



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report Nos.: 50-327/85-32 and 50-328/85-32

Licensee: Tennessee Valley Authority
6N11B Missionary Ridge Place
1101 Market Street
Chattanooga, TN 37402-2801

Docket Nos.: 50-327 and 50-328

License Nos.: DPR-77 and DPR-79

Facility Name: Sequoyah Units 1 and 2

Inspection Conducted: September 6, - October 5, 1985

Inspectors:	<u><i>G. J. Ignatowicz</i></u>	<u>10/30/85</u>
	for K. M. Jenison, Senior Resident Inspector	Date Signed
	<u><i>G. J. Ignatowicz</i></u>	<u>10/30/85</u>
	for L. J. Watson, Resident Inspector	Date Signed
Approved by:	<u><i>S. P. Weise</i></u>	<u>10/30/85</u>
	S. P. Weise, Section Chief	Date Signed
	Division of Reactor Projects	

SUMMARY

Scope: This routine, announced inspection involved 325 resident inspector-hours onsite in the areas of: operational safety verification including operations performance, system lineups, radiation protection, security and housekeeping inspections; surveillance and maintenance observations; review of previous inspection findings; followup of events; review of licensee identified items; Engineered Safety Feature; and review of inspector followup items.

Results: One violation was identified - Failure to follow procedure during a test of the Control Room Chlorine Detection System (paragraph 10).

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REPORT DETAILS

1. Licensee Employees

Persons Contacted

H. L. Abercrombie, Site Director
*P. R. Wallace, Plant Manager
L. M. Nobles, Operations and Engineering Superintendent
*B. M. Patterson, Maintenance Superintendent
*J. M. Anthony, Operations Group Supervisor
*D. C. Craven, Quality Assurance Supervisor
D. E. Crawley, Health Physics Supervisor
J. L. Hamilton, Quality Engineering Supervisor
*G. B. Kirk, Compliance Supervisor
D. H. Tullis, Mechanical Maintenance Group Supervisor
*R. C. Birchell, Compliance Engineer
*C. L. Wilson, Nuclear Engineer
*C. E. Bosley, QA Evaluator, Division of QA, Quality Assurance Branch
*D. L. Cowart, Quality Surveillance Supervisor

Other licensee employees contacted included technicians, operators, shift engineers, security force members, engineers and maintenance personnel.

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized with the Plant Manager and members of his staff on October 7, 1985. A violation described in paragraph 10 and a second example of a previous violation described in paragraph 6 were discussed. The licensee acknowledged the inspection findings and did not identify as proprietary any material reviewed by the inspectors during this inspection. During the reporting period, frequent discussions were held with the Site Director, Plant Manager and his assistants concerning inspection findings. At no time during the inspection was written material provided to the licensee by the inspector.

3. Licensee Action on Previous Inspection Findings (92702)

(Closed) Violation 328/83-16-02. The licensee's response of October 7, 1983, was reviewed and the indicated corrective actions were audited. The licensee conducted Mechanical Maintenance Section training on the importance of adhering to mandatory Quality Assurance procedural hold points. The licensee's corrective actions are considered complete.

(Closed) Violation 328/84-21-05. The licensee's response of September 20, 1984, was reviewed and the indicated corrective actions were audited. The licensee conducted training on the requirement for the independent verification of processed hold orders. In addition, administrative action was taken with respect to the involved individuals. The licensee's corrective actions are considered complete.

(Closed) Violation 328/83-31-03. The licensee's response of March 15, 1984, was reviewed and the indicated corrective actions were audited. The licensee conducted training on a variety of operational subjects involved with this violation. Surveillance Instructions were revised to include the methods and details of valve locking. The licensee's corrective actions are considered complete.

(Closed) Violation 328/83-31-04. The licensee's response of March 15, 1984, was reviewed and the indicated corrective actions were audited. The licensee amended its maintenance procedures to require that both Assistant Shift Engineers be required to sign prior to the removal from service of any inverter, 6900-volt shutdown board or 480-volt shutdown board. In addition, this topic was included in licensed operator requalification training. The licensee's corrective actions are considered complete.

