

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-247/84-27

Docket No. 50-247

License No. DPR-26 Priority -- Category C

Licensee: Consolidated Edison Company of New York

4 Irving Place

New York, New York 10003

Facility Name: Indian Point Nuclear Generating Station, Unit 2

Inspection At: Buchanan, New York

Inspection Conducted: September 17-21, 1984

Inspectors: *DJ Vito*
D. J. Vito, Reactor Engineer

10/19/84
date

Approved by: *L. H. Bettenhausen*
L. H. Bettenhausen, Chief
Test Programs Section

10/22/84
date

Inspection Summary:

Inspection on September 17-21, 1984 (Inspection Report No. 50-247/84-27)

Areas Inspected: Routine, unannounced inspection of the containment leakage testing program including procedure review of the Containment Integrated Leak Rate Test (CILRT) and Local Leak Rate Test (LLRT) procedures, CILRT witnessing, CILRT and LLRT test results review, and general tours of the facility. The inspection involved 49 hours onsite by one region based inspector.

Results: No violations were identified.

DETAILS

1. Persons Contacted

Consolidated Edison

- P. Bajohr, I&C Engineer
- *A. Bar, Operations Analysis Engineer
- J. Basile, General Manager, Operations
- *M. Blatt, Director, Regulatory Affairs
- K. Burke, General Manager, Administrative Services
- J. Goebel, Associate Test and Performance Engineer
- A. Nespoli, Major Projects Manager
- *S. Quinn, General Manager, Technical Support
- *J. Quirk, Test and Performance Engineer
- *H. Reizenstien, Senior Reliability Engineer, Quality Assurance and Reliability
- G. Tobler, Support Facilities Supervisor

EBASCO

- *P. Dillon
- *A. Musto
- W. Shell

U.S. Nuclear Regulatory Commission Personnel

T. Kenny, Senior Resident Inspector

*Denotes those present at exit interview on September 21, 1984.

2. Containment Integrated Leak Rate Test

2.1 Documents Reviewed

- Procedure PT-3Y1, Integrated Leak Rate Test, Revision 4, 8/17/84
- Procedure PT-A2-A, Internal Containment Structural Visual Inspection, Revision 0, 9/8/84
- Procedure PT-A2-B, External Containment Structural Visual Inspection, Revision 0, 9/8/84
- Test Log
- Test Data and Calculated Results
- CILRT-related Piping and Instrument Drawings

2.2 Scope of Review

The inspector reviewed the documents listed above for technical adequacy and to determine compliance with the regulatory requirements of Appendix J to 10 CFR 50, Technical Specifications, applicable industry standards, and with station administrative guidelines. The inspector witnessed a large portion of the CILRT and subsequent leakage verification testing. The inspector also performed an independent calculation of the test results.

2.3 Procedure Review

The inspector reviewed the "as-run" copy of the CILRT procedure for technical adequacy and for consistency with regulatory requirements, guidance, and licensee commitments. The procedure referenced and was in general conformance with the test methods and instrumentation guidelines stated in industry standard ANSI/ANS 56.8-1981, Containment System Leakage Testing Requirements. The procedure was well written and informative and included descriptive information regarding volume fraction calculations for both the RTD's and the dewcells and instrument specifications. The procedure valve lineups were reviewed to ensure that systems were properly vented and drained to expose the containment isolation valves to containment atmosphere and test differential pressure with no artificial leakage barriers. No unacceptable conditions were identified in these areas.

The inspector questioned the acceptance criterion stated in the procedure for the "As-Found" CILRT test result. The procedure acceptance criterion for this value was given as 0.1 wt%/day or La. The inspector noted that this acceptance criterion was related to overall integrated leakage measured during plant operation. The licensee's interpretation was that the addition of the "As-Found" leakages from penetrations isolated or in use during the CILRT to the test result should be compared to the "As-Found" limit. The inspector explained that after the repairs performed as a result of the Type B & C local leak rate test program are completed and pressurization is commenced for the performance of the CILRT, the containment is assumed to be in the "As-left" condition. All leakage additions to the Type A (CILRT) test result at that point are to be compared to the "As-Left" acceptance criterion of 0.75 La or 0.075 wt/% per day. A true "As-Found" integrated leak rate denotes the leakage from the containment as it existed immediately after plant shutdown. One method of doing this would be to add the difference between the total "As-Found" leakages measured by the Type B & C leak rate test program and the total "As-Left" leakages measured by the Type B & C program to the CILRT test result. The difference between the total Type B & C "As-Found" and "As-Left" leakages would also provide a measure of the leakage improvement accomplished by valve and penetration repairs. The licensee acknowledged the concern of the inspector and agreed that both the "As-Found" and "As-Left" leak rates, as stated in the procedure, would be compared to the regulatory test limit of 0.75 La. The inspector had no further questions with regard to this item.

