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

Report No.: 50-327/78-37

Docket No.: 50-327

License No.: CPPR-72

Licensee: Tennessee Valley Authority
830 Power Building
Chattanooga, Tennessee 37401

Facility Name: Sequoyah Unit 1

Inspection at: Sequoyah Site, Daisy, Tennessee

Inspection conducted: November 20-23, 1978

Inspector: T. J. Donat (November 20-23, 1978)

Accompanying Personnel: R. H. Wessman (November 20-21, 1978)
G. A. Belisle (November 20-22, 1978)

Reviewed by: R. D. Martin 12/11/78
R. D. Martin, Chief Date
Nuclear Support Section No. 1
Reactor Operations and Nuclear Support Branch

Inspection Summary

Inspection on November 20-23, 1978: (Report No. 50-327/78-37)
Areas Inspected: Routine, announced inspection of the Reactor Coolant System Hydrostatic Test; observation of hydrotest support activities and review of procedures; and facility tours. The inspection involved 72 inspector-hours onsite by three NRC inspectors.
Results: Of the three areas inspected, no items of noncompliance or deviations were identified.

DETAILS I Prepared by: R. D. Martin for 12/11/78
T. J. Donat, Reactor Inspector Date
Nuclear Support Section No. 1
Reactor Operations and Nuclear
Support Branch

Dates of Inspection: November 20-23, 1978

Reviewed by: R. D. Martin 12/11/78
R. D. Martin, Chief Date
Nuclear Support Secton No. 1
Reactor Operations and Nuclear
Support Branch

1. Persons Contacted

*J. M. Ballentine, Plant Superintendent
*W. Popp, Assistant Plant Superintendent
*W. E. Andrews, Plant QA Staff Supervisor
E. A. Condon, Preoperational Test Section Supervisor
*R. Olson, Assistant Construction Engineer
*J. Prevo, Construction Shift Coordinator
*A. W. Diegel, Supervisor, Construction Coordination Unit
W. Guinn, Operations Supervisor
J. Thompson, Mechanical Engineer
J. Pierce, Assistant Chemistry Engineer

*Denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

None.

3. Unresolved Items

None.

4. Exit Interview

The inspectors met with Mr. J. Ballentine and the members of his plant staff (as denoted in paragraph 1) on November 22, 1978. The inspectors summarized as reported in the following paragraphs, the findings of the inspection.

5. Conduct of Preoperational Tests

The inspectors monitored various aspects of the preparation for and performance of the cold hydrostatic test of the reactor coolant system. This effort included a detailed review of the test procedure (Construction Coordination Plan 68-1) to be used, verification of procedure prerequisites, and witnessing performance of the hydrostatic pressure test.

a. Hydrostatic Test Procedure Review

A preliminary copy of the hydrostatic test procedure was obtained by the inspector during a previous inspection (Report 50-327/78-35). A review of this procedure was conducted against the requirements of Regulatory Guide 1.68; FSAR Sections 5.2., 5.5., and 14.1; and ASME Boiler and Pressure Vessel Code Section III.

Based on this review, the applicant was contacted on November 14, 1978, and the inspector identified problems in the preliminary version of the hydrostatic test procedure were discussed. One of these items was the need to insure that the highest point within the hydrostatic test boundary was at the required test pressure. This meant that portions of the plant physically located at a lower elevation would see the hydrostatic test pressure plus the static head pressure due to the difference in elevations. It meant that the official Pressure Gauge for the Hydrostatic Test would have to be corrected so that it indicated the pressure seen at the top of the pressurizer or the required gauge reading during the test had to be corrected so that hydrostatic test pressure was applied to the top of the pressurizer.

Several comments were made concerning the Hydrostatic Test Valve Lineup. Specifically the CVCS valve lineup did not open the Alternate Charging Path and the Pressurizer Spray path isolation valves for proper pressurization. The reactor coolant pump bypass flow return header isolation valve needed to be open while the seal water injection filter bypass valve, 62-546, had to be closed in order to have filtered seal flow. Also discussed was the need to close the Pressurizer Relief discharge manifold vent valve so that if the hydrostatic test relief valve did lift, it would discharge into the pressurizer relief tank. The lack of consistency throughout the Safety Injection Systems portion of the valve lineup was also reviewed.