(Closed) Unresolved Item 327, 328/85-26-04. Corrective maintenance was reviewed on containment isolation valves 2-67-580A through D. Two of these valves were examined by the inspector after being cut from the Essential Raw Cooling Water system and disassembled. The valves were badly corroded and the internal flapper arm pins were out of round. The seating surface was worn, but there was no indication of foreign materials within the valves. These valves were retested and determined to be operable. The licensee updated their maintenance history associated with these components. This item is considered to be closed.

4. Unresolved Items

No unresolved items were identified during this inspection.

5. Operational Safety Verification (71707)

a. Plant Tours

The inspectors observed control room operations, reviewed applicable logs, conducted discussions with control room operators, observed shift turnovers, and confirmed operability of instrumentation. The inspectors verified the operability of selected emergency systems, reviewed tagout records, verified compliance with Technical Specification (TS) Limiting Conditions for Operation (LCO) and verified return to service of affected components. The inspectors verified that maintenance work orders had been submitted as required and that followup activities and prioritization of work was accomplished by the licensee.

Tours of the diesel generator, auxiliary, control, and turbine buildings were conducted to observe plant equipment conditions, including potential fire hazards, fluid leaks, and excessive vibrations and plant housekeeping/cleanliness conditions.

The inspectors walked down accessible portions of the following safety-related systems on Unit 1 and Unit 2 to verify operability and proper valve alignment:

- Residual Heat Removal System (Units 1 and 2)
- Charging Pump Flowpath (Units 1 and 2)
- Diesel Generators (Units 1 and 2)
- Control Room Ventilation Chlorine Detection System (Common)

b. Security

During the course of the inspection, observations relative to protected and vital area security were made, including access controls, boundary integrity, search, escort, and badging. No violations or deviations were identified.

c. Radiation Protection

The inspectors observed Health Physics (HP) practices and verified implementation of radiation protection control. On a regular basis, radiation work permits (RWPs) were reviewed and specific work activities were monitored to assure the activities were being conducted in accordance with applicable RWPs. Selected radiation protection instruments were verified operable and calibration frequencies were reviewed.

On September 26, 1985, the inspector observed workers frisking out of a regulated zone, on EL690 at the hallway leading to the hot machine shop. The licensee's procedure, Radiological Control Instruction, RCI-1, Radiological Hygiene Control, requires frisking of the hands and feet with a counter provided at the exit to the area. One maintenance section worker exiting the regulated area frisked his feet, but did not frisk his hands. Failure to follow the radiation protection procedure for frisking when exiting a regulated zone is a violation; however, since the licensee was in the process of implementing corrective action for a similar violation (327, 328/85-26-03), involving the failure to frisk out of a contaminated zone, this incident constitutes a further example of that violation.

Corrective action for this incident included the assignment of an HP technician to the maintenance section to provide additional training and assure awareness of Health Physics (HP) procedures and practices. This training will be completed by January 3, 1986. Implementation of these actions are intended to prevent recurrence of similar incidents.

Current audits conducted by the licensee indicate a substantial improvement in overall compliance with HP requirements during the past year, and adequacy of corrective actions will be verified by TVA through future audits.

In addition, the inspector noted that individuals were picking up the hand held monitor without frisking the hand used to pick up the monitor. This is a poor health physics practice and was brought to the attention of plant management. The inspector will continue to monitor the frisk out process to assure proper controls are in place.

6. Engineered Safety Features Walkdown (71710)

The inspectors verified operability of the Component Cooling Water System (CCS) on Units 1 and 2 by performing a partial walkdown of the accessible portions of the system. The remainder of the walkdown on this system will be completed in the next inspection period. The following specifics were reviewed and/or observed as appropriate:

- a. that the licensee's system lineup procedures matched plant drawings and the as-built configuration;
- b. that equipment conditions were satisfactory and items that might degrade performance were identified and evaluated;
- c. with assistance from licensee personnel, the interior of the breakers and electrical or instrumentation cabinets were inspected for debris, loose material, jumpers, evidence of rodents, etc.;
- d. that instrumentation was properly valved in and functioning and calibration dates were appropriate;
- e. that valves were in their proper positions, breaker alignment was correct, power was available, and valves were locked as required; and
- f. local and remote instrumentation was compared, and remote instrumentation was functional.

