



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

Report Nos. 50-327/81-36 and 50-328/81-45

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

Facility Name: Sequoyah Nuclear Plant

Docket Nos. 50-327 and 50-328

License Nos. DPR-77 and DPR-79

Inspection at Sequoyah Nuclear Plant near Soddy Daisy, Tennessee

Inspectors:	<u>R. V. Shryver for</u>	<u>10/27/81</u>
	E. J. Ford	Date Signed
	<u>R. V. Shryver for</u>	<u>10/27/81</u>
	S. D. Butler	Date Signed
Approved by:	<u>R. V. Shryver for</u>	<u>10/27/81</u>
	D. R. Quick, Section Chief, Division of	Date Signed
	Resident and Reactor Project Inspection	

SUMMARY

Inspection on September 6 - October 5, 1981

Areas Inspected

This routine unannounced inspection involved 153 inspector-hours on site in the areas of Operational Safety Verification, Unit 2 Preoperational and Startup Testing, Unit 2 open Items and License Conditions, Follow-up on Unit 2 Containment Spray System Valve Misalignment, Followup on Plant Incidents and Independent Inspection Effort.

Results

Of the six areas inspected, no violations or deviations were identified in five areas; one violation was found in one area (327/81-36-01, Failure to maintain ABGTS operable, paragraph 3).

8112160243 811207
PDR ADDCK 05000327
Q PDR

DETAILS

1. Persons Contacted

Licensee Employees

C. C. Mason, Plant Superintendent
J. W. Doty, Assistant Plant Superintendent (Acting)
W. T. Cottle, Assistant Plant Superintendent
J. M. McGriff, Assistant Plant Superintendent
D. H. Tullis, Maintenance Supervisor (M) (Acting)
B. M. Patterson, Maintenance Supervisor (I)
W. A. Watson, Maintenance Supervisor (E)
D. J. Record, Operations Supervisor
W. H. Kinsey, Results Supervisor
R. J. Kitts, Health Physics Supervisor
J. T. Crittenden, Public Safety Service Supervisor
R. L. Hamilton, Quality Assurance Supervisor
M. R. Harding, Compliance Supervisor
W. M. Halley, Preoperational Test Supervisor
J. Robinson, Outage Director

Other licensee employees contacted included construction craftsmen, technicians, operators, shift engineers, security force members, engineers, maintenance personnel, contractor personnel, and corporate office personnel.

Other Organizations

Cramer and Lindell Engineers, Inc. test personnel
Westinghouse Maintenance personnel

2. Exit Interviews

The inspection scope and findings were summarized with the Plant Superintendent and/or members of his staff on October 9 and October 13, 1981. The escalation of the unresolved item to a violation concerning ABGTS operability was discussed with the Plant Superintendent and he acknowledged. During the reporting period frequent discussions are held with the Plant Superintendent and his assistants concerning inspector findings and problems.

3. Licensee Action on Previous Inspection Findings

(Closed) Unresolved item 328/81-28-03: This unresolved item was reviewed during a previous reporting period and was escalated to a violation, 328/81-38-04. The unresolved item is closed.

(Closed) Unresolved items 327, 328/81-14-01: The inspector considers these items resolved by completion of ceiling tile replacement in the control room as required by license condition (see section 7 for details). These unresolved items are closed.

(Closed) Unresolved item 327/81-19-02: On April 28, 1981, during a tour of the auxiliary building the inspector found the outer door of the railroad bay open with no operator in attendance. The control switch to the door had a caution tag in place which stated that an operator must be present to close the door immediately if necessary while the door is open. This was a compensatory measure taken by the licensee to ensure Auxiliary Building Gas Treatment System (ABGTS) operability when they found that the door seals were not adequate to allow the system to maintain the fuel handling area at the required negative pressure (See LER 50-327/80-184). The inspector has completed his review of this matter and considers this a violation of Unit 1 Technical Specification 3.7.8.1, which requires that two trains of ABGTS be operable in Modes 1, 2, 3 and 4. Unit 1 was in Mode 4 at the time (327/81-36-01). The door was shut within 30 minutes after being found by the inspector. The licensee did not know how long the door had been open and unattended. The auxiliary unit operator assigned to the area stated it was closed when he left and he had been gone less than an hour. Subsequent to the inspector's findings the licensee reported this occurrence in LER 50-327/81-059, dated June 3, 1981. The licensee has also modified the door seals and reported that the ABGTS was successfully tested and that the compensatory measures are no longer necessary. The unresolved item 327/81-19-02, is closed and the resulting violation, 327/81-36-01, is covered in Appendix A.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Operational Safety Verification

