



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

Report Nos.: 50-327/87-02, 50-328/87-02

Licensee: Tennessee Valley Authority
6N38 A Lookout 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: January 6, 1987 thru February 5, 1987

Inspectors:	<u><i>[Signature]</i></u>	<u>4/8/87</u>
	K. M. Jenison, Senior Resident Inspector	Date Signed
	<u><i>[Signature]</i></u>	<u>4/8/87</u>
	P. E. Harmon, Resident Inspector	Date Signed
	<u><i>[Signature]</i></u>	<u>4/8/87</u>
	D. P. Loveless, Resident Inspector	Date Signed
	<u><i>[Signature]</i></u>	<u>4/8/87</u>
	W. K. Poertner, Resident Inspector	Date Signed
Approved by:	<u><i>[Signature]</i></u>	<u>4/8/87</u>
	F. R. McCoy, Chief, Section 1	Date Signed
	Division of TVA Projects	

SUMMARY

Scope: This routine announced inspection involved inspection onsite by the resident inspectors in the areas of: operational safety verification (including operations performance, system lineups, radiation protection, safeguards and housekeeping inspections); maintenance observations; review of previous inspection findings; followup of events; review of licensee identified items; and review of inspector followup items.

Results: Two violations were identified.

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|-------------------|---|
| 327,328/87-02-01, | failure to adequately control field changes, paragraph 7 |
| 327,328/87-02-02, | failure to establish, maintain and implement safety-related procedures, paragraphs 9 and 13 |

Four unresolved items were identified.

327,328/87-02-03, modification to control room ceiling, paragraph 5
327,328/87-02-04, access control, paragraph 5
327,328/87-02-05, adherence to Health Physics requirements, paragraph 5
327,328/87-02-07, two spills of reactor coolant, paragraph 9

No deviations were identified.

REPORT DETAILS

1. Licensee Employees Contacted

- *H. L. Abercrombie, Site Director
- *L. M. Nobles, Acting Plant Manager
- *B. W. Willis, Acting Power Plant Superintendent
- *B. M. Patterson, Maintenance Superintendent
- *R. J. Prince, Radiological Control Superintendent
- *M. R. Harding, Licensing Group Manager
- *L. E. Martin, Site Quality Manager
- *D. W. Wilson, Project Engineer
- R. W. Olson, Modifications Branch Manager
- *J. M. Anthony, Operations Group Supervisor
- *R. V. Pierce, Mechanical Maintenance Supervisor
- M. A. Scarzinski, Electrical Maintenance Supervisor
- *H. D. Elkins, Instrument Maintenance Group Manager
- J. T. Crittenden, Public Safety Service Chief
- R. W. Fortenberry, Technical Support Supervisor
- *G. B. Kirk, Compliance Supervisor
- D. C. Craven, Quality Assurance Staff Supervisor
- *J. H. Sullivan, Regulatory Engineering Supervisor
- J. L. Hamilton, Quality Engineering Manager
- D. L. Cowart, Quality Engineering Supervisor
- H. R. Rogers, Plant Operations Review Staff
- R. C. Burchell, Compliance Engineer
- *R. H. Buchholz, Sequoyah Site Representative

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 February 4, 1987. The two violations described in this report's summary paragraph were discussed. No deviations were discussed. 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.

3. Licensee Action on Previous Inspection Findings (92702)

(Closed) Violation 327,328/84-38-02, Failure to have Adequate Nonconformance Report Procedure. The licensee stated in their response to the violation dated March 15, 1985, that the violation was not caused by the

lack of procedure. They suggested instead that the violation resulted from a lack of management control which did not ensure the timely reporting of the potential nonconformance.

The licensee committed to instructing all office of engineering employees at Sequoyah and in Knoxville on the timeliness requirements of documenting and reporting potential nonconforming conditions. This information was presented by memorandum to all Sequoyah engineering project employees on April 9, 1985. Knoxville employees were informed during informal meetings with their supervisors as designated in an April 9, 1985 memorandum from John A. Raulston. Furthermore, the licensee has committed to training all office of engineering and nuclear power employees on the use of their new procedures on conditions adverse to quality in response to NRC Order 85-49. This training was completed in October 1985. This item is closed.

4. Unresolved Items

Unresolved items (URIs) are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations. Four unresolved items were identified during this inspection, and are identified in paragraphs 5 and 9 of this report.

(Closed) URI 327,328/86-60-11, Control of Safety-Related Pumps. This item concerned failure of the emergency core cooling system (ECCS) pumps to meet the flow balance requirements of Technical Specification (TS) 4.5.2.h during the performance of the surveillance instructions, failure of the turbine driven auxiliary feedwater (AFW) pump to reach rated speed and flow, acceptability of AFW pump discharge piping vibration, and technical errors in the inservice inspection (ISI) procedure for RHR testing.