During the tour, the inspectors identified several discrepancies:

- housekeeping in several areas was marginal
- new piping segments were attached to existing fire protection piping using masking tape
- valve labelling and location identifier accuracy
- conduit degradation

This was brought to the attention of the licensee. The licensee attributed the problem to outage work activities.

The inspector reviewed housekeeping logs kept by the licensee in accordance with procedure SQA-66, Plant Housekeeping. TVA management housekeeping tours are performed approximately monthly. Discrepant areas identified during tours are rechecked to assure corrective action has been taken. The inspectors also reviewed Operations Section Letter OSLA-99, Auxiliary Unit Operator (AUO) Duties, and determined that AUOs are required to identify housekeeping problems. The inspectors will review plant housekeeping and licensee implementation of SQA-66 and OSLA-99 during the remainder of the outage. Followup on this issue is an Inspector Followup Item (327, 328/85-32-02).

No violations or deviations were identified.

7. Monthly Surveillance Observations (61726)

The inspectors observed TS required surveillance testing and verified that testing was performed in accordance with adequate procedures; that test instrumentation was calibrated; that Limiting Conditions for Operation were met; that test results met acceptance criteria requirements and were reviewed by personnel other than the individual directing the test; that deficiencies were identified, as appropriate, and that any deficiencies identified during the testing were properly reviewed and resolved by management personnel; and that system restoration was adequate. For the completed tests, the inspector verified that testing frequencies were met and tests were performed by qualified individuals.

The inspector witnessed/reviewed portions of the following surveillance test activities:

SI-688.2	Functional Test for Accident Radiation Monitor System
IMI-99	Reactor Protection System RT 11.6 & 11.8, Response Time Test of Delta T/Tavg Channels 2 and 4
SI-40	Centrifugal Charging Pump
SMI-0-90-1	High Dose Rate Calibration for Containment High Range Accident Monitors

No violations or deviations were identified in this area.

8. Monthly Maintenance Observations (62703)

- a. Station maintenance activities of safety-related systems and components were observed/reviewed to ascertain that they were conducted in accordance with approved procedures, regulatory guides, industry codes and standards, and in conformance with TS.

The following items were considered during this review: LCOs were met while components or systems were removed from service; redundant components were operable; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures and were inspected as applicable; procedures used were adequate to control the activity; troubleshooting activities were controlled and the repair record accurately reflected what actually took place; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials used were properly certified; radiological controls were implemented; QC hold points were established where required and were observed; fire prevention controls were implemented; outside contractor force activities were controlled in accordance with the approved Quality Assurance (QA) program; and housekeeping was actively pursued.

- b. During the Unit 1 refueling outage the inspector observed portions of steam generator maintenance and audited documentation of the work activities involving the cleaning of the secondary side by sludge lancing, primary side eddy current examinations and plugging of the Row 1 and other tubes for all four steam generators. The following procedures were reviewed/observed by the inspectors:

Radiation Work Permit:	02-1-85112
Maintenance Requests:	A549689, A549690, A549692, A549528, A549691, A533110, A301950, A302397, A302398, A302399
Vendor Standard:	CFS-STD-020, Steam Generator Tube Sheet Sludge Removal
Maintenance Instructions:	MI 3.7, Preparation for Performance of and Recovery From Steam Generator Sludge Lancing MI 3.1, Removal and Installa- tion of Steam Generator Primary Manway Cover, Units 1 and 2 MI 3.3, Steam Generator Secondary Side Inspection MI 3.4, Breaching Penetration X-54 Without Breaching the ABSCE for Eddy Current Testing, Helium Leak Testing, Sludge Lancing and Other Purposes