The inspector toured various areas of the plant on a routine basis throughout the reporting period. The following activities were reviewed/verified:

- a. Adherence to limiting conditions for operation which were directly observable from the control room panels.
- b. Control board instrumentation and recorder traces.
- c. Proper control room and shift manning.
- d. The use of approved operating procedures.
- e. Unit operator and shift engineer logs.
- f. General shift operating practices.
- g. Housekeeping practices.
- h. Posting of hold tags, caution tags and temporary alteration tags.
- i. Personnel, package, and vehicle access control for the plant protected area.

- j. General shift security practices on post manning, vital area access control and security force response to alarms.
- k. Surveillance, start-up and operational testing in progress.
- l. Maintenance activities in progress.
- m. Health Physics Practices.

During the reporting period, Unit 1 was shutdown for an extended outage to perform necessary maintenance, inservice inspection and surveillance testing. The inspectors toured the plant and witnessed various activities in progress on a continuing basis including eddy current testing of steam generator "U" tubes, preparation for sludge lancing of steam generator secondary sides, containment isolation valve leak rate testing and disassembly and inspection of the 1B-B motor driven auxiliary feedwater pump. The inspectors followed the progress of the periodic ice weighing surveillance as required by technical specifications. In each case the inspectors verified that activities were being performed in accordance with approved procedures when required and proper precautions were being taken to protect personnel and equipment. The inspector toured the Unit 1 containment on several occasions to ensure the necessary health physics requirements were being implemented to support the jobs involving significant radiation levels or radioactivity. The progress of work and problems being encountered were discussed with cognizant licensee personnel as work progressed. Region II management was kept informed of the Unit 1 status and problems encountered as they became known by the inspectors.

During the sludge lancing of the steam generator secondary sides, the licensee identified a design deficiency which had caused damage to some of the steam generator "U" tubes. A tube-lane blocking device is installed at the tube sheet between the first row tubes of each generator to increase the effectiveness of steam generator blowdown for water chemistry control. The blocking devices had apparently vibrated during power operation and damaged adjacent tubes by physical contact. The licensee performed eddy current testing of the affected tubes to determine the extent of the damages and determined that no plugging of tubes would be necessary. The blocking devices were modified on both Unit 1 and 2 steam generators to prevent further damage. The licensee officially notified the Nuclear Regulatory Commission of the defect on September 30, 1981, in accordance with 10 CFR 21.

Eddy current testing was performed on approximately 9% of the #4 steam generator tubes to provide the licensee with information on sludge buildup and first row tube characteristics. During this inspection, indications of a tube denting phenomenon was seen on 72% of the tubes inspected. The resulting analysis of the eddy current testing was provided to the inspector and was forwarded to the Region II nondestructive testing/metallurgy specialists for their review.

During the outage, the reactor coolant pump (RCP) motors were tested due to a problem identified with the thrust bearing lift oil system on a Unit 2 RCP motor. Motors for three of the four RCP's required some disassembly and inspection. The licensee found broken lift oil lines and indication of oil sludging in all three motors that were inspected. The lift oil lines were repaired and the oil systems cleaned and flushed. Both of these occurrences had been identified previously as potential problems by the pump manufacturer and the licensee had already planned modifications at the first refueling outage to eliminate them. On October 2, 1981, while running the motors to flush the oil systems, the windings shorted on the #1 RCP motor. The licensee is replacing the shorted motor with a spare motor and will have to disassemble and inspect the damaged motor to determine the cause.

