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

Report Nos.: 50-327/91-31 and 50-328/91-31

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: December 8, 1991 through January 6, 1992

Lead Inspector: Paul Kellogg for 1/16/92
W. E. Holland, Senior Resident Inspector Date Signed

Inspectors: S. M. Shaeffer, Resident Inspector
R. D. McWhorter, Resident Inspector

Approved by: Paul J. Kellogg 1/16/92
Paul J. Kellogg, Chief, Section 4A Date Signed
Division of Reactor Projects

SUMMARY

Scope:

This routine resident inspection was conducted on site in the areas of plant operations, plant maintenance, plant surveillance, licensee event report closeout, and followup on previous inspection findings. During the performance of this inspection, the resident inspectors conducted several reviews of the licensee's backshift or weekend operations.

Results:

In the Maintenance/Surveillance functional area an apparent violation was identified concerning the failure to comply with the requirements of Technical Specification 3.3.2.1 from December 11 to December 15, 1991. An apparent violation with four examples was identified for failure to comply with the requirements of Technical Specification 6.8.1 concerning configuration control. An apparent violation was identified for failure to comply with 10 CFR 50 Appendix B Criterion XVI concerning inadequate corrective actions for previously identified similar events.

In the Operations functional area, a weakness was identified with regards to general operating instructions. These instructions were noted to be weak in providing for good operator control of unit startup evolutions (paragraph 3.a).

In the Maintenance Surveillance functional area, a weakness was identified with regards to the configuration control program. The procedures governing the configuration control log allow for multiple actions to be completed with one signoff (paragraph 4.).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*J. Bynum, Vice President Nuclear Operations
*J. Wilson, Site Vice President
*R. Beecken, Plant Manager
*L. Bryant, Maintenance Manager
*M. Cooper, Site Licensing Manager
*T. Flippo, Quality Assurance Manager
*J. Gates, Technical Support Manager/Outage Director
C. Kent, Radiological Control Manager
*W. Lagergren, Jr., Operations Manager
*M. Lorek, Operations Superintendent
D. Love, Maintenance Planning and Technical Manager
*R. Lumpkin, Site Quality Manager
*J. Osborne, Radwaste Manager
*J. Proffitt, Compliance Engineer
*R. Rogers, Acting Technical Support Manager
*R. Thompson, Compliance Licensing Manager
*P. Trudel, Nuclear Engineering Manager

NRC Employees

B. Wilson, Chief, DRP Branch 4
*P. Kellogg, Chief, DRP Section 4A

*Attended exit interview

Other licensee employees contacted included control room operators, shift technical advisors, shift supervisors and other plant personnel.

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

On December 10 through 13, 1991 the NRC Region II Section Chief, Paul J. Kellogg visited the Sequoyah Nuclear Plant. Mr. Kellogg and the Senior Resident Inspector conducted several tours of the plant, met with licensee management, and attended several plant safety committee meetings where issues were discussed involving the restart of Unit 1 from its Cycle 5 refueling outage. Mr. Kellogg informed the licensee that Region II had reorganized to place the TVA plants back into a normal alignment reporting through the Division of Reactor Projects.

On December 19, 1991, the NRC Region II Branch Chief, B. Wilson visited the Sequoyah Nuclear Plant. Mr. Wilson toured the plant with the inspectors and discussed current issues at the facility.

2. Plant Status

Unit 1 began the inspection period in Mode 5 (day 64 of the Cycle 5 refueling outage). After completion of required maintenance and testing activities and establishment of required plant conditions, the unit commenced heatup and entered Mode 4 early on December 8. Additional testing was accomplished during the heatup and the unit was taken critical (Mode 2) on December 16. Power operations (Mode 1) was entered on December 18. On December 28, the unit experienced a turbine runback which dropped reactor power from approximately 98 percent to 75 percent. The runback resulted from setpoint drift on flow control valve 1-FCV-106B on the number 3 heater drain tank. The licensee discovered that the setpoint on the valve had drifted from 429 psig to approximately 450 psig which induced the automatic turbine runback. After reestablishing the proper setpoint, the unit continued to increase towards full power operation and ended the inspection period at approximately full power.