TS 4.5.2.h requires the performance of a flow balance test during shutdown following completion of modifications to the ECCS subsystem that alter the subsystem flow characteristics. As a result of concerns raised in Westinghouse bulletin NSD-TB-80-11 concerning pump degradation, Sequoyah began performing the ECCS flow balance on an 18 month surveillance interval. The performance of the flow balance tests indicated that at the end of the 18 month period the flow balance for the centrifugal charging pumps would be just below the minimum acceptable value. The licensee has received a change to the TS to reduce the required value for the sum of the injection line flow rates (excluding the highest flow rate) from 346 gpm to 316 gpm. The flow balance is now conducted with the pump mini-flow valves open where previously they were closed. However, discussions with the mechanical test engineers responsible for conducting the surveillance, determined that the TS change to a lower flow requirement should improve the pass rate of this surveillance activity. The licensee has also initiated a design change request to replace the positive displacement charging pump with a centrifugal pump. This will reduce the run times on the centrifugal charging pumps therefore the pump degradation between flow balances would be reduced. Further review of the licensees performances

of the ECCS flow balances and the status of the design change request to replace the positive displacement pump will be inspected during routinely scheduled NRC ASME Section XI testing inspections. This URI is closed.

Concerning the failures of the turbine driven auxiliary feedwater pump to reach rated speed and flow, the inspector reviewed the Licensee Event Reports associated with these events for adequacy. The inspector reviewed the licensee's potential reportable occurrence (PRO) files to determine if this constituted a recurring problem when running the turbine driven auxiliary feedwater pumps. These events appeared to be isolated incidents and not recurring failures with similar root causes. PRO 1-87-56 has been issued against the AFW System.

The other items addressed in this URI concerning pump performance were addressed in NRC Inspection Report 86-71 and are considered to be resolved. URI 327,328/86-60-11 is closed.

(Closed) URI 327,328/86-71-05, Containment Spray System Field Change Request. This item is addressed as violation (VIO) 327,328/87-02-01 in paragraph 7d of this report. This URI is closed.

(Closed) URI 327,328/86-71-06 Control Auxiliary Building and Containment Isolations. This item is addressed as violation (VIO) 327,328/87-02-02 in paragraph 9a. This URI is closed.

(Closed) URI 327,328/86-71-04 Adequacy of Surveillance Instruction (SI) 400.1, Liquid Effluent Batch Release

A discrepancy was identified between two different methods used to calculate background radiation on effluent releases. For the particular release that the inspector observed, the procedural discrepancy did not have any safety significance. SI 400.1 and Technical Instruction 18, radiation monitoring, are both under review in the licensee's surveillance instruction review program. This URI will be evaluated under the overall appraisal of the licensee's surveillance instruction review program URI 327,328/86-60-10 described in paragraph 7 of this report. URI 327,328/86-71-04 is closed.

(Closed) URI 327,328/86-42-02, Vendor Supplied Requirements

This issue was resolved in subsequent environmental qualification inspections conducted at Sequoyah nuclear plant and is therefore closed.

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, and verified compliance with TS limiting conditions for operation (LCO). 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, 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
- component cooling water system
- safety related heat tracing

During a tour of the control room the inspectors observed water dripping into pans hung in the false ceilings and onto the ceiling itself. The licensee stated that they were in the process of installing drip pans and gutters in the false ceilings to catch the water from the leaking control building roof. This modification was being performed under work request (WR) B214608 with a plant operation review committee (PORC) approved unresolved safety question determination (USQD) in place. The inspector questioned the use of a WR to perform a safety related modification and the corrective action time frame. These issues will be reviewed during the next inspection period. This item is considered unresolved and will be identified as URI 327,328/87-02-03.

No violations or deviations were identified.

b. Safeguards Inspection

In the course of the monthly activities, the inspectors included a review of the licensee's physical security program. The performance of various shifts of the security force was observed in the conduct of daily activities including protected and vital area access controls; searching of personnel and packages; badge issuance and retrieval; patrols and compensatory posts; and escorting of visitors.

In addition, the inspectors observed protected area lighting, and protected and vital areas barrier integrity. The inspectors verified various interfaces between the security organization and the operations and maintenance organizations. Specifically, the inspectors inspected security during outages and verified protection of safeguards information.

During a tour of the Unit 2 west valve room the inspectors identified that a security guard did not appear to have direct control over access to the open valve room which is a vital area. This issue was discussed with Regional management and will be identified as URI 327,328/87-02-04 until resolution by a security specialist is effected.

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 ensure the activities were being conducted in accordance with applicable RWPs. Selected radiation protection instruments were verified operable and calibration frequencies were reviewed.

