U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-354/85-65

Docket No. 50-354

License No. CPPR-120

Licensee: Public Service Electric & Gas Company
80 Park Plaza - 71C
Newark, New Jersey 07101

Facility Name: Hope Creek Generating Station

Inspection At: Hancocks Bridge, New Jersey

Inspection Conducted: December 23, 1985 to January 3, 1986

Inspectors: Jon R. Johnson, for S. Kucharski, Reactor Engineer — 1/29/86 date

for J. Golla, Reactor Engineer — 1/29/86 date

Approved by: Jon R. Johnson
J. Johnson, Chief,
Operational Programs Section, OB, DRS — 1/29/86 date

Inspection Summary:
Inspection on December 23, 1985 to January 3, 1986 (Report No. 50-354/85-65)

Areas Inspected: Routine announced inspection including: Integrated Leak Rate Test (ILRT) procedure review, ILRT witnessing and results evaluation, QA/QC involvement, and tours of the facility. The inspection involved 115 hours onsite by two region-based inspectors.

Results: One violation was identified (closure of a containment isolation valve by other than normal operation, paragraph 2.5).

DETAILS

1.0 Persons Contacted

1.1 Public Service Electric & Gas Company (PSE&G)

*A. Barnabei,	Principal QAE
*W. Brammeier,	QA Engineer
*R. Brandt,	Inspection Services Engineer
*J. Carter,	Startup Manager
*C. Churchman,	Site Engineering Manager
*R. Donges,	Lead QAE
*G. Druffner,	Test Engineer
*G. Duncan,	Senior ISI Supervisor
*R. Griffith,	Principal QAE
B. Hicks,	Test Engineer
*R. Johnson,	Site Engineer
*A. Kao,	Principal Engineer
*S. LaBruna,	Assistant General Manager - HCO
*L. Lake,	ISI Engineer
*P. Landrieu,	Project Manager
*J. Lawrence,	Licensing Engineer
E. Maloney,	ISI Engineer
*M. Metcalf,	Principal QAE
*S. Riggle,	QA Engineer
*R. Salvesen,	General Manager - HCO
*S. Saundra,	Senior Operations Supervisor

1.2 Bechtel Construction

K. Wareham, Engineer

1.3 Stone & Webster Engineering Corporation

H. Thickman, Test Engineer

1.4 USNRC

*R. Borchardt, Senior Resident Inspector

*Denotes those present at exit meeting on January 3, 1986.

2.0 Containment Integrated Leak Rate Test

2.1 Documents Reviewed

- PTP-GP-1, Rev. 0, November 8, 1985, "Primary Containment Integrated Leak Rate Test (CILRT)"
- piping and instrumentation diagrams relevant to ILRT valve lineup

- calibration records for: 3 pressure gauges, 6 dewpoint hygrometers, 17 resistance temperature detectors, and 1 air flow meter
- containment volume fraction calculation
- ILRT related Technical Specifications
- instrumentation selection guide
- ILRT log of events
- QA/QC log
- ILRT data center log
- P-1000-1-GP-09, Rev. 0, December 10, 1985, Bechtel work plan/procedure record, "Leak Testing of Piping Systems, Test Procedure and Report"

2.2 Scope of Review

The inspectors reviewed the above documents to ascertain compliance with the regulatory requirements of 10 CFR 50, Appendix J; Hope Creek draft Technical Specifications; applicable industry standards and station administrative guidelines. The inspectors witnessed activities related to the ILRT and subsequent ILRT verification test. Also witnessed were structural integrity test (SIT) completion and drywell to torus bypass test. The inspectors performed an independent calculation of ILRT leak rate using PSE&G test data.

2.3 Procedure Review

The inspectors reviewed the ILRT procedure PTP-GP-1 for technical adequacy and consistency with regulatory requirements. Review of the procedure's acceptance criteria, test methods and references indicate adequate conformance with 10 CFR 50, Appendix J. The inspectors reviewed the procedural valve line-ups for containment piping penetrations. This review was performed to ensure that systems were properly vented and drained to expose the containment isolation valves to test pressure with no artificial boundaries.

No unacceptable conditions were identified.

2.4 ILRT Instrumentation Calibration

Prior to performance of the test the inspectors reviewed the calibration records for the resistance temperature detectors (RTD's), dew point instruments, precision pressure gauges, and the verification test flow meter. This review determined that Precision Pressure

Gauge No. 2686 was not within the required 6 month calibration frequency for ILRT instrumentation. Also, no records on the calibration of the ILRT verification test flow meter were available. The inspectors informed the licensee of these deficiencies which were then promptly corrected before performance of the test. The precision pressure gauge was recalibrated by PSE&G Nuclear Service Personnel and another air flow meter with current calibration was obtained. The rest of the ILRT instrumentation was found to meet calibration accuracy and frequency requirements. Calibration standards used were traceable to the National Bureau of Standards.

2.5 Test Performance & Control

The SIT, and drywell-to-torus bypass tests were performed within the guidelines of the procedure. SIT completion involved pumping the containment to specific pressures to permit visual (soap bubble) examinations required to complete the primary containment ASME Code Section III acceptance pressure testing. The purpose of the drywell-to-torus bypass test was to verify that the leakage from the drywell to the suppression chamber which bypasses the downcomer vents is within the acceptance criteria.

