



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

Report Nos.: 50-327/84-31 and 50-328/84-31

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

Inspection Conducted: October 23 - 26, 1984

Inspector:

W. H. Miller, Jr.
W. H. Miller, Jr.

11-7-84

Date Signed

Approved by:

T. E. Conlon
T. E. Conlon, Section Chief
Engineering Branch
Division of Reactor Safety

11-8-84

Date Signed

SUMMARY

Scope: This routine, unannounced inspection entailed 27 inspector-hours on site in the areas of fire protection/prevention, followup on the licensee's compensatory actions regarding Confirmation of Action Letter on Appendix R fire protection discrepancies, and review of corrective actions on previously identified NRC and licensee identified items.

Results: Of the areas inspected, two apparent violations were found (all fire brigade members are not respirator qualified - paragraph 6.a, and no maintenance program provided for fire protection strainers - paragraph 6.c. One apparent deviation was found (fire protection system containment isolation valves are not provided with status lights in the main control room - paragraph 3.e).

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REPORT DETAILS

1. Licensee Employees Contacted

J. Alexander, Shift Engineer
*W. H. Baker, Fire Protection Engineer
*J. Blankenship, Information Officer
*L. Bush, Operations Group
*S. Butler, QA Supervisor
*M. R. Cooper, Compliance Engineer
*D. E. Crawley, Health Physics Supervisor
*J. T. Dills, Jr., Asst. Health Physicist
*V. L. Dudley, Fire Protection Engineer
*R. W. Fortenbury, Engineering Section Supervisor
*M. R. Harding, Engineering Group Supervisor
*G. B. Kirk, Compliance Engineer
*J. B. Krell, Plant Superintendent (Maintenance)
*J. D. McCamy, Engineering and Testing
R. Moore, DQA/QAB
*L. M. Nobles, Superintendent (O&E)
*R. W. Olson, Modification Manager
*D. L. Paul, Senior Engineer, Site Service
*M. A. Purcell, Mechanical Engineer
*J. H. Sullivan, Appendix R, Project Manager
*J. M. Qualls, Operations
*P. R. Wallace, Plant Manager
*J. E. Wills, Licensing Engineer
*G. G. Wilson, Assistant Ops Supervisor

NRC Resident Inspector

E. Ford

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on October 26, 1984, with those persons indicated in paragraph 1 above. The licensee acknowledged the following inspection findings:

- a. Inspector Followup Item (327 and 328/84-31-01), Fire Detectors Over ERCW Pumps are Not Included in the Technical Specifications - paragraph 3.a.
- b. Deviation Item (327 and 328/84-31-02), Fire Protection System Containment Isolation Valves Are Not Provided with Status Lights in the Main Control Room - paragraph 3.e.

- c. Violation Item (327 and 328/84-31-03), All Fire Brigade Members Are Not Respirator Qualified - paragraph 6.a.
- d. Violation Item (327 and 328/84-31-04), No Maintenance Program Provided for Fire Protection System Strainers - paragraph 6.c.

3. Licensee Action on Previous Enforcement Matters

- a. (Closed) Deviation Item (327/81-14-03), Fire Detection Is Not Provided Over ERCW Pumps. Fixed temperature type fire detectors have been provided over each ERCW pump. These detectors are not included in Technical Specifications as required. This is identified as Inspector Followup Item (327 and 328/84-31-01), Fire Detectors Over ERCW Pumps are not Included in the Technical Specifications, and will be reviewed during a subsequent NRC inspection.
- b. (Closed) Unresolved Item (328/81-14-03), Fire Detection is Not Provided Over ERCW Pumps. Refer to above item 3.a.
- c. (Open) Deviation Item (327/80-10-01), Substandard Fire Protection Administrative Procedures. As previously reported in Report Nos. 327/80-17 and 328/80-10, the licensee revised the plant procedures to comply with the NRC guidelines for fire brigade training and drills. Subsequently, procedure PHYSI 13, Section 4.5.1, has been revised to require wood used in safety-related areas of the plant to be of the pressure fire retardant type unless an exemption is granted by the plant safety staff for use of other types of materials. This appears to meet the intent of the NRC guidelines. Fire fighting procedures for all safety-related areas have not yet been prepared. The licensee stated that approximately five procedures for safety-related areas and 20 for nonsafety-related areas remain to be prepared. This item is to remain open until these procedures are prepared.
- d. (Closed) Deviation Item (327/80-10-02), Substandard Supervision of Fire Protection Control Valves. The licensee has established Procedure SI 654, Fire Protection Header Valve Seal Inspection (Weekly), and is inspecting the control valves to the automatic sprinkler systems weekly. These valves are maintained sealed in the correct alignment. This arrangement meets the applicable NFPA criterion and is acceptable, but does not meet the TVA commitments to lock the valves in the open position. The commitments should be reviewed and revised as required. However, for Region II's inspection program, this item is closed.
- e. (Closed) Unresolved Item (327/80-10-07), Supervision of Containment Isolation Fire Protection Valves. TVA has taken no corrective action on this item. FSAR, Section 6.2.4.2.2, states that the safeguard position of automatic containment isolation valves is indicated by status lights in the main control room. The position of the containment isolation valves in the fire protection piping which penetrates