During this same time frame the licensee was completing the flushing runs on #3 RCP motor. The tagout for the #1 RCP motor work was in the process of being hung and it included component cooling water which is supplied through a common supply valve to all four motors. On October 3, 1981, the unit operator started the #3 RCP motor for its final two hour flushing run without verifying CCW flow to the motor upper bearing as required by system operating instruction SOI-68.2, "Reactor Coolant pumps". Approximately fourteen minutes later the operator received the motor "Thrust Bearing Temperature" alarm and was reading the motor temperatures from the computer when he was distracted by a spurious initiation signal from the solid state protection system. After another fifty-four minutes the operator read the bearing temperature for the #3 RCP motor and it was 300.5°F and he immediately stopped the motor. The licensee has completed their investigation into this occurrence and prepared a written report. The inspector reviewed the report and discussed its content with the Operations Supervisor and the Plant Superintendent including the corrective action. Corrective actions included management meetings with operators involved and appropriate disciplinary action and meetings of the shift engineers with their operating groups to describe the incident and each person's responsibility regarding the use of procedures. The Operations Supervisor is reviewing the operating instructions and maintenance instructions that were being used at the time to determine what changes are necessary, if any, to aid in preventing recurrence of this incident. It appears that the licensee has taken prompt appropriate corrective action to prevent recurrence of this violation and it meets the other criteria found in the Interim Enforcement Policy, 45 FR 66754 (October 7, 1980). The matter will remain as a licensee identified violation and a notice of violation will not be issued. The licensee has opened and inspected the thrust bearing for the #3 RCP motor and cleaned the lift oil system. There was no visible damage other than a damaged gasket in the main lift oil header and a small amount of debris in the lift oil system. The oil was replaced and the flushing process completed on the motor.

During the reporting period the inspector discussed the applicability of technical specification 3.4.1.3 for Unit 1. The licensee apparently could not fully meet the requirement of 3.4.1.3 regarding operable and operating reactor coolant loops to mode 5 when they drained down the system to the reactor vessel nozzles to support the steam generator "U" tube work. The

inspector discussed the tech spec with the licensing project manager in the Office of Nuclear Reactor Regulation (NRR). The more stringent flow requirements were imposed on the Unit 1 license due to the unresolved containment hydrogen control matter and the tech spec is footnoted to indicate that the requirements were to remain in effect pending resolution of the matter. The licensing project manager stated that the containment hydrogen control matter had been resolved by the implementation of the interim distributive ignition system and the Unit 1 flow requirements for Modes 4 and 5 were now the same as the standard technical specification requirements as contained in tech specs 3.4.1.3 and 3.4.1.4 of the Unit 2 license. For Modes 5, tech spec 3.4.1.4 requires that two residual heat removal loops shall be operable and at least one loop shall be in operation. The effective flow requirements for Unit 1 were discussed with the licensee and he acknowledged. The licensee has submitted a formal change request to NRR for Unit 1 to delete the stringent requirements of tech spec 3.4.1.3 and replace them with the standard technical specification flow requirements.

No other violations or deviations were identified.

6. Unit 2 Preoperational and Startup Testing

The inspectors continued to remain cognizant of Unit 2 status and schedule for startup and testing. The NRC Commissioners met on September 8, 1981, and approved a Unit 2 license which authorizes operation of the Unit up to and including full power based on satisfactory completion of the startup test program and other conditions. The senior resident inspector attended the meeting and provided testimony. The full power license was issued on September 15, 1981.

Unit 2 was brought to cold shutdown on September 6, 1981, to make various repairs and final preparations for initial criticality. Following repairs to a leaking seal on #2 reactor coolant pump (RCP), the licensee decided to inspect the #2 RCP motor thrust bearing to investigate a problem with the thrust bearing lift oil system. Broken oil lines in the lift oil system were identified and repaired. The other RCP motors on both units were tested. No other problems were identified in Unit 2. Problems identified on Unit 1 are detailed in Section 5. During repressurization of Unit 2 after repairs a leak was identified on the main flange of #2 RCP. The licensee made several unsuccessful attempts to tighten the flange to stop the leak. On October 2, 1981, the licensee decided to disassemble the pump and replace the gaskets to prevent further leakage. The reassembly of the pump is presently in progress.

