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

Report Nos.: 50-327/89-27, 50-328/89-27

Licensee: Tennessee Valley Authority
6N 38A 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: November 6, 1989 thru December 5, 1989

Lead Inspector: J. B. Brady for 12/9/89
J. Jenison, Senior Resident Inspector Date Signed

Inspectors: P. Harmon, Senior Resident Inspector
D. Loveless, Resident Inspector
J. Brady, Project Engineer

Approved by: Bruce A. Wilson for 1/2/90
L. J. Watson, Chief, Project Section 1 Date Signed
TVA Projects Division
Office of Nuclear Reactor Regulation

SUMMARY

Scope:

This announced inspection involved inspection effort by the resident inspectors in the area of operational safety verification including control room observations, operations performance, system lineups, radiation protection, safeguards, and housekeeping inspections. Other areas inspected included maintenance observations, surveillance testing observations, review of previous inspection findings, follow-up of events, review of licensee identified items, and review of inspector follow-up items.

Results:

Management strengths observed during this inspection period included management response and control of plant activities during natural circulation conditions.

The areas of Operations, Maintenance, and Surveillance were adequate and fully capable of supporting current plant operations. In general, the observed activities of the control room operators were professional and well executed.

During observation of activities of the Operations section, the inspectors identified a specific instance of insufficient professional inquisitiveness with respect to plant condition indications displayed on control room panels (described in paragraph 2.a). Plant Housekeeping was specifically observed and has improved (paragraph 9).

Unit 2 was shutdown on November 8, 1989, for replacement of the leaking RCS vessel head vent manifold (described in paragraph 8.a).

One non-cited violation (NCV) was identified:

NCV 327,328/89-27-01, Failure to Control System Configuration, paragraph 4.b.

Three unresolved items* were identified:

URI 327,328/89-27-02, RHR Pump Testing, paragraph 4.d.

URI 327,328/89-27-03, Generic RM Related ESF Actuations, paragraph 7.c.

URI 327, 328/89-27-04, Average Thermal Power, paragraph 8.b.

No deviations, licensee identified items, or inspector followup items were identified.

The licensee announced the loss of several upper level managers during this inspection period. These managers included the Sequoyah Site Director and the TVA Manager of Technical Training. During this inspection period the position of Sequoyah Site Director was temporarily filled by the Vice President, Nuclear Power Production. A temporary organization was established, a description of which was provided to the NRC.

* Unresolved items are matters for which more information is required to determine whether they are acceptable or may involve violations or deviations.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*J. Bynum, Vice President, Nuclear Power Production
*C. Vondra, Plant Manager
T. Arney, Quality Assurance Manager
*R. Beecken, Maintenance Superintendent
*M. Burzynski, Site Licensing Staff Manager
*M. Cooper, Compliance Licensing Manager
*S. Crowe, Site Quality Manager
*W. Lagergren, Jr., Operations Manager
*M. Lorek, Operations Superintendent
R. Pierce, Mechanical Maintenance Group Supervisor
*R. Proffitt, Licensing Engineer
*R. Rogers, Supervisor Engineering Support Section
*M. Sullivan, Radiological Controls Superintendent
S. Spencer, Licensing Engineer
C. Whittemore, Licensing Engineer

NRC Employees

*L. J. Watson, Chief, Project Section 1

*Attended exit interview

Acronyms and initialisms used in this report are listed in the last paragraph.

2. Operational Safety Verification (71707)

a. Control Room Observations

The inspectors conducted discussions with control room operators, verified that proper control room staffing was maintained, verified that access to the control room was properly controlled, and that operator behavior was commensurate with the plant configuration and plant activities in progress, and with on-going control room operations.

During previous inspections, the inspector had noted several instances where various operators had been unable to answer questions on control board alarms. During this inspection, the inspectors followed up on these concerns by observing instrumentation and recorder traces for abnormalities and verified the status of selected control room annunciators to ensure that control room operators understood the status of the plant. During these observations the inspectors walked down selected control room boards for both Unit 1 and Unit 2, and questioned the operators about several conditions and

alarms. The operator for Unit 1 was able to answer all questions and seemed well aware of the status of the control board and the plant under his control. The Unit 2 operator was not able to answer approximately half of the questions concerning his assigned control board and the plant status. The Unit 2 operator was questioned the next day and still had not investigated and resolved the status of any of the questions he was unable to answer the previous day. This demonstrated a lack of professional inquisitiveness and attention to detail which are expected of a licensed operator for areas under his control. A knowledge of control board and plant status is necessary for acceptable plant control.

The inspector informed the plant manager of his observations with respect to operator control board knowledge. The plant manager also stated that operations personnel would be advised to pay greater attention to plant and board status. The plant manager stated that he had similar concerns with a lack of a questioning attitude and he intended to pursue the issue aggressively. With the exception of the weaknesses identified above the operators were observed adhering to appropriate, approved procedures for the on-going activities.

The inspector also verified that the licensee was operating the plant in a normal plant configuration as required by TS and when abnormal conditions existed, that the operators were complying with the appropriate LCO action statements. The inspector verified that leak rate calculations were performed and that leakage rates were within the TS limits. Panel indications were reviewed for the nuclear instruments, the emergency power sources, the safety parameter display system and the radiation monitors to ensure operability and operation within TS limits.

No violations or deviations were observed.

b. Control Room Logs

The inspectors observed control room operations and reviewed applicable logs including the shift logs, operating orders, night order book, clearance hold order book, and the configuration log to obtain information concerning operating trends and activities. The TACF log was reviewed to verify that the use of jumpers and lifted leads causing equipment to be inoperable was clearly noted and understood. The licensee is actively pursuing correction of conditions requiring TACFs. No issues were identified with these specific logs.

