

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 50-293/80-20

Docket No. 50-293

License No. DPR-35 Priority -- Category C

Licensee: Boston Edison Company M/C Nuclear
800 Boylston Street
Boston, Massachusetts 02199

Facility Name: Pilgrim Nuclear Power Station, Unit 1

Inspection at: Plymouth, Massachusetts

Inspection conducted: May 4-8, 1980

Inspectors: W A Rekito
W. A. Rekito, Reactor Inspector

5/30/80
date signed

date signed

date signed

Approved by: D L Caphton
D. L. Caphton, Chief, Nuclear Support Section
No. 1, RO&NS Branch

6/3/80
date signed

Inspection Summary:

Inspection on May 4-8, 1980 (Report No. 50-293/80-20)

Areas Inspected: Routine unannounced inspection of Containment Leak Rate Testing and Licensee action on previous inspection findings. The inspection involved 42 inspector-hours onsite by one regional based inspector.

Results: Of the two areas inspected, two items of noncompliance were found in one area (Infraction - Failure to conduct CILRT in accordance with 10 CFR 50, Appendix J, Paragraph 3.g; and Infraction - Failure to perform local leak rate test following maintenance, Paragraph 4.b).

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DETAILS

1. Persons Contacted

The below listed technical and supervisory personnel were contacted.

- P. Cafarella, Performance Engineer
- F. Famulari, Senior Mechanical Engineer
- * C. Guilbert, Consultant (S&W)
- * E. Graham, Senior Plant Engineer
- * R. Machon, Assistant Station Manager
- * P. McGuire, Station Manager
- M. McLaughlin, Senior Compliance Engineer
- * R. Parry, Consultant (S&W)
- R. Silva, Maintenance Staff Engineer
- B. Sivigny, Chief Maintenance Engineer
- * P. Smith, Chief Technical Engineer
- * S. Wollman, Senior Performance Engineer

NRC Personnel

K. Roberts, Resident Inspector

The inspector also talked with and interviewed other licensee personnel during the inspection. They included members of the operating and technical staffs.

* denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

a. Items Closed

Unresolved Item (293/80-04-01): Procedure 8.7.1.4, Revision 2, "Primary Containment Integrated Leak Rate Test," has been revised to specify the **proper** acceptance criteria and use of the mass point method of data analysis. The procedure revision also corrected the valve lineup for the containment pressure transmitters. These items are considered resolved.

Unresolved Item (293/80-04-03): The inspector reviewed records for the flow transmitter orifice, used for local leak rate testing, which certified traceability to the National Bureau of Standards. The item is considered resolved.

Unresolved Item (293/80-04-09): Procedure TP 80-10, Revision 1, "Visual Examination" has been revised to include verification of spring hanger settings. The inspector also reviewed records to verify that settings had been checked for all spring hangers examined during the 1980 refueling outage. These items are considered resolved.

b. Items Remaining Open

Unresolved Item (293/80-04-02): Local leak rate test device bypass. The inspector reviewed a draft Procedure Change Notice (PCN) for Procedure 8.7.1.5 which included a prerequisite to check the leak tightness of the bypass isolation valve. This action appears to be acceptable but the item will remain open pending approval and implementation of the procedure change.

Unresolved Item (293/80-04-10): T.S. Hydraulic Snubber Inspection Schedule. The inspector reviewed an office memorandum which increased the surveillance frequency for accessible snubbers from 18 months to 12 months due to failure of the RHR snubber during the last inspection. However, the licensee has not yet completed his review of the HPCI snubber replaced during the last inspection period. The inspector discussed his concern for delaying the decision on this snubber because its effect would increase the inspection frequency to six months. This item remains unresolved pending the licensee's further action and review by NRC:RI.

Inspector Follow Item (293/77-15-08): T.S. Hydraulic Snubber Lockup Rates. The inspector requested to see documentation for piping system design thermal expansion rates during heatup to verify that these values do not exceed the snubber lockup rates. The licensee stated this information was available in their engineering office and would be provided to the NRC resident inspector. This item remains unresolved pending receipt of the necessary information and review by the NRC.

3. Primary Containment Integrated Leak Rate Test (PCILRT)

a. General

On May 4-8, 1980, Pilgrim Unit 1, performed their second periodic PCILRT. The test was conducted at a test pressure of 23 psig in accordance with Procedure 8.7.1.4, Revision 2, "Primary Containment Integrated Leak Rate Test," dated April 26, 1980. The inspector reviewed the procedure, witnessed various portions of the test, verified qualifications of test personnel, and independently verified calculations of the test results. Details of the test are discussed below.

b. Procedure Review

The inspector reviewed Procedure 8.7.1.4, Revision 2, "PCILRT" for technical adequacy and compliance with 10 CFR 50, Appendix J, ANSI N45.4, and Pilgrim Technical Specifications.

