U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-293/87-58

Docket No. 50-293

License No. DPR-35

Licensee: Boston Edison Company
800 Boylston Street
Boston, Massachusetts 02199

Facility Name: Pilgrim Nuclear Generating Station

Inspection At: Plymouth Massachusetts

Inspection Conducted: December 20-23, 1987

Inspector: Joseph A. Golla, Reactor Engineer — date: 2/17/88

Approved by: P. K. Eapen, Chief, Special Test Programs Section, EB, DRS — date: 2/17/88

Inspection Summary: Routine unannounced inspection of containment integrated leak rate testing and preliminary results evaluation on December 20-23, 1987. (Report No. 50-293/87-58)

Results: No violations or deviations were identified. The inspector did however note deficiencies in the area of administrative control of test activities with regard to procedural sign-offs, inadequately detailed test log of events, and lifted electrical leads not restored for the test which had impact on the test. A hardware problem noted was a dismounted pressure gage on a section of HPCI turbine gland seal leak-off piping which allowed for water leakage upon containment pressurization. These deficiencies constitute an unresolved item (UNR No. 50-293/87-58-01).

Details

1.0 Persons Contacted

*J. Alexander, Operations Manager
*R. Barrett, Deputy Station Manager
*J. Bellefeuille, Onsite Safety & Performance Group Leader
*M. Brosee, Outage Manager
*J. Busa, Test Engineer (Stone & Webster)
*N. Desmond, Sr. Mechanical Engineer-Acting QC Group Leader
*B. Lunn, Sr. Compliance Engineer
*P. Manderino, Sr. Test Engineer
*R. Parry, Sr. Test Engineer (Stone & Webster)
*K. Roberts, Nuclear Operations Manager
*R. Schifone, Sr. QA Engineer
*J. Seery, Technical Station Manager

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*J. Lyash, Resident Inspector

*Indicates those present at the exit meeting on December 23, 1987.

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

2.0 Containment Integrated Leak Rate Testing

2.1 General

During the period December 20-23, 1987, a periodic Containment Integrated Leak Rate Test (CILRT) was conducted at Pilgrim Nuclear Generating Station, as required by 10 CFR 50, Appendix J. The test was conducted with containment isolation boundaries in an "As-Left" condition.

The test was performed in accordance with Station Procedure No. 8.7.1.4.2 "Primary Containment Integrated Leak Rate Test," Revision 4. The inspector reviewed the test procedure and witnessed preparations and various portions of the "As-Left" CILRT.

The purpose of this inspection was to ascertain that the CILRT was conducted in compliance with the requirements and commitments referenced in the following sections, and that the test results met the acceptance criteria specified in the station procedures and Appendix J, 10 CFR 50. The procedures were reviewed for their technical adequacy to perform the intended activities.

2.2 References

* Pilgrim Nuclear Generating Station Technical Specifications.

* 10 CFR; Part 50, Appendix J, Primary Reactor Containment Leakage Testing for Water Cooled Power Reactors.

* Final Safety Analysis Report (FSAR).

* ANSI/ANS 56.8-1981, Containment Systems Leakage Testing Requirements.

* USNRC I&E Information Notice No. 85-71; Containment Integrated Leak Rate Tests.

2.3 Documents Reviewed

* 8.7.1.4.1, Primary containment integrated leakage rate test preparations, Revision 5.

* 8.7.1.4.2, Primary containment integrated leakage rate test, Revision 4.

* BECO quality control inspection reports - various covering the CILRT.

* Calibration reports for CILRT instrumentation.

* Local Leak Rate Test results.

2.4 Administrative Control of CILRT and Procedure Review

The inspectors reviewed procedural sign-offs, the CILRT Log, and the Main Control Room Daily Log to verify that:

* Test directors were designated and their responsibilities were clearly defined.

* The procedures were adequately detailed to assure satisfactory performance.

* Test prerequisites were met.

* All systems required to maintain the plant in a safe condition were operable and in their normal mode.

* All required plant parameters were being recorded on at least an hourly basis.

The inspector noted that in several cases procedural sign-offs were entered late, and brought this to the attention of the licensee. The inspector noted also that the degree of detail of entries in the test log of events was insufficient to reconstruct all significant events and milestones of the test.

The inspector observed that access to the reactor building during the test was appropriately restricted to personnel either directly involved with the test or those with a specific short term need for access. Plant personnel were given a CILRT briefing prior to the test to ensure that people not directly involved with testing activities were aware of the importance of maintaining control of CILRT activities and reactor building access.

2.5 Test Witnessing

The inspector witnessed portions of the following test activities:

1. Containment Atmospheric Stabilization.

2. Twenty four hour CILRT data acquisition.

3. Four hour instrument verification.

These activities were witnessed to verify that the CILRT was conducted in accordance with the test procedure and within the regulatory requirements of 10 CFR 50, Appendix J. The inspector made several reactor building walk downs to inspect for the existence of artificial boundaries and boundaries showing evidence of leakage. Additionally, the licensee had leak crews throughout the reactor building during the initial stages of the test. Two leakage paths were identified by the licensee during containment pressurization. One was an air leak at pressure transmitter 65-PT-10001-601B. This was a needle valve vent leak on the 74' elevation in the reactor building. This amount of leakage was judged to be minor and was left alone for the test, it was secured after the test. The other leakage path was through a "tee" connection on an HPCI turbine gland seal leak-off pipe and out the fan motor shaft of the HPCI turbine gland seal condenser blower which resulted in a water leak in the HPCI pump room. This section of piping became pressurized as a result of the static CILRT pressure forcing suppression pool water up the HPCI turbine exhaust pipe, into this pipes condensate drain pot, past containment isolation valves (CIV's) CV9068A and CV9068B and into the turbine gland seal condenser. The "Tee" connection where the water leakage occurred was installed to accommodate a pressure gage. The gage was found on the floor of the HPCI pump room and the connection was open to the reactor building atmosphere. It was unknown how this pressure gage became dismounted from its "Tee" connection. The suppression pool water flowed past CIV's CV9068A, CV9068B because they had opened upon level indication in the drain pot. This occurred

because electrical leads had been lifted which bypass the HPCI turbine trips for these valves for a functional test of HPCI which had yet to be completed. This constitutes an administrative oversite on the part of the licensee because the lifted leads should have been restored for the CILRT. Under accident conditions, which CILRT is designed to simulate, these valves would stay closed regardless of the level in the drain pot. The licensee then isolated this leakage pathway and began the test. The inspector discussed the oversight with the licensee and determined that it was not a situation which would have compromised containment integrity during plant operation. The leads would have been restored upon completion of the HPCI functional test. The inspector did however convey to the licensee concern about maintaining good administrative control over activities which may affect the containment boundary.

2.6 Test Instrumentation

The inspector reviewed the calibration records of the CILRT instrumentation to ascertain that the instruments had been calibrated within the 6 month period prior to the test, as per the industry standard ANSI/ANS-56.8-1981. The calibrations were traceable to the National Bureau of Standards. The inspector also verified that the instrument system satisfied the specifications given in the instrument selection guide of ANSI/ANS-56.8-1981. The inspector observed the operation of the automatic data collection system during the conduct of the test.

No unacceptable conditions were identified.

2.7 Chronology of Events

December 21, 1987 0543; commenced containment pressurization.

Inspection for leaks commenced at 5 psig.

Inspection results; pressure transmitter PT-65 10001-601B needle valve vent leaking. At 1440 hrs. water leak reported in HPCI room. Water coming out of gland seal condenser via a missing plug (pressure gage) upstream of HO-84B. Problem diagnosed and leak isolated.

1815; began stabilization period.

2215; stabilization period completed.

2225; began 24 hr test period.

December 22, 1987 2225; completed 24 hr test period.

2305; began supplemental leak rate test

December 23, 1987 0355; supplemental leak rate test complete.

2.8 Temperature Stabilization

The containment atmosphere must meet the following criteria per station procedure 8.7.1.4.2: "The primary containment stabilization period shall be a minimum of four hours long. Stabilization criteria will have been satisfied when the average containment temperature change is less than 0.5 degree/hr over the last two hours."

The inspector independently calculated the average containment temperature change over the last two hours of the four hour stabilization period to be .03 degree F/hr. This meets the criteria for temperature stabilization.

2.9 CILRT Results

The inspector independently calculated the CILRT leak rate utilizing an NRC approved computer code. A comparison of licensee and inspector computed results is given below. Results are in weight %/day.

24 HR CILRT

	TOTAL TIME METHOD		MASS POINT METHOD	
	LICENSEE	NRC	LICENSEE	NRC
Measured (Lam)	0.189	0.188	0.181	0.184
Lam + UCL	0.240	0.238	0.183	0.187
Acceptable	0.750	0.750	0.750	0.750

The licensee and inspector computations show close agreement. These preliminary results indicate a successful "As-Left" CILRT. Note that corrections for improvements to containment isolation boundaries (Type B&C Leakages) indicate a failure of the test criterion for the "As-Found" condition of the containment. This has been acknowledged by the licensee and reported in LER number 86-017-00. A final test results evaluation is pending NRC review of the licensee's summary technical report. The twenty-four hour CILRT was followed by a successful four hour superimposed leak verification test.

3.0 QA/QC Coverage

The inspector discussed coverage of the CILRT with QA/QC representatives. It was determined that QA provided coverage of test prerequisites such as valve lineup. QC also provided coverage of test preparations as well as ongoing coverage during the test. The inspector reviewed various quality control inspection reports pertaining to the CILRT. The reports were administered well and findings were clearly presented. No unacceptable conditions were identified.

4.0 Unresolved Items

The below-listed problems identified during the inspection may indicate a lack of attention to detail and sufficient overview of activities. Therefore, these issues collectively constitute an unresolved item (UNR No. 50-293/87-58-01) pending licensee action to determine the scope of the problems, root causes, and appropriate corrective actions:

(1) Procedural sign-offs and test log of events as described in Section 2.4.

(2) HPCI turbine trip bypass leads lifted and not restored for the test which resulted in a water leak in the HPCI pump/turbine room as described in Section 2.5.

(3) Reason for pressure gage being dismounted from "tee" connection on HPCI turbine gland seal leak-off pipe described in Section 2.5.

5.0 Exit Meeting

Licensee management was informed of the purpose and scope of the inspection at the entrance interview. The findings of the inspection were periodically discussed and were summarized at the exit meeting on December 23, 1987.

Attendees at the exit meeting are listed in section 1.0 of this report. At no time during the inspection was written material provided to the licensee by the inspectors.

The licensee's representatives did not indicate that this inspection involved any proprietary information.