Plant chemistry reports were reviewed to confirm steam generator tube integrity in the secondary and to verify that primary plant chemistry was within TS limits. The implementation of the licensee's sampling program was observed. Plant specific monitoring systems including seismic, meteorological and fire detection indications were reviewed

for operability. A review of surveillance records and tagout logs was performed to confirm the operability of the RPS.

No violations or deviations were observed.

c. ECCS System Alignment

The inspectors walked down accessible portions of the following safety-related systems on Units 1 and 2 to verify operability, flow path, heat sink, water supply, power supply, and proper valve and breaker alignment:

Unit 1 - RHR system
Unit 1 - MDAFW system

No deviations or violations were identified.

d. Plant Tours

Tours of the diesel generator, auxiliary, control, and turbine buildings, and exterior areas were conducted to observe plant equipment conditions, potential fire hazards, control of ignition sources, fluid leaks, excessive vibrations, missile hazards and plant housekeeping and cleanliness conditions. The plant was observed to be clean and in adequate condition. 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.

The inspector performed the housekeeping inspection module during this inspection period as described in paragraph 9. Through the use of this inspection module, the inspector observed shift turnovers and determined that necessary information concerning the plant systems status was addressed.

No violations or deviations were observed.

e. Radiation Protection

The inspectors observed HP practices and verified the implementation of radiation protection controls. On a regular basis, RWPs were reviewed and specific work activities were monitored to ensure the activities were being conducted in accordance with the applicable RWPs. Workers were observed for proper frisking upon exiting contaminated areas and the radiologically controlled area. Selected radiation protection instruments were verified operable and calibration frequencies were reviewed. The following RWP was reviewed in detail:

RWP 89-20-1 Unit 1 Post Accident Monitor

f. 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; escorting of visitors; badge issuance and retrieval; and patrols and compensatory posts.

In addition, the inspectors observed protected area lighting, and protected and vital areas barrier integrity. The inspectors verified interfaces between the security organization and both operations and maintenance. Specifically, the resident inspectors:

1. observed a security boundary being established
2. visited the central alarm station
3. verified protection of Safeguards Information

No violations or deviations were observed.

No trends were identified in the operational safety verification area. One weakness was identified in the area of operator control board knowledge. General conditions in the plant were adequate. There was a moderate number of outstanding control room maintenance and modification items. The licensee appeared to have efforts in place to reduce and manage these items.

Radiation protection and security are adequate to continue two unit operations.

3. Surveillance Observations and Review (61726)

Licensee activities were directly observed/reviewed to ascertain that surveillance of safety-related systems and components was being conducted in accordance with TS requirements.

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

The following activities were observed/reviewed with no deficiencies identified except as noted:

SI 128.4, RHR Pump 2A Performance Testing. The results of this SI are detailed in Paragraph 4.d.

SI 220.2, Automatic Load Sequence Timer Functional Test.

SI 108.5, Ice Condenser Intermediate Doors. As a result of a successful completion of this surveillance only one ice condenser related surveillance remained that would result in a mid-cycle impact on Unit 2 plant operations. This activity would be ice weighing in accordance with TS 3.6.5. Based on conversations with licensee management, the inspector determined that there was a reasonable expection that the licensee will request to be released from this requirement until the completion of the next full cycle by submitting a TS change.

SI 166.32.4, Turbine Driven Auxiliary Feedwater Pump Check Valve Test. The licensee determined, during the performance of the Unit 2 TDAFWP testing, that the method of testing was not consistent with the design basis. This procedural test deficiency was documented in ICF 89-0823. The inspector reviewed the procedural change resulting from the licensee's corrective actions and determined the corrective actions to be adequate.

SI 137.2, Reactor Coolant System Water Inventory.

The areas of surveillance performance, scheduling and management were observed to be adequate. The management of the TS SI program had some minor administrative scheduling difficulties during this inspection period. However, upper plant management took corrective action.

4. Monthly Maintenance Observations and Review (62703)

Station maintenance activities on 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 T.S.

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 records accurately reflected the activities; functional testing and/or calibrations were performed prior to returning components or systems to service; QC 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 QA program; and housekeeping was actively pursued.

a. Reactor Vessel Head Vent Maintenance Activities

The inspector reviewed the following WRs:

WR B268252 - Head Vents
WR B236340 - Head Vents
WR B236338 - Head Vents
WR B252699 - Rupture Disk

WRs B268252, B236340, and B236338 were written to remove the Unit 2 head vent valve manifold. This required the depressurization of the manifold. The method of removing the contained pressure in the head vent manifold required the vent valves be reenergized and cycled.

TS 3.4.11 states that with only one RCSV path operable, power operation may continue provided the inoperable path is maintained closed with power removed from the valve actuators. Reenergizing and cycling the head vent valves did not constitute an operability question since it was a necessary part of the head vent manifold depressurization and purging process, and the cycling activities took only a few minutes, and were well controlled.

During the down power outage for the above work, the licensee supported inspection/work on the pressurizer relief tank (including rupture disc replacement) and head vent manifold with single valve protection and no hold order on the PORV block valves. This decision was primarily based on schedular requirements because the use of a hold order on the PORV block valves would make the PORV vent path inoperable and result in a TS required mode change to mode 4 within twelve hours. Because the RCS was maintained between 400 and 500 psig during this maintenance and the PORVs and block valves were suspected to leak, this appeared to be a less than conservative decision. The licensee later amended its work plans to include additional personnel protection as a result of the inspector's comments. These included additional communications capabilities with the control room operators, verification that the PORV block valves were not leaking, and determination that rupture disc replacement was not necessary.

b. Ice Bed Temperature Monitor

On November 13, the inspector inspected WR 3758007 - Ice Bed Temperature Monitor Fan. This WR was written to replace a fan within the monitor cabinet and had been outstanding since October 27, 1989. Because the fan had failed, the monitor overheated and would not print correctly. As a result of the monitor failure, the licensee racked the monitor out of the cabinet into an extended position and placed an operator aid sticker on it that said to leave the recorder

in the withdrawn position with the drawer open to provide cooling until fan replacement. The monitor in the extended position did record acceptable data. However, the licensee did not maintain the monitor's seismically tested configuration nor justify the configuration change with a safety evaluation for continued compliance with TS 3.6.5.2. In addition, this off normal configuration was not controlled through the use of a temporary alteration (TACF), a clearance, or some other configuration control process. When notified by the inspector, the licensee replaced the monitor cabinet fan within a few hours and returned the cabinet to its normal configuration.

