UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report No.: 50-261/84-39

Licensee: Carolina Power and Light Company
411 Fayetteville Street
Raleigh, NC 27602

Docket No.: 50-261 License No.: DPR-23

Facility Name: H. B. Robinson

Inspection Conducted: October 29 - November 2, 1984

Inspectors: H. L. Whitener 11-27-84
H. L. Whitener Date Signed

for Frank Jape 11/27/84
L. S. Mellen Date Signed

Approved by: Frank Jape 11/27/84
F. Jape, Section Chief Date Signed
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope: This routine, announced inspection involved 74 inspector-hours on site in the areas of witnessing the Type A leak rate test and review of associated documentation; review of Type B and Type C leak rate test procedures and program; and follow-up of outstanding items.

Results: No violations or deviations were identified.

REPORT DETAILS

1. Licensee Employees Contacted

*R. E. Morgan, General Manager
*M. F. Page, Engineering Supervisor, Performance
*S. W. Farmer, Senior Engineer, Technical Support
*C. L. Wright, Senior Specialist, Regulatory Compliance
*J. C. Sturdavant, Technician, Regulatory Compliance

Other Organization

Gilbert Associates

*R. E. Shirk, ILRT Engineer
J. J. Blessing, ILRT Engineering Specialist

NRC Resident Inspector

*H. Krug

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on November 2, 1984, with those persons indicated in paragraph 1 above. The inspector stated that preliminary evaluation of the Type A test data show that an acceptable containment leak rate was demonstrated. The licensee acknowledged the inspection findings and agreed to perform post-test reverification of valve alignments for pressurized gas sources. The licensee also agreed to resolve the potential for unmonitored make-up air flow through the test rig used for local leak rate testing. This matter was identified for followup inspection as:

Inspector Follow-up Item: (50-261/84-39-01) Modify LLRT Test Rig to Prevent Unmonitored Leakage During Type C Testing (see paragraph 6).

3. Licensee Action on Previous Enforcement Matters

Not inspected.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Containment Integrated Leak Rate Test - Unit 2 (61719)

The inspector reviewed and witnessed test activities to determine that the primary containment integrated leak rate test was performed in accordance with the requirements of Appendix J to 10 CFR 50, ANSI 45.4 and the test procedure, SP-621, "Containment Integrated Leak Rate Test."

Selected sampling of the licensee's activities which were inspected included: (1) review of the test procedure to verify that the procedure was properly approved and conformed with the regulatory requirements; (2) observation of test performance to determine that test prerequisites were completed, special equipment was installed, instrumentation was calibrated, and appropriate data were recorded; and (3) preliminary evaluation of leakage rate test results to verify that leak rate limits were met.

Pertinent aspects of the test are discussed in the following paragraphs.

a. General Observations

The inspector witnessed and reviewed portions of the test preparation, containment pressurization, temperature stabilization and data processing during the period of October 29 - November 2, 1984. The following items were included:

(1) The test was conducted in accordance with an approved procedure. Procedure changes and test discrepancies were properly documented in the procedure.

(2) Test prerequisites selected for review were found to be completed.

(3) Plant systems required to maintain test control were reviewed and found to be operational.

(4) Special test instrumentation was reviewed and found to be installed and calibrated.

(5) Data required for the performance of the containment leak rate calculations were recorded at 15-minute intervals.

(6) Problems encountered during the test were described in the test event log.

(7) Pressurized gas sources were properly isolated and vented to preclude in-leakage or interference of out-leakage through containment isolation valves.

(8) Valve alignments were reviewed against system drawings to verify correct boundary alignment, and venting and draining of specific systems.

(9) Temperature, pressure, dew point, and flow data were recorded at 15-minute intervals. Data were assembled and retained for final evaluation and analysis by the licensee. A final ILRT report will be submitted to the Office of Nuclear Reactor Regulation.

No violations or deviations were identified in the above review. Relative to item (7), however, one incorrect vent path was identified by the licensee.

While performing a verification of the isolation and venting of pressurized gas sources to prevent in-leakage or blockage of out-leakage through any containment penetrations, the licensee found that the tubing connection to vent penetration No. 4, Nitrogen Supply to the Reactor Coolant Drain Tank, had been disconnected at the wrong place and did not provide a proper vent. The licensee subsequently verified that there was no leakage through the high pressure nitrogen block valve and will add the largest leakage through penetration No. 4, measured by local leak rate measurements, to the Type A test results.

b. Test Procedure Review

The inspector reviewed portions of SP 621 to verify that adequate test controls, acceptance criteria and valve alignments were specified. No significant problems were identified.

c. Leak Rate Test Performance

(1) Method

The containment leak rate was determined by the mass point-linear regression analysis on a minimum of 24 hours of data recorded at 15-minute intervals at a pressure of 21 psig. The 95% upper confidence limit was determined and a supplemental test was performed.