During a routine tour of the auxiliary building, the inspectors observed a group of workers gathered around one train of the emergency gas treatment system (EGTS) charcoal tray beds. The system had been breached, and one worker had his head and part of his shoulders within the internal boundary of the system. The worker inside the EGTS system appeared to be performing a task with a pair of channel-lock type pliers. When questioned, another worker stated that an HP technician had taken a smear of the area in addition to frisking the area. The worker further stated that the HP technician had directed the workers to wait until he had counted the smear before entering the internals of the EGTS charcoal tray bed area to commence work. The inspector questioned the worker who was inside the EGTS system boundary and he stated that he was aware of the instruction given by the HP technician. The outside of the EGTS was not marked potentially contaminated, however, it was marked "notify HP prior to entry." Survey number D-87-0162 found no detectable transferable surface contamination. Because of the low safety significance of this particular issue, no violation will be issued at this time. However, adherence, to directions from HP technicians and compliance with HP practices will be reviewed as URI 327,328/87-02-05.

No violations or deviations were identified.

6. Monthly Surveillance Observations (61726)

The inspectors observed/reviewed TS required surveillance testing and verified that testing was performed in accordance with adequate procedures; that test instrumentation was calibrated; that LCOs 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 completed tests,

the inspector verified that testing frequencies were met and tests were performed by qualified individuals.

The inspector reviewed the performance of SI-244, Periodic Functional Tests of Radiation Effluent Monitoring Instruments, which was intended to satisfy TS surveillance requirements for the third quarter of 1986. The licensee documented that this surveillance had been missed in its September 1986 monthly report. The inspector reviewed the recalibration of flow indicator FI-77-230 and level transmitter LT-27-225. This issue was reported by the licensee in LER 327,328/86-37.

The licensee is currently in a large scale surveillance instruction (SI) review. The inspector reviewed that process and determined that the licensee is now in the third iteration of this review effort. Significant technical issues have been identified by the site quality assurance (QA) organization, which may have contributed to this iteration process. The following issues were evaluated by the inspector during a review of the licensee's SI review process:

- LER 327,328/86-30 Inadequate TS Procedure
- LER 327,328/86-34 Failure to Perform Surveillance on Time
- LER 327,328/86-37 Failure to Perform Surveillance on Time
- LER 327,328/86-40 Inadequate Isolation Valve Leak Test
- LER 327,328/86-43 Inadequate Containment Leak Rate Test
- LER 327,328/86-44 Inadequate Emergency Core Cooling System Procedure
- LER 327,328/86-48 Inadequate Emergency Core Cooling System Procedure
- LER 327,328/86-50 Inadequate Surveillance Instruction
- URI 327,328/86-71-04 Procedural Discrepancies

The above issues will be included with the issues identified in inspector followup item IFI 327,328/86-60-10, and are administratively closed.

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 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. On January 7, 1986, the inspectors observed workers replacing Raychem heat shrinkable tubing following the Raychem inspections. Workers discussed with the inspector the color coding of the tags that were affixed during Raychem signoffs. The work was covered by special maintenance instruction (SMI)-2-302-1, Walkdown Procedure for 10 CFR 50.49 Splices Located in Unit 2 Containment Penetrations, R1. The procedure was PORC approved and appeared to be adequate. The specific work observed involved the preparations and determination of proper Raychem packages on cables 2-PM-1626-IV and 2-PM-1741-IV. This specific work was authorized under WR B217558 and B217559 respectively.
- c. The inspector witnessed a portion of work plan 12195, AFW system Cavitating Venturi Post Maintenance Test on MDAFW pump 2A-A. This post maintenance test (PMT) plan was being performed because the cavitating venturi associated with MDAFW pump 2A-A had been replaced by MR A-522793. The PMT consists of three parts; performed with the steam generator (SG) pressure less than 100 psig, with SG pressure at approximately 385 psig and finally with SG pressure at 1005 psig. The inspector witnessed the performance of the first part of the work plan. No discrepancies were identified.
- d. Portions of design change request (DCR) 2259 were reviewed in order to resolve URI 327,328/86-71-05. DCR 2259 was written to change the sequencing time of the containment spray (CS) pumps and other loads when a loss of offsite power is followed by a need to commence containment spray. The closure of this particular issue is considered by the NRC and TVA to be necessary prior to the startup of either unit. A discussion was held with department of nuclear engineering (DNE) and Sequoyah nuclear plant compliance personnel to resolve whether certain field generated changes to engineering change notice (ECN) documents were adequately accomplished. The following documents were reviewed:

ECN L6715

DCR 2259

Field Change Request (FCR) 4873

Nuclear Engineering Procedure (NEP) 6.1, Variances/Expansions

Sequoyah Engineering Procedure (SQEP) AI-11A, FCR Handling

Sequoyah Administrative Instruction (AI)-19, Part IV, Plant

Modifications After Licensing

Work Plan 12227

After a discussion with the licensee, it was determined that:

