report of the Design Document update task. The licensee identified and prioritized 47 systems for which updated design change documentation was required. Design documents (433 drawings) required to operate and maintain each system were identified and revised. Nuclear Engineering Department memorandum NED 84-546 documents this summary report.

-- III3.D.1.3 (MAC 2); Redraw and restore illegible system drawings. A total of 57 drawings required photo restoration and 2 were redrawn. The inspector reviewed a sample of reissued microfiche drawings.

The licensee also provided a description of the Vendor manual validation process which is ongoing in conjunction with the remaining milestone due in October, 1984, namely The Procedure Update Program.

No violations were identified. The inspector determined that the July, 1984 milestones were met.

8. Valve and Piping Nondestructive Examinations

The licensee is evaluating the ultrasonic indications found in residual heat removal (RHR) and core spray system piping outside containment (NRC Inspection Report No. 50-293/84-17). The RHR piping has been removed and is being tested to identify the nature of the defects. The licensee is evaluating the core spray piping and does not plan to replace it.

Dye penetrant indications were noted on the inner surface of an RHR primary containment penetration weld. The licensee stated that the indications were not cracks but were not acceptable by code. The indications were ground out prior to installing cladding inside the penetration piping.

Dye penetrant indications were also noted inside RHR discharge valve MOV 1001-29B. The licensee stated that the indications were acceptable fabrication defects and did not require repair.

Ultrasonic indications were noted in a nozzle weld connecting a nitrogen purge line to the torus shell. The licensee is evaluating the indications and stated that they were probably due to a lack of fusion in the weld.

The licensee has issued nonconformance reports for these indications and is determining whether LERs should be issued. No violations were identified.

9. Management Meetings

During the inspection, licensee management was periodically notified of the preliminary findings by the resident inspectors. A summary was also provided at the conclusion of the inspection and prior to report issuance. No written material was provided to the licensee during this inspection.