



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

DEC 06 1982

Report Nos. 50-327/82-28 and 50-328/82-28

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 site near Soddy Daisy, Tennessee

Inspectors: Paul F. Johnson 12/1/82  
for E. J. Ford Date Signed

Paul F. Johnson 12/1/82  
for S. D. Butler Date Signed

Approved by: D. A. Quick 12/1/82  
D. A. Quick, Section Chief, Division of Date Signed  
Project and Resident Programs

SUMMARY

Inspection on October 6 - November 5, 1982

Areas Inspected

This routine unannounced inspection involved 183 inspector-hours on site in the areas of Operational Safety Verification, Unit 1 Refueling Outage, Review of Licensee's Surveillance Program, Licensee Event Report Review and Independent Inspection Effort.

Results

Of the five areas inspected, no violations or deviations were identified in two areas; three violations were found in three areas; (327/82-28-01, Failure to maintain cognizance of system status; 327/82-28-02, Failure to follow IMI-92-SRM-FT; and 328/82-28-01, Failure to take adequate corrective action on containment airlocks).

## DETAILS

### 1. Persons Contacted

#### Licensee Employees

C. C. Mason, Plant Superintendent  
J. E. Cross, Assistant Plant Superintendent  
P. R. Wallace, Assistant Plant Superintendent  
J. M. McGriff, Assistant Plant Superintendent  
J. W. Doty, Maintenance Supervisor (M)  
B. M. Patterson, Maintenance Supervisor (I)  
D. C. Craven, Maintenance Supervisor (E)  
L. M. Nobles, Operations Supervisor  
R. W. Fortenberry, Engineering 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, Field Services Director

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

### 2. Exit Interview

The inspection scope and findings were summarized with the Plant Superintendent and/or members of his staff on November 5. The violations identified in the report details were discussed and the licensee acknowledged the inspection findings.

During the reporting period, frequent discussions were held with the Plant Superintendent and his assistants concerning inspection findings.

### 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 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 testing in progress.
- l. Maintenance activities in progress.
- m. Health Physics Practices.

Unit 2 tripped from 100% power on October 7. A main generator voltage regulator malfunction apparently actuated generator relaying which tripped the generator and turbine. The inspector determined from discussions with operations personnel and log review that plant equipment functioned as designed following the trip. The malfunction was corrected and the Unit returned to power on October 8.

On November 3 during a review of control room logs, the inspector noted that earlier in the day the annunciator inverter supplying Unit 1 and common annunciators had tripped causing a momentary loss of all Unit 1 and common annunciators. The licensee investigated the loss of power and initial indications were that work in progress near the inverter resulted in the output breaker tripping. The work was halted and the breaker reshut after approximately four minutes. Unit 1 was in mode 6 at the time. The inspector discussed the event with the shift engineer and reviewed the Radiological Emergency Plan (REP). Implementing Procedure IP-1 "Emergency

Plan Classification Logic" requires the "loss of all annunciators" to be classified as an alert. The inspector discussed the matter at great length with various licensee personnel to determine why the event was not classified as an alert. The licensee contended that the intent of the requirement was that an alert was to be declared when the annunciators were lost and there was no prospect of regaining them in a reasonable period of time. They further contended that their system was designed to cope with normal power outages since an operator can go to the inverter and transfer the annunciators to an alternate power supply by operating a transfer switch. In this instance, since it appeared that the breaker tripping was inadvertent, it was only a matter of reshutting the breaker. The inspector did not take exception to this interpretation; however, possible changes to the licensee's REP were discussed to prevent confusion in the future. The licensee indicated they would pursue the changes and the inspector will review the changes when made. Region II management was informed of the inspector's determination on the matter.

No violations or deviations were identified.