Unit 2 operated at approximately full power for the duration of the inspection period.

3. Operational Safety Verification (71707)

a. Daily Inspections

The inspectors conducted daily inspections in the following areas: control room staffing, access, and operator behavior; operator adherence to approved procedures, TS, and LCOs; examination of panels containing instrumentation and other reactor protection system elements to determine that required channels are operable; and review of control room operator logs, operating orders, plant deviation reports, tagout logs, temporary modification logs, and tags on components to verify compliance with approved procedures. The inspectors also routinely accompanied plant management on plant tours and observed the effectiveness of management's influence on activities being performed by plant personnel.

During the latter portion of the Unit 1 refueling outage, with the unit in Mode 5, the licensee discovered several emergent problems with regards to the recently installed Unit 1 and common board annunciator system. The annunciator modification was previously discussed in NRC Inspection Reports 327,328/91-23 and 91-26. The major issues identified and their affect on Unit 1 operation in Modes 4 and higher was discussed with the resident inspectors and NRC Headquarters and Regional management. Satisfactory interim measures were verified in place by the inspectors prior to mode escalation. Operators appeared to be aware of the problem symptoms and required operator actions. The following major issues were identified by the licensee:

(1) A software condition was discovered where, after 32,768 inputs have accumulated without any operator action to reset the

computer processor, the system would no longer allow the operators to remove the point description for return to normal points after they have been reset (acknowledged and cleared). To correct the problem after each accumulation of 32,768 points, the operator must reset the computer processor of the affected channel. The condition does not inhibit the operators ability to acknowledge alarms; however, it would allow the accumulation of uncleared alarms on the multiple page screen over time. This could result in difficulties for the operators to maintain proper cognizance over the unit's alarm status. The problem had not occurred on the new annunciator system and did not affect the information available to the operators through the annunciator windows or printers. The licensee will address this issue during subsequent software enhancements; however, periodic resetting of the system on a weekly basis has been proceduralized and put in place until permanent resolution of the problem.

(2) The licensee discovered a condition where either one of the two annunciator channels may exhibit a random failure due to a software communication protocol error. This error interrupts proper communications between the main controller and the scanner cards allowing inaccurate data to be accepted by the system without screening it for acceptability. The condition is not expected to occur simultaneously in both annunciator channels. This problem was initially exhibited by failure of one of the annunciator panel window trains in conjunction with randomly illuminated alarm windows. The condition may be cleared by the operators by manually resetting the particular A or B channel chassis that experienced the anomaly. During the licensee's investigation into the phenomenon, it was concluded that the as-installed grounding configurations may have been adversely affecting the system operation. The licensee installed an isolation transformer to improve the noise immunity of the system and also replaced a failed scanner card. After system observation, the licensee considers that these resolutions have not corrected the original software error; however, the improvements have modified the symptoms which the problem exhibits to a normal annunciator error alarm rather than random display of the annunciator windows. The licensee is currently working with the vendor on a permanent software solution to the condition.

During this period, the inspectors monitored control room activities associated with the restart of Unit 1. The inspectors specifically focused on the general operating instructions to determine if appropriate control was being maintained. The inspectors concluded that operator control of unit startup was being maintained; however, during several reviews of the procedures, the inspectors noted that the general operating instructions were not written in a manner which made for orderly control of startup evolutions. For example, the inspectors noted that operators

had to use several operator aids (yellow page markers) to help remember to go back and sign off steps because they could not be performed when listed in the GOIs. Also, entry into GOI-2, PLANT STARTUP FROM HOT STANDBY TO MINIMUM LOAD, was commenced prior to completing all the requirements of GOI-1, PLANT STARTUP FROM COLD SHUTDOWN TO HOT STANDBY. Based on these observations, the inspectors consider that the GOIs are weak in providing for good operator control of unit startup evolutions.

b. Weekly Inspections

The inspectors conducted weekly inspections in the following areas: operability verification of selected ESF systems by valve alignment, breaker positions, condition of equipment or component, and operability of instrumentation and support items essential to system actuation or performance. Plant tours were conducted which included observation of general plant/equipment conditions, fire protection and preventative measures, control of activities in progress, radiation protection controls, plant housekeeping conditions/cleanliness, and missile hazards.

