



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

Report No.: 50-395/88-07

Licensee: South Carolina Electric and Gas Company
Columbia, SC 29218

Docket No.: 50-395

License No.: NPF-12

Facility Name: Summer

Inspection Conducted: February 29 - March 4, 1988

Inspector: S. E. Sparks 3-17-88
S. E. Sparks Date Signed

Accompanying Personnel: J. Zeiler

Approved by: Frank Jape 3/21/88
F. Jape, Section Chief Date Signed
Division of Reactor Safety

SUMMARY

Scope: This routine, unannounced inspection was in the areas of review of post-refueling startup tests, and review of local leak rate testing.

Results: One violation was identified: Failure to properly implement procedures - Paragraph 5.d.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

L. Archie, Reactor Engineer
*M. D. Blue, Regulatory Compliance Engineer
*O. S. Bradham, Director of Nuclear Plant Operations
*L. B. Collier, Maintenance/ISI-Welding
W. Haltiwanger, Senior Reactor Engineer
*W. R. Higgins, Supervisor, Regulatory Compliance
*B. L. Johnson, Supervisor of Core Engineering
*A. R. Koon, Manager, Nuclear Licensing
*J. L. Skolds, General Manager of Operations
*D. C. Warner, Manager of Core Engineering & Nuclear Computer Services

Other licensee employees contacted included, engineers, technicians, operators, mechanics, and office personnel.

NRC Resident Inspectors

*R. Prevatte, Senior Resident Inspector
*P. Hopkins, Resident Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on March 4, 1988, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed in detail the inspection findings listed below. No dissenting comments were received from the licensee. The following new item was identified during this inspection:

Violation, 395/88-07-01: Failure To Properly Implement Procedures, Paragraph 5.d.

The licensee did identify some material as proprietary during this inspection, but this material is not included in this inspection report.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Post-Refueling Startup Tests - Unit 1 (72700, 61708, 61710)

- a. REP-107.003, Beginning of Cycle Dilution to Criticality, Revision 1, was begun on June 5, 1987, and completed on June 6, 1987.

Prior to pulling rods, both source range channels were tested for operability using the chi-squared test. The inspector independently verified the analyses from the raw data. Both systems were well behaved. The use of the chi-squared test confirms the detectors are responding proportionally to neutrons, an assurance not obtained from simply satisfying the operability surveillance required in the Technical Specifications.

With an initial boron concentration of 2222 ppm, shutdown and then control banks were withdrawn in 30 step increments until bank D was at 160 steps. The inverse count rate ratio (ICRR) was calculated for each increment. The final ICRR for source range channel 31 was 0.313. The ICRR was renormalized to 1.0 and dilution was initiated at a rate of approximately 100 gpm until the ICRR reached 0.329 on the source range. At that point, dilution was reduced to approximately 50 gpm and continued until criticality was reached. The logged critical configuration was 1734 ppmB in the Reactor Coolant System (RCS) with bank D inserted to 118 steps to level off the flux. The critical configuration, when adjusted for the observed critical bank D position, satisfies the acceptance criteria of plus or minus 50 ppmB when compared with the expected critical boron concentration.

The inspector expressed concern about the reactivity overshoot noted during the approach to criticality. It would appear prudent to stop dilution earlier to allow criticality to occur during RCS mixing with additional control rod adjustments as necessary. This approach would also reduce the amount of water processing required for the tests. This consideration was discussed and acknowledged by the licensee at the exit interview.

- b. STP-208.001, Shutdown and Control Rod Drop Test, was begun on June 3, 1987, and completed on June 4, 1987.

The inspector reviewed all drop times and recorder traces used in the determination of drop times. All drop times from initialization of drop to dashpot entry were less than the Technical Specification limit of 2.3 seconds.

- c. REP-107.008, Boron Endpoint Measurement, was begun on June 6, 1987, and completed on June 6, 1987.

The inspector reviewed test results and strip chart recordings for the licensee's test to determine the critical Reactor Coolant System (RCS) boron concentration at hot zero power. The measured value of

1830.6 ppmB agreed well with the predicted value of 1799 ppmB, satisfying the acceptance criteria of plus or minus 50 ppmB.

- d. STP-210.002, Isothermal Temperature Coefficient Measurement, was begun on June 6, 1987, and completed on June 7, 1987.

