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

Report No.: 50-395/90-02

Licensee: South Carolina Electric & Gas Company
Jenkinsville, SC 29065

Docket No.: 50-395 License No.: NPF-12

Facility Name: V. C. Summer

Inspection Conducted: January 8 - 12, and January 22 - 26, 1990

Inspector: John Zeiler 2/6/90
J. Zeiler Date Signed

Approved by: G A Belisle 2/6/90
G. A. Belisle, Chief Date Signed
Test Programs Section
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope:

This routine unannounced inspection was conducted in the areas of the containment local leak rate testing, verification of containment integrity, and licensee actions on previous inspection findings.

Results:

In general, the licensee's local leak rate test (LLRT) program was adequate in all areas inspected. Two weaknesses were identified regarding: 1) the lack of documentation for review to assure that penetration boundaries were properly drained before testing, paragraph 2.a, and 2) improper recording of leak rate test results, paragraph 3.b.

A strength was identified with regard to the setting of strict controls on containment isolation valve leakage limits which should help to maintain low containment penetration leakage.

In the area of containment integrity, the inspector found adequate procedures and controls were established to ensure containment integrity during unit startup and operation.

No violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

L. Collier, Operations Test Coordinator, Operations Test Unit
*H. Donnelly, Jr., Senior Engineer, Regulatory Interface
D. Goldston, Shift Supervisor, Operations Test Unit
*W. Higgens, Supervisor, Regulatory Compliance
A. Koon, Manager, Nuclear Licensing
*J. Skolds, General Manager, Nuclear Plant Operations
*G. Taylor, Manager, Operations

Other licensee employees contacted during this inspection included engineers, operators, technicians, and administrative personnel.

NRC Resident Inspector

*L. Modenos

*Attended exit interview

2. Containment Local Leak Rate Testing (61720)

The purpose of the inspection activities in this area was to ascertain that the licensee's local leak rate test (LLRT) program was being conducted in compliance with NRC requirements and applicable industry standards. The inspector reviewed LLRT procedures, evaluated test results, and reviewed containment isolation valve (CIV) maintenance records.

a. LLRT Procedure and Administrative Control Review

The inspector examined the following surveillance procedures:

GTP-302	Inservice Testing of Valves
GTP-007	General Procedure for Operation of Leak-Rate Monitors
STP-115.005	Reactor Coolant Valve Leakage Test
STP-115.007	Safety Injection System Valve Leakage Test
STP-115.009	Liquid Waste System Valve Leakage Test
STP-115.012	Service Water System Valve Leakage Test
STP-115.017	Reactor Building (RB) Spray System Valve Leakage Test
STP-115.021	Hydrogen Removal System Valve Leakage Test

The inspector verified that the following attributes were included in these procedures to ensure adequate leak rate testing of containment isolation boundaries:

(1) All required containment penetration boundaries and CIVs were included in the LLRT program.

(2) LLRTs were performed at containment integrated leak rate test (CILRT) peak design pressure.

(3) The LLRT program utilized approved methods for testing containment penetration boundaries and CIVs.

(4) Penetration leakage rates were determined using the maximum pathway leakage.

(5) The criteria and response for LLRTs and combined leakage rate failure were incorporated in the test program procedures.

Review of the above procedures indicated a weakness in the licensee's LLRT program with regard to penetration venting and draining control. The licensee's procedures for Type C LLRTs did not provide the level of detail necessary for the inspector to verify and ensure that adequate penetration draining was accomplished for all leakage tests. Step-by-step instructions of the draining process for each penetration tested were not included in the procedures and no documentation was available which described how each penetration was drained. However, the test procedures did specify purging the process piping between the test boundaries in order to remove any residual moisture left after penetration draining. Although the inspector found this practice acceptable, detailed draining instructions would provide a more positive means to assure that penetrations are being fully drained.

A strength was noted in the licensee's control of penetration leakage. Specifically, GTP-302 specified three levels of valve leakage limits, and at each level, corrective action was required should these limits be exceeded. The inspector viewed this as positive action toward keeping valve leakage rates reasonably low. The licensee also recently transferred leak testing responsibility from the Operations Department to a leak rate test group. The test group personnel appear to be more knowledgeable of test equipment and general test practices. This should provide greater coordination of test activities and control of leakage limits.

A detailed review was performed for Type C classified CIVs in the following penetrations to verify adequate alignment for venting and draining, and adequate boundary alignment for leak rate testing. No discrepancies were identified.