On November 17, 1978, the applicant contacted the inspector and reported that the procedure had been modified to require a new official test gauge reading which corresponded to the hydrostatic test pressure at the top of the pressurizer. He also stated that the procedure had been modified to correspond with the NRC inspector's

comments or that usage of the plant's system operating instructions (SOI's) had resolved the identified problem. He also stated the the SOI concerning reactor coolant pump seal flow was being modified to specify that the seal filter bypass valve, 62-546, be closed based on the inspector's comment.

In performing a separate reivew of the final version of the cold hydrostatic test procedure it was noted that precaution 3.5 states in part, "Do not operate reactor coolant pumps at pressures below 325 psig or above 2485 psig". A check of the FSAR, Section 5.5.1.3.8 entitled "Pump Cavitation" found that it states in part: "This results in a requirement of a minimum of 400 PSI in the primary plant before the RCP may be operated". When this difference in minimum pressure for RCP operation was brought to the applicant's attention, he stated that they had received new information from the vendor and had incorporated it into the hydrostatic test procedure. The applicant stated that they intended to submit an amendment to the FSAR to show the new minimum pressure for RCP operation. Until the amendment to the FSAR has been issued, this discrepancy will be considered an open item (78-37-01).

b. Prerequisite Ver fication

The inspectors performed an on-site review of various prerequisites of Coordination Plan 68-1 including:

1. Hydrostatic Test Plugs being installed in the loop bypass RTD mainfolds and in the Incore Flux detector tubes at the seal table.

2. Hydrostatic Test valve lineup and tags for each loop bypass RTD manifold, each loop flow instrumentation, the Safety Injection System, and the portion of the Upper Head Injection System on the reactor vessel head.

3. Installation and calibration of hydrostatic test relief valves at top of pressurizer and at discharge of positive displacement pump.

4. Installation and calibration of test gauges at discharge of positive displacement pump and at reactor vessel upper head vent.

5. Installation and calibration of official test gauge at reactor vessel upper head vent.

6. Official copy of RCS Hydrostatic Test Boundary Drawing showing extent of test along with construction inspection procedures for documenting hydrostatic test results.

7. Radiochemistry Department records of reactor coolant system and refueling water storage tank water chemistry were checked against paragraph 5.3 of the FSAR for grade A water.

8. Checked installation of thermocouples on the reactor vessel, the pressurizer, the steam generators and the part length CRDM's.

9. Discussed with various Department of Power Production (DPP) personnel their knowledge of the test procedure, their function during the test and their means of communications available during the test.

The inspectors had no comment on the preparations for performing the RCS cold hydrostatic test.

c. Cold Hydrostatic Test Performance

The applicant notified the inspector on November 23, 1978, that he had raised plant pressure to 2000 psig and would soon be raising it to 2300 psig in preparation for performing the hydrostatic test. When the inspector arrived on site, the plant was at 2300 psig awaiting completion of the valve lineup which isolated the normal RCS instrumentation. The inspector checked the procedure change notices to insure that they had been completely filled out and signed by the Test Director and by the Construction Coordination Unit Supervisor. Also checked were the thermocouple readings for the reactor vessel, system generators, and pressurizer; and the readings on the official gauge as well as the two test gauges.

After the nuclear steam supply system vendor and the applicant resolved what pressure the official gauge should read during the hydrostatic pressure test, the plant was pressurized above 2485 psig. After resolving problems with leakage past one of the pressurizer's power operated relief valves and with positive displacement pump capacity, the plant was pressurized to 3131 psig as read on the official test gauge (corresponding to 3107 psig at the top of the pressurizer), held at this pressure for ten minutes, and then depressurized to slightly above 2485 psig while the hydrostatic test boundary was inspected. No leakage except that past the power operated relief was identified and the test was considered as having been successfully completed.

The inspector considered that the test was conducted in accordance with the applicable TVA, ASME, and Regulatory Guide requirements and has no further comment on its conduct. However, certain sections of plant piping, instrumentation, sampling, residual heat removal, chemical volume and control, safety system injection and upper head injection are not included within the hydrostatic test boundaries per Coordination Plan 68-1 (RCS Cold Hydro). The applicant's mechanical engineering section stated that some of the previously mentioned systems had already been hydrostatically tested while others are still untested. The verification of the hydrostatically testing of all of the piping connected to the reactor coolant systems will be examined at a later date and will remain an open item until the verification has been completed (78-37-02).