#### 6. Unit 1 Refueling Outage

During the Unit 1 refueling outage the inspectors periodically toured the control room, fuel handling area and the reactor building to ensure that:

1. Surveillance testing required by technical specifications and licensee procedures is complete and current.
2. Periodic testing of refueling related equipment is current.
3. Fuel handling operations and other ongoing activities are performed in accordance with technical specification requirements and approved procedures.
4. Containment integrity is maintained as required.
5. Adequate housekeeping is maintained in the refueling area.
6. The licensee's staffing during refueling is in accordance with technical specification requirements and approved procedures.

On October 7 the inspectors were informed that while lifting the Unit 1 reactor vessel head, the licensee noticed that the Control Rod Drive Mechanism (CRDM) thermal sleeve guide funnel for rod C-11 had come loose from the thermal sleeve and was resting in the rod guide tube assembly. Further inspection revealed that the tack weld for the funnel locking pin had probably failed allowing the pin to fall out and the funnel to unthread from the CRDM thermal sleeve. After the licensee had determined the failure mode they informed the inspectors of their plans to repair the defective funnel and inspect the others to ensure they were intact. The licensee's

plans for inspection included considerable health physics precautions in that the underside of the reactor vessel head is an extremely high radiation area. The inspectors informed Region II management and health physics specialists of the failure and the licensee's proposed plans for inspection and repair. The licensee subsequently found no other defective CRDM guide funnels and repaired the defective funnel. The lower core plate and the upper internals package were inspected but the locking pin could not be located. The licensee is obtaining a safety analysis from Westinghouse to determine if safe operation of the unit can be justified without retrieving the pin. During the inspection under the head, discrepancies were noted with the Upper Head Injection (UHI) head penetration end pieces. The discrepancies did not affect the structural integrity of the end pieces and they were corrected with the concurrence of Westinghouse.

Technical Specification 6.2.2.d. requires that a licensed senior reactor operator (SRO) be assigned and directly supervise all core alterations. Because of some confusion that had arisen regarding this requirement, as it applied at Sequoyah, on October 25, the inspectors discussed it with Regional management. It was concluded that in addition to having no other concurrent duties during fuel loading, the refueling SRO had to actually be in the reactor building on the refueling floor in order to observe and directly supervise core alterations as defined in section 1.8 of tech specs. The inspectors discussed the requirement with the Operations Supervisor who in turn discussed it with the SROs assigned to the Unit 1 refueling. Subsequently, the inspector questioned the refueling SROs and several auxiliary unit operators and determined that there had been no violations of the requirement prior to the clarification.

In the past, several Westinghouse plants have experienced breakage of the fuel assembly insert holdown springs during operation. As a result of this the licensee scheduled replacement of the affected inserts during the current refueling outage. The replacement insert springs have been redesigned and the manufacturing process altered to improve reliability of the springs. During the change out process the licensee identified four burnable poison assemblies and six thimble plug assemblies with broken springs. The assemblies were inspected with a video camera and all spring parts have been accounted for. The Unit 2 springs were replaced prior to initial criticality.

On November 1 the inspector was observing a portion of Surveillance Instruction SI-260 "SIS/BIT Injection Flow Balance Test Following Modification" being performed on Unit 1. The operator was lining up the "A" train Residual Heat Removal (RHR) pump on cold leg recirculation in order to test the "B" train pump on hot leg injection in accordance with the procedure. No fuel was in the reactor vessel at the time. When the "A" pump was lined up to the loops through the heat exchanger, there was no indication of flow. The pump was secured and the operators performed an investigation to determine the cause of the lack of flow. The configuration log indicated that the system had been tagged out for modification and returned to normal on October 31. A system valve lineup had been run on October 31 to support pumping some water from the refueling canal back to the refueling water storage tank. An operator was sent to check manual valves in the flow path

of the pump and found valve 1-PCV-74-524 locked closed instead of locked open. The system valve lineup indicated that the valve was locked open and the pump was tested to determine if any damage had been done while it was run at the shutoff head. There was no reported indication of damage to the pump. The inspector discussed the occurrence with the Assistant Operations Supervisor and Shift Engineer who indicated that they planned on further investigation and interviews to determine the cause of the valve misalignment. In that failure to maintain cognizance of system alignment of critical systems is a violation of Administrative Instruction AI-2 "Authorities and Responsibilities for Safe Operation and Shutdown" a Notice of Violation will be issued (327/82-28-01).

