

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-293/87-55

Docket No. 50-293

License No. DRP-35 Priority -- Category C

Licensee: Boston Edison Company
800 Boylston Street
Boston, Massachusetts

Facility Name: Pilgrim Nuclear Generating Station

Inspection At: Plymouth, Massachusetts

Inspection Conducted: November 30 - December 4, 1987

Inspector: *CH Woodard*
Carl H. Woodard, Reactor Engineer

1/15/88
date

Approved by: *CJ Anderson*
Clifford J. Anderson, Chief Plant Systems
Section, EB

1/15/88
date

Inspection Summary: Inspection on November 30 - December 4, 1987 (Report No. 50-293/87-55).

Areas Inspected: A routine announced inspection was conducted to review the licensee's followup and corrective actions related to several of NRC's previously identified open items.

Results: A number of unresolved items and inspector followup items and one previously identified violation item were closed. No violations were identified during this inspection.

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DETAILS

1.0 Persons Contacted

1.1 Boston Edison Company

- *R. Bird, Senior Vice President Nuclear
- C. Mathias, Deputy Vice President Nuclear
- *K. Roberts, Nuclear Operations Manager
- *P. Hamilton, Senior Compliance Group Leader
- *R. Whetsel, Compliance Engineer
- C. Stephenson, Senior Compliance Engineer
- M. McGuire, Senior Electrical Maintenance Engineer
- *N. Brosee, Outage Manager
- *R. Grazio, Field Engineering Manager
- *R. O'Neil, Surveillance Coordinator
- *W. Clancey, Systems Specialist
- R. Atkins, Senior Electrical Engineer

1.2 Nuclear Regulatory Commission

- C. Warren, Senior Resident Inspector
- *J. Lyash, Resident Inspector
- T. Kim, Resident Inspector

*Denotes those present at exit meeting.

2.0 Licensee Action on Previous Inspection Findings

2.1 (Closed) Unresolved Item 85-36-01 - Excessive Calibration Drift in Differential Pressure Switch

There are eight model 288 Barton differential pressure switches used to measure recirculation pump flow. One of these switches 261-38A required calibration adjustment in three of the four quarters of 1985. The other switches maintained their calibration. Licensee investigation reported in LER 85-032-00 revealed that the cause of the erratic operation (calibration shift) was the binding of the differential pressure switch mechanical linkage due to improper alignment. The switch roller cam guides were found to be out of place such that they were rubbing against the actuating linkage mechanism.

This condition was corrected by repositioning the roller cam guides into their proper place thereby freeing the actuating linkage of undue friction. In order to prevent recurrence, the vendor manual

V-0055 was revised to stress the importance of proper linkage alignment and adjustment in the periodic calibration of the differential pressure switch.

This item is closed.

2.2 (Closed) Unresolved Item 86-01-03 Use of Metal Links in Place of Fuses

Inspection revealed that the licensee had initially used solid copper links instead of fuses in control circuits for certain safety related pumps and valves including RHR, core spray, and component cooling water. The links were used because it was thought to be safer than fuses due to the importance of the circuit.

The licensee has now concluded analysis of the impacted circuits and finds that correctly sized fuses will not open during normal pickup or run operation. But they will open for direct short circuits and so protect the control transformer from damage or destruction.

The inspector reviewed the licensee analysis and program for replacement of the links with fuses contained in PDC 86-18 "Removal of Solid Links in Control Transformer Circuits in 480 Volt Motor Control Centers". This program included walkdown inspections to verify all locations where links are used, engineering evaluation to select proper fuses, correction of drawings to include the fuses and to replace all metal links in safety related circuits with fuses.

The inspector confirmed that the licensee has now completed this work by a review of Implementation/Completion Status Reports for PRDC 86-18 and by inspection/review of the RHR motor operated valve electrical circuit as shown in schematic diagram E5010.

This item is closed.

2.3 (Closed) Inspector Followup Item 86-06-13 Preventive Maintenance Program - 480 volt Molded Case Circuit Breakers

In response to NRC Followup Item 50-293/86-06 the licensee committed to expand and strengthen the preventive maintenance of 480 volt molded case circuit breakers.

