



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

Report Nos.: 50-327/86-06 and 50-328/86-06

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

Docket Nos.: 50-327 and 50-328

License Nos.: DPR-77 and DPR-79

Facility Name: Sequoyah Units 1 and 2

Inspection Conducted: January 6, 1986 thru February 5, 1986

Inspectors: *K. M. Jenison*
K. M. Jenison, Senior Resident Inspector

2/28/86
Date Signed

L. J. Watson
L. J. Watson, Resident Inspector

2/28/86
Date Signed

Approved by: *S. P. Weise*
S. P. Weise, Section Chief
Division of Reactor Projects

3/4/86
Date Signed

SUMMARY

Scope: This routine, announced inspection involved 417 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; and review of IE Information Notices.

Results: No violations or deviations were identified. One unresolved item was identified involving the reagent air supply to the hydrogen analyzers as discussed in paragraph 9.

REPORT DETAILS

1. Licensee Employees 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
*R. W. Olson, Modifications Branch Manager
*M. R. Sedlacik, Electrical Section Manager, Modifications Branch
*H. D. Elkins, Instrument Maintenance Group Manager
*C. W. LaFever, Instrument Engineering Supervisor
M. A. Scarzinski, Electrical Maintenance Supervisor
*M. R. Harding, Engineering Group Manager
*D. C. Craven, Quality Assurance Staff Supervisor
*D. L. Cowart, Quality Surveillance Supervisor
*D. E. Crawley, Health Physics Supervisor
*G. B. Kirk, Compliance Supervisor
M. L. Frye, Compliance Engineer
H. R. Rogers, Compliance Engineer
*R. C. Burchell, Compliance Engineer
*E. W. Whitaker, Licensing Engineer
D. H. Tullis, Mechanical Maintenance Group Supervisor
J. H. Sullivan, Regulatory Engineering Supervisor
*C. E. Chmielewski, Nuclear Engineer, NSS

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

Other NRC Personnel:

*P. E. Harmon, NRC Resident Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized with the Plant Manager and members of his staff on February 13, 1985. One unresolved item described in paragraph 9 was discussed. The licensee committed to provide appropriate corrective action completion dates as discussed in paragraph 3. The licensee acknowledged the inspection findings. The licensee did not identify as proprietary any of the material reviewed by the inspectors during this inspection. During the reporting period, frequent discussions were held with the Site Director, Plant Manager and other managers concerning inspection findings. At no time during the inspection was written material provided to the licensee by the inspectors.

3. Licensee Action on Previous Inspection Findings (92702)

(Closed) Violation 327,328/85-23-01. The inspector reviewed the licensee's response to the violation dated August 2, 1985. This included a review of the revision to TI-70, Cleaning and Decontamination of Plant Equipment. The procedure was revised on August 13, 1985, to clarify requirements for end caps. The inspector determined that training described in the response had been completed on January 17, 1986. The response to the violation states under the heading Corrective Steps Taken and Results Achieved, "handling requirements for stainless steel will be reemphasized with craft personnel during training sessions." The response further states, under the heading Date When Full Compliance Will Be Achieved, that the plant would be in full compliance on August 22, 1985.

The licensee stated that the full compliance date was intended to apply to the procedure revision and compliance with the procedure and did not include the training commitment. The licensee stated that no commitment date had been made for the training.

The inspector determined that there had been other responses to violations in which dates provided under headings such as "date when full compliance was achieved" does not encompass all corrective actions stated. The ambiguity of the wording could lead an NRC reviewer to accept a response in which the licensee maintains that no commitment date was provided.

The licensee is conducting a review of all open and closed NRC commitments as discussed in the Sequoyah Nuclear Performance Plan Section 3.2. This item and the response to violation 328/85-24-02 discussed below have already been identified in that review. The licensee is providing revised responses to commitments missed which the licensee considers covered under the due dates specified in the responses. Consequently, any identified missed actions which the licensee considers to be open ended would be scheduled and completed, but may not be identified to the NRC by letter.

This violation is closed since all corrective actions have been completed. Followup on commitment dates in responses and review of the licensee's commitment tracking review is identified as Inspector Followup Item 327, 328/86-06-01. The licensee has committed to provide appropriate due dates for each commitment made in future submittals.