The failure to control a temporary plant alteration in accordance with licensee administrative procedures AI-4, Clearance Procedure, or AI-9, Control of Temporary Alterations is a violation. However, the safety significance was low because; ice bed temperature indication was available in the control room, in accordance with TS 3.6.5.2; the temperature monitor was not needed for a safe shutdown; the licensee took immediate corrective action when the issue was identified; and the specific instance was neither a repeat or programmatic violation. Therefore, this issue will be tracked as a non-cited violation (NCV) 327,328/89-27-01, Failure to Control System Configuration, and is closed.

c. Post Accident Sampling System

The inspector reviewed WR B757781 - Post Accident Sampling System, and the following supporting documents:

Drawing 47W610-4310
Drawing 47W625-15
Drawing 47B601-4340
SI 487, Post Accident Sampling System Operability Verification and Calibration
PMSP 6.2.2, Maintenance Management System
CAQR SQP 89 402, Post Accident Sampling

The licensee discovered that the Unit 1 PASS gas chromotagraph had been ruined by water contamination. The licensee conferred with the vender (Sentry) and determined that the probable cause was an ineffective water trap just upstream of the gas vacuum flask. The vendor told the licensee that similar conditions had been noted at two other facilities. The result of the water contamination of the chromatograph is reduced sample sensitivity and peak indication height.

The licensee documented, in CAQR SQP 890492, that there was an operator experience problem in addition to the identified hardware issue. The hardware issue was submitted for NRC generic consideration. The inspector had no further questions.

d. RHR Pump 2A ASME Section XI Testing

The inspector reviewed the ASME Section XI testing performed to verify the performance capability of the 2A RHR pump utilizing SI 128.4, RHR Pump 2A Performance, Unit 2. The pump was taken out of service and the appropriate LCO was entered at 12:02 a.m., on November 27 as part of the licensee's modification of the A train of the ERCW header. SI 128.4 was initiated at 8:00 a.m on November 28. The purpose of the SI was to verify that the measured RHR pump flow and differential pressure (d/p) were within an acceptable range. The pump flow was within normal and acceptable range, but the differential pressure was higher than acceptable. Acceptable range was greater than 168.3 and less than 184.6 psid. The initial run of the pump resulted in a d/p of 200 psid. The calibration of the test instrumentation was checked and found to be acceptable but on the high end of the acceptable range. The test instruments were recalibrated and the SI was reperformed. The second test resulted in a d/p of 194.5 psid, which was still outside the acceptable range. System alignment was reverified to ensure that system configuration was correct for the test. DNE was directed to perform analysis of the test results and to check the acceptance criteria. A preliminary operability determination indicated that the pump flow and motor amperage during the pump runs provide assurance that the pump was functional and could perform its intended safety functions, but would not be declared operable until either an acceptable run was completed or the acceptance criteria was changed.

DNE performed an engineering analysis on November 29 and dispositioned the test deficiency according to Section XI requirements. This included, in effect, a Justification for Continued Operation (JCO) based on an analysis that determined that the proper acceptance criteria should be that the two RHR pumps would develop differential pressures below a value that would cause either pump to dead head when in parallel operation. The maximum value of this developed head differential was established at 11.1 psid. The most recent test run of the 2B RHR pump resulted in a pump differential pressure of 183.0 psid. The final d/p of the 2A RHR pump was 189.0 psid, and the differential between the two pumps was 6.0 psid. Based on this engineering evaluation, the 2A RHR pump was declared operable as of 12:59 p.m. on November 29.

The inspector reviewed the engineering evaluation, SQN-DC-V-27.6, and agreed that the new criteria was appropriate. During the review, the inspector reviewed test data for the Unit 1 RHR pumps and identified instances where the 1A and 1B RHR pumps exhibited head differentials of as much as 23 psid, and the latest results, taken November 3, 1989 for the 1A RHR pump and November 8, 1989 for the 1B RHR pump, show a differential of 13.0 psid. The licensee was asked to provide

calculations to demonstrate why the Unit 1 RHR pumps should not be declared inoperable based on the criteria applied to an essentially identical configuration for Unit 2. The potentially inoperable RHR pumps for Unit 1 will be tracked as URI 327,328/89-27-02.

e. WR B737018 - Component Cooling Temperature Monitor

Activities performed under this WR were adequate. The inspector had no further questions.

f. Shield Building Exhaust Monitor

The inspector reviewed maintenance and surveillance activities related to the Unit 2 Shield Building Exhaust Monitor. The activities seemed to lack strong control of inprocess work activities. This lack of control was discussed with the Plant Manager and the Maintenance Superintendent on November 30, and December 1, 1989 respectively. The inspector was informed that the licensee was developing standards to control such activities. These controls will be reviewed during the performance of normal core inspection. The inspector had no further questions.

One non-cited violation NCV 327,328/89-27-01, Failure to Control System Configuration, was identified in the area of Maintenance. No deviations or IFIs were identified and no trends were identified in the area of Maintenance. Based on the maintenance activities observed and reviewed during this inspection period, maintenance is adequate.