- (1) The original DCR was not reviewed during the review and approval process for FCR 4873. Attachment 2, of NEP-6.1, which is used during the initial ECN review and approval process, was not used by either the design engineer or the review engineer to consider whether FCR 4873 affected certain aspects of ECN L6715.
- (2) It is not a normal practice for DNE engineers to review the affected work plan or other issued FCRs prior to approving a specific FCR.
- (3) The reviews of WP 12227 and FCR 4873 conducted under AI-19 and SQEP-AI-11A incorrectly determined that FCR 4873 was within the scope of ECN L6715. FCR 4873 addressed the removal of administrative control markings (hold clouds) and electrical circuits within the hold clouds on certain as-constructed electrical drawings. These circuits and hold clouds were addressed by another ECN. ECN L6715 did not address the addition or deletion of the hold clouds on the affected drawings. Therefore, FCR 4873 was not within the original scope of ECN L6715, yet it was reviewed with respect to ECN L6715. The FCR was not reviewed with respect to the ECN to which it really applied, and consequently, an inadequate review was done prior to implementing the FCR.

10 CFR 50 Appendix B, Criterion III, states that design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design. NEP-6.1, states that changes to any design documents which deviate from the approved scope of work will be evaluated against the original work scope. As described above, FCR 4873 was not reviewed and approved subject to design control measures commensurate with those applied to the original design. This is a violation VIO 327,328/87-02-01.

Three additional issues were identified during the review.

- (1) SQEP-AI-11A Attachment A sections 12 through 14 were not completed when the inspector reviewed this completed FCR.
- (2) It was not clear what type of technical review the assigned approving technical supervisor completed prior to approving this FCR. It appeared that the supervisory (DNE management) review was administrative in nature and did not consider the technical aspects of the FCR.
- (3) The drawings reviewed and approved by the plant operations review committee (PORC) were marked up by modifications personnel and were not the drawings approved by the DNE engineers. The drawing revision numbers on the SQEP-AI-11A document did not match the drawing revision numbers on the AI-19 document. In

this case the drawing changes were found to be the same. However, the FCR process did not ensure the documents were the same.

These issues will be resolved during a review of the licensee's corrective action for VIO 327,328/87-02-01.

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 no violations of regulations or TS conditions had been identified.

LERs Unit 1

327/84-070 - Failure of Containment Isolation Valves, due to Sediment Buildup on the Valve Stems.

During the performance of the weekly portion of SI-3, "Daily, Weekly, and Monthly Logs," the ice condenser glycol system containment isolation valves failed to stroke to the fully closed position on demand. The obstruction was a sediment buildup on the stem of the valves. The stems were cleaned and polished and the O-rings and diaphragms replaced. The licensee was unable to determine the source of the buildup. There have been no indications of any similar buildup on these or other valves on the glycol system prior to the event or to date.

The inspector determined through a records review and interview process, that the event had been discussed with maintenance personnel. The LER states that the results of a further investigation will be supplied in a supplemental report. To date this report has not been issued. The inspector discussed this discrepancy with licensee personnel and the report will be issued in the near future. The publishing of this supplemental report will be tracked as IFI 327,328/87-02-06.

327/84-42 - Incomplete Radiation Monitor Modification
327/86-52 - Administrative Control of High Radiation Areas

LERs Unit 2

328/83-129 - Loop 3 & 4 Main Steam Line Isolation Valves Would Not Close Due to Excessive Heating During Operation.

The licensee determined that the valve packing had dried out during operation. Subsequent cooling during the refueling outage had caused the packing to harden around the stem. This prevented the valve from

closing properly. The valve stems were lubricated and the valves tested satisfactorily. Licensee review of past events showed that the valves had been tested during the previous outage. On the basis of these tests the licensee determined that no further work was required on the valves. The valves are now tested and lubricated every refueling outage regardless of the valve stroke-time. This recommendation was implemented in the Sequoyah preventative maintenance program. The inspector reviewed documentation available to ensure that the problem has not occurred since that time. This item is closed.

- 328/86-08 - Inadvertent Phase A Isolation As a Result of Personnel Error In Failing to Follow Procedures. Events described in this LER contributed to the issuance of Violation 327,328/87-02-02, described in Paragraph 9. This item is closed.
- 328/86-09 - Inadvertent Control Room Isolation Resulting from Deficient Workplan. Events described in this LER contributed to the issuance of Violation 327,328/87-02-02, described in paragraph 9. This item is closed.
- 328/86-10 - Inadvertent Phase B Isolation Occurred During Testing. Events described in this LER contributed to the issuance of Violation 327,328/87-02-02, described in Paragraph 9. This item is closed.
- 328/86-11 - Inadvertent Containment Ventilation Isolation From Electro-magnetic Interference On A Radiation Monitor