	MI 3.2, Method of Plugging Steam Generator Tubes
Standard Practices:	SQA 119, Unreviewed Safety Question Determination (USQD)
	SQM 001, Sequoyah Nuclear Plant Maintenance Program
USQD Documentation:	USQD 85-0998, involving use of a special eddy current test probe for Row 1 tubes.
	USQD 85-0999, involving performance of worker platform training.
ASME Code Document:	ASME Code Section XI, 1977 amended by Summer 1978 addenda

The licensee began steam generator (SG) maintenance with a visual examination of the secondary side using a fiberscope to determine the condition of the steam generators. Video recordings were made of the inspection. It was determined that sludge lancing was needed to remove sediment on the secondary side at the tube sheet. The inspector observed sludge lancing activities, which involved a newly developed technique.

All four SGs were sludge lanced between three to four sweeps each with a total of approximately 1750 pounds of sludge removed. This averaged over 400 pounds per SG. Fiberscopic examinations after completion indicated that the SGs were essentially clean. The new technique was found to be more effective for sludge removal.

The licensee stated that the sludge removed consisted of approximately 70% iron and 30% copper. The licensee is also replacing the main feedwater heaters and the moisture separator reheater tube bundles during this outage to eliminate copper from the secondary system. The licensee recovered two small pieces of a drill bit from one steam generator. No damage was attributed to this material. The licensee also had to recover parts of a camera that came loose during a fiberscopic exam.

The licensee inspected 100% of the tubes on all four SGs using eddy current probes, with the exception of the U-bend portion of the Row 2 tubes. This exception was made due to the difficulty associated with an inspection of these U-bends and no industry wide history of failures in the Row 2 U-bend area.

The eddy current exams identified that four Row 1 tubes had indications of corrosive cracking. Although the indications were minor and could not be categorized as to depth, the licensee decided to plug the Row 1 tubes in all four steam generators to ensure that cracks did not develop in these tubes. The licensee will evaluate the indications and can later remove the Row 1 tube plugs as desired. The licensee is evaluating a stress relieving process which employs electric heaters to remove induced thermal stresses as a part of the process that could return the plugged Row 1 tubes to service. Three other tubes with indications of less than 30% through wall were plugged. At the end of this inspection period, the licensee was still evaluating the eddy current data and may elect to plug additional tubes.

The licensee also utilized a new device for tube plugging developed by Combustion Engineering. The device was installed in the steam generator and manipulated remotely to install tube plugs. The device is capable of employing a magazine which can be loaded with a number of plugs at one time reducing entries into the SG. The device offered reductions in the dose and time associated with SG tube plugging. The licensee estimated that the dose associated with the plugging operations during this outage was reduced from approximately 200 rem to 50 rem.

- c. Replacement of the 1-A Centrifugal Charging Pump mechanical seals was observed. The following documents were reviewed/observed in part:

Maintenance Instruction (MI) 6.4 - Removal, Inspection and Replacement of Centrifugal Charging Pump Seals

Surveillance Instruction (SI) 40 - Centrifugal Charging Pump

Maintenance Request A529430

During the performance of the seal replacement, the technicians identified that an O-ring, issued from Power Stores, was not the size specified by the vendor. This appeared to be due to mispackaging of the O-ring by the vendor, since the shipping package and the receipt documentation matched the material identification numbers specified by the vendor. A new O-ring was requisitioned to replace the defective one.

- d. During this outage period, preventive maintenance was conducted on both Unit 1 and Unit 2 Reactor Coolant Pumps (RCP). One activity involved an evaluation of the breakaway torque associated with each RCP motor. Maintenance Request A529848 was used to obtain the breakaway torque for each RCP motor and the data was evaluated against vendor's acceptance criteria. The inspector observed the performance of the preventive maintenance on the Unit 2 loop 3 RCP with no discrepancies identified. The licensee later identified the Unit 1 loop 2 RCP as not meeting the acceptance criteria and disassembled the subject pump to perform corrective maintenance.

No violations or deviations were identified.