5. Management Activities in Support of Plant Operations

TVA management activities were reviewed on a daily basis by the NRC inspectors. Resident inspectors observed that planning, scheduling, work control and other management meetings were effective in controlling plant activities. First line supervisors appeared to be knowledgeable and involved in the day to day activities of the plant. First line supervisor involvement in the field was observed as follows:

During the head vent valve outage, a Component Cooling System (CCS) leak was discovered on a flexible hose connected to #3 RCP. To repair this hose, CCS to all 4 RCPs was required to be isolated since the plant design did not provide individual isolation valves. Management decided to shut down all RCPs and place the unit in natural circulation. Procedure changes were required, since the typical natural circulation scenario was intended to cool the unit down to Mode 5, Cold Shutdown. Management involvement in the decision process, procedure changes, and presence in the control room during the evolution demonstrated direct and effective involvement in plant activities.

6. NRC Inspector Follow-up Items, Unresolved Items, Violations (92701, 92702)

(Closed) IFI 327,328/88-51-03, Silicone Rubber Cables

This IFI was opened to track the licensee's long term corrective actions with respect to the acceptability of silicone rubber cable installed at Sequoyah. The licensee performed several tests documented in a Wyle Laboratory report, RIMS B43 890303 003. This report was transmitted to the NRC in accordance with a TVA, March 17, 1988, commitment letter, RIMS L44880317 808. The issue was also reported to the NRC in a 10 CFR 21 report on January 25, 1988. Tracking of this item will be through the two mentioned licensee submitals and the NRC safety evaluation. The inspector had no further questions.

IFI 327,328/88-51-03 is closed.

(Closed) URI 327,328/88-02-02, First Line Management Involvement

This URI questioned whether there was adequate involvement of first line Sequoyah managers in day to day plant activities. Since this URI was written, several organizational changes have occurred and the licensee took corrective actions to strengthen the accountability of first line managers. An observed increase in first line manager involvement in field activities has occurred. However, the technical capabilities of the first line managers were not evaluated. The inspector had no further questions.

URI 327,328/88-02-02 is closed.

(Closed) LIV 327,328/88-48-01, Individuals Not Briefed On RWP.

While reviewing the licensee's RWP 88-1-00003-00, the inspector discovered that three individuals who were signed in on the RWP had not signed the corresponding briefing sheet. The briefing sheet is signed to signify that the individuals have received the required briefing prior to entering the RWP area. This condition was reported to the Radiological Protection Section Shift Supervisor who cancelled the RWP, and wrote a new RWP. This required all personnel on the original RWP to receive new briefings. As a subsequent corrective action, the applicable site procedure, RCI 14, RWP Program, was revised to incorporate the briefing sheet and the RWP sign-in sheet on a common page. The corrective actions were appropriate and complete for this item.

LIV 327,328/88-48-01 is closed.

(Closed) VIO 327,328/88-19-03, Fire Protection Program

This violation addressed a failure to have an adequate procedure for periodic inspections of the shield building penetration fire barrier foam

seals. The licensee addressed this issue in PRO 1-88-037 and LER 1-87-040. In addition, the licensee changed SI 233.1, Visual Inspections of Penetration Fire Barriers. Finally, the licensee performed an inspection of installed penetration boots and identified three that required repair. The licensee's corrective actions appeared to be adequate.

VIO 327,328/88-19-03 is closed.

(Closed) VIO 327,328/88-39-03, Inadequate Work Plan

This violation addressed an inadequate work plan (WP 7152-01), the performance of which resulted in a load shed of the 1BB 6.9 KV shutdown board and a loss of the 1BB board for approximately 20 minutes. The licensee took adequate initial corrective actions to correct the loss of power. Long term corrective action included an increased management emphasis on the completeness and technical accuracy of work instructions. The licensee's corrective action appeared to be adequate.

VIO 327,328/88-39-03 is closed

(Open) VIO 327,328/89-15-04, Inadequate 10 CFR 50.59 Reviews

The inspectors reviewed the licensee's response to the violation dated October 23, 1989. The response referenced a number of audits which were conducted of the licensee's implementation of 10 CFR 50.59 and encompassed the basis for the licensee's corrective action. The inspectors found that these audits were generally adequate and improved as the licensee learned more about the total scope of their 10 CFR 50.59 problems. The most current review of these audits conducted by the TVA special task force appeared to be broad in scope and evaluated all of the data and findings from the previous reviews.

The TVA special task force concluded that taking the BIT out of recirculation could constitute an unreviewed safety question when LCO action requirements are not met. Since the RCS was borated to the cold shutdown, xenon free condition during the period the BIT was inoperable, there was not, in fact, an unreviewed safety question in effect. This was fortuitous, and not as a result of controls imposed by the licensee's processes.

The licensee's response discussed whether procedures were required for all valve manipulations. It appeared that TVA was still reviewing this situation. However, the inspector was assured that configuration control was still required for all situations. The AI-58 Appendix B, Configuration Control Data Sheet, is still used as the configuration control mechanism.

The response does not address the fact that the intermediate range detector was not included on the screening review form. The licensee indicated to the inspector that the preparers of the screening review form had considered the IR detectors when preparing the screening review and

that the only reason it was not mentioned on the screening review was that the procedure change was for a procedure that only addressed the source range. The licensee's new safety assessment form adequately addresses the interaction of systems and components including their effect on safety, and therefore has already encompassed this concern in the corrective action. In addition, the inspectors determined that the detector cart location had been added to the containment closeout checklist in addition to the design documents mentioned in the response.

The inspectors reviewed the circumstances surrounding the 14 questionable screening reviews mentioned in the licensee's response which were initially determined by the interim program to require safety evaluations. There apparently was an ambiguity in the interim form which could have been interpreted in an extremely conservative manner. After the licensee had discussed this interpretation with the auditing individual, these screening reviews were determined to be adequate and the subject form was revised to eliminate the ambiguity.