The inspector confirmed that the licensee has developed and implemented maintenance, trip settings, testing and acceptance of these circuit breakers in accordance with Procedure No. 8.Q.3-3 entitled 480 VAC Motor Control Center Testing and Maintenance, Revision 8, dated October 30, 1987. This procedure was developed by the licensee and it incorporates the manufacturer's recommendations.

The licensee has implemented the following periodic schedule for cycling a certain percentage of these circuit breakers through this preventive maintenance program each refueling outage.

| | |
|----------------------------------|------------|
| safety related harsh environment | 50 percent |
| safety related mild environment | 33 percent |
| non-safety related | 25 percent |

This item is closed.

2.4 (Closed) Unresolved Item 87-09-02 Safety-Related Batteries Maintenance

Maintenance issues identified and licensee corrective actions are as follows:

- Corrosion noted on two battery cell terminals. All battery cell terminals and connections are now inspected quarterly for corrosion in accordance with Procedure 8.C.16 "Quarterly Battery Cell Surveillance", Revision 13 dated September 2, 1987 and cleaned in accordance with Procedure 3.M.3-25 "Cleaning and Agitation of Station Batteries".
- Gray material noted in the battery electrolyte. The battery vendor, C&D Power Systems, Inc. has identified this material as minor fragments of glass fiber from the battery separator assembly which are reported to have no adverse effect on battery performance or life.
- Low specific gravity noted under licensee Deficiency ID-8504 for B-125 VDC Cell 15. This deficiency was corrected by the licensee in accordance with Procedure 3.M.3-25 which provides for agitating the battery electrolyte to eliminate stratification inaccuracies in taking specific gravity measurements.

An inspection was made of all of the safety related batteries. No deficiencies were observed except for the fact that the battery rooms are dusty from on-going work in the rooms to seal conduit and cable penetrations through the walls. The inspector confirmed that the batteries are scheduled for their 18 month technical specification capacity test prior to start-up. This test will be performed in accordance with test procedure 8.9.8 "Battery Rated Load Discharge Test." Steps 18 through 22 of this procedure require cleaning the battery rooms and batteries.

This item is closed.

2.1 (Closed) Unresolved Item 86-21-08 Problems with Master Surveillance Tracking Program (MSTP) Scheduling of Technical Specification Surveillances

In June 1986 the licensee notified the NRC that certain surveillance tests required by the technical specifications had been improperly scheduled in the MSTP and may be overdue. These tests are required to be conducted once per cycle by the technical specifications and include the following:

- Calibration of undervoltage relays that sense loss of power to the startup transformer and to the two 4160 volt safety buses to start the emergency diesel generators.
- Local leak rate tests (LLRT) of primary containment penetrations and isolation valves.

The licensee attributed wording differences in requirements as being contributing factors to the scheduling problem as follows:

- The technical specifications have two definitions of Operating Cycle:
 - Definition O (page 4): Interval between the end of one refueling cycle and the end of the subsequent refueling cycle.
 - Definition U (page 5A): The operating cycle is considered to be 18 months.
 - 10 CFR 50 Appendix J specifies a minimum LLRT frequency of once per two years.

The licensee had originally scheduled these tests to be run every 18 months. However in 1985 the test schedules were modified to change the due dates to the "next refueling outage". As a result of the extended refueling outage in 1984 and the extended operating cycle in 1985 and 1986, some of these tests exceeded an 18 month surveillance interval. The inspector confirmed licensee actions to resolve these missed surveillances and to prevent their recurrence as follows:

- During the current outage the licensee has completed the calibration of all of the undervoltage relays that sense loss of power to the startup transformer and to the two 4160 VAC safety buses to start the emergency diesel generators. The inspector further confirmed the calibration of the timing and sequencing relays associated with transfers of power and loading.