9. Licensee Event Report (LER) Followup (92700)

The following LER's were reviewed and closed. The inspector verified that: reporting requirements had been met; causes had been identified; corrective actions appeared appropriate; generic applicability had been considered; the LER forms were complete; the licensee had reviewed the event; no unreviewed safety questions were involved; and violations of regulations or TS conditions had been identified.

a. LER Unit 1

327/82115	Inoperable Upper Containment Personnel Airlock (Revision 1)
327/83093	Inoperable Condenser Vacuum Flow Rate Monitor (Revision 1)
327/83100	Automatic Control Valve Declared Inoperable
327/83166	Primary Containment Internal Pressure (Revision 1)
327/83168	1 A-A Diesel Generator (DG) Failed to Start
327/83177	2 A-A DG Failed to Trip
327/83183	Limiter Operator Limit Switch Failed
327/83186	1 A-A DG Trip
327/84011	Control Habitability System (Revision 1)
327/84034	No Flow Indication on 'B' Essential Raw Cooling Water Header
327/84045	Inoperable Auxiliary Air Compressors (Revision 1)
327/85003	Surveillance Interval Exceeded
327/85022	Failure to Complete Hourly Fire Watch
327/85024	Failure to Complete Hourly Fire Watch
327/85025	Failure to Obtain a Noble Gas Sample
327/85028	Failure to Complete Hourly Fire Watch
327/85031	Auxiliary Building Isolation
327/85033	Main Control Room Isolation

327/85035 Emergency Diesel Generator Start

327/85036 Failure to Complete Hourly Fire Watch

b. LER Unit 2

328/84004 Loss of 6900 Volt Unit Board

328/84020 Inadvertent Safety Injection (Revision 1)

10. Event Followup (93702, 62703, 61726)

- a. On August 27, 1985 an engineered safety feature actuation occurred as a result of a Train B main control room isolation signal. The main control room isolation occurred during the performance of Surveillance Instruction (SI) 240, Functional Test of Control Room Air Intake Chlorine Detection System. Step 4.4 of SI 240 requires the technician to place switch HS-43-205B in the test position prior to introducing chlorine fumes into the detection system. The technician performing the surveillance and the assistant observing his actions failed to implement step 4.4 of SI 240, and as a consequence, initiated an engineered safety feature actuation when the chlorine fumes were introduced into the detection system. This failure to follow procedure constitutes a violation (327, 328/85-32-01). The technician placed the subject switch in the test position after becoming aware of the main control room isolation. He then continued the surveillance, initialing Section 4.4 of Appendix B to SI 240 and reapplying the chlorine standard to the detection system, without informing appropriate supervisory or operations personnel.

As a result of previous Inspector Followup Item (327, 328/85-26-07), the licensee committed to provide formal instructions to employees on actions to be taken when the employee fails to follow procedures. The licensee issued a maintenance notice entitled, Your Responsibilities in Following Instructions, to all maintenance employees on or about July 22, 1985. Based on inspector review, a majority of the maintenance technicians appear to have received the notice. The technician that was involved in the above failure to follow procedure was temporarily assigned to the TVA training center during the period that the notice was issued and therefore was not fully aware of its contents. Inspector Followup Item 327, 328/85-26-07 will remain open pending further NRC assessment.

- b. On September 27, 1985, a Combustion Engineering employee abraded his plastic gloves and scraped his hand on the SG tube sheet while performing steam generator tube plugging activities. The individual was removed from the area for decontamination. Initial contamination was approximately 1,000 cpm. The licensee decontaminated the hand to a level of 400 cpm. At the advice of an offsite physician, the licensee

decided to take the individual to the hospital for further treatment. The licensee declared an Unusual Event in accordance with IP-1, Emergency Plan Classification Logic, and IP-2, Notification of Unusual Event, in anticipation of transporting a contaminated person to an offsite medical facility. The individual, however, refused to be transported offsite and continued decontamination efforts. He successfully reduced the contamination to below acceptable limits, and the Unusual Event was terminated. Reports of the incident were made to the NRC and the State of Tennessee, as required.

11. Inspector Followup Items (92701)

Based on inspection activities in the affected functional areas the following items were determined to require no additional specific followup and are closed.

328/84-21-04
328/84-31-05
328/84-31-06
327/84-11-03
327/83-23-04