



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

Report No. 50-327/80-16

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

Docket No. 50-327

Facility Name: Sequoyah Unit 1

License No. DPR-77

Inspection at: Sequoyah site near Chattanooga, TN

Inspector: H. C. Dance / fn  
W. T. Gottle

6/2/80

Date Signed

Approved by: H. C. Dance  
H. C. Dance, Section Chief, RONS Branch

6/2/80

Date Signed

Dates of Inspection: April 8-30, 1980

SUMMARY

Areas Inspected

This routine, announced inspection involved 58 inspector-hours onsite in the areas of followup of previously identified items, followup of plant incidents, testing of pipe support and restraint systems, pre-critical test witnessing, QA for the startup test program, operational safety verification, and independent inspection.

Results

Of the seven areas inspected, no items of noncompliance or deviations were identified in six areas; one item of noncompliance was found in one area (deficiency - failure to maintain vital area barrier integrity).

## DETAILS

### 1. Persons Contacted

#### Licensee Employees

J. M. Ballentine, Plant Superintendent  
C. E. Cantrell, Assistant Plant Superintendent  
W. F. Popp, Assistant Plant Superintendent  
J. W. Doty, Maintenance Supervisor (M)  
J. M. McGriff, 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  
C. R. Brimer, Outage Director  
R. S. Kaplan, Supervisor, Public Safety Services  
W. M. Halley, Preoperational Test Supervisor  
D. O. McCloud, Quality Assurance Supervisor

Other licensee employees contacted included 4 construction craftsmen, 2 technicians, 7 operators, 7 shift engineers, 9 security force members, 8 engineers, 2 maintenance personnel, 6 contractor personnel, 4 corporate office personnel and 3 construction supervisors.

#### Other Organizations

Two representatives from the Office of Nuclear Reactor Regulation and three representatives from the Office of Inspection and Enforcement.

### 2. Exit Interviews

The inspection scope and findings were summarized with the Plant Superintendent and members of his staff on April 12 and 28, 1980. The item of noncompliance discussed in section 5 was reviewed with the plant superintendent.

### 3. Licensee Action on Previous Inspection Findings

Not inspected.

### 4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Operational Safety Verification

The inspector toured various areas of Unit 1 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. Fire protection measures for hot work.
- i. Posting of hold tags, caution tags and temporary alteration tags.
- j. Measures to exclude foreign materials from entry into open systems.
- k. Personnel, package, and vehicle access control for the unit 1 protected area.
- l. General shift security practices on post manning, vital area access control and security force response to alarms.
- m. Surveillance testing and preoperational testing in progress.
- n. Maintenance activities in progress.

During a plant tour on April 12, 1980 the inspector found an unsecured breach of a vital area barrier. This is an item of noncompliance and is described in attachment 1 to these details.

6. QA for the Startup Test Program

The inspector witnessed portions of an audit performed by personnel from the licensee's Office of Power QA staff. This audit was the initial performance of a formal QA audit of the activities associated with the Sequoyah Operator Retraining Program.

The inspector found that the audit was conducted and documented in accordance with the requirements of licensee's accepted Quality Assurance Program.

No items of noncompliance or deviations were identified.

7. Testing of Pipe Support and Restraint Systems

The inspector conducted a walkdown of dynamic pipe supports, fixed pipe supports, and component support structures associated with the main steam, main feedwater, and auxiliary feedwater systems in the the unit 1 steam valve instrument room (west). The walkdown was performed with the systems at ambient temperatures.

The inspector selected approximately 40 individual supports/structures on which to perform the following verifications:

a. Fixed Pipe Supports

- (1) Deterioration and corrosion are not evident.
- (2) Deformation is not evident.
- (3) If pipe clamps are used to support vertical lines, shear lugs welded to the pipe are provided as specified.
- (4) Spring hangers provided with indicators, indicate "cold" position.
- (5) Springs in hangers are not obstructed by foreign material.
- (6) Threaded connections are secured by locknuts, fasteners, cotterpins or similar locking devices.
- (7) Hydrostatic Test Stops are removed or inoperable.

b. Dynamic Pipe Supports

- (1) Hydraulic fluid level in snubbers, shock suppressors and restraints is at proper level.
- (2) Fluid leaks through seals or elsewhere are not evident.
- (3) Elead holes are open and free of foreign material.
- (4) Deterioration, corrosion, physical damage or deformation are not noticeable.
- (5) Lubricants are applied wherever required.
- (6) Bolts, nuts, washers are tight and secure.