- The licensee has loaded the test information for all of these relays into their computerized Master Surveillance Tracking Program System (MSTP). The inspector confirmed that the next calibration due date for each of these relays is 18 months from the recent calibration date with a maximum slippage date consistent with the technical specification requirements.
- The inspector reviewed licensee letter BECO 86-153 to USNRC which requested interpretation/clarification of the containment leakage testing intervals for the Type A, B, and C tests of 10 CFR 50 Appendix J. The inspector confirmed that the licensee has performed the LLRT of primary containment penetrations and isolation valves on a component by component basis. Further in order to assure that the 10 CFR Appendix J maximum two year test interval criteria is met, the licensee has entered each containment penetration as a separate test line item in the MSTP. The inspector confirmed from a current printout of the MSTP that each component is shown with a fixed next test due date which is less than the two year maximum test interval from the last test date.
- Reviewed the licensee analyses of the causes of missed surveillances and also the analyses made by an outside independent consulting firm as reported in "PLG-0516 Pilgrim Nuclear Power Station Late or Missed Surveillance Test Root Cause Analysis, dated December 1986". This report included eighteen specific recommendations to the licensee to improve the MSTP program.
- Reviewed the MSTP detailed program evaluations findings made in NRC Inspection Report 87-41 which covers implementation of improvements in the program.
- Reviewed the new PNPS Master Surveillance Tracking Program, Procedure No. 1.8 Revision 5 dated January 8, 1987. In addition, the inspector attended a detailed presentation of the program and its implementation which was made by the licensee senior surveillance coordinator and by the Deputy Vice President of Nuclear Operations who is directing the MSTP program effort.

Conclusions reached during this inspection are essentially the same as those made during the MSTP evaluation review conducted during NRC inspection 87-41. It was determined that BECo has provided the resources, time, and qualified personnel to develop and implement the new MSTP.

This item is closed.

2.6 (Closed) Violation (85-03-04) Failure to Perform Technical Specification Surveillance, Calibration and Functional Testing of the Rod Block Monitors.

On February 21, 1985 the licensee notified the NRC of technical specification surveillances that had been missed during the December 1984 - January 1985 startup sequence. The missed surveillances included the control rod block monitor surveillance, calibration and functional testing. The requirements are included in licensee procedures 8.M.2.3.1 "Rod Block Monitor" which is scheduled monthly to satisfy the functional test requirements of Technical Specification Table 4.2.C. Procedure 8.M.2.3.2 "Rod Block Monitor Calibration" is scheduled every six months and is used to fulfill the requirements of Technical Specification Table 4.2.C. The licensee stated that the surveillances were missed because specific due dates had not been entered for the tests in their Master Surveillance Tracking Program (MSTP).

Followup NRC inspection reported in Inspection Report 85-03 considered that the licensee identification of the violations of the technical specifications and corrective actions were inadequate in the following areas.

- Failure to functionally check the portion of the rod block logic system which is operable in the "Run Mode" prior to declaring the logic system operable. This problem was caused by delays in conducting tests 8.M.2-3.6-1 and 8.M.2-3.6.2 which were also listed in the MSTP schedule with start-up due dates.
- Failure to functionally test the downscale rod block trips prior to declaring them operable in the "Run Mode". The functional test procedure 8.M.1-3 was considered inadequate in that tests were not required until the reactor power is between 30-60 percent.

The licensee took immediate corrective actions as reported in LER 85-005-00 "Missed Surveillance Tests" to perform the required surveillances. The licensee also reported the root causes of the missed technical specification requirements and corrective actions which were to be taken to prevent recurrence by letter response to the violation dated May 17, 1985.

The inspector verified licensee corrective actions taken to prevent recurrence as follows:

- Implemented changes into the MSTP program including consultants recommendations contained in report "PLG-0516 - Pilgrim Nuclear Power Station Late or Missed Surveillance Test Root Cause Analysis" dated December 1986. The MSTP scheduling

for these surveillances now factors in other parameters such as power level, temperature, pressure, mode switch position and it takes into account extended time periods for the various modes. Cross referencing of related technical specifications requirements within the program is used to flag prerequisite surveillances required prior to proceeding.

- Refer to the corrective actions for missed surveillances discussed in paragraph 2.5 of this report since they apply to this item.

This item is closed.

3.0 Unresolved Items

Unresolved items are matters about which more information is needed to determine whether it is acceptable or a violation, unresolved items are discussed in paragraph 2.0.

4.0 Exit Meeting

The inspector met with the licensee's representative (identified in details, paragraph 1.0) at the conclusion of the inspection of December 4, 1987. The inspector summarized the scope of the inspection and inspection findings.

During this inspection, the inspector did not provide any written material to the licensee. The licensee representatives did not indicate that this inspection involved any proprietary information.