The licensee's finding that there were no USQs discovered during any of these audits (approximately 1000 screening reviews) appeared to support the licensee's determination that a 100% audit would not improve safety. The licensee's motivation in coming to this conclusion was in relation to TS 6.5.1A which requires a USQD (safety evaluation) for every TS 6.8.1 procedure change. Screening reviews were not intended to make USQ determinations. However, it was discovered that screening reviews had been used to satisfy this requirement. The licensee believed that it could reasonably be assumed from the audits performed that the screening reviews audited from the 1987 -1989 time frame adequately represented the overall population of screening reviews for that time period. Since no USQs were discovered, further auditing of old screening reviews would probably not improve safety.

The licensee told the inspector that the interface problem between screening reviews and safety evaluations would have a negligible effect on the FSAR update process since other design documents drove this process in addition to safety evaluations.

The licensee's audits appeared to adequately address the issues. The corrective actions appeared to address all the identified program and implementation problem areas. The licensee's new program has only been implemented for several weeks and will be reviewed further at a later date to determine adequate implementation. Therefore, VIO 327, 328/89-15-04 remains open.

(Closed) URI 327,328/88-48-04, TDAFW ESF Test Adequacy

This issue involved the testing of the ESF actuator system response time under SI 247.900, ESF Response Time Verification. Following the performance of this surveillance, the licensee determined that the

response time exceeded the TS required 60 seconds. The licensee entered LCO 3.7.1.2 at approximately 11:00 a.m., on October 25, 1988. However, the data was taken nearly 24 hours before and the action statements of LCO 3.3.2 were not ertered. The licensee determined in PRO 1-88-329 that no operability issues existed and that entry into LCO 3.7.1.2 had been a conservative action.

PRO 1-88-329 based its determination that conservative action had been taken on DNE calculations SQN-CA-D053, and EPM-JDW-102588 (RIMS B25 881026 500). The inspector reviewed these calculations and concluded that at the time the response time verification was performed, pump rated flow could have been attained within the TS required 60 seconds. In addition, the pump was not inoperable or degraded at the time that the LCO was entered. However, the operator's action of entering the LCO effective at a time 24 hours after the initial data was taken does not appear to be conservative. This issue was discussed with both the Plant Manager and the Operations Superintendent. Because of the low safety significance of this specific instance, no further action was necessary.

URI 327,328/88-48-04 is closed.

(Closed) VIO 327,328/88-29-01, Containment Spray System Calculations

This violation addressed the failure of TVA to have hydraulic and thermal design calculations for the Containment Spray system, an essential safety system. The design calculations established the design basis for the pressure and temperature boundaries shown on TVA drawing 47W612-1, Revision 16. The licensee responded to this violation in a revised response dated March 27, 1989.

The inspector reviewed the licensee's corrective actions including work plan 6674-01 and determined that the corrective actions for this specific set of calculations was adequate. As stated in a previous licensee letter, dated November 21, 1988, the programmatic aspects of the required corrective actions were addressed in the licensee's Calculation Regeneration Program. This Calculation Regeneration Program was reviewed separately by the NRC. The inspector had no further questions.

VIO 327,328/88-29-01 is closed.

7. Licensee Event Report Followup (92700)

a. UNIT 1 LERs

(Closed) LER 327/88-41, Feedwater Isolation Signal Resulting From A High-High Steam Generator Level Due to a Procedural Inadequacy

This LER addressed a feedwater isolation that occurred as a result of a receipt of a high-high level signal in loop 1 steam generator (SG), during backfilling of the SG narrow range level transmitter LT-3-42. The level transmitter was backfilled using Maintenance Instruction MI-19.1.6,

Backfilling Sensing Lines for System 3 Transmitters. During the backfilling a common turbine auxiliary feedwater pump level transmitter was affected resulting in an increased SG feed flow through the feedwater bypass regulation valve for SG loop 1. The high-high steam generator level resulted in a turbine trip, feedwater isolation and reactor trip.

The inspector reviewed the procedure change to MI-19.1.6 and other licensee actions and determined that they were adequate.

LER 327/88-41 is closed.

(Closed) LER 327/88-33, Unplanned Reactor Trip Due to an RPS Channel I Instrument Failure During RPS Channel II Calibration

This event occurred while Unit 1 was in Mode 4 with the reactor trip breakers open and the rods on the bottom. At the time, the Channel II RCS Delta T/Tavg instrument bistables were in the tripped condition while that channel was being calibrated. A reactor trip signal was generated when channel I Overpower (OP) Delta T bistable tripped due to a spurious failure of the loop's dynamic compensator. With the channel II OP Delta T bistable already in the tripped condition, the 2 out of 4 logic was made up and a reactor trip signal was generated.

The corrective action for this event included troubleshooting and replacing the failed dynamic compensator on Channel I. The root cause of the failure was investigated by the manufacturer, Foxboro, but a definitive cause was never determined.

LER 327/88-33 is closed.

(Closed) LER 327/88-36, Reactor Trip

This LER addressed a reactor trip that resulted from a steam flow to feedwater flow mismatch of greater than forty percent coincident with a low steam generator level signal. Both signals were the result of actual plant hardware conditions. The flow mismatch signal was a result of calibration work being performed and the steam generator low level signal was a result of a preexisting instrument failure. The licensee determined in its post trip review, that a combination of a breakdown in management systems and procedural inadequacy allowed for this failure to identify the potential for logic interactions.