The inspector identified the fact that the procedure required measuring reactor building atmospheric pressure and temperature every four hours. ANSI N45.4 requires this data to be recorded hourly. The licensee revised the procedure to record this data each hour during the test.

c. Valve Lineup Review

On a sampling basis, the inspector checked the PCILRT procedure valve lineup sheets to verify that:

- Valve lineups were provided for each penetration;
- Valves were positioned correctly;
- Proper vent paths were provided; and,
- Artificial leakage barriers were not created which could mask containment leakage.

The inspector identified the following problems with system alignments:

- (1) Pressure Switch, PS 5030 was isolated and vented. The licensee corrected the procedure to have this switch lined up for normal operation during the test.
- (2) Penetration 47 used for the supplemental verification test was isolated creating an artificial leakage barrier. The licensee corrected the procedure to vent these two lines downstream of containment isolation valves (CIVs) P14A and P14B during the test.
- (3) Penetrations 26 and 205 used for the Containment pressurization were isolated thus creating an artificial leakage barrier. The licensee corrected the procedure by venting these lines to atmosphere outboard of CIVs AO 5033A, AO 5033B, and AO 5033C.

d. Instrumentation

The inspector reviewed the calibration records for the resistance temperature detectors, dew point instruments, pressure detectors and verification test flowmeters. Their calibration prior to the PCILRT were found to meet applicable accuracy requirements and were traceable to the National Bureau of Standards.

e. Chronology

5/5	0500	Commenced pressurization.
	0900	Identified gross water leakage from 8" pipe flange on a line from the RCIC turbine exhaust to the torus.
	1000	Above mentioned flange bolts were tightening in an attempt to repair the leak.
	1200	Commenced depressurization.
	1500	Measured leakage from RHR valve 1001-36A packing to be approximately .5 gpm and then tightened packing gland to stop leakage.
5/6	0230	Performed local leak rate test on 8" RCIC exhaust line flange. Measured leakage 6.63 standard liters per minute (SLM).
	0400	Repaired 8" RCIC exhaust line flange by replacing double O-ring seals. Post repair leak test measured zero leakage.
	0630	Commenced pressurization.
	1200	Pressurization completed. Commenced four hour temperature stabilization.
	1700	Identified air leakage from open vent in Nitrogen Makeup line and discovered that CIV AO 5033A was in the open position.
	1800	Closed CIV AO 5033A.

5/7 0325 Closed vent valve A on the compressed air supply header to isolate leakage past valves AO 4356 and AO 5046.

0525 Closed vent valve H-4 to isolate leakage in Oxygen analyzer line past CIV 5065-23.

1800 Recorded data indicated leak rate was within the acceptance criteria.

5/8 0301 Completed PCILRT and commenced supplemental verification test.

0701 Completed verification test.

0300 Performed local leak rate tests for the leakage paths isolated during the PCILRT.

f. Plant Tours

The inspector accompanied licensee personnel on various plant tours both before and during the PCILRT. During these tours, test boundaries were surveyed for evidence of leakage and on a sampling basis, selected valves were verified to be in the correct position.

During one of these tours, the inspector questioned the existence of a 6" manual isolation valve and blank flange which appeared to be part of the test boundary. The licensee's representative explained that this was part of a design modification (PDCR 79-29) for the Containment Atmospheric Dilution System scheduled to be completed at a later date. The licensee's representative satisfied the inspector's concern by initiating a change to the procedure to identify and include the modification as an extension of the PCILRT boundaries. No unacceptable conditions were identified.

g. Leakage Repairs

Paragraph III.A.1.(a) of 10 CFR 50, Appendix J requires that no repairs or adjustments be made following the containment closure inspection. The NRC position regarding the provisions of this paragraph were identified during a previous inspection 293/80-04 on January 28-31, 1980. It was clarified at that time that identified leakage paths could be isolated, provided the leak path is locally tested before repair and leakage is added to the PCILRT results to obtain the 'as found' leakage. The inspector further emphasized the need to carefully control such isolations and repairs during the test to avoid invalidating test results.

During the PCILRT, one repair and one adjustment to the containment isolation boundary were made without measuring (quantifying) the 'as found' leakage. They are:

- (1) Attempted repair (tightening) of an 8" flange on the RCIC turbine exhaust line at 1000 hours on May 5, 1980.
- (2) Made adjustment by closure of valve AO 5033A in the containment atmospheric control system at 1800 hours on May 6, 1980.

The two actions identified above represent a failure to comply with Containment Leakage testing requirements and constitute, an item of noncompliance with 10 CFR 50, Appendix J. (293/80-20-0i)

h. PCILRT Results

(1) Initial Attempt

The initial attempt of the PCILRT, from 0500 hours till 1200 hours on May 5, 1980 revealed a known leakage of 0.5 gpm from RHR valve 1001-36A and an unknown gross leakage from the 8 inch RCIC Turbine exhaust flange. The licensee's initial evaluation identified the leakage to be in excess of the test acceptance criteria. Because the 'as found' flange leakage was not measured before repair and therefore unknown, the inspector conservatively assumed the total containment 'as found' leakage to have failed to meet the acceptance criteria and therefore, identified the initial attempt at this periodic type A test to be a failure. The licensee acknowledged these comments.