(2) Test Description

System conditions for the integrated leak rate test were as follows:

(a) Containment Fan Coolers - Adjusted for high density air and operating.

(b) Steam Generators - In wet layup.

(c) RHR - Shutdown cooling in operation.

(d) Instrument Lines - Isolation valves were open to transmitters which sense post accident containment pressure.

(e) Pressurized Gas Sources - Isolated and vented to atmosphere except as discussed in paragraph 5.a above.

After inspection, the containment was pressurized to 21 psig. Pressurization was started at 12:10 a.m. and was stopped at 9:10 a.m. on October 31, 1984. Containment conditions were allowed to stabilize for the next seven hours. During this period, a decrease in containment air temperature caused the containment air pressure to drop to 20.9 psig, which is below the Technical Specification test pressure of 21 psig. The containment was repressurized to about 21.4 psig in the period from 4:00 p.m. to 4:30 p.m. The perturbation of containment conditions from this pump up was small and the Type A test was initiated at 6:15 p.m. on October 31, 1984. Data were recorded at 15-minute intervals for the following 26.5 hours. The Type A test was terminated at 8:45 p.m. on November 1, 1984. An imposed leak rate of 1.15 L_t was established and a supplemental verification test was performed. The supplemental test was terminated at 12:45 a.m. on November 2, 1984.

(3) Test Results

The Technical Specification allowable leakage (L_t) for the one-half pressure test is 0.0707 wt.% of the containment volume per day. The acceptable test leak rate limit of 0.75 L_t is therefore 0.053 wt.% per day. The leak rate calculated for the 26.5 hour Type A test was 0.008 wt.% per day and the 95% Upper Confidence Limit (UCL) was 0.011 wt.% per day. These values are below the acceptable leak rate of 0.75 L_t.

A four hour supplemental test was performed in accordance with Appendix C of ANSI-45.4, 1972. The measured composite leak rate of 0.082 wt.% per day was determined after imposing a leak rate of 0.061 wt.% per day (1.94 scfm). The composite leak rate is within the upper and lower acceptable limits of 0.087 wt.% per day and 0.051 wt.% per day, respectively.

6. Local Leak Rate Testing (61720)

The inspector reviewed the following procedures to determine whether the Type B and C Leak Rate tests are in conformance with regulatory requirements, industry guides or standards, and other correspondence to the Commission:

a. EST-004, Isolation Valve Seal Water Refueling Interval

b. EST-009, Leak Rate Test of Containment Manometer Line

c. EST-046, Local Leak Rate Test of Post Accident Sample Valves

d. EST-059, Local Leak Rate Test of Nitrogen (N_2) Supply to Accumulator Isolation Valves

e. EST-060, Local Leak Rate Test of N_2 Supply to Pressurizer Tank Isolation Valves

f. EST-061, Local Leak Rate Test of N_2 Supply to R. C. Drain Tank Isolation Valves

g. EST-062, Local Leak Rate Test of Containment Instrument Air Header Isolation Valves

h. EST-063, Local Leak Rate Test of Containment Firewater Supply Isolation

i. EST-064, Containment Isolation Valve Local Leakage Rate Survey

The procedures appeared adequate to accomplish the type B&C testing specified in 10 CFR 50, Appendix J. During the procedure review, a potential non-conservative leakage path in the local leak rate test-rig was identified. This was schematically represented in several of the reviewed procedures. The licensee agreed to modify the test-rig bypass valve and associated piping to remove a possible source of inadvertent, undetected pressure leakage during testing. In addition, the licensee agreed to periodically check the leak tightness of the rotometer isolation valves during use of the test-rig. This is inspector followup item IFI (50-261/84-39-01): Modify LLRT Test Rig to Prevent Unmonitored Leakage During Type C Testing.

7. Isolation and Venting of Pressurization Sources (61720)

The inspector reviewed the required actions of IFI (50-261/82-22-01) in which PT-16.3 and PT-16.4 were to be revised to require isolation and venting of pressurization sources. To accomplish this, a new procedure EST-064, Containment Isolation Valve Local Leakage Rate Survey, has been developed and implemented for containment isolation valves individually tested and not served by Isolation Valve Seal Water or the Penetration Pressurization System.

IFI (50-261/82-22-01) relating to the isolation and venting of pressurization sources is closed by the inspection discussed above.