The licensee reviewed reactor protection/engineered safety feature calibration procedures in order to ensure all associated trip functions were identified. In addition, the licensee discussed with appropriate instrument maintenance personnel the requirement to follow procedures and/or stop work activities when deficiencies are identified. Third, a training letter was issued addressing the requirement to verify logic interactions prior to the initiation of work. Finally, the licensee stated

that the Work Control Group had implemented an in-house measure to identify potential logic interactions before approving work performance by the use of a dynamic tracking system using the appropriate drawing to indicate out of service devices. These corrective actions appeared to be adequate.

LER 327/88-36 is closed.

(Closed) 327/88-39, Reactor Trip Signal

This LER addressed a reactor trip signal that was generated by the reactor protection system when a loop 3 steam generator low-low level signal was generated (note: the reactor trip breakers were already open when the reactor trip signal was initiated, therefore, no reactor trip occurred). Loop 3, channel IV, steam generator low-low level signal was in the tripped condition to support surveillance testing. Loop 3, channel I, steam generator low-low level, signal initiated because of electrical interference generated from a portable radio. Radio interference related reactor trips were previously identified by the licensee in LER 327/88-18.

The licensee took additional corrective actions to those identified in the 327/88-18 incident, which included a strengthening of procedural requirements for the use of portable radios. There have been no radio signal related incidents for a period of greater than a year. The licensee's corrective actions appear to be adequate.

LER 327/88-39 is closed.

(Closed) LER 327/88-40, Inadequate Assessment of a Work Request for Mode Change Caused a Condition of Operation Prohibited by TS.

The LER described an entry into an operational mode without having the required equipment operable. A safety-related snubber on a containment penetration isolation valve had been disassembled while Unit 1 was in Mode 5. The snubber was required to be operable in Modes 1, 2, 3, and 4. The snubber was disassembled to allow the affected valve's motor operator to be disassembled and the gear case lubricant to be replaced. The valve operator work was completed and the valve tested and returned to service, but the adjacent snubber was not reconnected. The WR was marked as complete. Unit 1 entered Mode 4 on September 27, and the snubber was reconnected on October 16. On October 17, Operations personnel were reviewing WRs as part of the WR closure process. At this time they noticed that the snubber was safety related and had not been returned to an operable status prior to entry into Mode 4.

As required by TS 3.7.9, an engineering analysis was performed to determine the effect of the inoperable snubber on the associated valve. The analysis determined that the design function of the valve was not degraded due to the snubber. The valve would have performed its isolation function without the snubber.

This incident was reviewed with work control personnel to remind them of the importance of careful review of work packages prior to closure.

LER 327/88-40 is closed.

(Closed) LER 327/88-44, Auto Start of Turbine Driven Auxiliary Feedwater Pump

This LER addressed an automatic start of the Unit 1 turbine driven auxiliary feedwater (TDAFW) pump which is considered an engineered safety feature (ESF) actuation. The automatic start of the TDAFW pump resulted from a simultaneous trip of the hotwell pumps and subsequent main feedwater pump trip signal. All ESF equipment responded to the main feedwater pump trip signal as designed. The licensee determined that the hotwell pump trip was caused by a 240 VDC ground on a 3HW relay. The ground was inadvertently applied by maintenance personnel who were working a related activity.

Licensee corrective actions included a review for damage sustained by the transient and a realignment of related systems. The licensee's corrective actions appear to be adequate.

LER 327/88-44 is closed.

(Closed) LER 327/88-47, Unit 1 Reactor Trip on Low-Low Steam Generator Level

This LER addressed a Unit 1 reactor trip that was caused by erratic feedwater controls. These erratic feedwater controls resulted in a feedwater isolation on high-high steam generator level followed by a reactor trip on low-low steam generator level. In response to the reactor trip the unit operator took manual control of the TDAFW pump and emergency borated the RCS.

The licensee had several previous and subsequent incidents involving the ability to control steam generator level during startup activities. In response to these activities the licensee made procedural and hardware changes in the plant which appeared to have improved plant performance in this area. The inspector had no further questions.

LER 327/88-47 is closed.

b. UNIT 2 LERs

(Closed) LER 328/88-38, 6.9 KV Unit Board Potential Transformer Fuses

This LER addressed inadequate maintenance involving the potential transformer fuses for the alternate feeders to the 2A and 2C unit boards. The cause of the inadequate maintenance was a system operating instruction

(SOI) which when used to put start bus 2A back in service, did not contain steps to ensure that the potential transformer fuses were installed.

Licensee corrective actions included a revision of SOI 202.1, 6900V Start Buses, and licensed operator training. The licensee's corrective action appear to be adequate.

LER 328/88-38 is closed.

c. ESF Related LERs From Both Units

The inspector performed a review of ESF actuations related to radiation monitor activities. This has been a continuing problem at Sequoyah since original plant startup and was last reviewed just prior to the restart of Sequoyah Unit 2. The following LER's were reviewed:

327/88-034	Inadvertent Auxiliary Building isolation which occurred during modification work inside a control room panel
327/88-035	Auxiliary Building isolation that occurred when an operator inadvertently tripped a circuit breaker, thereby interrupting power to the Auxiliary Building vent radiation monitor
327/88-038	Auxiliary Building isolation occurring during the performance of a post maintenance test for a design change to the spent fuel pool area radiation monitor
327/88-046	Containment ventilation isolation which resulted from inadequate test recorder ground strap configuration
327/89-002	Train A control room isolation which resulted from a loose recorder ground lug on a main control room ventilation intake radiation monitor
327/89-003	Brief interruption of alternate control power to 6.9 KV shutdown board resulted in auto start of a motor driven auxiliary feedwater pump
327/89-007	Main control room isolation which was caused by personnel error during Control Building fresh air intake duct smoke detector replacement activity
327/89-012	A spurious spike on a containment radiation monitor which caused a containment ventilation isolation