The ILRT of the containment is designed to test its leak tight integrity. A problem with this test arose when a post test inspection by QA personnel of CIV's inside containment revealed a CIV with it's clutch lever down. This indicated that the clutch was engaged and that the valve, instrument air valve No. KL-001 (HV-5148), was closed by it's handwheel. Normal operation for this valve is accomplished by its motor operator. Hand tightening of valves which are normally motor operated may result in a tighter closure which can inhibit leakage through the valve and may cause a test result which does not reflect the actual leak tight integrity of the containment under accident conditions.

Although licensee QA personnel identified this problem it is considered a repetitive type of event; QA personnel had identified similar findings prior to the initiation of the ILRT for which the appropriate operations and test personnel had been made aware of and reportedly corrected. Therefore, it appears that additional corrective actions are warranted in the area of procedural control of valve operations.

Closure of a CIV for an ILRT by other than normal means is a violation of 10 CFR 50, Appendix J, Section III.A.1.(b) (50-354/85-65-01).

2.6 Test Chronology

See Attachment 1 to this report.

2.7 Test Results Reviewed

2.7.1 ILRT

The licensee evaluated the test results for the 24 hour period 0421 December 31, 1985 to 0435 January 1, 1986. The calculated leakage rate at the upper confidence limit (UCL) was 0.181 WT. %/day. This was done using the mass point method. The test acceptance criteria based on 0.75 La is 0.375 WT %/day.
The inspectors performed an independent calculation of the test results using test data to compare with the licensee's leak rate calculation. A comparison of licensee to NRC results is given below. The units are WT %/day, allowable is 0.375.

Licensee

Mass point method - 0.176, Calculated UCL - 0.181

NRC

Mass point method - 0.175, Calculated UCL - 0.179

The above values are subject to add-on local leakages from valves that will be reworked after the ILRT.

Also, the total local leakage from instrument Air Valve No. KL-001 (HV-5148) is planned to be added to the ILRT result as previously detailed in paragraph 2.5. This is the CIV which was found to be manually closed. This add on leakage will compensate for any difference in leakage through the valve which may have occurred due to it being hand tightened instead of being closed by its motor operator.

2.7.2 ILRT Verification Test

The ILRT was followed by a successful superimposed leak verification test. The licensee imposed a leak of 0.470 WT %/day on the existing overall containment leakage. This number represents approximately 1.0 La. The test results were within the acceptance criteria band.

The inspectors also verified these results by independent calculations. A comparison is given below. Again, units are containment air WT %/day.

Licensee

Mass Point Band - $0.520 \leq 0.571 \leq 0.770$
NRC - Mass Point Band - $0.520 \leq 0.591 \leq 0.770$

These preliminary results indicate a successful ILRT.

2.7.3 Drywell-To-Torus Bypass Test

The bypass leakage rate satisfied the acceptance criteria of a drywell-to-torus differential pressure change of less than 0.25 inches of water per minute for 10 minutes.

2.7.4 SIT Completion

This test was performed by the licensee in conjunction with contractor personnel (Becthel Construction) and was fully successful. All weld joints within the test boundary were examined for leak tightness and found to be acceptable.

No unacceptable conditions were noted.

3.0 Facility Tours

The inspectors conducted inspection tours independently both before and during ILRT. Examined during these tours were containment system boundaries, component tagging, and instrumentation to support the ILRT. During these tours the inspectors observed licensee personnel checking for evidence of leakage and inspecting containment boundaries.

No unacceptable conditions were noted.

4.0 Independent Calculations

The inspectors performed independent calculations of the containment leakage and subsequent ILRT verification test. Details are included in Section 2.7 of this report.

5.0 QA/QC Involvement

The inspectors observed QA/QC personnel monitoring the activities concerning the SIT, ILRT, ILRT Verification Test, and Drywell-to-torus bypass test. QA/QC personnel performed 24 hours surveillance of these activities and were knowledgeable of test sequences and their responsibilities.

No unacceptable conditions were noted.

6.0 Exit Meeting

A meeting was held on January 3, 1986 with PSE&G/Hope Creek management to discuss the scope and findings of the inspection as delineated in this report. At no time during this inspection was written information provided to the licensee.

Attachment 1 to Report 50-354/85-65

Test Chronology

DATE	TIME	ACTIVITY
12/27/85	1315	Commenced final drywell walkdown
12/28/85	0555	Commenced pressurizing w/incremental hold points for SIT completion
12/29/85	0045	SIT completed and results acceptable
12/30/85	2330	Commenced pressurizing for ILRT
	2355	Commenced 4 hr. stabilization period
12/31/85	0421	Commenced ILRT
01/01/86	0435	Completed ILRT, realigning computer program for the ILRT verification.
	0800	Commenced verification test
	1200	Completed verification test
	1245	Reviewed verification test data and found satisfactory results.
	1335	Commenced depressurization
	2310	Completed post test inspection of torus exterior shell & supports. No deficient conditions noted.
01/02/86	0114	Completed torus interior structural inspection. No deficient conditions noted.
	0205	Commenced inspection of 17 motor operator CIV's in drywell.
	0310	Inspection of 17 CIV's completed. One valve KL-001, HV-5148 was found to have manual operator clutch engaged.
	0350	Commenced post ILRT drywell inspection
	0607	Completed post ILRT drywell inspection. No structural or equipment deficiencies noted.
	2343	Commenced drywell-to-torus bypass test stabilization.
01/03/86	0050	Commenced bypass test
	0112	Completed bypass test
	0210	Drywell depressurized.