UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W., SUITE 3100
ATLANTA, GEORGIA 30303

Report No. 50-395/82-56

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

Facility Name: V. C. Summer

Docket No. 50-395

License No. NPF-12

Inspection at Summer plant site near Jenkinsville, South Carolina

Inspector: for P. T. Burnett — Frank Jape — 11/29/82 Date Signed

Approved by: F. Jape, Section Chief — Frank Jape — 11/29/82 Date Signed
Engineering Inspection Branch
Division of Engineering and Technical Programs

SUMMARY

Inspection on November 17-20, 1982

Areas Inspected

This routine, unannounced inspection involved 24 inspector-hours on site in the areas of review of completed zero-power tests and witnessing power operations tests.

Results:

No violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

O. S. Bradham, Station Manager
*B. G. Croley, Assistant Manager-Technical Support
K. W. Woodward, Supervisor of Operations
G. Putt, Supervisor of Mechanical Maintenance
*S. F. Fipps, Director of Technical Services
B. Williams, Shift Supervisor
H. O'Quinn, Shift Supervisor
H. Shepp, Shift Supervisor
W. Higgins, Shift Supervisor
G. Taylor, Reactor Engineer

Other licensee employees contacted included six operators, and two office personnel.

Other Organizations

C. Bowman, Westinghouse
L. A. Wooldridge, Westinghouse

NRC Resident Inspector

J. Skolds, Senior Resident Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on November 20, 1982, with those persons indicated in paragraph 1 above. The licensee acknowledged the inspection findings. Three inspector followup items were identified:

395/82-56-01: Control bank A high worth (paragraph 5b),
395/82-56-02: Review boron worth determination (paragraph 5b),
395/82-56-03: Confirm proper review of Zpt-3.3 (paragraph 5c).

3. Licensee Action on Previous Enforcement Matters

Not inspected.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Review of Completed Zero-Power Tests (61710, 61708)

a. Boron Endpoint Concentrations The following completed boron endpoint measurement tests were reviewed:

ZPT-2.1 for the all rods out condition,

ZPT-2.2 for the control bank D in,

ZPT-2.3 for D and C control banks in,

ZPT-2.4 for D, C and B banks in, and

ZPT-2.5 for all control banks in.

Each test satisfied the acceptance criterion that the measured boron concentration be within plus or minus ten percent of the concentration predicted for the conditions specified.

b. Control Bank Reactivity Worth Measurements

The following completed test procedures, each bearing the title "Control Bank Reactivity Worth Measurement by RCS Dilution," were reviewed:

- ZPT-5.1, Revision 0, change 1, for control bank D,
- ZPT-5.2, Revision 0, change 1, for control bank C,
- ZPT-5.3, Revision 0, for control bank B, and
- ZPT-5.4, Revision 0, change 1, for control bank A.

For control banks D and A approximately thirty reactivity computer trace each were independently analyzed. In every case there was acceptable agreement (plus or minus 0.2 pcm) with the reactivity increment determined by the licensee. The acceptance criteria of measured and predicted worth being in agreement within ten percent was satisfied for all but the bank A worth. For that bank the measured worth was more than ten percent greater than predicted. The licensee has concluded that there is no direct safety significance in this result since shutdown margin is increased. Nevertheless, the corresponding off-normal report number 82-64 has not been resolved nor has the issue of the acceptability of the calculational model, in view of the discrepancy, been resolved. (Inspector followup item 395/82-56-01: Resolve issue of high worth of control bank A.)

Completed procedure ZPT-7, "Control Bank Worth in Overlap" was reviewed. Good agreement between the worth in overlap (5956 pcm) was obtained, and the acceptance criterion of agreement within four percent was satisfied.

A second part of ZPT-7 was to determine boron worth. The engineer selected to pair observations of boron concentration and integral reactivity insertion obtained during control bank withdrawal in overlap. Then least squares fits were obtained for sets of paired data of seven, ten and twelve pairs. Finally, the results of the three fits were averaged. The inspector had interpreted the intent of the procedure to be to obtain a least-squares fit to the five pairs of data obtained in performing boron endpoint measurements. That approach appeared to be superior to the one used in two aspects: endpoint data were representative of a well-mixed RCS, and stable boron concentrations assured that a pair of concentration and reactivity insertions were representative of the same point in time. At the exit interview the licensee agreed to further review the method of determining boron reactivity worth. (Inspector followup item 395/82-56-02: Review boron worth determination.)

c. Isothermal Temperature Coefficient Measurements

Three completed test procedures were reviewed:

- ZPT-3.1 (Revision 0, incorporating changes 1 and 2) for the all-rods out configuration,
- ZPT-3.2 for D bank fully inserted, and
- ZPT-3.3 for C and D banks fully inserted.

Each test consisted of at least one heatup and one cooldown of about 5°F. A signal calibrated in temperature units was input to one axis of an X-Y recorder with a reactivity signal to the other axis. The slope of the resulting line was taken as the isothermal temperature coefficient. (The inspector independently verified the correct resolution of each slope.) Agreement between heatup and cooldown slopes was within a few percent in all cases. By subtracting the analytically-predicted doppler coefficient (one value) from each of the isothermal temperature coefficients, the moderator coefficients were obtained. Contrary to prediction and to technical specification (T.S.) 3.1.1.3.a, the moderator coefficient for the all-rods-out configuration (ZPT-3.1) was positive (+1.13 pcm/°F). Zero power testing was continued under special test exception in T. S. 3.10.3. Since completion of low-power physics testing, the licensee has complied with the action statements appropriate to T. S. 3.1.1.3.a.

Form SAP-420 for completed test ZPT-3.3 did not bear the required signatures of the PSRC chairman and the station manager. Licensee personnel stated that the completed test had been properly reviewed and that the absence of signatures was an oversight. This issue will be pursued during a future inspection. (Inspector followup item 395/82-56-03: Confirm proper review of ZPT-3.3)

6. Witnessing Power Operations Tests (72522, 72529)

Prior to the performance of the simulated control room evacuation, the following procedures were reviewed:

- POT-10, "Shutdown from Outside the Control Room," Revision 0, and
- EOP-8, "Control Room Evacuation," Revision 4.

During the performance of the test, activities in the control room were witnessed. The senior resident inspector witnessed the tripping of the reactor by tripping the turbine from the front standard and manipulations performed from the two adjacent control room evacuation panels.

The acceptance criterion of remotely maintaining hot standby for thirty minutes using a normal operating crew was satisfied.

7. Followup on Previous Outstanding Items (92701)

(Closed) Inspector followup item (395/82-28-01): Safe load paths to be added to crane operating procedures. The following procedures were reviewed:

- GMP-100.011, "Crane Operations-Reactor Building," Revision 0 (approved 6/14/82),
- GMP-100.012, "Crane Operations-Fuel Handling Building," Revision 0 (approved 6/14/82),
- GMP-100.13, "Crane Operations-Auxiliary Buildings," Revision 0 (approved 6/14/82),
- GMP-100.14, "Crane Operations-Intermediate Building," Revision 0 (approved 6/14/82), and
- GMP-100.15, "Miscellaneous Crane Operations," Revision 0 (approved 10/19/82).

All procedures have drawings included on which safe load paths are shown by shaded areas and safeguards equipment to be avoided by cross-hatched areas.

(Closed) Inspector followup item (395/82-28-03): The head plus lifting load was not specified in MMP-500.59. By a change to revision 0, the load mass was added to the procedure.