9. Event Followup (93702, 62703)

- a. During the inspection period covered by Inspection Report 327,328/86-71, three engineered safety features (ESF) initiations occurred that were identified as URI 327,328/86-71-06. The three events have been determined to constitute a violation of TS 6.8.1.
 - (1) On November 30, 1986, a containment ventilation isolation (CVI) was initiated when an instrument mechanic (IM) failed to follow IMI-99, RT-106A.2, Response Time Test for Containment Lower Rad Monitor 2-RM-90-106A. The procedure stipulates that the IM is required to have the operator place the appropriate channel block switch in the "block" position prior to inserting a test lead. The IM inserted the test leads without having the block switch in the correct position and a CVI resulted.
 - (2) On December 1, 1986, a control room isolation (CRI) occurred when a deficient workplan (WP) was used to perform a test on CRI handswitch 2-HS-31A-7A. The workplan was in error in that the test procedure in WP 12268 required that the test personnel lift one wire at the handswitch. Subsequent review of wiring diagram 45N631-2 showed that additional parallel wire should have been

specified in the procedure. When the handswitch was placed in the "actuate" position, a CRI occurred. Inclusion of the second wire in the procedure would have prevented this event.

- (3) On December 3, 1986, a containment phase "B" isolation occurred when an inadequate procedure was used to perform instrument maintenance instruction IMI-99, "Reactor Protection System Response Time Test for Containment Pressure Channel III, RT-16.7." The procedure requires that only the train being tested be placed in "test" prior to tripping the high-high containment pressure bistables. The test did not indicate that the bistables feed both trains of the reactor protection system. A phase "B" isolation was initiated by the train not in "test" when the test was initiated.

TS 6.8.1 requires that written procedures be established, implemented and maintained for surveillance and test activities of safety-related equipment. Contrary to this requirement, the licensee failed to properly implement the procedure in instance 9.a.(1) above, and failed to adequately establish and maintain procedures in instances 9.a.(2) and 9.a.(3). These three examples constitute violation VIO 327/328-87-02-02.

- b. On January 6, 1987, the plant was notified by the division of nuclear engineering (DNE) that a problem existed with the trip settings for certain safety related breakers. The significant condition report (SCR) SQNEEB86124 R0, "SQN Auxiliary Power System class 1E Equipment Ampacity Study," stated that the calculated maximum loading that could occur during a loss of coolant accident (LOCA) exceeds the feeder breaker continuous current setpoints for the control and auxiliary building ventilation boards 1A1-A, 2A1-A and 2B1-B.

These ventilation boards supply safety related loads such as Emergency Gas Treatment System (EGTS), Auxiliary Building Gas Treatment System (ABGTS) and control room emergency ventilation fans as well as various room coolers. At approximately 4:00 p.m. (EST), the plant determined that there was not an immediate operability problem because certain (ESF) signals were blocked in the present mode (cold shutdown - mode 5). If the plant were at power, the potential for maximum LOCA loading would cause the boards to be inoperable. For example, board 1A1-A could have a continuous loading of up to 444 amps following a LOCA. The feeder breaker from the 480V shutdown board to the vent board 1A1-A is set at 392 amps per the setting sheets and other plant drawings. Because the maximum expected loading on these boards is within the capacities of these breakers, the plant resolution will be to reset the breakers to a higher amperage capacity and change the drawings.

The inspector questioned why the licensee had not discovered this when the vent boards are tested on a 18 month interval in SI-26.1A, -26.1B, -26.2A and -26.2B, "Loss of Offsite Power with Safety

Injection - D/G 1A-A, 1B-B, 2A-A and 2B-B," respectively. These tests, however, do not ensure that cyclic loads (e.g., room coolers that cycle on temperature) are running. Therefore, the maximum LOCA loading was never experienced. Resolution of this issue is expected to be part of the design basis verification program.

This item will be reviewed under URI 327,328/86-60-10.

- c. During the inspection period the licensee began a program to inspect the feedwater lines in response to the feedwater break event at Surry Power Station.
- d. During the inspection period two separate spills of reactor coolant system (RCS) fluid from open steam generator (SG) manways occurred. Unit 1 SGs are presently undergoing heat treatment of the first two rows of tubes to relieve stresses induced in manufacturing. This necessitates draining down the RCS to a level below the SG primary nozzles to allow robot aided access to the tube sheets. A non-watertight cover is placed over each RCS nozzle to prevent tools and debris from entering the RCS loops. The RCS is then placed on RHR recirculation and the primary access manways are opened. Proper water level in the RCS is maintained by use of an installed sight-glass monitored by a television camera and a TV monitor in the control room.

The first event occurred on January 28, 1987, and was caused by a partially plugged sightglass. The operators in the control room noticed water level above the maximum allowed and began lowering level by reducing charging pump flow. Water level in the sightglass did not respond, and the operators continued to decrease charging flow rate. The residual heat removal (RHR) pump amperage began to fluctuate, indicating pump cavitation. The operators stopped the pump and entered abnormal operating instruction (AOI)-14, "Loss of RHR Cooling." The operators began to raise water level to restore adequate pump suction. This caused actual water level in the RCS to be increased until the SG channel heads began to fill and water spilled out the manway. The operators were alerted and stopped the evolution. After blowing down the sightglass, level indication was restored and proper level attained. The RHR pumps were then started and RHR cooling restored. Approximately 500 gallons of RCS water was spilled.