A condition was noted during a routine tour where a potential exit point from the RCA was not correctly posted or locked to prevent inadvertent exit to a plant clean area. Door A161 on elevation 734' (entry to the 2B2 480V Shutdown Board Room) was marked only "Clean Area" and had no RCA boundary markings or instructions for frisking prior to passage. The inspectors discussed this issue with Radiological Control management, who agreed with the observation and had the exit appropriately posted.

c. Biweekly Inspections

The inspectors conducted biweekly inspections in the following areas: verification review and walkdown of safety-related tagouts in effect; review of the sampling program (e.g., primary and secondary coolant samples, boric acid tank samples, plant liquid and gaseous samples); observation of control room shift turnover; review of implementation and use of the plant corrective action program; verification of selected portions of containment isolation lineups; and verification that notices to workers are posted as required by 10 CFR Part 19.

d. Other Inspection Activities

Inspection areas included the turbine building; diesel generator building; ERCW pumphouse; protected area yard; control room; vital 6.9 kv shutdown board rooms, 480 v breaker and battery rooms; auxiliary building areas including all accessible safety-related pump and heat exchanger rooms. RCS leak rates were reviewed to ensure that detected or suspected leakage from the system was recorded, investigated, and evaluated; and that appropriate actions were taken, if required. RWPs were reviewed, and specific work activities were monitored to assure they were being accomplished per the RWPs.

Selected radiation protection instruments were periodically checked, and equipment operability and calibration frequencies were verified.

e. Physical Security Program Inspections

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 to include: 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.

f. Licensee NRC Notifications

(1) On December 13, 1991 the licensee made a notification to the NRC as required by 10 CFR 50.72 with regards to entry and exit from the plant emergency plan. At 1520 hours, a Notification of Unusual Event was declared and exited for Sequoyah Unit 1 which was in Mode 3. The event was declared due to the suspected failure of a main steam line check valve on loop #4 SG which is outside of containment. The suspected failure was a body to bonnet leak which caused a reactor coolant system cooldown of approximately 11 degrees F (545 to 534 degrees F), and a drop in RCS pressure of approximately 40 psig (1900 psig to 1860 psig). Operator actions included shutting of the 4 MSIVs which appeared to terminate the cooldown. No automatic actuation of any ESF equipment was required.

Further investigation of the NOUE by a event investigation team allowed for a revised determination that the RCS cooldown was caused by an inadvertent opening of at least two main steam dump valves. The steam dump valve master controller was subsequently found to be faulty and maintenance was performed to correct the condition. After the maintenance activity was completed and tested, the RCS was returned to normal hot standby conditions.

(2) On December 14, 1991 the licensee made a notification to the NRC as required by 10 CFR 50.72 with regards to a condition that placed Sequoyah Unit 1 in an unanalyzed condition due to discovery of inoperable A train automatic closure circuits for the four MSIVs. Unit 1 entered TS LCO 3.0.3 at 2239 hours. The unit was in Mode 3 at the time of discovery. The automatic closure feature had been defeated in Mode 5 by the installation of temporary electrical jumpers during performance of a maintenance activity when the valves were not required to be operable. Following the identification, the jumpers were removed from the four MSIV A train circuits, and subsequent post-maintenance testing was performed to ensure the valves' operability. LCO 3.0.3 was exited at 0009 hours on December 15

after three of the four valves were satisfactorily tested. The fourth valve (loop 4) passed the acceptance criteria of the testing at 0120 hours. At the end of the inspection period, licensee was continuing an investigation of the cause of the event. The event is further discussed in paragraph 4 of this report.

Within the areas inspected, no violations were identified.

4. Maintenance Inspections (62703 & 42700)

During the reporting period, the inspectors reviewed a specific maintenance activity regarding the safety-related MSIVs to assure compliance with the appropriate procedures and requirements.

a. Inspection Description

The inspectors reviewed the maintenance related activity associated with the event where, on December 14 at 2339 hours, the licensee discovered that electrical jumpers were installed in the A train junction boxes for all four Unit 1 MSIVs. Unit 1 was in Mode 3 operation at the time of discovery and had been in Mode 3 for approximately 70 hours. The installed jumpers had been inappropriately verified as being removed following previous maintenance on the valves which required both the A and B train automatic valve functions to be inhibited.