327/89-013	A main control room isolation that resulted due to personnel error during radiation monitor recorder chart paper replacement activity
327/89-014	An event when a control power fuse opened during the replacement of an indicating lamp, which caused an emergency diesel generator to become inoperable, and resulted in entering the action of Limiting Condition for Operation 3.0.5 for both trains of auxiliary building gas treatment system being technically inoperable
327/89-015	Main Control Room Isolation that resulted from a worn set of contacts in the 480 VAC motor starter for the Train B main control room radiation monitor
327/89-016	Failure to block a radiation monitor before deenergization, which resulted in a containment ventilation isolation
327/89-018	Four key events concerning the operability of the auxiliary building gas treatment system when radiation monitor 0-RM-90-101 is removed from service
327/89-019	A spurious containment ventilation isolation occurred during unblocking of handswitch HS-90-136A2
327/89-024	Inadvertent containment vent isolation event that occurred resulting from a difficult man-machine interface during surveillance testing
328/88-029	Spurious spike on particulate channel of upper compartment radiation monitor resulted in containment ventilation isolation
328/88-039	Incorrect connection of test equipment caused by incomplete labeling of terminal connections results in a containment ventilation isolation
328/88-040	Loss of power to radiation monitor results in a containment ventilation isolation
328/89-003	A containment ventilation isolation actuation and a momentary loss of residual heat removal occurred when power was removed from a vital instrument power board

As a result of the large number of these incidents, the licensee formed a second task force to reevaluate on a broader perspective, the cause and impacts of ESF actuations. This task force prepared a report including several recommendations. The licensee is to provide a report of the

findings and corrective actions of this task force to the NRC as requested during the followup of the shutdown margin events documented in NRC Inspection Report 327,328/88-55. The review of the licensee's corrective actions and a further look at the generic problems of ESF actuations caused by radiation monitors will be tracked as URI 327,328/89-27-03.

Because each of the above LERs individually appeared to have adequate TVA corrective actions, they were closed. NRC review of TVA generic corrective actions, and indicated root causes will be reviewed to determine if those corrective actions and root causes appropriately addressed the generic cause of ESF actuations that occurred between 1984 and 1989.

8. Event Follow-up (93702)

a. On November 10, 1989 at approximately 6:30 p.m., Sequoyah Unit 2 entered mode 3 to repair a leaking reactor head vent system manifold. The manifold consists of two motor operated valves, two block valves and associated piping. The high RCS head vent temperature indication had been in alarm for several months prior to November 10, 1989 and was documented on a WR. It was thought, at the time that the WR was written, that the high RCS head vent temperature indication was the result of a faulty RTD circuit.

Associated with the leaking RCS head vent system was the possibility of leaking safety and power operated relief valves (PORVS). The licensee determined through pyrometer measurements and walkdown activities that the safety valves were not leaking. The licensee also determined that both PORVs were leaking and shut the associated block valves, as allowed by the TSs (see section 4 of this report for a discussion of the maintenance activities related to the PORV block valves).

b. On November 29, 1989 at approximately 11 p.m., the inspector identified that Unit 1 was operating with an eight hour average of 3411.3 MW, which was in excess of its rated thermal power of 3411 MW. The issue was discussed with the SOS and after approximately twenty minutes, power was reduced. Because the eight hour average was driven by a recent power peak of 3417.97 MW it took a turbine power reduction of approximately 0.4% to bring the eight hour average below 3411 MW.

This is potentially a repeat condition of a problem described in violation 327,328/89-15-03. TVA implemented an event investigation which will be reviewed by the inspector. This event will be tracked as URI 327,328/89-27-04.

9. Plant Material Conditions and Housekeeping Controls (54834)

The inspector walked down accessible areas in the auxiliary building, control building and diesel generator buildings for cleanliness, material

condition and other housekeeping attributes. With few exceptions, the plant was clean, material discrepancies were properly identified and tagged for repair, and equipment was properly stowed and secured. Overall, plant conditions in these specific attributes has improved substantially since the end of the previous SALP period. Specific housekeeping and material condition observations were as follows:

a. Leaks were being promptly identified and controlled by temporary catch funnels and drain lines when immediate repairs could not be effected.

b. A scaffold removal program has had considerable success in eliminating scaffolding that was not in current use. This has resulted in marked improvement in long-standing scaffolding throughout the plant.

c. A contaminated area reduction program has resulted in large areas being decontaminated and returned to general access.

d. Equipment storage continued to be a problem in that several areas have become traditional storage areas for such items as welding carts, decontamination supplies, and low level contaminated trash and tools. While this has improved, designated storage areas should be assigned and enforced.

e. Standing water and temporary drain hoses in safety-related pump rooms have been noted by the inspectors for several weeks. Room coolers supplied by the ERCW system were leaking at such a rate in several rooms that special provisions were in place to reroute the water out of the rooms to allow disposal in non-radioactive waste processes. Replacement coolers were on order and scheduled to be installed on a high priority basis.

f. Painting, floor surfacing and general cleanliness was given intense management attention. The resulting improvements were apparent throughout the plant.

10. Licensee Quality Assurance Program Implementation (35502)

An internal office evaluation was conducted on November 6 and 7, 1989, of the licensee's quality assurance program implementation by reviewing inspection reports, SALP reports, open items, licensee corrective actions for NRC inspection findings, and licensee event reports. Particular emphasis was placed on all new items or findings since the last SALP report period (February 4, 1989). Recommendations were made to add additional inspection modules in the areas of Emergency Preparedness and Safety Assessment/Quality Verification.

11. Exit Interview (30703)

The inspection scope and findings were summarized on December 4, 1989, with those persons indicated in paragraph 1. The Senior Resident Inspector described the areas inspected and discussed in detail the inspection findings listed below. The licensee acknowledged the inspection findings and did not identify as proprietary any of the material reviewed by the inspectors during the inspection period.