the containment is not provided with status lights in the control room. Therefore, this unresolved item is closed, but this FSAR discrepancy which is applicable to both units is identified as Deviation Item (327 and 328/84-31-02), Fire Protection System Containment Isolation Valves Are Not Provided With Status Lights in the Main Control Room.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Review of Appendix R Confirmation of Action Commitments (92703)

Following the NRC Region II July 16 - 20, 1984, 10 CFR 50 Appendix R inspection of Watts Bar (Report Nos. 50-390/84-55 and 50-391/84-43), TVA identified a number of cable interaction deficiencies at Sequoyah. On August 10, 1984, NRC Region II issued a Confirmation of Action Letter to TVA identifying the action to be taken by TVA to implement a complete review of the Appendix R program at Sequoyah, the compensatory measures to be established for the identified deficiencies, and an established time schedule for submission of status reports.

TVA's review continues to identify Appendix R deficiencies. The final TVA report is scheduled to be submitted to Region II prior to January 1, 1985, at which time the appropriate enforcement action will be determined.

This inspection reviewed the following deficiencies as identified by TVA's report dated October 15, 1984, and the compensatory action taken for the deficiencies:

a. TVA Appendix R Review Team

TVA has established a team consisting of 51 (38 full-time and 13 part-time) engineers, technicians, and operational personnel to reevaluate the Sequoyah plant for compliance with Appendix R requirements. TVA Design Engineering (ENDES) has 11 people on site and 27 in the design office in Knoxville and operations has assigned 13 personnel to assist in the site review. The team appears well managed, organized and is on schedule to meet the established review completion schedule.

b. Fire Shutdown Logic Diagram

The shutdown logic diagram continues to be revised to reflect the actual "as built" plant conditions and systems currently considered to be required for safe shutdown. This item will be reviewed during a future NRC inspection.

c. Cable Interaction Evaluation

As of October 15, 1984, TVA has produced over 90 drawings which indicate the cable routing in the plant. Approximately 75% of these drawings had been field verified. Field verification is scheduled to be completed by October 29, 1984. A total of 34 cable interactions

which violate Appendix R, Section III.G.2 criteria have been identified by TVA. The NRC inspector toured each of these interaction areas and noted that all of these interactions are in areas provided with automatic sprinkler protection and a fire detection system, except interactions above the ceiling of the counting room and RWST pipe tunnel in Unit 1 which consist of a bank of 36 conduits, and interactions in the Units 1 and 2 pipe chases at 690' elevation. However, a temporary temperature monitor system has been installed in the Units 1 and 2 pipe chases and ERCW pipe tunnel (Refer to paragraph 5.g below).

The installed sprinkler systems have some minor obstructions from cable trays, ducts, hangers, structural support, etc. The more critical obstructions are located on the 714' elevation of the auxiliary building. The inspector suggested that TVA review the entire sprinkler system installation and verify that the systems would meet the requirements of Appendix R, Section III.G., i.e., the system must be capable of assuring that in the event of a fire at least one train of hot shutdown system is maintained free of fire damage.

d. Associated Circuit Analysis

The associated circuit analysis is being conducted in TVA's Knoxville design office. This analysis is approximately 55 percent complete for auxiliary power cables and 95 percent complete for control power cables. The analysis is required to be completed and submitted to NRC Region II by December 21, 1984. A review of this analysis will be made by the NRC during a subsequent NRC inspection.