7. Unit 2 Open Items and License Conditions

(Closed) Open Item 328/81-02-37: The licensee submitted a revised final report for construction deficiency EEB 8054 (Failure of the Generator System to Supply Adequate Voltage to the Safety-Related Boards) on August 27, 1981, which concluded that the probability of a main generator voltage regulator failure following a reactor trip was insignificant and therefore no modification to the prevent protection system design was necessary to ensure

safe operation of the units. The report was reviewed by the inspector and discussed with Region II specialist inspectors who concurred with the licensee's conclusions. This open item is closed.

(Closed) Open item 328/81-20-19: The licensee submitted a revised final report for construction deficiency NEB 8122 (Power Operated Relief Valve (PORV) Operating Time), which stated that the inadequate opening time of the pressurizer PORV's only affected the cold overpressurization protection system and did not affect the normal overpressurization protection system for the reactor coolant system. Since the Office of Nuclear Reactor Regulation (NRR) had previously evaluated and approved deferral of installation of the cold overpressurization protection system on Unit 1 (See Safety Evaluation Report Supplement 1) the licensee requested a similar deferral for the system on Unit 2. Based on the fact that the licensee has a similar solid water high pressure alarm on Unit 2 and the procedural controls for solid water operations which were required for Unit 1 operation apply equally to Unit 2, NRR approved the deferral of installing the cold overpressurization protection system on Unit 2 until the first refueling outage. The Unit 2 license has been modified to reflect this requirement. The Unit 1 license has been previously modified with this requirement. The inspector reviewed the licensee's revised final report and discussed the matter with Region II and NRR personnel and concurred with the deferral of the cold overpressurization protection system for Unit 2. This open item is closed.

(Closed) The Unit 2 fuel loading and low power license was modified to include the requirement that the licensee complete the applicable pre-operational test program and resolve significant test deficiencies prior to initial criticality. The inspectors have remained cognizant of the status of the preoperational test program for Unit 2 and inspected various portions while in progress. In addition, preoperational test specialists from Region II have inspected portions of the test program and reviewed the resolution of significant deficiencies. Based on the results of various inspections, the reported status of the test program and discussions with responsible licensee personnel, the inspectors concluded that the licensee has satisfactorily completed the preoperational test program and resolved significant test deficiencies. This item is closed.

(Closed) Paragraphs 2.c.(13)b. of licensee DPR-79 (Unit 2) and 2.c.(16)c. of license DPR-77 (Unit 1) requires that the licensee replace the control room ceiling tile with tile that is acceptable to the NRC by September 30, 1981. The combustibility question of the control room ceiling tile was also identified as unresolved items 327/81-14-01 and 328/81-14-01 by a Region II fire protection specialist. The inspector verified by visual inspection that the ceiling tile in the control room was replaced with a different design tile prior to September 30. In addition, the inspector reviewed the licensee's procurement document (81x5-829726) which specified the type of material required for the replacement tile and included the manufacturer's certification that the material used was identified to the material tested under UL Card No. R3818A. Finally the inspector verified that the ceiling tiles were of the same type that were identified in a letter from the

licensee to the Office of Nuclear Reactor Regulation (NRR), dated April 30, 1981, which was found to be acceptable to the NRC. The inspector considers the referenced license conditions met by the licensee.

No violations or deviations were identified.

8. Follow-up on Unit 2 Containment Spray System Valve Misalignment

As a result of the containment spray system valve misalignment identified on Unit 2 August 26, 1981 (See IE reports 327/81-31, 328/81-40), Region II management required that the licensee's proposed corrective action to prevent recurrence would be implemented to the satisfaction of the NRC prior to initial criticality. The proposed corrective actions were a result of the licensee's thorough investigation into the root causes of the incident and were detailed in a Licensee Event Report (LER SQR0-50-328/81104) to the NRC, dated September 8, 1981. The inspector's verification that the corrective action have been adequately implemented consisted of the following:

1. Attendance at selected meetings between the Assistant Plant Superintendent (Operations) and operating groups where discussions were held covering the requirements of administrative procedures for plant operation and maintaining cognizance of operational status. The inspector verified that emphasis was placed on the importance of following procedure and meticulous attention to detail.
2. Spot checks of system status files and configuration logs to ensure they were being upgraded and that quality assurance personnel were performing the necessary surveys.
3. Review of revised surveillance procedures that required a frequent periodic check of the alignment of critical locked manual valves in safety-related systems.
4. Review of revised general operating instructions which required verification of the proper position of locked manual valves in safety-related systems prior to heating the Units up from cold shutdown.
5. Review of selected revised system operating instructions to ensure necessary verifications were included concerning the operation of locked manual valves.
6. Review of revised safety-related system operability surveillances to ensure locked manual valves were included.
7. Review of revised administrative procedures to ensure necessary clarification was included concerning the use of procedures for safety-related systems.

8. Discussion with various supervisors and plant personnel to ensure that a memorandum concerning procedure adherence written by the Director of Nuclear Power had been distributed and discussed with Division of Nuclear Power employees.
9. Attendance at a meeting between the Director of Nuclear Power and selected plant supervisors and operations personnel which was held to emphasize and demonstrate the licensee's commitment to procedure adherence and the importance of meticulous attention to detail and emphasize the need for managers to meet with their subordinates to get this message down to the working level.
10. Discussion with the Quality Assurance Supervisor and review of the quality assurance section instruction letter concerning the Quality Assurance plan for increased surveillance of operational activities to verify that administrative controls and procedures are being followed. In addition discrepancy reports for various problems that had been identified to date were reviewed and corrective action that was being taken was discussed.

The inspectors discussed their findings with Region II management and concluded that the licensee has adequately implemented their corrective action. Region II indicated their concurrence for the licensee to proceed with initial criticality of Unit 2 in a memorandum from the Director, Office of Inspection and Enforcement, Region II, dated September 30, 1981. In the same memorandum Region II confirmed the licensee's commitment not to proceed beyond the 5% power plateau without the NRC's concurrence. This concurrence will be based on a reverification of the implementation and effectiveness of the corrective measures outlined above.

No violations or deviations were identified.

9. Followup on Plant Incidents

On September 10, 1981, the licensee experienced a radioactive gas leak in the auxiliary building. The inspector reviewed the licensee's response to the incident including health physics survey data taken in the auxiliary building. A leak was found on a waste gas vent header mechanical joint located in a Unit 2 pipe chase early in the search and it was thought by the licensee to be the only source. Later in the day the licensee restricted access to all personnel to the auxiliary building due to a large number of employees found with detectable amounts of Rubidium 88 on their clothing. Further search led to a second waste gas system leak in the Unit 2 sample room. The inspector continued to follow the progress of the licensee's investigation during the day and in addition went to the main control room to verify that no unplanned releases of activity were being made from the plant. The inspector kept Region II management and health physics specialists informed of the events as they occurred. Once the second leak was located and repaired, normal access was restored to the auxiliary building. There was no indication of significant personnel exposure or contamination that required significant decontamination effort.

On September 11, 1981, the inspector was notified by the licensee that a drain valve on an acid storage tank had failed and allowed approximately 4000 gallons of sulphuric acid to leak out of the tank. All but approximately 300 gallons of the acid was contained in the chemical storage building sump until it could be pumped into a tank truck for disposal. 300 gallons of the acid leaked out of the sump into a cable tunnel under the west switchyard. There was no loss of safety-related equipment or equipment that affected plant operation. The acid in the cable tunnel was diluted and transferred to the turbine building sump so that it could be treated and released.

No violations or deviations were identified.

10. Independent Inspection Effort

The inspector routinely attended the morning scheduling and staff meetings during the reporting period. These meetings provide a daily status report on the operational and testing activities in progress as well as a discussion of significant problems or incidents associated with the start-up testing and operations effort.

The senior resident inspector attended the Quarterly Resident Inspector meeting in the Region II office September 23-25, 1981.

No violations or deviations were identified.