(2) Successful Test

After repairs of leaks identified during the initial PCILRT attempt, the containment was repressurized and a successful test run from 0300 hours on May 7 to 0300 hours on May 8, 1980. Preliminary calculation indicated leakage at the 95% upper confidence level to be 0.383 weight percent per day (%/day). The test acceptance criteria is 0.596 weight %/day.

The inspector noted that the measured leak rate of 0.383 is not corrected for any change in the containment free volume due to water accumulation. The inspector independently calculated the leak rate, using raw data from the test with the results being identical to and verifying the accuracy of the licensee's leak rate calculations.

i. Future Test Schedule

Paragraph III.A.6.(b) of Appendix J states that if two consecutive periodic Type A tests fail to meet the acceptance criteria then tests shall be performed at each refueling, not to exceed 18 months, until two consecutive periodic tests meet the acceptance criteria. The inspector noted that the initial attempt of the 1976 and 1980 periodic Type A test at Pilgrim failed to meet the acceptance criteria and that the licensee was therefore subject to the increased frequency of tests as described above. The licensee acknowledged this comment and stated that following his evaluation of the 1980 test events he would submit plans for future test schedules in his PCILRT Report.

4. Local Leak Rate Testing (LLRT)

a. Test Witness

On May 4, 1980, the inspector witnessed the Type B local leak rate test on the Containment Equipment Hatch double O-ring seal. The inspector verified that the test was conducted in accordance with the approved procedure 8.7.1.5, Revision 7, dated January 18, 1980, "Local Leak Rate Testing of Primary Containment Penetrations and Isolation Valves." The inspector observed that test instruments were properly calibrated, the operator appeared to be knowledgeable of the procedure and suitably qualified and the results appeared to be satisfactory. No unacceptable conditions were identified.

b. Special Testing Requirements

Paragraph IV.A of Appendix J requires that any modification or replacement of a component which is part of the primary reactor containment boundary be followed by the applicable type leakage rate test.

Paragraph VII.E of PNPS Procedure No. 8.7.1.3, Revision 2, dated January 4, 1980, Local Leak Rate Test stated "Whenever maintenance is performed on any of the tested valves, seals or penetrations which affect their leak tight integrity, such valve, seal or penetration must be retested..."

Following the identification of the leak from the 8 inch RCIC turbine exhaust line flange during the PCILRT, the inspector requested to see the test records and maintenance records for this component.

Review of Maintenance Request No. 080-696, dated April 15, 1980 revealed that the RCIC flange was disassembled on May 2, 1980 to inspect the adjacent stop check valve 1304-64. The licensee's representative stated that the post work testing requirement (LLRT) was not performed due to an oversight and inappropriate closeout of the maintenance request documentation.

Failure to perform a local leak rate test of the RCIC turbine exhaust line flange, which is part of the reactor containment boundary, following maintenance on May 2, 1980 constitutes an item of noncompliance with 10 CFR 50, Appendix J and PNPS Procedure No. 8.7.1.3. (293/80-20-02)

5. Maintenance Activities

The inspector noted that two of the problems encountered during the PCILRT were caused in part, by the licensee's maintenance activities. They were: (1) MR No. 080-696, Failure to perform required post work retest discussed in Paragraph 4.b of this report; and (2) MR 080-4122 used to replace solenoid valve SV-5033A. It was discovered during the PCILRT that this valve would not close by its normal means because the air supply was connected incorrectly. The licensee's representative explained that this maintenance request final review had not been completed and the installation error would have been identified during the functional operability test for this valve.

The inspector questioned the licensee's representative about remaining outstanding work activities, especially those affecting reactor containment integrity and other safety related components.

The licensee's representative stated that a special review has been started of all work activities from the recent refueling outage. This review is intended to verify the proper and complete close out of all safety related maintenance requests prior to the next plant startup.

This matter will receive further review during a subsequent inspection. (293/80-20-03)

6. Surveillance of Hydraulic Shock Suppressors (Snubbers)

The inspector reviewed Procedure 3.M.4-28, Revision 6, dated March 7, 1980, Inspection of Hydraulic Shock Suppressors (snubbers), Mechanical Shock Arrestors, Pipe Hangers and Restraints. As a result of this review, the inspector questioned the adequacy of the procedural guidance. The licensee's representative satisfied the inspector's concerns by initiating a procedure change notice (PCN) to improve clarification of the acceptance criteria and document review of the inspection results on the data sheet.

No items of noncompliance were identified.

7. Control Room Observations

The inspector observed Control Room operations on both day and evening shifts. Activities reviewed included: manning requirements, status of plant systems, and equipment tagging requirements.

No items of noncompliance were observed.

8. Unresolved Items

Unresolved items are matters about which more information is required to determine acceptability. Paragraph 7.b of this report contains unresolved items.

9. Exit Interview

The inspector met with licensee representatives (See Detail 1 for Attendees) at the conclusion of the inspection on May 8, 1980. The inspector summarized the scope and findings of the inspection at that time.