- (7) Fasteners are not loose or removed.
- (8) Hydrostatic Test Stops are removed or inoperable.

c. Component Support Structures

- (1) Deformation is not evident
- (2) Cracks or other detrimental indications are not observed on welded surfaces.
- (3) Hydrostatic Test Stops are removed or inoperable.

The following items were identified by the inspector as requiring corrective action:

a. Fixed Pipe Supports

- (1) AFDH-367 - Spring appeared to be bottomed out.
- (2) AMSH-13 - Pipe wedged in restraint with wood block.
- (3) Tubing Hanger - Bolts loose on tubing hanger supporting line from root valve of i-PT-1-5.
- (4) Fixed Hanger - Hanger supporting horizontal line near 1-FCV-1-18 had loose nuts and locknuts.

b. Dynamic Pipe Supports

- (1) MSM-310 - Common fluid reservoir for upper/lower supports empty.
- (2) MSH-315 - Lock nuts loose.
- (3) AFDH-367 - Fluid reservoir empty, support rotated approximately 75°.
- (4) AMSH-12 - Loose lock nut, support rotated 180°.
- (5) AMSH-8 - Air in fluid reservoir.
- (6) All snubbers appeared to need cleaning and lubricating.

These items were discussed with plant supervisory personnel and have subsequently been corrected. In addition, all supports in the Steam Valve Instrument Room (west) were reinspected by licensee personnel and a visual inspection of all safety-related hydraulic snubbers in unit 1 was conducted. The inspector informed plant management that a similar inspection would be

conducted following plant heatup and that additional restraint and support system verifications would be conducted during a followup inspection of IEB 79-14 requirements.

No items of noncompliance or deviations were identified.

8. Witness of Pre-Critical Testing

The inspector witnessed selected portions of test W-9.1 (Control Rod Mechanism Timing), W-9.5 (Rod Position Indication System) and W-11.4 (Movable Incore Detector System), interviewed test supervisors and inspected the following to verify conformance to license and procedural requirements for pre-critical testing:

- a. Procedure of appropriate revision available and in use by all crew members.
- b. All test prerequisites and initial conditions are met in accordance with procedure requirements.
- c. Special test equipment required by the procedure is calibrated and inservice.
- d. Test is performed as required by the procedures; changes to the procedure were made in accordance with procedure requirements.
- e. Quick summary analysis made to assure proper component response to the test.
- f. Reviewed records of deficiencies and difficulties encountered to assure the adequacy of corrective actions, and the review and approval of actions taken.
- g. Reviewed data sheets for legibility, traceability and permanence.

During the observation of W-9.1, it was noted that manual control rod speed had been changed from its normal setting to its maximum setting in order to expedite the test. Further investigation revealed that the test procedure had no specific requirements for rod speed. After questioning the test supervisor and the shift engineer, it was determined that the change had been made at the request of the test supervisor with the concurrence of the cognizant EN-DES engineer and documented in the test chronological log. In addition, the adjustment was properly documented, logged and tagged in accordance with AI-9 (Temporary Alterations). The inspector had no further questions.

No items of noncompliance or deviations were identified.

9. Followup of Plant Incidents

During the reporting period, the inspector conducted followup activities on the following incidents at the facility:

- a. On April 10, 1980, two construction electricians were killed in an industrial accident. Both died of injuries received when a boom truck in which they were working overturned.
- b. On April 17, 1980, the containment recirculation sump was inadvertently filled with borated water during the performance of a surveillance test.
- c. On April 18, 1980, a welder inadvertently cut an emergency raw cooling water line to #2 reactor coolant pump. The cut occurred when a welding torch inadvertently came in contact with the flexible piping and caused a pinhole leak.
- d. On April 21 and 28, 1980, inadvertent safety injection actuation signals were initiated as result of personnel errors. Due to the unit being in Mode 5, no water was actually injected in either instance.
- e. On April 29, 1980, a small electrical fire occurred in a lighting controller in the pump intake station. No damage to plant equipment resulted from the fire.

The inspector reviewed the circumstances involved in each incident and, where appropriate, the actions taken by licensee management in response to the incident. Licensee's management response appeared to be both timely and adequate in each case.

No items of noncompliance or deviations were identified.

10. Followup of Previously Identified Items

(Open) Open Item (327/80-08-02) Leak testing of waste gas system. Licensee's proposed leak test was reviewed by this inspector and L.L. Jackson, Region II. Comments were resolved and the following test program will be conducted prior to exceeding five (5) percent thermal power. A soap test will be performed on all flanges, valves, and bolted/fitted connections on the waste gas system. This will be followed by a pressure test at approximately 100 psig with an acceptance criteria of no detectable pressure drop over a one hour period. This item will remain open pending conduct of the test program.