2.4 Instrumentation

The inspector reviewed the calibration records for the CILRT-related instrumentation including the resistance temperature detectors, dewcells, pressure sensors, verification test flow meters, ambient temperature and pressure sensors, and the Fluke datalogger (data acquisition system). The calibration records were complete and acceptable and included certificates of calibration and NBS traceability documentation. No unacceptable conditions were identified.

2.5 Test Chronology

A large portion of the CILRT test sequence, including the supplemental verification test, was witnessed by the inspector. Inspector observations of licensee test performance and control are included in Section 2.6 of this report. The test chronology was as follows:

TEST CHRONOLOGY

| | | |
|---------|------|--|
| 9/15/84 | 0700 | Commenced pressurization of containment. |
| 9/16/84 | 1016 | Secured compressors for leak survey. Containment at 10.5 psig. Noted leaks from fan cooling unit/service water lines, airlock weld channel pressurization lines, nitrogen lines to cold leg accumulators, and an electrical penetration (H-32). Leaks to be monitored as pressure increases. |
| 9/16/84 | 1830 | Resumed pressurization of containment. |
| 9/17/84 | 1800 | Secured compressors at pressure of 66.49 psia. Isolated three (3) leaking penetrations. Airlock (80') weld channel pressurization line, fan cooling Unit 22, and electrical penetration H-32. Commenced taking data for temperature stabilization. |
| | 2215 | Completed temperature stabilization period. Acceptance criteria met. |

| | | |
|---------|------|--|
| 9/18/84 | 0400 | Commenced taking data for CILRT. |
| 9/19/84 | 0400 | Completed taking data for CILRT. Measured leak rate $L_{am} = 0.0461$ wt%/day. Leakage at 95% Upper Confidence Limit (UCL) = 0.0474 wt %/day. |
| 9/19/84 | 0500 | Imposed leak of L_a (7.2 SCFM) and commenced taking data for verification test. |
| 9/19/84 | 1000 | Measured leakage rate for verification test not falling within acceptance criteria band. |
| 9/19/84 | 1200 | After check of rotameter calibrations, licensee discovers that the two rotameters in the test rig are measuring slightly different imposed leak flows. Difference is not enough to explain the difficulty in meeting the verification test acceptance criteria. Remaining possibility is that one or both of the airlocks have experienced leakage past the inner door during the test. After the airlock becomes fully pressurized, the leak would stop, reducing the measured leak rate in the latter stages of the CILRT. Licensee decides to maintain pressure in containment and declare the first test attempt "unsuccessful". |
| 9/19/84 | 1400 | Commenced taking data for second CILRT attempt. |
| 9/20/84 | 1400 | Completed second CILRT attempt. Measured leak rate (L_{am}) = 0.026 wt/% per day. Leakage at 95% UCL = 0.028 wt/% per day. (Excluding Type C test additions) |

| | | |
|---------|------|--|
| | 1500 | Installed new calibrated large-bore rotameter for imposed leak verification test. Also installed filter in imposed leak flow line to reduce moisture accumulation which seemed to cause a problem in the test rig rotameters. |
| | 1515 | Imposed leak of 6.2 SCFM (0.081 wt/% per day). Commenced taking data for verification test. |
| 9/20/84 | 2040 | Completed verification test. Measured leakage within acceptance criteria band and test is declared successful. Post test check of the 80' airlock indicates that it was fully pressurized, confirming the earlier postulation. |

2.6 Test Performance and Control

The inspector observed test-related activities and attended several licensee meetings called to discuss problems encountered during the performance of the test. The meetings were well organized and productive and were participated in by members of upper plant management. Problems encountered during testing were addressed in a logical and technically sound manner. Test personnel were knowledgeable of test methods and precautions and were cognizant of their roles in the test. Procedural guidelines were adhered to. The test log was maintained in accordance with station procedural and administrative guidelines. No unacceptable conditions were identified.