Prior to the inspection period, Unit 1 was in the scheduled cycle 5 refueling outage. Work had been performed during the outage to install improved packing on all four Unit 1 MSIVs. This work was performed in Mode 5. The Atwood Morrill MSIVs are air operated to open and spring loaded to close. TS 3.7.1.5, Main Steam Isolation Valves, requires that the MSIVs be operable in Modes 1, 2, and 3. In addition, each valve requires full closure within five seconds per TS Surveillance Requirement 4.7.1.5 and is demonstrated via ASME Section XI testing. This testing is accomplished utilizing both the A and B train controlled vent paths in order to bleed down the air supplied on the valve and allow closure. In addition, single train response time testing is performed to demonstrate valve closure capability per TS 3.3.2.1, Engineered Safety Feature Actuation System (ESFAS) Instrumentation. This testing ensures that single train ESFAS operability is demonstrated on a periodic basis and includes actuation of the vent path valve solenoids for selected trains on the MSIVs. The acceptance criteria for this testing requires 7 or 8 second full closure (for different accident scenarios) of any MSIV utilizing a single train air bleed down.

Prior to the jumpering of the ESFAS inputs to the MSIVs for the installation of the new packing, the licensee had successfully performed the single train ESFAS testing on all four valves. Subsequently, the licensee installed the subject jumpers and

completed the maintenance activity involving the EPRI packing. The installation of the jumpers was controlled via steps in WO #9027948 and by a component listing in an attached configuration log. The log identified the specific junction boxes where both the A and B train jumpers (two per valve) were located. The junction boxes are located in the MSIV valve vaults; however, the A and B train boxes are not located in a common area. Two hourly maintenance personnel were assigned the task of removing the jumpers to restore the MSIVs automatic closure functions after the new packing was installed. Both the log and the steps in the work package required a second party verification of the work performed. The licensee's preliminary investigation of the event determined that upon completion of the job, only the B train jumpers were removed from the field. Upon returning to the maintenance shop, the workers inappropriately verified, in two locations in the work plan, that both the A and B train jumpers had been removed. The second party verifications of the work performed had also been signed as complete. The licensee also identified that the work instructions and configuration log were not present at the job site during removal of the jumpers. At the time the B train jumpers were removed, Unit 1 was in Mode 5.

The licensee then began preparations for escalation into Mode 3 operation. This included stroking the MSIVs in accordance with Section XI criteria utilizing both A and B train air vents in order to achieve the 5 second required closure time. Initial stroke times of the valves was excessive (up to 15 seconds) and the licensee attributed this to the new packing of the valves. Problems were discovered with the torque values initially assigned to the new packing mechanism which the licensee used to account for the excessive stroke times. The licensee eventually attained the required 5 second closure after evolutions of adjusting the valves packing and tuning the air bleed down ports on the valves. The adjustable devices in the bleed down ports had been replaced during the outage due to the devices being moved to the Unit 2 MSIVs. This evolution was further discussed in NRC Inspection Report 327, 328/91-26. Once the valves met the required 5 second closure time, the unit proceeded through Mode 4 and was taken into Mode 3 on December 11, at 1046 hours.

Subsequent to Mode 3 entry, a concern was raised via PER SQPER910406 whereby following the new MSIV packing installation, the results of the previously performed single train vent path response time test may have been inadvertently affected. This concern was raised, in part, due to the two train performance test marginally passing the 5 second closure time requirements. Also, after reviewing the PER, management raised questions as to whether the single train 7 and 8 second closure requirements (from sensor through valve closure) would be maintained. At this time the licensee felt the sluggish valve performance was due to the incorporation of the new packing and not stroking the valve at normal operating temperatures. Normal stroke times before the packing modification were in the 3 to 4 second

range, whereas the current values were just under the 5 second TS requirement. The inoperability of the A train circuitry was not yet identified. Due to these concerns, plant management determined that additional testing should be performed. Special Test Instruction (STI) 148, was written to test each of the valve's closure time on an individual train basis. During the performance of the A train portion of the test, the MSIVs failed to close. Upon investigation, jumpers were found installed in the A train junction boxes. The licensee subsequently removed the jumpers and satisfactory testing of the valves was accomplished.