The second event occurred on February 1, 1987. The RCS and RHR system were in the same configuration as in the first event. The operators were attempting to perform SI-166.3, "Stroke Time Testing of FCV-63-1," which is the isolation valve for the normal RHR suction from the refueling water storage tank (RWST). When the valve was opened, water from the RWST began to fill the RCS through the RHR suction line connected to RCS Loop D, and then spilled from the open SG manways. The two series valves in the RCS suction line had not been shut by the operator prior to opening the RWST suction. With

the RCS open to atmosphere, the elevation head in the RWST was enough to cause flow back to the RCS. The operator could not reclose FCV-63-1 until the open limit was reached (approximately 25 seconds stroke time). After the valve was reclosed, water continued to spill from the manway. The operators suspected that valve FCV-63-1 had not been fully shut by the motor operator, and sent an auxiliary operator to the valve to manually shut it. The auxiliary operator reported that the local handwheel was turned approximately 10 turns in the shut direction before valve travel stopped. Total handwheel travel is approximately 450 turns. The rapid filling of the RCS displaced 6 of the 8 SG nozzle covers. Total water spilled was estimated at 3000 to 4000 gallons. Neither event resulted in personnel contamination. These issues will be tracked as URI 327,328/87-02-07.

10. Inspector Followup Items (93701)

Inspector followup Items (IFIs) are matters of concern to the inspector which are documented and tracked in inspection reports to allow further review and evaluation by the inspector. The following IFIs have been reviewed and evaluated by the inspector. The inspector has either resolved the concern identified, determined that the licensee has performed adequately in the area, and/or determined that actions taken by the licensee have resolved the concern.

(Closed) IFI 327,328/86-31-06, Moisture Entrained in Sense Lines Could Cause Stress Corrosion Cracking in Bellows of Containment Sump Level System.

(Closed) IFI 328/84-38-05, Procedure to Address Early Implementation of Emergency Plan on Inadvertent Safety Injection.

(Closed) IFI 327,328/86-28-03, Component Cooling System Inleakage. Increasing activity levels in the component cooling system (CCS) have been observed since early 1985. Efforts to locate the source of the leak were not successful until the most recent investigation. The location of the leak has been identified as the 2B containment spray (CS) pump seal water heat exchanger, which was found to have a sheared O-ring at the inboard seal. This O-ring provides the barrier between the CCS in the seal water heat exchanger and the fluid in the pump casing. The leak was found by comparing cobalt 60/58 ratios from each component served by the CCS system. The unit 2 RCS was determined as the source of the radioactive fluid. The CS seal water heat exchangers were initially discounted as possible leak points since the CS pumps are lined up to take suction from the refueling water storage tank (RWST), and not from the RCS. Local samples at the Unit 2 Train B CS pump were conclusive.

The CS pump suction has the capability of switching to the ECCS recirculation sump in the post-LOCA scenario. This sump suction is by way of the line common to the RHR Pumps. Isolation from the sump and RHR system is through a single valve, 2-FCV-72-20. When this valve is opened (or leaks by) the CS pump suction is exposed to RHR suction pressure. With the RHR system on RCS recirculation, the pressure at this point is approximately

100 psig. The leak was intermittent, which complicated the search. It was later determined that leakage only occurred when CCS pressure dropped below 100 psig, such as when major components were placed in service. The licensee is presently disassembling the other three CS pumps to inspect their seals. IFI 86-28-03 is closed.

(Closed) IFI 327,328/85-27-03, Modifications to Chemical Volume Control System (CVCS)

(Closed) IFI 327,328/85-27-05, Flow Induced Vibrations on CVCS

(Closed) IFI 327,328/86-15-04, CVCS line Tee

(Closed) IFI 327,328/86-20-05, Word Processing Errors

(Closed) IFI 327,328/86-42-04, Vendor Manuals

11. Review of Employee Concern Element Reports (TI251574)

Based on a review the following element reports the following general areas of interest were identified:

- a. Many of the reports did not completely address the concern as expressed by the individual.
- b. In some reports the scope and depth of the investigation appeared not to be acceptable.
- c. There appeared to be a disconnection between some of the element reports and the document files.
- d. Corrective action in some cases appeared not to resolve the concern and in others the indicated corrective action did not include ancillary issues.