(Closed) Violation 328/85-24-02. The inspector reviewed the licensee's response to the violation dated September 6, 1985. The response stated that the plant would be in full compliance by January 1, 1986. The inspector reviewed the December 31, 1985 revision to SQM-2, Maintenance Management System, which incorporated directions on post modification testing. The inspector also reviewed training on post modification testing for planners. The training was completed on January 16, 1986. This item was identified in the licensee's review of NRC commitments conducted under the Nuclear Performance Plan. Since corrective action has been completed, this violation is closed. However, followup on meeting commitment dates will be reviewed as discussed above in Inspector Followup Item 327,328/86-06-01.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations. One unresolved item identified during this inspection is discussed in paragraph 9.

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 auxiliary, control, and turbine buildings and containment 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)
- Diesel Generator Fuel Oil System (Units 1 and 2)
- 480 Volt AC Vital Power Supply (Units 1 and 2)
- Auxiliary Control Air (Units 1 and 2)
- Auxiliary Building Gas Treatment System (Units 1 and 2)
- 125 VDC Vital Battery Boards and Vital Batteries
- 120 VAC Vital Instrument Power Boards

No violations or deviations were identified.

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. The inspector identified certain facets of the licensee's implementation of personnel and package search procedures which appeared inadequate. These issues were discussed with a NRC Region II security specialist. These issues involve safeguards information and are discussed in NRC Inspection Report 327,328/86-10.

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.

No violations or deviations were identified.

6. Monthly Surveillance Observations (61726)

The inspectors observed Technical Specification (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 and were reviewed by personnel other than the individual directing the test; that deficiencies were identified, as appropriate; that any deficiencies identified during the testing were properly reviewed and resolved by management personnel; and that system restoration was adequate. For complete 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-686 Channel Calibration for High Range Accident Radiation Monitors

During observation of the 18-month calibration of the containment radiation monitors, 1-RE-90-272 failed to provide the appropriate control room indication when the 10R source was attached to the monitor. The licensee has written a maintenance request to correct the problem. Followup on this deficiency is identified as Inspector Followup Item 327,328/86-06-02.

SI-166.6 Post Modification Test for Category A and B Valves

SI-7 Electrical Power Systems

During diesel generator (DG) testing conducted this month, testing results obtained by stopwatch indicated that one DG did not meet the Technical Specification 4.8.1.1.2.a.4 requirement that the DG voltage and frequency be within certain limits in 10 seconds after a start signal. During the tests observed by the inspector, the licensee utilized a strip chart recorder to monitor the voltage and frequency after the start signal. It was determined that the voltage and frequency were within the required ranges in 7 to 8 seconds and then

overshot the range, coming back within the required values in less than 11 seconds. The review of the results of further testing and the interpretation of the requirements for the end point of the 10 second time frame required by the TS is identified as Inspector Followup Item 327,328/86-06-03.

IMI-92-SRM-CAL Source Range Monitor Calibration Channel N-32

IMI-99-RT-6.22 Response Time Testing of FT-68-71A and FT-68-48A - RCS Flow

During observation of the response time testing, the inspector noted that the procedure required the use of stainless steel tubes to attach the hydraulic signal generator to the RCS flow transmitters. Copper tubing had been used for the attachment. A change had not been processed for the deviation from the procedure. The technicians stated that they believed that stainless steel was only required in high pressure applications; however, the technicians decided to stop the response time test and process a change to the procedure. After review of equipment requirements, the licensee stated that the stainless steel tubing was only needed in high pressure applications. In this test, pressure was approximately 15 psig. The inspector reviewed the events with management, i.e., that the procedure had not been followed and that a change had not been sought until after the inspector had discussed the deviation with the technicians. The inspector emphasized the need for adherence to safety-related procedures. In this instance, the failure to follow procedure had no safety significance, therefore, no violation will be issued. However, licensee actions to assure adherence to procedures will continue to be reviewed during future inspections.

No violations or deviations were identified.

7. 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 met while components or systems were removed from service; redundant components operable; approvals obtained prior to initiating the work; activities accomplished using approved procedures and inspected as applicable; procedures adequate to control the activity; troubleshooting activities controlled and the repair record accurately reflected what actually took place; functional testing and/or calibrations performed prior to returning components or systems to service; quality control records maintained; activities accomplished by qualified personnel; parts and materials used properly certified; radiological controls implemented;

QC hold points established where required and observed; fire prevention controls implemented; outside contractor force activities controlled in accordance with the approved Quality Assurance (QA) program; and housekeeping actively pursued.

- b. IE Circular 78-19 concerned events related to safety system circuit designs which incorporate manual override (bypass) features. This issue was also addressed in an NRC March 19, 1980 letter to the licensee. The licensee's review resulted in Design Change Request (DCR) SQ-DCR-664 which was written on March 17, 1980. The DCR requested that the engineered safety system be changed so that a safety injection signal would give containment vent isolation directly without interference from override switches. TVA responded to NRC in an April 24, 1980 letter which stated that design changes had been initiated.

