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

Report Nos. 50-327/80-43 and 50-328/80-21

Licensee: Tennessee Valley Authority
500A Chestnut Street
Chattanooga, TN 37401

Facility Name: Sequoyah Unit 1 and 2

Docket Nos. 50-327 and 50-328

License Nos. DPR-77 and CPPR-73

Inspection at Sequoyah site near Chattanooga, Tennessee

Inspectors: C. Julian — 1/23/81
C. Julian — Date Signed

E. Ford — 1/23/81
E. Ford — Date Signed

D R Quick for — 1/23/81
R. Fiedler — Date Signed

E Ford for — 1/23/81
T. Heatherly — Date Signed

Approved by: H C Dance — 1/26/81
H. C. Dance, Section Chief, RONS Branch — Date Signed

SUMMARY

Inspection on November 2-6, 1980

Areas Inspected

This routine, announced inspection involved 160 inspector-hours on site to witness the preparation and conduct of cold hydrostatic pressure testing of the Unit 2 reactor coolant system and selected review of QA Records regarding hydrostatic testing of other safety related systems. In addition, start-up testing in progress on Unit 1 at 30% power level was observed.

Results

Of the three areas inspected, two items of noncompliance were found in one area (Failure to review and approve safety related procedure and failure to follow procedures - see paragraph 5).

## DETAILS

1. Persons Contacted

Licensee Employees

*J. M. Ballentine, Plant Superintendent
*J. R. Bynum, Assistant Plant Superintendent
*W. T. Cottle, Compliance Supervisor
*R. W. Dibeler, Chief, QAB, Construction
*L. G. Hebert, OEDC-QC Staff, Knoxville
*D. W. Mack, Assistant Construction Engineer
*D. L. McCloud, QA Supervisor - Nuclear Power
*J. M. Munns, Construction QA
*W. Poling, Power - OPQA
*G. G. Stack, Construction Project Manager
J. Northern, Construction Engineer
W. Popp, Assistant Plant Superintendent
A. W. Crevasse, Power - QA
W. Andrews, Power QA
G. Miller, Assistant Shift Engineer - Unit 2
R. Adams, Construction Test Engineer
J. Loftis, Mechanical Engineering Supervisor

Other licensee employees contacted included several construction craftsmen, operators, mechanics, security force members, and office personnel.

NRC Resident Inspector

S. D. Butler

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on November 6, 1980 with those persons indicated in Paragraph 1 above. The inspector discussed the violations and the unresolved items. Licensee representatives acknowledged their understanding of the findings. TVA representatives committed to halt the Unit 2 hydrostatic test until the procedure could be reviewed and approved by management representatives of construction, power operations, and construction quality assurance as described in paragraph 5.

3. Licensee Action on Previous Inspection Findings

Not inspected.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve noncompliance or deviations. New unresolved items identified during this inspection are discussed in paragraph 5.

5. Unit 2 Cold Hydrostatic Test

The inspectors witnessed portions of the test in progress. On November 4, 1980 the following unsatisfactory conditions were observed.

The procedure in use by the test director entitled "Reactor Coolant System Unit 2 Cold Hydrostatic Coordination Plan 68-2" had not been reviewed and approved by TVA management representatives nor by representatives of TVA Quality Assurance. TVA Quality Assurance had assumed no responsibility for auditing or otherwise assuring the proper conduct of the test.

The procedure in use was not being followed in that, with the reactor coolant system pressurized to 1000 psig, in the second pressure plateau, the following prerequisites for that condition had not been met.

a. Step 4.3.4 requires that a temporary relief valve set to relieve at 3250 psig be installed on the CVCS charging line at the discharge of the positive displacement pump. No relief valve was installed at this location.

b. Step 7.5.6 requires that, prior to increasing pressure to 600 psig, a hydro boundary valve lineup as listed in Appendix E be verified. Appendix E lists valve numbers, desired valve position, and provides a blank for sign off by the person verifying valve position. No completed Appendix E was available. Operators stated that the boundary valves had been aligned using a separate valve lineup sheet that was not part of the procedure in use.

Additionally, step 7.5.6 states place hold orders on all boundary valves listed in Appendix E. At the 1000 psig plateau, operators stated that this step was still in progress and not yet complete.

The inspectors observed a sampling of approximately ten valves and found five not positioned in accordance with Appendix E.

c. Step 7.4.2 and 7.5.1 state do not exceed 150 degrees F until lithium hydroxide is added. The Unit 2 Assistant Shift Engineer's log states that chemicals were added at 3:40 a.m. November 4, but inspectors observed from a process computer printout that reactor coolant temperature first exceeded 150 degrees F at 1:06 a.m. on November 4. The highest temperature record observed prior to chemical addition was 166 degrees F.

d. Steps 7.6.2 and 7.7.3 require that three reactor coolant system water samples be taken at 600 and 1000 psig respectively and analyzed to verify that the chemistry meets the specifications of procedure TI-27 Table 1. As of 11 a.m. on November 4, when the reactor coolant system pressure was 1000 psig, no chemistry sample results were available.

e. Step 4.1.14 states that the reactor building and other areas where pressurized piping and/or equipment is located shall be restricted to test personnel only and that these areas shall be barricaded. As of 2:00 p.m. on November 4, with the reactor coolant system pressure at 1000 psig, no barricades were placed at entrances to the reactor building, no measures were in effect to restrict access, and normal construction activities, including welding and grinding, were continuing in the reactor building. Several workers questioned by the inspectors were not aware that the hydrostatic test was in progress.

f. Step 4.1.12 states that direct communications shall be established between the reactor coolant area, the charging pump rooms, and the control room. On November 4, 1980, no such direct method of communications was established.