e. Reactor Coolant Pump Oil Collection

The oil collection systems for the reactor coolant pumps were identified by TVA as being of insufficient capacity to hold the oil resulting from the largest spill due to a single failure. Modifications which had been made since the initial design of the system to satisfy other commitments and safety issues had reduced the volume available for oil collection. TVA's evaluation indicated that the drain piping system plus a portion of the collection sump would be sufficient to hold the oil from a single failure if sufficient capacity was available for oil collection. Therefore, TVA has revised annunciator procedure No. SOI-55-1MS, Annunciator Response, (Change No. 84-1475) and issued a "Night Order" to require the operator to verify that the reactor building pocket sump is maintained at less than 45% full in the event of a high or low level alarm in either the upper or lower bearing oil reservoir for the reactor coolant pumps. The inspector verified that these procedures were properly filed within the control room.

The present arrangement of the oil collection system for the reactor coolant pumps does not meet the requirements of Appendix R, Section III.O since the drainage system will not handle an oil break from all of the lubrication systems simultaneously following a safe shutdown earthquake. This discrepancy requires a formal deviation request. NRC Region II will review this system in detail during a subsequent inspection.

f. Emergency Lighting

TVA has identified a number of additional plant areas where operator action is required to bring the plant to hot shutdown. These additional areas are not provided with the 8-hour emergency lighting units required by Appendix R, Section III.J. Approximately 75 additional 8-hour type lighting units will be required. Also, some of the existing lighting units were found by TVA to have 25 watt lamps in lieu of 10 watt lamps which are needed for the units to provide eight hours of illumination. The correct lamps are to be installed for these units. As an interim measure, TVA has supplied 12 portable lanterns to the operation staff for use in the event of the failure of the normal and other emergency lighting systems. The inspector verified that these portable lanterns were provided. Nine lanterns were provided in a cabinet adjacent to the auxiliary control room and three lanterns were in a cabinet adjacent to the shift engineer's office in the control building. Additional flashlights and batteries were also provided.

g. Firewatch

Following identification of the Appendix R, Section III.G, cable interaction discrepancies, the licensee initiated three roving and one fixed firewatch per shift to provide continued surveillance of selected areas in the auxiliary, control, turbine, diesel generator, and essential raw cooling water pumping station buildings in which the interaction discrepancies had been identified. Each roving firewatch is required to cover his assigned areas once each hour per shift. Checklists have been provided to document the time each room or area is visited. The one stationary firewatch monitors the temperature indicators provided for the two pipe chases and ERCW pipe tunnel. TVA has implemented a procedure which identifies the firewatch duties and assignments.

The inspector verified that all of the current personnel assigned firewatch duties had completed the required training, appropriate firewatch records were provided and that the program was being implemented. No discrepancies were noted, except the firewatch checklists for two shifts, August 13 (2300 to 0700) and September 24, (0700 to 1500) 1984, were not available. However, the daily control room journal log indicated that the firewatch duties were performed for these dates. This problem occurred following the initial implementation of this firewatch program. At that time, a portion of the fire

watch personnel was supplied by two management groups. To improve the management of this program, TVA assigned all firewatch personnel under the supervision of the operations supervisor. Presently, this program appears to be satisfactorily implemented.

h. QA Program

The licensee stated that all modifications accomplished as a result of this Appendix R reevaluation are to be accomplished under the normal operations QA/QC program. The inspector reviewed work plan 11192 (ECN-L6209) for the installation of some of the fire barriers and verified that appropriate QA/QC hold points were designated.

Within the areas examined, no violations or deviations were identified. However, as noted above, enforcement action on the licensee identified items is being deferred pending completion of TVA's evaluation.

6. Fire Protection/Prevention Program Implementation (64704)

A review was made of the following fire protection features to verify that the licensee was implementing a program for fire protection and prevention that was in conformance with NRC requirements, commitments to the NRC, and site procedures:

a. Fire Brigade

The fire brigade is composed of personnel from the operations group. The team leader is an assistant shift engineer and the brigade members are auxiliary unit operators. There are 16 designated brigade leaders and 79 members. The training, drill and medical review records for four team leaders and ten members were reviewed to verify that these personnel had attended the basic and/or leadership training, quarterly classroom training, two drills within the past year, medical review within the past year, and were respirator qualified. From the record data reviewed, the only discrepancy noted was that four of the brigade members were not respirator qualified. One member had never received a respirator fit test, one member was five months overdue for a whole body count, and two were slightly over due (24 and 4 days) for medical review.