Penetration	304	Service water to RB cooling unit A
Penetration	305	Service water from RB cooling unit A
Penetration	403	RB cooling unit B supply
Penetration	102	RB cooling unit B return
Penetration	420	Pressure relief tank nitrogen supply/return line

Penetration	422	Pressure relief tank makeup
Penetration	418	Reactor coolant drain tank to vent header and H_2
Penetration	423	Reactor coolant drain tank
Penetration	303	Supply to RB spray nozzles - Train B
Penetration	327	Spray pump A suction from RB recirculation sump
Penetration	328	Spray pump B suction from RB recirculation sump
Penetration	401	Supply to RB spray nozzles - Train A

Penetration leakage results for each containment barrier tested were recorded and summed in GTP-302. The inspector reviewed a sample of the completed "As-Found" and "As-Left" Type B and C LLRT results from the last refueling outage through the current operating cycle. A minor weakness was identified with regard to the licensee's tracking of total penetration leakage. The inspector noted that for leak rate test results which were unquantifiable, i.e., exceeded leak rate instrumentation range, the licensee recorded the maximum instrumentation capacity as the leak rate result. This value was then added into the total containment leakage summation. The inspector was concerned that if this recording practice was used during periods of unit operation, the 0.6La technical specification (TS) total leakage limit could be exceeded without being identified. The licensee committed to revise the procedure format for tracking the total Type B and C leakage total.

The inspector tracked the maintenance, repair, and leakage retest of eight CIVs to assure that controls were established to ensure adequate maintenance and retest of CIVs. All work requests written since 1984 for valves XVC-8381, XVT-8100, XVC-8103, XVT-8112, PVT-8880, XVC-8947, MVG-8811B, and LCV-1003 were reviewed. No discrepancies were identified. The inspector concluded that the licensee has implemented a workable system to ensure that maintenance and retest of CIVs are satisfactorily completed.

b. Review of Containment Purge Valve Design

NRC Information Notice 88-73, Direction-Dependent Leak Characteristics of Containment Purge Valves, dated September 8, 1988, identified a potential problem regarding the unexpected direction dependent leakage through Fisher Series 9200 butterfly valves used in containment purge lines. These valves have a tapered seat that gives them a directionally dependent leakage characteristic. The Notice indicated that a potential problem could also exist in other valves which were normally considered to have bidirectional leakage characteristics.

The licensee uses Posi-Seal, International butterfly valves in the containment purge lines. The valve design and leak rate test configuration were reviewed by the licensee and valve vendor. Although the Posi-Seal valve sealing design is different from the Fisher design, the valve does have a preferred direction in which tighter shutoff capability is expected. However, the valves are

oriented and leak rate tested in a conservative manner. The containment inboard purge valve is tested in the non-accident direction, but this is conservative since accident pressure would be in the valve's pressure assisted direction. The outboard valve is tested in the accident pressure direction. The inspector considered that the licensee's current LLRT configuration for these valves to be acceptable and meets the requirements of 10 CFR 50, Appendix J.

Within the areas inspected, no violations or deviations were identified.

3. Verification of Containment Integrity (61715)

The purpose of the inspection activities in this area was to verify the adequacy and implementation of procedures and controls designed to maintain containment integrity and to mitigate contamination releases in the event containment integrity is lost following a loss-of-coolant accident (LOCA).

a. Primary Containment Integrity Controls

The inspector reviewed General Operating Procedure GOP-1, Plant Startup and Heatup from Cold Shutdown to Hot Shutdown, and General Test Procedure GTP-702, Surveillance Activity Tracking and Triggering, which together ensure all necessary plant conditions are established and prerequisites are met for reactor startup. The inspector verified that the procedures included the following minimum provisions that ensure primary containment integrity exists before the plant enters operational modes which require containment integrity:

(1) All penetrations required to be closed during accident conditions are closed by operable automatic valves or closed by manual valves, blind flanges, or deactivated automatic valves.

(2) All equipment hatches are closed and sealed.

(3) Each containment airlock is operable.

(4) Containment leakage rates are within technical specification (TS) limits.

(5) Sealing mechanisms associated with each penetration are operable.

The inspector reviewed STP-115.001, Penetration Isolation Verification, which provides assurance of primary containment isolation by verifying that all manual valves, blind flanges, and deactivated automatic valves are closed and locked as required. The inspector verified that the procedure included all appropriate barriers. Completed records for STP-115.001 were reviewed over the

previous seven months of reactor operation. The inspector verified that all valves were inspected and found to be in their correct position. In addition, the inspector conducted a walkdown of selected penetrations to ensure that manual isolation valves were in their required closed or locked closed position and blind flanges were installed as required. No discrepancies were identified.

b. Containment Systems Designed to Mitigate Contamination Releases

The following containment related systems designed to mitigate the consequences of contamination releases following a LOCA were inspected for compliance with plant TSs:

Containment airlocks
Containment ventilation system
RB spray and spray additive system
RB cooling system
Particulate iodine cleanup system
Combustible gas control

The inspector reviewed the following surveillance procedures and verified that the procedures complied with applicable plant TS requirements, that adequate information and instruction were provided, and that adequate acceptance criteria and limits were specified:

STP-115.002	RB Airlock Test
STP-118.004	RB Purge Isolation Verification
STP-115.022	Air Handling System Valve Leakage Test
STP-112.001	RB Spray Monthly Valve Verification
STP-112.002	RB Spray Pump Test
STP-125.010	Integrated Safeguards Test
STP-112.009	Spray Additive Tank Sodium Hydroxide Contained Solution Volume Test
STP-116.001	RB Cooling Unit Functional Test
STP-117.001	Iodine Removal System Test
STP-553.001	RB Cooling Units Performance Test
STP-301.004	Train A Containment Hydrogen Monitor Calibration
STP-301.006	Train A Containment Hydrogen Monitor Operational Test
STP-119.001	Hydrogen Removal System - Post Accident

The inspector reviewed surveillance records listed in Table 1 below and verified that the surveillances were performed at the required frequencies, test results met acceptance criteria or limits, and appropriate sign-offs, test reviews, and test concurrences were performed.