The licensee began an event investigation shortly after identification of the issue. The Unit 2 MSIV configurations were verified as being correct and generic implications of the event were reviewed for possible corrective/preventative actions. A list of components that are actuated by dual trains was developed based on a review of design documents. Upon completion of a review of historical maintenance and scheduled outage work, it was concluded by plant management that existing PMTs for other work performed on dual train actuated devices during the U1C5 outage was adequate to ensure operability.

b. Technical Specification Compliance

The inspectors reviewed the licensee's compliance with TS 3.3.2.1 in relation to the subject event. The A and B train solenoids, which operate the MSIVs' vent valves, are part of the ESFAS instrumentation, and as such are included in the train logic test channels. TS 3.3.2.1 requires, in part, that ESFAS instrumentation channels and interlocks be operable in accordance with Table 3.3-3, section 4, Steam Line Isolation. This table requires a minimum of 2 operable automatic actuation logic channels in Modes 1, 2, and 3. Contrary to this, from December 11, at 1046 hours until December 15 at 0009 hours, the A train automatic actuation logic channel for all four Unit 1 MSIVs was inoperable. This is identified as an apparent violation of TS 3.3.2.1 (327/91-31-01).

c. Procedural Compliance/Adequacy

The inspectors reviewed the licensee's compliance with TS 6.8.1 in relation to the subject event. This specification requires, in part, that written procedures shall be established, implemented and maintained, which includes procedures for performing maintenance activities.

1) SSP-6.25, MAINTENANCE MANAGEMENT SYSTEM PERFORMANCE OF WORK ORDERS, Section 3.2.B requires that the craft/performer maintain work instructions at the work location, when maintenance activities are being performed. The maintenance workers who removed the jumpers failed to maintain work instructions at the job location as required by the SSP. This is identified as a

first example of an apparent violation of TS 6.8.1 for failure to follow the requirements of SSP 6.25 (327/91-31-02).

2) SSP-6.25, MAINTENANCE MANAGEMENT SYSTEM PERFORMANCE OF WORK ORDERS, Section 3.2.C, requires in part that craft/performers of maintenance activities follow work instructions. The removal of the jumpers was not performed in accordance with the work order instructions in that, maintenance personnel failed to remove the specific jumpers identified on the configuration control log. This is identified as a second example of an apparent violation of TS 6.8.1 for failure to follow the requirements of SSP 6.25 (327/91-31-02).

3) AI-37, INDEPENDENT VERIFICATION, Section 2.2.2 does not require independent verification if a second-party verification and a functional test is performed. The planner of the PMT failed to follow these requirements, in that, the functional test assigned to be performed with second party verification was not adequate. The planner of the PMT failed to recognize the entire scope of work, which included the jumper installations, and failed to plan adequate (single train) testing to verify their proper removal. This is identified as a third example of an apparent violation of TS 6.8.1 for failure to follow the requirements of AI-37 (327/91-31-02).

4) AI-37, INDEPENDENT VERIFICATION, Section 6.2 details specific qualification requirements for those individuals assigned to perform an independent verification. During the inspectors review of AI-37, it was concluded that the AI was inadequate in that it did not specify any qualification requirements for those personnel performing second party verifications. The inspectors noted that the individuals involved in the subject and previous events (as discussed in paragraph 4.d) exhibited some confusion regarding the method and intent of second party verifications. This is identified as a fourth example of an apparent violation of TS 6.8.1 for an inadequate procedure, AI-37 (327/91-31-02).

d. Previous Corrective Actions

The inspectors compared the subject event to previous LERs. The inspectors identified two similar occurrences where problems resulted from inadequate functional testing in conjunction with inappropriately performed second party verifications. Also, in all cases, since functional testing was inadequate, independent verification should have been the method chosen in accordance with AI-37 (see paragraph c.3) above). The corrective actions of these LERs appear inadequate in that similar causes have been identified for this event. Specific findings include:

1) LER 91-05 concerns the emergency diesel generator fire protection system becoming inoperable due to improperly

terminated leads identified during system testing. This event also involved safety-related system restoration following maintenance. The system was returned to normal improperly using second party verification without an adequate functional test, contrary to AI-37 requirements. No corrective actions were identified in the LER to review the use of independent verification requirements in conjunction with partial functional testing for other maintenance procedures.