The following employee concern element reports were reviewed during this inspection period:

OP308.06 SQN	OP307.02 SQN
C015101 SQN	OP308.05 SQN
OP301.05 SQN	OP306.01 SQN
MAS-86-001	OP310.02 SQN
C015109 SQN	OP301.11 SQN
OP301.07 SQN	OP313.07 SQN
OP301.12 SQN	OP307.08 SQN
OP308.01 SQN	OP309.05 SQN
C015102 SQN	OP313.02 SQN
C01509 SQN	OP307.06 SQN
OP305.01 SQN	OP313.09 SQN
C015105 SQN	OP301.01 SQN
OP301.11 SQN	OP309.01 SQN

OP301.08 SQN
OP313.07 SQN
OP310.01 SQN

OP307.11 SQN
OP310.03 SQN

12. Experience Review (93702)

A potentially reportable occurrence report (PRO) 1-87-013, was issued January 10, 1987. The report described a condition where water could be lost from the ECCS recirculation sump area in a post-LOCA event. The postulated loss was described as through leak paths at the air-return fans on the upper containment deck level, and/or through a failed divider deck seal. The licensee has made a preliminary evaluation to determine the amount of water that could be lost from the ECCS path (ref. SCR SQNNEB8623R0). The preliminary result of this analysis indicates that water in the sump could fall below the sump swapover elevation (+13.7 ft.), but would be above the minimum level to prevent pump cavitation (+8.0).

A second issue involved the possible failure of one of the two air-return fans during spraydown of the area above the upper deck. Fan A-A, located above accumulator room 3, has the potential for having water from the post-LOCA spraydown pooling above the open fan inlet. The fan has been estimated to have a water flow rate of approximately 650 gpm. This value is in excess of the 50 gpm value guaranteed by the manufacturer. TVA personnel have been in informal contact with Duke Power personnel, alerting them to the possibility of an arrangement that could allow water to pool above their fans. Resolution of SCR SQNNEB8623R0 is IFI 327,328/87-02-08.

13. Cold Weather Preparations (71714)

On January 16, 1987, the inspectors observed work in progress per general operating instruction (GOI) - 6H, Apparatus Operations - Freeze Protection. During this performance the inspector noted several discrepancies. Step 17.A. and 18.A. both list a number of thermostats to be checked. These steps require that the following be checked: "All Circuits greater than or equal to 75 degrees F - Check thermostats Set at 75 degrees F." The auxiliary unit operator (AUO) conducting the procedure told the inspector that temperature indications did not exist for these circuits. Additionally, the thermostats were set ranging from 40-150 degrees F. They were left at 75-150 degrees F even though the procedure stated that they were to be set at 75 degrees. The response received was that the procedure simply meant to make sure the thermostats were set greater than 75 degrees.

The inspector discussed the events with other AUOs and the Unit Operator on shift. The responses ranged from the fact that some thermostats were not good enough to hold the circuit at or above 75 degrees without setting them above that point, to the statement that it really did not matter as long as the circuit remained above freezing.

The inspector found that circuit thermostats for circuits 369P, 367P, 369S and 367S were not identified in the panels designated in the procedure. The AUO accompanied by the inspector could not locate these thermostats. The inspector was told by other AUOs that they did not exist. One AUO informed the inspector that he knew the thermostats did not exist, but believed that the problem was identified on a WR. No WR was identified. Another AUO stated that he had in the past circled the errors and stated that they were wrong. The inspector reviewed past performances of the GOI performed on December 19, 1987, January 2 and 9, 1987, and found that all steps were signed off except on January 2, 1987. During this performance circuits 365S, 363S, 369P and 367P were scribed out with no initials or justifications.

The inspector went on a second tour with a different AUO on January 27, 1987. During this tour the AUO showed the inspector the appropriate way to determine the circuit temperatures. Also using hand written cabinet labeling he determined that the circuits were supplied by thermostats that controlled more than one circuit. The inspector verified this to be the case by reviewing the circuit drawings with instrument maintenance personnel. Neither of these points had been addressed by the original performance or by the procedure. The inspector reviewed the January 23, 1987 performance and found that circuits 365S, 363S, 369P, 367P and 367S were all circled and annotated, "not found or non-existent."

TS 6.8.1 requires that written procedures be established, implemented and maintained covering activities affecting quality. GOI-6H, Freeze Protection Checklist, is one such procedure.

Contrary to the above, on January 16, 1987, GOI-6H was performed without verifying the temperatures of circuits as required. In addition, the performance did not check certain thermostats as required because they were not found. Finally, circuit thermostats were not set to 75 degrees per procedure specifications. This is a violation of TS and shall be identified as another example of Violation 327,328/87-02-02.

In addition, the inspector determined several labeling discrepancies which included incorrect panel numbers, hand written labeling, and incorrect switch labeling. These cases were identified to the licensee personnel, and will continue to be followed as housekeeping violation VIO 327,328/85-32-02.