On November 2 the inspector reviewed Surveillance Instruction SI-6 "Containment Building Ventilation Isolation" which had been performed prior to commencement of reloading the Unit 1 core to ensure containment integrity as required by technical specifications. No problems were noted. The inspector observed the performance of SI-99 "Functional Test of Source Range Neutron Flux Channel within 8 hours prior to Initial Start of Core Alterations During Refueling" on channel N-31. The functional test was performed in accordance with Instrument Maintenance Instruction IMI-92-SRM-FT. During the check of the "Loss of Detector Voltage" bistable the inspector noted that the procedure called for recording the detector high voltage in a column titled "As Found Meter Indication" prior to lowering the voltage to check the bistable setpoint. Instead of recording the meter reading of 2050 VDC the instrument mechanic recorded the desired value of 2000 VDC, completed the test and returned the detector voltage to 2000 VDC. The channel was returned to service and the test reported as complete. Further discussion with the mechanic involved, the Senior Instrument Foreman and the Instrument Maintenance Supervisor revealed that there had been some previous confusion about what the procedure required and what was required to be recorded on the data sheet. The conclusion was that since the bistable setpoint was based on the desired value of 2000 VDC, which is set during the channel calibration, the desired setpoint would be recorded and then the detector adjusted back to the desired value after the bistable was checked. The procedure was never changed to reflect this decision. A review of other performances of the functional test revealed inconsistency among the mechanics who performed the tests in that some recorded 2000 VDC which may or may not have been the "as found" value and others recorded values other than 2000 VDC which appear to have been the "as found" meter readings. The inspector considers failure to follow IMI-92-SRM-FT as it was written a violation and a Notice of Violation will be issued (327/82-28-02). The licensee indicated they would issue a change to the functional test procedure to reflect the manner in which they intended the test to be run.

On November 3 the inspectors were informed that a cable guard on the manipulator underwater camera had broken loose and fallen into the Unit 1 reactor vessel. The two parts of the cable guard were retrieved but the

licensee could not locate the two bolt heads that had broken off. If the bolt heads cannot be located, the licensee will obtain a safety analysis to justify safe operation without retrieving the bolt heads.

On November 3 the inspectors were informed that the disc from the Unit 1 Loop 1 Main Steam (MS) check valve had broken loose from the valve swing arm. The disc had been located in the steam dump header below the main condenser. The disc attaching stud had apparently broken loose from the disc sometime during power operation prior to the refueling outage. The defect was noted during maintenance on the valve. The licensee is planning on repairing the disc and valve and repairing minor damage that occurred on the interior of the main steam line. The other three valves on Unit 1 were inspected and one other valve appears to have a stud weld defect that will be repaired. The Unit 2 valves will be inspected during the surveillance outage scheduled to start in November. The licensee's engineering staff is evaluating the failure mode and the possibility of reporting in accordance with 10 CFR 21. The licensee reported the occurrence to the NPC in licensee event report SQRO-50-327/82126. The inspectors will monitor the resolution of the problem by the licensee.

No other violations or deviations were identified.

#### 7. Review of Licensee's Surveillance Program

The inspectors reviewed the adequacy of the licensee's surveillance test program. It is noted that as a portion of the inspectors review for licensing of Unit 1 the surveillance instructions (SI) were reviewed to ensure they satisfied the technical specification (TS). In addition, the licensee's QA staff has completed a similar review of Surveillance Requirements (SR).