A cursory document review indicated that a number of other fire brigade members were also not respirator qualified. Radiation Control Instruction RCI-14, Section V.A, states that respirator protection is required for conditions involving airborne contamination and that the workers must have a current whole body count, respiratory fit and training and current medical review. Technical Specification, Section 6.8.1.a, requires written procedures to be established, implemented and

maintained covering the applicable procedures listed in Appendix A of Regulatory Guide 1.33. This guide requires procedures for radiation protection. The failure of brigade members to meet the respiratory qualification program is identified as Violation Item (327 and 328/84-31-03), All Fire Brigade Members are Not Respirator Qualified.

b. Fire Brigade Equipment

The fire brigade equipment is stored in a locked storage area on 706' elevation of the service building which is readily accessible to the auxiliary and control buildings. A total of ten self contained breathing apparatus with ten spare cylinders, ten sets of turnout gear (boots, helmets, coats, gloves, etc.), hand lights, fire hose, nozzles, two portable exhaust fans and miscellaneous equipment were provided. An equipment trailer with additional fire hose, extinguishers and miscellaneous equipment is located outside the plant structure near the main security entrance gate. An additional 82 breathing apparatus and 72 spare cylinders are available to the fire brigade from health physics, which is adequate to meet the required six-hour supply for the brigade. The fire brigade equipment appeared satisfactorily maintained.

c. Fire Protection Systems

The completed surveillance inspection and test records for the following systems at indicted dates were reviewed to verify that these systems were inspected and tested within the frequency established by the Technical Specifications:

- (1) SI 167, Fire Header Valve Lineup Inspection (Monthly)
January 5 through September 15, 1984
- (2) SI 172, Fire System Testable Valve Cycling (12 months)
August 10, 1982 through August 24, 1984
- (3) SI 173, Fire System Nontestable Valve Cycling (18 months)
July 29, 1983 through October 13, 1984
- (4) SI 174, Fire System Sprinkler System Testable Valves (12 months)
August 9, 1983 through August 8, 1984
- (5) SI 176, Fire Suppression Water Sprinkler System Functional Test (18 months)
September 12, 1982 through March 2, 1984

(6) SI 180, Fire Pump Start Test

January 9 through September 15, 1984. Pump 1AA was removed from service on July 18, 1984, for major repairs. Pump was restored to service on August 24, 1984.

(7) SI 190, Fire Hose Inventory (Monthly)

January 13, 1984 through October 15, 1984

(8) SI 234.2, Fire Detection System - 714' of Auxiliary Building, Intake Pumping Station and ERCW Pumping Structure (6 months)

July 2, 1983 through July 16, 1984

In reviewing the licensee's surveillance inspection and test program for the fire protection automatic water spray and sprinkler system, it was noted that the strainers in the supply piping to these systems were not included in periodic maintenance inspection and cleaning programs required by NFPA-15, Water Spray Fixed Systems for Fire Protection, Section 6012 (1973 Edition). FSAR, Section 9.5.1.4, states that fixed water suppression systems are periodically tested in accordance with the applicable NFPA code requirements to ensure operability and inspected at regular intervals to ensure that all equipment is in good operating condition. Technical Specification, Section 6.8.1.f, requires written procedures to be established, implemented and maintained for the fire protection program implementation. The lack of a maintenance program for these strainers is identified as Violation Item (327 and 328/84-31-04), No Maintenance Program Provided for Fire Protection System Strainers.

d. Annual Full-Scale Fire Drill With Offsite Fire Fighting Organization

The annual full-scale fire drill was conducted on November 3, 1983, with the site brigade and the Soddy-Daisy Fire Department. A total of approximately 19 site fire brigade and 15 fire department personnel participated. The inspector reviewed the drill report and evaluation and had no further questions.

e. Plant Tour

During the plant tour to review the Appendix R cable interaction discrepancies, the plant's fire prevention and protection features were observed. As a whole, the housekeeping and control of combustible and flammable liquids and gases within the areas toured were satisfactory. A welding operation was noted in which an approved "hot work" permit had been issued and appropriate safety precautions were being observed. The fire protection systems within the areas toured were found to be in service and appeared to be satisfactorily maintained.

Within the areas examined, except as noted above, no additional violations or deviations were identified.