The Isothermal Temperature Coefficient (ITC) for the All Rods Out (ARO) configuration was reported to be $-3.73 \text{ pcm}/^\circ\text{F}$ for the cooldown and $-4.26 \text{ pcm}/^\circ\text{F}$ for the heatup. The average ITC was corrected for a Doppler Temperature Coefficient (DTC) of $-2.29 \text{ pcm}/^\circ\text{F}$, yielding a Moderator Temperature Coefficient (MTC) of $-1.71 \text{ pcm}/^\circ\text{F}$. However, the inspector determined that the licensee incorrectly scaled the temperature changes during the cooldown and heatup, thereby calculating an incorrect ITC, and thus an incorrect MTC. Licensee personnel involved with the test were interviewed and acknowledged the error, and subsequently revised the calculation. Correcting for the error, the licensee calculated new ITCs for the cooldown and heatup of $-2.69 \text{ pcm}/^\circ\text{F}$ and $-3.08 \text{ pcm}/^\circ\text{F}$, respectively. Considering the DTC, the new MTC average was calculated to be $-0.60 \text{ pcm}/^\circ\text{F}$. Although the new MTC conforms to the limit imposed by Technical Specification 3.1.1.3, the change is in a non-conservative direction. Proper determination of MTC ensures that the coefficient remains within the limiting condition assumed in the FSAR accident and transient analyses. The licensee is required in Station Administrative Procedure SAP-134, Control of Station Surveillance Test Activities, Section 6.5.2.b, to perform a post-test review of test results to determine programmatic and technical accuracy. The licensee failed to identify an error in the determination of the MTC, and thus performed an inadequate post-test review. Failure to properly implement procedure SAP-134 has been identified as a violation against TS 6.8.1.c (VIO 395/88-07-01).

- e. REP-103.001, Control Rod Worth Measurement, was begun on June 6, 1987, and completed on June 7, 1987.

Control rod worths were determined by rod swap. The reference bank was bank B, which had a measured worth against boron dilution of 1354 pcm. This value was 1.9% greater than the predicted bank D rod worth. The remaining bank worths were determined by rod swap and ranged from -2.7% to +1.4% more than predicted. The total rod worth was +0.01% less than predicted.

No additional violations or deviations were identified.

6. Containment Local Leak Rate Program (61720)

a. Documents Reviewed

- GTP-007 "General Procedure for Valve/Penetration Leakage Testing, Revision 4"

The procedure establishes the controls for tracking and summing the individual Type B and C local leak rate tests to verify that leakage is within the stated acceptance criteria.

- STP-115.003 "Equipment Hatch Leak Rate Test"
- STP-115.006 "Chemical and Volume Control System Valve Leakage Test"
- STP-115.114 "Instrument Air System Valve Leakage Test"
- STP-115.116 "Component Cooling System Valve Leakage Test"
- STP-115.118 "Sampling System Valve Testing Test"
- STP-115.025 "Demineralization Water System Valve Leakage Test"
- STP-115.029 "Control Rod Drive Mechanism Cooling System Valve Leakage Test"

b. Scope of Review

The inspector reviewed the overall local leakage rate program to verify that procedures have been developed and implemented consistent with regulatory requirements. The inspector reviewed the documents listed above for technical adequacy and for compliance with the regulatory requirements of Appendix J to 10 CFR 50, the Technical Specifications, and with applicable industry standards. The inspector also discussed the status of the current local leak rate test program with the licensee's representative. Included in the discussions were 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" conditions as applied to Containment Integrated Leak Rate Test (CILRT) results.

c. Findings

Based on the review of portions of the above procedures, the inspector concluded that the licensee has developed and implemented procedures which address the essential elements of the local leak rate test regulatory requirements. The licensee representatives interviewed by the inspector appeared to be familiar with the use of the procedures and knowledgeable with regulatory requirements. The inspector reviewed the local leak rate test results summary and discussed analysis of test results with the licensee. The inspector was satisfied with the licensee's understanding of the application of these results to the "as-found" condition of containment. The licensee acknowledged the application of these results to the Technical Specification overall leakage limits and CILRT failure criteria.

With no ongoing local leak rate testing being done at the time of the inspection, the inspector discussed test operations with the licensee's test personnel. The licensee personnel interviewed appeared familiar with test equipment and the use of test procedures.

No violations or deviations were identified.