14. Sustained Control Room and Plant Observation (71715)

During the inspection period, meetings were held with the Sequoyah operational readiness restart group for the purpose of coordinating the NRC restart inspection effort. The licensee presented, for information, two operational readiness procedures; standard practice SQA-190, "Sequoyah Activities List Restart Item Disposition," and standard practice SQA-191, "Evaluation of Operational Readiness Prior To Plant Restart." These procedures establish TVA's restart criteria and describe the closeout process including independent reviews. The Sequoyah restart criteria,

Appendix A to SQA-190, is provided below for information:

- a. The item identifies a specific deficiency which has significant probability of leading to the inoperability of a system required for startup or operation by the appropriate TS.
- b. The item identifies a programmatic deficiency which has a high probability of causing or has caused a specific deficiency which meets No. 1 above.

NOTE: To assist in the determination of required for restart relative to TS as in criteria No. 1 and 2 above, an affirmative answer to any or the following questions requires consideration of the item for restart based on TS requirements.

- (1) Does the item directly and adversely affect safety-related equipment function, performance, reliability, or response time?
- (2) Does the item indirectly and adversely affect safety-related equipment power supply, air supply, cooling, lubrication, or ventilation?
- (3) Does the item adversely affect primary containment integrity?
- (4) Does the item adversely affect secondary containment integrity?
- (5) Does the item adversely affect control room habitability?
- (6) Does the item adversely affect systems used to process radioactive waste?
- (7) Does the item adversely affect fire protection or fire loads?
- (8) Does the item adversely affect the ability of a system or component to meet its safety function during a design basis event by impacting the seismic analysis, single failure criteria, separation criteria, high energy line break assumptions, or equipment qualification?
- (9) Are the programs such as radiological health, security, radiological emergency preparedness, or quality assurance which are necessary for safe conduct of operations of the plant adversely affected?

(10) If not corrected prior to restart, could it lead to an uncontrolled release or spread of radioactive contamination beyond the regulated area?

- c. The item identifies a specific deficiency that results in a failure to comply with NRC regulations and no variance has been approved by NRC.
- d. TVA has committed to NRC to complete the item prior to restart.
- e. The item identifies a specific deficiency which has a significant probability of leading to a personal injury during plant operation.
- f. The item identifies a specific condition which has a forced outage risk (probability X outage length) during the next cycle in excess of the critical path time to correct the condition prior to restart.

The above restart criteria was evaluated against the criteria established in volume 2 of the revised Sequoyah nuclear performance plan (SNPP). The criteria listed in SQA-190 was the same as that in the SNPP with the exception of items e and f above. Item e addresses the personnel safety aspect, where item f addresses schedule considerations. Item f appears to place a high degree of importance on schedule; however, when considered along with the other established criteria it appears to be acceptable. Additionally, SQA-190 has attempted to define the degree of significance of an item, where the SNPP implies the item must lead to inoperability of equipment or systems before it becomes a restart item. Implementation of the above criteria will be evaluated during subsequent inspections.

15. Liquid and Gaseous Effluents (90713)

The report listed below was reviewed by Regional inspectors to verify reporting requirements of technical content, data collection, acceptance criteria, and handling of deficiencies noted.

Report reviewed was as follows:

Sequoyah Effluent and Waste Disposal Semi-annual Report, 1st Half 86,
dated August 29, 1986

No violations or deviations were identified.

16. IE Bulletins (92703)

(Closed) 327,328/86-BU-03, Potential Failure of Multiple ECCS Pumps Due to Single Failure of Air Operated Valve in Minimum Flow Recirculation Line. A review of the licensee response to IEB 86-03 (dated November 14, 1986) was conducted in the region. In their response, the licensee stated that

the single failure vulnerability discussed in the bulletin did not exist at Sequoyah due to the following:

- ° The active ECCS consists of the safety injection system (SIS), residual heat removal system (RHRS), and the centrifugal charging portion of the chemical and volume control system.
- ° The SIS has two safety injection pumps; each pump has a minimum flow recirculation line connected to a common return line to the refueling water storage tank (RWST). A motor-operated flow control valve is located in the recirculation line for each pump and in the common return line to the RWST. The valve on the common return line to the RWST is normally open and fails "as-is" and is remote-manual controlled. Because it is the only isolation valve on the common return line from the safety injection pump discharge to the RWST (minimum flow recirculation line), the design of the control circuit is such that no spurious actuation will be able to energize the opening and closing coils for the valve operator. Emergency instructions call for the valve to be closed before transferring SI pump suction to the containment sump during recirculation mode of accident mitigation to prevent transfer of radioactively contaminated water to the RWST. As such, this system does not represent a concern in this area.
- ° The RHRS has two trains and each train has its own separate and redundant minimum flow recirculation line. Each recirculation line has its own normally-closed, fail "as-is," motor-operated globe valve. The control logic for each valve is identical. With the respective RHRS pump running and switches in the normal/auto position, the valve will automatically open for flow below a prescribed setpoint. The valve can also be opened remote manual.
- ° Two centrifugal charging (CC) pumps share a common minimum flow recirculation line which has two motor-operated globe valves in series. These valves are normally open with the power removed to satisfy 10 CFR 50 Appendix R requirements.

This item is closed.