(Closed) Open item (327/79-48-02) Flanged connections on filter housings. Workplan (WP 8274 R1) was reviewed by the inspector. The workplan covered seal welding gasket joints in the Emergency Gas Treatment System filter housing downstream of the HEPA filter banks. The inspector verified that the field work, verification of operability, and post-modification testing

had been completed. Workplan (WP 8246) to accomplish the same modification on the Auxiliary Building Gas Treatment System was reported as also having been completed. The inspector did not review WP 8246. This item is closed.

(Closed) Licensee Identified Item (327/79-72-03) Defective charcoal absorber trays. The inspector reviewed the receipt documentation for the new charcoal absorption trays for the Control Building Emergency Air Cleanup System (CBEACS), the Auxiliary Building Gas Treatment System (ABGTS), and the Containment Purge Air Cleanup System (CPACS). The shipping ticket for disposal of the defective trays was also reviewed. The post-modification testing on the CBEACS and the ABGTS was reviewed as follows:

<u>System</u>	<u>Test</u>	<u>Date</u>
ABGTS	SI-132 Train A	2/12/80
	SI-132 Train B	2/29/80
CBEACS	SI-143 Train A	12/19/79
	SI-143 Train B	12/12/79

The post-modification testing on the CPACS had been completed but was not reviewed by the inspector. This item, reported as NCR 17P, is closed.

(Closed) Licensee Identified Item (327/79-72-05) Undetectable failure in reactor protection system. The inspector reviewed SI-268, AOI-1 Rev 7, and GOI-2 Rev 5 to verify that the recommendations of the solid state protection system vendor had been properly incorporated. This item, reported as NCR NEB 79-04, is closed.

(Closed) Licensee Identified Item (327/79-51-01) Fluctuations of Foxborough instrumentation. The inspector reviewed the following workplans involved in the replacement of the vital instrument inverters:

- a. 8001 - Removal of Unit 1 inverters 1-I, II, III, IV
- b. 8029 - Installation of new unit 1 inverters
- c. 8034 - Foundation concrete work
- d. 8007 - Installation of conduit
- e. 8051 - Installation of conduit hangers
- f. 8040 - Pull and terminate cables to new inverters
- g. 8022 R1 - Installation of water shields

These workplans were found to have been satisfactorily completed. In addition, the inspector reviewed TVA-15 RT, vital 120 VAC power system, which covered the preoperational testing of the new inverters. A visual inspection of the inverters was performed to verify that cables were securely landed and that no unauthorized temporary alterations were in effect.

The inspector discussed the effectiveness of the new inverters in eliminating the output fluctuations of the Foxborough instrumentation in the reactor



protection system with the maintenance supervisor (I). The problem appears to be adequately resolved. This item, reported as SWP-79-S-5, is closed.

(Closed) Open Item (327/78-39-19) Preparation of surveillance test procedures required by technical specifications. The inspector reviewed Attachment 3 to SA 41 and determined that surveillance test procedures had been prepared for all surveillance requirements in the Sequoyah technical specifications. This item is closed.

(Closed) Open Item (327/79-70-02) Duplicate records storage requirement. The inspector reviewed OQAM, Part III, Section 4.1, paragraph 4.2; Administrative Instruction AI-7; and Administrative Section Instruction Letter 75. It was determined that the licensee is not using the duplicate records storage option allowed by the OQAM at this time. Microfilmed quality assurance records are being stored in the permanent records storage facility. The inspector had no further questions in this area. This item is closed.

(Open) Open Item (327/79-70-04) Nuclear safety review board charter. The inspector reviewed Revision 6 to the Nuclear Safety Review Board Charter dated February 28, 1980. The following items were found to require addition or clarification in the NSRB Charter to make the charter consistent with the Technical Specifications.

- a. The NSRB charter allows the NSRB chairman to appoint alternate members in the event of the absence of the principal and his designated alternate.
- b. The NSRB review of minutes of the Radiological Assessment Review Committee meetings required by the Technical Specifications is not addressed in the NSRB charter.

These items were discussed with the chairman of the NSRB who committed to making a revision to the NSRB Charter. This item will remain open pending issuance of the revised charter.

No items of noncompliance or deviations were identified.

#### 11. Independent Inspection Effort

The inspector routinely attended the morning scheduling and staff meetings during the reporting period. These meetings provided a daily status report of the construction and testing activities in progress as well as a discussion of significant problems or incidents associated with the construction, preoperational testing, and operations effort.