The deficiency documented in the DCR involved an override feature which existed in the design of the containment ventilation system retentive memory circuit. The actuating signals for the circuit are a high containment radiation monitor signal or an SI signal. On manual reset, the circuit sealed in a retentive memory output signal which defeated all actuating signals until the original actuating signal was removed. On this same manual reset, however, the containment ventilation isolation was also reset independent of the retentive memory circuit. In an event where a high radiation signal was present the circuit could be reset without clearing that signal. This deficiency could have prevented the closure of 30 containment vent isolation valves on an actual SI signal if the valves had been manually opened following manual reset of a spurious signal.

Administrative action was taken to preclude reset of the containment ventilation isolation with an actuating signal present. System Operating Instruction SOI-32.2B (Unit 1 and 2) was revised on April 30, 1981 to include a caution statement under the recovery from a containment ventilation system isolation actuation to instruct the operator not to reset the isolation until the actuating signal is cleared. The caution states that by resetting under these circumstances other isolation signals are blocked.

The licensee requested that Westinghouse review the design problem and provide a modification to the circuitry to separate the SI signal from the high radiation signal. The modification package was issued by the vendor in November, 1984. The modifications were performed in Unit 1 during October, 1985 and on Unit 2 during January, 1986. The inspector reviewed the completed workplans (WP) 117426 and 11851 for Unit 1 and proposed WPs 11887 and 11908 for Unit 2. These WPs covered the installation and post modification testing of the modifications. No violations or deviations were identified.

During discussions with the cognizant engineer for these modifications, the engineer stated that the deficiency was applicable to Watts Bar and had been corrected at Watts Bar.

During this review the inspectors noted that other Engineered Safety Features (ESF) had the same type of retentive memory design; however, these features isolate valves that have other than containment isolation functions. A review of these features is identified as Inspector Followup Item 327, 328/86-06-04.

During implementation of WP 11887 on Unit 2 on January 23, 1986, the Residual Heat Removal System (RHR) was isolated when the power supply to the Solid State Protection System circuitry involved in the modification was deenergized. Unit 2 had been in Mode 5 for 5 months at the time of the event. RHR was returned to service in one hour. The licensee determined that this event was not reportable. Followup on this event is identified as Inspector Followup Item 327, 328/86-06-05.

- c. The inspector observed cable splicing and QC review of hold points for crimping and sealing cables for the relocation of pressurizer level instrument 2-PDT-68-339 under Work Plan 11882.
- d. The inspector observed maintenance activities on the "A" Component Cooling System (CCS) Heat Exchanger (1-HEX-70-08) which was performed in order to resleeve and plug defective tubes. The following data was reviewed:
 - MR A549627
 - MI 6.20, Configuration Control During Maintenance Activities
 - SMI-0-70-1, Sleeving of CCS Heat Exchanger Tubes
 - MI 6.14, Plugging of HX Tube Leaks
 - MI 6.15, Tightening Bolted Joints
 - SI 679, ERCW Heat Exchanger Inspection
 - Unresolved Safety Question Determination 85-24
 - Drawing 47W859-1
- e. Maintenance on limit switch 2-LS-067-0345 was performed to adjust the actuation setpoint. Maintenance Request A543246 was reviewed.
- f. The inspector reviewed work activities on WR B108836. The work request covered the upgrade of discharge piping in the Essential Raw Cooling Water traveling screen wash pumps from Class G to Class C piping. At the time of the inspection, two welds had been built up to meet the Class C requirements. The inspector also reviewed the documentation for signoffs on QC holdpoints.

No violations or deviations were identified.

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

The following LERs 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 Technical Specification conditions had been identified.

LERs Unit 1

327/83155	Inoperable Feedwater Flow Transmitter
327/85048	Failure to Properly Review Maintenance Procedures
327/85049	Failure to Perform Surveillance Requirements
327/85050	Containment Ventilation Isolation
327/85051	Missed Hourly Fire Watches

LERs Unit 2

328/84013	Rupture of Pressurizer Relief Tank Disc
Rev. 1	
328/83024	Inoperable Feedwater Flow Channel

9. Event Followup (93702, 62703)

- a. The inspector reviewed the licensee's action in regard to the reanalysis of a main steam line break (MSLB) inside the steam vaults considering the effects of superheated steam produced when steam generator tubes uncover. Safety-related equipment in the steam vault could be adversely affected by the resulting environment. The licensee's letter to the NRC dated August 2, 1984, provided the basis for the failure evaluation of the equipment located in the steam vault. The analysis submitted, which indicated that essential actions could be completed and events mitigated prior to equipment damage, was based on the inside containment mass and energy release analysis performed by Westinghouse on the Catawba Nuclear Station.