The inspectors brought these matters to the attention of various members of plant management. The test was halted and pressure maintained at 1000 psig pending resolution of the inspectors' concerns.

A meeting was held on site on November 5, 1980 between the inspectors and TVA representatives of office of Power Operations, Construction, Power Operations QA, and Construction QA. TVA construction stated that the hydrostatic test was being conducted under procedure SNP Inspection Instruction (II) No. 41, Hydrostatic Test of Piping Systems, that II-41 had been reviewed and approved by TVA management and QA, and that this general hydrostatic test procedure is sufficient to conduct the test of the reactor coolant system. The inspector stated that to safely conduct a hydrostatic test of the reactor coolant system, a detailed procedure must be utilized. It was pointed out that step 1.0 (objectives) of II-41 states "As the need arises for specific requirements not listed in this instruction, a supplement to this instruction shall be issued". The inspector stated that a supplement was certainly needed in this case and further stated that the failure to obtain proper review and approval of the test procedure in use is a violation of the requirements of 10 CFR 50 Appendix B, Criterion VI, Document Control (328/80-21-01).

The inspector discussed in detail the numerous examples of failure to follow the procedure which was in use for this test and expressed strong concerns that damage to equipment or personnel injury might result if the test continued in this manner. The inspector further stated that failure to follow the procedure in use is a violation of 10 CFR 50 Appendix B requirements (328/80-21-02) and that NRC Region II management would be consulted as to the applicability of Criterion V, Instructions, Procedures, and Drawings, or Criterion XI, Test Control.

Licensee representatives agreed to halt the test at the 1000 psig pressure plateau and to revise the procedure as necessary to achieve the following:

a. Devise a single valve lineup sheet acceptable to both construction and operations. Verify this valve lineup before proceeding.

b. Review and approve the procedure by appropriate representatives of TVA construction and power operations management and by construction quality assurance.

c. Include a clear method for approval of in progress procedure changes.

d. Establish clearly which single individual is in charge and responsible for conduct of the test.

e. Consider the need to prohibit containment entry throughout the test by individuals not directly involved.

f. Evaluate the effects of any possible earlier misalignment of boundary valves to low pressure systems during the first part of the test.

Representatives of TVA construction quality assurance stated that they did not consider hydrostatic tests as a QA activity but that they would commit to treat this particular test as a QA activity and audit the performance of the test.

The results of these efforts will be evaluated during a future inspection. (Open item 328/80-21-03).

During the exit interview on November 6, 1980, the inspector repeated the findings as described above. TVA representatives reaffirmed their commitments to revise the test procedure before proceeding further.

The inspector noted that no continuous recording device was in use to monitor reactor coolant system temperature and pressure. Without continuous recording one could not assure that the system was not over pressurized or that the procedural requirement of a maximum heatup rate of 50 degrees F per hour was not exceeded. The inspector stated that this matter would remain unresolved pending further reviews during a future inspection. (Unresolved item 328/80-21-04).

The Unit 2 shift engineer's log states that at approximately 0345 on 11/5/80 a reactor coolant system pressure transient occurred. From discussions with plant personnel, it appears that Unit 2 valves were being realigned in an effort to obtain a correct configuration to continue the hydrostatic test. An incorrect manipulation was made opening a bypass line around the boron injection tank. This led to an increased charging rate in excess of letdown capability, and the

pressurizer power operated relief valves were used to control the pressure increase. The inspector asked what was the maximum pressure reached. Licensee representatives stated they would investigate further to determine maximum pressure reached and that their preliminary information was 1200 psig. Pending resolution, this will remain an open item. (328/80-21-05).

6. Review of Selected QA Records

The inspector reviewed the available documentation for the hydrostatic testing of the Residual Heat Removal (RHR) system. The method of inspection was to compare test data cards against the working system drawing and hydrostatic design information on the drawing. Of nine (9) test data cards reviewed for the RHR system, two (2) cards show an apparent failure to properly hydrostatically pressure test that section of the system between the RHR pump suction and discharge valves. This applies to both pumps. This item (328/80-21-06) is unresolved pending further inspection effort in this area.

7. Unit 1 Startup Testing

The inspectors witnessed various portions of the Unit 1 power escalation testing program at the 30% plateau. No deviations or violations were identified in this area.