The inspector participated in a meeting with licensee and Office of Nuclear Reactor Regulation (NRR) representatives in methods of dealing with containment recirculation sump debris during an accident condition. The meeting was held at the Sequoyah site on April 8, 1980.

The inspector reviewed a Technical Specification change submitted March 28, 1980. Comments were provided to NRR Division of Project Management.

The inspector developed a proposal to purchase time on the Sequoyah Simulator to allow Office of Inspection and Enforcement (IE) personnel to train on the special low power test program procedures. This would also provide a technical review of the test procedure by selected members of the IE staff.

Weekly inputs were developed for the routine facility status reports to the Director, NRR.

The inspector reviewed the special low power test program procedures and the safety evaluation for the program. Comments were discussed in a meeting with NRR and licensee representatives in Bethesda, Maryland on April 23, 1980.

The inspector conducted initial followup activities on a potential problem identified by the nuclear steam supply system vendor involving failure of burnable poison rod assembly and thimble plugging device springs.

Recent occurrences of violations of radwaste shipping regulations at other Region II facilities were discussed with the Assistant Plant Superintendent and Health Physics Supervisor.

The special auxiliary feedwater system water hammer test procedure, submitted to NRR April 15, 1980, was reviewed. Comments were provided to NRR, Division of Project Management.

No items of noncompliance or deviations were identified.

## 12. Verification of License Conditions

Section 7.2 "Administrative Controls and Procedures" of the technical specifications required that the applicant obtain IE verification of administrative controls and procedures modified to reduce the probability of an overpressurization event occurring during water solid, low temperature conditions and that plant operations personnel have received additional training regarding the causes and protection requirements for potential overpressure transients. These verifications are specified in item 7.2.1 and 7.2.2 of Section 7.2 of the Technical Specifications.

The inspector reviewed the commitments for administrative controls, procedures, and operator training made in the Sequoyah Final Safety Analysis Report Sections 5.2.2.4.3 and 5.2.2.4.4, and in the applicant's response to review question Q 5.25. The following procedures were reviewed to determine if adequate provisions had been made for inclusion of those commitments:

- . GOI-1
- . GOI-3
- . GOI-3B

- . GOI-3C
- . MI-1.2
- . SOI-62.1
- . SOI-68.1
- . SOI-74.1

The inspector noted some minor discrepancies in the procedures but in each instance, the discrepancy was resolved to the inspector's satisfaction by a revision to the procedure.

A review of the operator requalification training program for 1979 indicated that adequate training on the causes and protection requirements for potential overpressurization transients during low temperature conditions had been conducted. Each of the applicable procedures was reviewed in the classroom and simulator phases of the requalification program. However, the inspector noted that the annual requalification examination did not include any specific questions on solid water operation. The inspector interviewed four senior reactor operators and three reactor operators to determine their knowledge of the causes and protection requirements for potential overpressurization transients during low temperature conditions. In each case, the individual interviewed was found to have a satisfactory knowledge of the subject area. In addition, the operations supervisor had the shift technical advisor on each shift conduct a review of the subject area with each licensed operator, Assistant Shift Engineer, and Shift Engineer following the interviews conducted by the inspector.

Based upon the procedure reviews, personnel interviews, and observations of the shift personnel during actual solid water operations, the inspector considers the verifications required by items 7.2.1 and 7.2.2 of the technical specifications to be satisfactorily resolved.

ATTACHMENT 1

On April 12, 1980, during a routine, off-shift tour, the inspector found six (6) unsecured openings in the barrier wall of a Unit 1 vital area. The openings were ventilation ports, approximately 18 inches by 24 inches, and were located at approximately ground elevation on the outside of the barrier wall. Each opening was thus large enough and easily accessible to allow an individual to enter the vital area. The inspector notified the supervisor, Public Safety Services, who took immediate action to establish adequate compensatory measures to secure the vital area barrier wall. This item constitutes an apparent item of noncompliance with the requirements of 10 CFR 73.55 (d)(7) and the Sequoyah Nuclear Plant Physical Security Plan section 5.2.1. At the time of this incident, the plant was in mode 5 and had not achieved initial criticality. Therefore, the breach of this vital area barrier posed no threat to the health and safety of the public.

Subsequent to the initial finding, appropriate measures were taken to prevent recurrence. These measures included a reinspection of all vital area perimeter barriers by security force supervisory personnel and a review of all outstanding work requests on security system/barriers/components. The inspector verified the appropriateness of the measures taken. This item is closed.