The SI/SR reviewed included an examination of SQA 41, "Surveillance Test Program" which applies to all SIs written that satisfy the requirements of the plant's TSs and other periodic commitments. SQA-41 is a cross-reference index of SI versus SR requirements for each unit. The inspector discussed and reviewed SI scheduling methods with the Plant Services Supervisor and the individual directly responsible for scheduling. A random selection of SRs was then correlated to the appropriate SIs and verified as being properly tracked. The QA Supervisor and personnel were interviewed to determine the extent of review of completed SIs. It was noted that a 100% review was done. The inspectors also reviewed AI-4, "Plant Instructions Document Control" which addresses controls and standard practices regarding controls for plant instructions including SIs, pertaining to critical structures, systems, and components (CSSC). The inspectors noted that AI-4 also requires a periodic review of these instructions after issuance and documentation by the Plant Operations Review Committee (PORC).

The inspector selected the last three amendments to the TS and verified that acceptable revisions had been made to the appropriate SIs. The inspectors interviewed personnel to ascertain how TS changes were incorporated into the SIs. This is accomplished by having the Plant Services Group direct changes

to the appropriate section supervisor for his review and evaluation. Furthermore, changes are initiated at the plant level and approved by PORC. The inspector discussed this method with the Compliance Supervisor and noted that it had not been institutionalized as a written statement in AI-4. The licensee committed to documenting the above in SQA-30. A change will be made to SQA-30 to provide for a formal method of tracking and documenting the cognizant section supervisor's evaluation of the TS change for revision to procedures, instructions, drawings or other appropriate documents. The compliance section will then review those changes to ensure that SRs are properly addressed.

The inspector randomly selected 10 SRs and reviewed the appropriate SIs for technical adequacy. No discrepancies were noted. Also, prior to Unit 1 refueling (presently ongoing), the inspector reviewed all TS Section 3/4.9 SRs. No discrepancies were noted.

No violations or deviations were identified.

#### 8. Licensee Event Report (LER) Review

During the reporting period, LER's were reviewed on a routine basis as they were received from the licensee. Each LER was reviewed to determine that:

- a. The report accurately described the event,
- b. The reported cause was accurate and the LER form reflected the proper cause code,
- c. The report satisfied the Technical Specification reporting requirements with respect to information provided and timing of submittal,
- d. Corrective action appeared appropriate to correct the cause of the event,
- e. Corrective action has been or is being taken,
- f. Generic implications if identified were incorporated in corrective action,
- g. Corrective action taken or to be taken was adequate, particularly to prevent recurrence, and
- h. The event did not involve continued operation in violation of regulatory requirements or licensee conditions.

The inspector reviewed Unit 2 LER SQRO-50-328/82115 which provided details concerning both upper containment personnel airlock doors being open simultaneously on 10/02/82. The licensee determined that during an individual's exit from the upper containment personnel airlock, the outer door bounced back on closure. This allowed the latch bar to close and block the door open. Minutes later, another individual who was unaware of the



condition opened the inner door to exit containment resulting in both airlock doors being open simultaneously.

The apparent cause of the occurrence was the door swing operating chain (linkage) being out of adjustment. The licensee subsequently adjusted the operating chain and the door was tested satisfactorily.

To prevent recurrence, the frequency for verifying proper adjustment of the operating chain will be changed from at least every six months to at least every three months. Also, during periods of high usage of the airlocks, a person trained in proper operation of the doors will be stationed at the airlock to operate the doors for all entries and exits.

A previous occurrence happened on Unit 1 on 7/19/81 and was reported on LER SQRO-50-327/81025. At that time an instruction had been prepared and implemented to periodically check and adjust the slack in the operating linkage. Other previous occurrences were reported as SQRO-50-327/80113 and 80116.

Due to the operating chain being out of adjustment, and previous LERs and corrective actions, the inspector concludes that previous corrective action taken to preclude repetition have been inadequate. This is a violation. (328/82-28-01).

No other violations or deviations were identified.

#### 9. 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 maintenance activities in progress as well as a discussion of significant problems or incidents associated with the refueling and operations effort.

No violations or deviations were identified.