2.7 Test Results Review

After the unsuccessful first CILRT attempt, the licensee submitted an LER pursuant to the guidelines of 10 CFR 50.72 delineating the potentiality of a test failure (due to the addition of leakrates from the penetrations isolated or in use during the test) as well as problems with the verification test. The discovery of air pressurized to containment test pressure in the 80' airlock substantiated the postulated reason for the failure of the initial verification test. The inspector agreed with the reasoning behind the failed verification test and agreed that the first CILRT attempt should be declared unsuccessful and that its results should not be used in the determination of whether

or not the CILRT has failed. The second CILRT attempt resulted in a uniform leak rate throughout the test period and should be used for the determination of test results.

The calculated leakage rates for the second CILRT attempt were 0.026 wt/% per day (measured) and 0.028 wt/% per day at the 95% upper confidence limit (excluding Type B & C test additions). The inspector performed an independent calculation of the test results using a sample of raw data from the test to estimate the accuracy of the licensee's leak rate calculations. The inspector's calculations were identical to, and verified the accuracy of, the licensee's CILRT computer program.

The success or failure of the CILRT could not be determined by the inspector at the end of the inspection as the total leakage correction for Type C penetrations isolated or in use during the test had not been tabulated. The licensee has committed to submitting a supplement to the previously noted LER informing NRC of the success or failure of the CILRT. A more detailed test results evaluation will be provided in the CILRT summary report required by Appendix J to 10 CFR 50.

3. Local Leak Rate Testing

3.1 Documents Reviewed

- Procedure PT-R26, Isolation Valve Seal Water System (IVSWS) Functional Test, Revision 7, 8/28/84.
- Procedure PT-R26A, Local IVSWS Test, Type B & C, Revision 0, 5/21/84.
- Procedure PT-R26B, Local IVSWS Test Type B & C (Nitrogen), Revision 0, 6/2/84.
- Procedure PT-R27, Containment Isolation Valve Leakage Test, Revision 10, 6/8/84.
- Procedure PT-R27A, Containment Isolation Valves 885A, B and 741A, Leakage Determination, Revision 0, 5/21/84.
- Procedure PT-R27B, Service Water Containment Isolation Valve Leakage Rate Determination Test, Revision 0, 7/19/84.
- Procedure PT-R27C, Containment Isolation Valve Leakage Rate Determination Test, Revision 2, 5/21/84.
- Type B & C Test Results Summary

3.2 Scope of Review

The inspector reviewed the documents listed above to determine compliance with the regulatory requirements of Appendix J to 10 CFR 50, Technical Specifications, applicable industry standards, and with station administrative guidelines. The inspector also held discussions with the licensee regarding the documentation of test results, the repair and retesting following failed tests, and the relationship of these items to the "As-Found" and "As-Left" condition of containment as applied to integrated leak rate test results.

3.3 Findings

The procedures reviewed were technically accurate and in conformance with the regulatory requirements of Appendix J to 10 CFR 50, applicable industry standards and licensee commitments. The test personnel interviewed by the inspector were familiar with the use of the procedures and knowledgeable of the test equipment used. The inspector reviewed the local leak rate test results summary and discussed the analysis of test results with the licensee. After resolution of a concern regarding the licensee's understanding of the definition of the "As-Found" condition of containment (See Section 2.3 of this report), the inspector was satisfied with the licensee's understanding of the application of local leak rate test results to the "As-Found" and "As-Left" conditions of containment. The licensee acknowledged the application of the test results to Technical Specification Leakage limits and to CILRT failure criteria. No unacceptable conditions were identified.

4. QA/QC Involvement

The inspector interviewed licensee QA personnel to determine their involvement in containment leakage testing activities. The inspector verified QA coverage of CILRT-related activities through discussions with QA personnel, observation of monitoring activities and by review of QA Surveillance Reports 84-SR-199, 200, 243, 244, 245, 245A, 246, and 249. The documentation review indicated QA/QC involvement in the following areas:

- instrument functional checks
- instrument placement/installation
- procedure review
- instrument calibration review
- computer program and data handling verification
- containment inspection
- test performance

The inspector concluded that QA/QC input to and coverage of the CILRT and related activities is appropriately planned, technically useful and comprehensive, and well documented. Local leak rate testing is covered on a monitoring basis. No unacceptable conditions were identified.

5. Tours

The inspector made several tours of various areas of the facility to observe CILRT-related activities, component tagging, other work in progress and general housekeeping. No unacceptable conditions were identified.

6. Exit Interview

A management meeting was held on September 21, 1984, to discuss the scope and findings of the inspection as detailed in this report. No written information was provided to the licensee at any time during the inspection.