Additionally, the event referred to in LER 91-05 resulted in a corrective action to review the event specifically with electrical maintenance personnel, and to issue a site dispatch on the topic. This corrective action was inadequate in that it was limited to salaried employees and did not consider hourly workers which were also involved in the subject event, and who failed to properly perform second party verifications.

2) LER 91-17 concerned an event where the lower containment radiation monitor was inoperable due to inappropriate isolation of an inlet valve following filter replacement. After filter replacement, the system was improperly restored in that second party verification was performed without an adequate functional test. This action was again contrary to the requirements of AI-37 in that independent verification was not specified. No corrective actions were identified in the LER to review independent verification requirements for other procedures, although the licensee's incident investigation report (II-S-91-75) concluded that the chemistry procedure provided inadequate verification.

Additionally, this LER identified that procedures were not used by personnel performing the maintenance. The LER corrective actions addressed provisions to reenforce the use of procedures by personnel in the field. As discussed in paragraph c.1 above, the practice of not having the procedure at the work location occurred again in the subject event.

10 CFR 50 Appendix B, Criterion XVI requires, in part, that measures be established to assure that conditions adverse to quality are promptly identified and corrected. In addition, for activities regarding significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude recurrence. Both LERs reviewed by the inspectors involved instances where a failure to adequately perform second party verification, in conjunction with an inadequate or lack of a functional test, resulted in an inoperability of TS required safety-related equipment, as well as other similar problems. Based on the similarity of this event to the previous events, and the failure of the assigned corrective actions to preclude repetition, the inspectors consider the corrective actions identified in the

above LERs inadequate. This is identified as an apparent violation of 10 CFR 50, Appendix B, Criterion XVI, (327/91-31-03).

e) Adequacy of Administrative Controls

The inspectors reviewed SQN-PMSP-6.2.4, MAINTENANCE MANAGEMENT SYSTEM CONFIGURATION CONTROL LOG in conjunction with the event. Section 3.3.1.C requires, in part, that the maintenance performer list configuration changes in sufficient detail to uniquely identify each item (e.g. jumper). Section 3.3.1.G further requires that the performer and verifier shall initial and date each "return to normal" action for each change. During the subject event, the control of two jumpers was maintained by single signoffs (two party verifications) in the configuration control log. Although not specified in the procedure, the licensee maintains that the procedure allows the use of multiple activities with a single signoff. The inspectors also reviewed other similar procedures for multiple steps being controlled by a single signoff. Among other examples, 1-MI-EXX-241-024.0, PLACEMENT OF SPARE MAIN TRANSFORMER IN SERVICE, had single signoffs for up to eight wire termination evolutions. The inspectors concluded that the routine use of single signoffs for multiple actions was weak in assuring adequate controls for facility-wide activities. This is identified as a weakness in the licensee's configuration control program.

The licensee, at the end of the inspection period, was continuing their incident investigation to identify root causes and develop corrective actions to prevent recurrence. The licensee plans to issue an LER on the event which will include analyzing the safety significance of the event. The inspectors also concluded that recent events regarding the MSIVs including missing air limiting devices, numerous limit switch failures, and the inadequate control of jumpers in the MSIV circuitry reflect a general lack of attention to detail concerning these safety-related components.

Within the areas inspected, three apparent violations were identified.