Westinghouse has completed a reanalysis of the MSLB with superheated steam. The reanalysis indicated that equipment in the steam vaults could fail when subjected to the higher temperatures. This analysis, however, did not consider certain design features incorporated at Sequoyah, such as the Boron Injection Tank.

The licensee has performed a comparison study with the reanalysis performed by Westinghouse on Diablo Canyon. This analysis incorporates features at Diablo Canyon which are essentially identical to Sequoyah and were not assumed in the generic Westinghouse analysis. The licensee is contracting with Westinghouse to provide a site specific analysis of the MSLB inside the steam vaults for Sequoyah.

The licensee held a telecon with the NRC on February 6, 1986, to discuss the revised computer models to be utilized in the reanalysis.

- b. On December 11, 1985, during a system walkdown conducted by the Sequoyah Nuclear Plant Quality Assurance Organization, it was discovered that the reagent air supply line for Unit 2 "A" train containment hydrogen analyzer was connected to the control air system. The control air system is nonessential and not seismic Category I. The licensee declared the Unit 2 "A" train to be inoperable. At the time the alignment error was identified, Unit 2 was in mode 5; therefore, no Limiting Condition for Operation action statement was entered. The modification resulting in the alignment error was installed in January 1985. Unit 2 was operated in violation of LCO 3.6.4.1 from approximately January 1985 to August 21, 1985.

The inspectors reviewed licensee documents to determine adequacy of design change controls. Nonconformance Report NCR-SQN-EEB-8014 identified equipment which did not meet environmental qualification requirements. Design Change SQ-DCR-972 was written January 5, 1984, to relocate instrumentation and equipment to accessible mild environments in accordance with NUREG 0588. DCR-972 was implemented through approximately 99 Engineering Change Notices (ECNs). One of these ECNs, ECN L6032, was written to relocate the hydrogen monitor instrumentation as addressed in the corrective actions for NCR-SQN-EEB-8014.

The corrective action for NCR-SQN-EEB-8014 required, among other actions, relocation of the reagent gas, supplied by instrument air, for the hydrogen analyzers. The ECN L6032, Unreviewed Safety Question Determination (USQD), stated that the affected equipment would be relocated to a mild environment area and installed to the same requirements of the previous location, i.e., seismic Category I, TVA Class B and Class IE.

Field Change Request FCR 2468 was written to revise control air flow drawings 47W848-8 and 47W848-12 to show control air going to panels 1-L-382 and 383. FCR 2468 was categorized as a Category A change, which was within the scope of the original ECN L6032 USQD. The Plant Operations Review Committee (PORC) approved FCR 2468 (which replaced auxiliary air with control air) on July 19, 1984. FCR 2468 was not implemented for Unit 2 Train B due to another field change, FCR 3275.

The following Work Plans (WPs) were reviewed during the evaluation of this issue:

WP 11006	WP11396	WP11002
WP 11110	WP11911	WP11019

At the end of the inspection period, the inspectors had not completed their review. Until further review of licensee design controls is completed, the resolution of the following issues is Unresolved Item 327,328/86-06-06:

- a. Adequate PORC review of ECN L6032 and its associated WPs and FCRs
- b. Adequate implementation of Design Change FCR 2468
- c. Adequate Post Modification Test of the Hydrogen Monitor System

10. IE Information Notices (92701)

The following IE Information Notices (IENs) were reviewed and closed. The inspector verified that: corrective actions appeared appropriate; generic applicability had been considered; the licensee had reviewed the event and that appropriate plant personnel were knowledgeable; no unreviewed safety questions were involved; and that violations of regulations or Technical Specification conditions did not appear to occur.

IEN 85-97 Jail Term For Former Contractor Employee

11. Independent Inspection (71707)

The inspectors accompanied NRC Region II management on a tour of the licensee's equipment spaces during this inspection period. In addition, a similar tour was conducted with the Chairman of the NRC, the NRC Executive Director for Operations and other NRC management representatives. Observations from these tours were documented in a February 7, 1986 letter from the NRC Deputy Regional Administrator for TVA to the TVA Manager of Nuclear Operations.