Inspection Findings:

One non-cited violation (NCV) was identified:

NCV 327,328/89-27-01, Failure to Control System Configuration, paragraph 4.b

Three unresolved items were identified:

URI 327,328/89-27-02, RHR Pump Testing, paragraph 4.d.

URI 327,328/89-27-03, Generic RM Related ESF Actuations, paragraph 7.c.

URI 327, 328/89-27-04, Average Thermal Power, paragraph 8.b.

No deviations, licensee identified items, or inspector followup items were identified.

The area of Operations was discussed with respect to the professional inquisitiveness of control room operators and appropriate timing for LCO entry when equipment failed initial test acceptance criteria. The area of Maintenance was discussed with respect to inprocess work control of maintenance activities. The licensee stated that it had ongoing programs to improve these areas. Finally, the licensee's plans for an assignment of a new Site Director were discussed.

No commitments were requested during the exit and no proprietary information was supplied to the inspectors by the licensee.

During the reporting period, frequent discussions were held with the Site Director, Plant Manager and other managers concerning inspection findings.

12. List of Acronyms and Initialisms

ABGTS- Auxiliary Building Gas Treatment System
ABI - Auxiliary Building Isolation
ABSCE- Auxiliary Building Secondary Containment Enclosure
AFW - Auxiliary Feedwater

AI - Administrative Instruction
AOI - Abnormal Operating Instruction
AUO - Auxiliary Unit Operator
ASOS - Assistant Shift Operating Supervisor
ASTM - American Society of Testing and Materials
BIT - Boron Injection Tank
BFN - Browns Ferry Nuclear Plant
C&A - Control and Auxiliary Buildings
CAQR - Conditions Adverse to Quality Report
CCS - Component Cooling Water System
CCP - Centrifugal Charging Pump
CCTS - Corporate Commitment Tracking System
CFR - Code of Federal Regulations
COPS - Cold Overpressure Protection System
CS - Containment Spray
CSSC - Critical Structures, Systems and Components
CVCS - Chemical and Volume Control System
CVI - Containment Ventilation Isolation
DC - Direct Current
DCN - Design Change Notice
DG - Diesel Generator
DNE - Division of Nuclear Engineering
ECN - Engineering Change Notice
ECCS - Emergency Core Cooling System
EDG - Emergency Diesel Generator
EI - Emergency Instructions
ENS - Emergency Notification System
EOP - Emergency Operating Procedure
EO - Emergency Operating Instruction
ERCW - Essential Raw Cooling Water
ESF - Engineered Safety Feature
FCV - Flow Control Valve
FSAR - Final Safety Analysis Report
GDC - General Design Criteria
GOI - General Operating Instruction
GL - Generic Letter
HVAC - Heating Ventilation and Air Conditioning
HIC - Hand-operated Indicating Controller
HO - Hold Order
HP - Health Physics
ICF - Instruction Change Form
IDI - Independent Design Inspection
IN - NRC Information Notice
IFI - Inspector Followup Item
IM - Instrument Maintenance
IMI - Instrument Maintenance Instruction
IR - Inspection Report
KVA - Kilovolt-Amp
KW - Kilowatt

KV - Kilovolt
LER - Licensee Event Report
LCO - Limiting Condition for Operation
LIV - Licensee Identified Violation
LOCA - Loss of Coolant Accident
MCR - Main Control Room
MI - Maintenance Instruction
MR - Maintenance Report
MSIV - Main Steam Isolation Valve
NB - NRC Bulletin
NOV - Notice of Violation
NQAM - Nuclear Quality Assurance Manual
NRC - Nuclear Regulatory Commission
OSLA - Operations Section Letter - Administrative
OSLT - Operations Section Letter - Training
OSP - Office of Special Projects
PLS Precautions, Limitations, and Setpoints
PM - Preventive Maintenance
PPM - Parts Per Million
PMT - Post Modification Test
PORC - Plant Operations Review Committee
PORS - Plant Operation Review Staff
PRD - Problem Reporting Document
PRO - Potentially Reportable Occurrence
QA - Quality Assurance
QC - Quality Control
RCA - Radiation Control Area
RCDT - Reactor Coolant Drain Tank
RCP - Reactor Coolant Pump
RCS - Reactor Coolant System
RG - Regulatory Guide
RHR - Residual Heat Removal
RM - Radiation Monitor
RO - Reactor Operator
RPI - Rod Position Indication
RPM - Revolutions Per Minute
RTD - Resistivity Temperature Device Detector
RWP - Radiation Work Permit
RWST - Refueling Water Storage Tank
SER - Safety Evaluation Report
SG - Steam Generator
SI - Surveillance Instruction
SMI - Special Maintenance Instruction
SOI - System Operating Instructions
SOS - Shift Operating Supervisor
SQM - Sequoyah Standard Practice Maintenance
SQRT - Seismic Qualification Review Team

SR - Surveillance Requirements
SRO - Senior Reactor Operator
SSOMI- Safety Systems Outage Modification Inspection
SSQE - Safety System Quality Evaluation
SSPS - Solid State Protection System
STA - Shift Technical Advisor
STI - Special Test Instruction
TACF - Temporary Alteration Control Form
TAVE - Average Reactor Coolant Temperature
TDAFW- Turbine Driven Auxiliary Feedwater
TI - Technical Instruction
TREF - Reference Temperature
TROI - Tracking Open Items
TS - Technical Specifications
TVA - Tennessee Valley Authority
UHI - Upper Head Injection
UO - Unit Operator
URI - Unresolved Item
USQD - Unreviewed Safety Question Determination
VDC - Volts Direct Current
VAC - Volts Alternating Current
WCG - Work Control Group
WP - Work Plan
WR - Work Request