Table 1

Containment System	Procedure No.	Records Reviewed	TS
Airlocks	STP-115.002	12/05/88 - 10/29/89	4.6.1.3.b/c/d
Ventilation	STP-118.004	11/19/89 - 01/13/90	4.6.1.7.1.b
	STP-115.022	06/07/89 - 11/30/89	4.6.1.7.3
RB Spray and Additive	STP-112.001	11/11/89 - 01/06/90	4.6.2.1.a 4.6.2.2.a
	STP-112.002	10/09/89 - 12/31/89	4.6.2.1.b
	STP-125.010	11/26/88	4.6.2.1.c 4.6.2.2.c
	STP-112.009	06/06/89 - 10/15/89	4.6.2.2.b.1
RB Cooling	STP-116.001	09/22/89 - 01/12/90	4.6.2.3.a
	STP-125.010	11/26/88	4.6.2.3.b
Iodine Removal	STP-117.001	09/21/89 - 01/12/90	4.6.3.a
	STP-553.001	05/05/87 - 11/13/88	4.6.3.b/c.1/d
	STP-125.010	11/26/88	4.6.3.c.2
Combustible Gas	STP-301.004	05/26/89 - 11/08/89	4.6.5.1
	STP-301.006	11/08/89 - 01/03/90	4.6.5.1
	STP-119.001	12/18/88 - 12/15/89	4.6.5.2.a

A weakness was identified from this record review concerning the RB personnel airlock seal test conducted October 29, 1989 with the unit at power. The airlock door seal leakage limit is specified by TS 4.6.1.3.a as 0.01La. This corresponds to a total of 724 cubic centimeters per minute (cc/m). The leakage test for the inner door seal yielded 1750 cc/m. From review of the control room logbook and completed Removal and Restoration data sheets, the licensee failed to document that the Limiting Condition for Operation (LCO) was entered when the seal test failed. However, from discussions with on-duty operations personnel, the inspector was confident that, at the time of the event, operations personnel acknowledged that the LCO was entered. Appropriate action was taken by the licensee to restore the airlock operability within the 24 hours allowed by TS. The inspector determined this to be a documentation problem.

During discussion regarding the airlock test, the licensee stated that their interpretation of Action Statement a.1 for the airlock LCO 3.6.1.3 allowed them to open the outer airlock door, when the inner door is inoperable, in order to perform maintenance on the inner door and return it operability. Action Statement a.1 states that with one airlock door inoperable, maintain the operable airlock

door closed and either restore the inoperable door to operable status within 24 hours or lock the operable airlock door closed. The inspector discussed this issue with NRC Region II management, who agreed that with an inoperable inner door, the outer door may be opened, but only with the sole purpose to repair the inner door.

c. Reactor Building Spray System Walkdown

The inspector conducted a walkdown of portions the reactor building spray and spray a ditive systems located outside containment. All valves were verified to be in their required position for proper system operation. The position of automatic valves in the system lineup was also verified from the control room by observing control panel light indication status. Both trains were operational. In addition, all areas inspected were generally clean and free from debris. No unacceptable conditions were identified.

The inspection findings indicated that required plant systems and components designed to ensure containment integrity or mitigate the consequences of a LOCA were being tested as required by plant TSs.

Within the areas inspected, no violations or deviations were identified.

4. Followup on Previous Inspection Findings (92701)

a. (Closed) Inspector Followup Item (395/89-15-02): Non-Citable Violation (NCV) for Failure to Fully Implement Section XI IST Pump Requirements

This NCV identified two examples in which the licensee failed to fully implement the IST program as required by Section XI of the ASME Boiler and Pressure Vessel Code. In both examples, the violation was not willful, and the licensee initiated corrective actions before the original inspection was completed. The violation met the criteria specified in Section V.A of the NRC Enforcement Policy for not issuing a Notice of Violation. Thus, the violation was not cited. This violation was, therefore, closed by reference in NRC Inspection Report No. 50-395/89-15. No further NRC action was necessary concerning this issue.

b. (Closed) Inspector Followup Item (395/89-15-03): Thrust Values at Degraded Voltage

NRC Inspection Report No. 50-395/88-20 identified several outstanding action items with regard to NRC Bulletin 85-03, Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings. Among these were the licensee's failure to obtain thrust values at degraded voltages for valves XVG-8809A, B, and C. With this one exception, all outstanding bulletin items were satisfactorily completed as verified in NRC

Inspection Report No. 50-395/89-15.

The inspector reviewed Westinghouse letter dated August 14, 1989, which supplied stall thrust values for the limitorque operators on the aforementioned valves. The thrust values supplied were determined acceptable to the inspector.

5. Exit Interview

The inspection scope and results were summarized on January 26, 1990, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection findings. Dissenting comments were not received by the licensee. Proprietary information is not contained in this report.