5. Surveillance Inspections (61726 & 42700)

During the reporting period, the inspectors reviewed various surveillance activities to assure compliance with the appropriate procedures and requirements. Inspection areas included the following:

The inspectors witnessed portions of the licensee's performance of rod worth and rod bank worth measurements. The licensee performs these activities utilizing 0-RT-NUC-000-005.0, ROD BANK WORTH MEASUREMENT USING DILUTION/BORATION METHOD, and 0-RT-NUC-000-007.0, ROD WORTH MEASUREMENT USING ROD SWAP. The purpose of the testing is to provide a method for measuring the reactivity worth of the control and shutdown banks. Utilizing boration/dilution to establish the reactivity worth of a reference bank, the reactivity worth of all rod cluster control banks can

then be performed using a rod swap technique. During observations of the performance of rod swap measurements, the inspectors noted that the test directors' knowledge of the activities in progress was good and that the procedure adherence and content was well executed. The inspectors also noted that despite numerous control room activities, communications between Operations and Technical Support personnel appeared effective, with common repeat back for most of the observed rod movement activities. The inspectors reviewed the completed test packages after data computations were accomplished by the licensee. No discrepancies were identified.

Within the areas inspected, no violations were identified.

6. Licensee Event Report Review (92700)

The inspectors reviewed the LERs listed below to ascertain whether NRC reporting requirements were being met and to evaluate initial adequacy of the corrective actions. The inspector's review also included followup on implementation of corrective action and/or review of licensee documentation that all required corrective action(s) were either complete or identified in the licensee's program for tracking of outstanding actions.

(Closed) LER 327/91-06, The Reactor Building Annulus Fire Protection System was not Properly Verified as Required by TS because of a Failure to Update the Associated Procedure as a Result of a Modification. The event involved a discovery that seven sprinkler heads located in the Unit 1 reactor building annulus had not been inspected as required by TS. In June of 1988, the seven heads were added to the system as well as the relocation of ten heads; however, the applicable implementing surveillance procedures were not updated to reflect the changes. Poor drawing conditions also inhibited more timely identification of the issue. Immediate corrective actions included posting of a fire watch in the affected area, the performance of a system walkdown in the annulus, and the performance of a pressure test to further verify integrity of the system. Further corrective actions included drawing revisions, Fire Operations training on the use of the drawing control process, and revision of the applicable SIs through the Fire Protection Improvement Plan (Phase I). In addition, the licensee performed a review of any TS SIs identified associated with open work plans and determined that all TS performance intervals have been met for the work packages. The inspectors reviewed the LER closeout package, portions of the Fire Protection Improvement Plan, and verified implementation of the identified corrective actions. This LER is closed.

Within the areas inspected, no violations were identified.

7. Action on Previous Inspection Findings (92701, 92702)

(Closed) URI 327, 328/89-27-03, Generic Radiation Monitor (RM) Related ESF Actuations. The subject URI involved a review of LERs relating to ESF

actuations from RM signals. This review concluded that there may be an excessive amount of ESF actuations resulting from failure of or work associated with RMs. Due to the inspectors findings, the licensee formed a task force to reevaluate, on a broad perspective, the cause and impacts of the ESF actuations identified. The inspectors reviewed a licensee assessment of the 1988 ESF actuations for commonality and adequacy of the corrective actions taken. Followup actions from this assessment concluded that of the total number of RM ESF actuations, approximately 25 percent were personnel related, 25 percent actual radiation level induced, and 50 percent due to equipment problems. Corrective actions which resulted from individual RM events were implemented to decrease the number of events. These included the addition of RM cable shielding tape to increase RM noise immunity and operator training associated with RM operation. The licensee also plans to remove certain containment vent isolation features on RMs 90-106 and 90-112 as a recommended action from their evaluation of the study. The inspectors questioned the licensee regarding the current number of ESF and RM induced ESF actuations. Results since 1989 indicated approximately the same number as 1990 (average of 22); however, 1991 results were 3. Based on discussions with the licensee, review of the ESF study performed by the licensee, and recent unit ESF reductions in 1991, the inspectors consider this URI closed.

Within the areas inspected, no violations were identified.

8. Exit Interview

The inspection scope and results were summarized on January 6, 1992 with those individuals identified by an asterisk in paragraph 1 above. The inspectors described the areas inspected and discussed in detail the inspection findings listed below. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspectors during this inspection. Dissenting comments were not received from the licensee.

Item Number	Description and Reference
327/91-31-01	Apparent Violation - Failure to establish and maintain operable ESF function for MSIVs as required by TS 3.3.2.1, paragraph 4.
327/91-31-02	Apparent Violation - Failure to follow procedures as required by TS 6.8.1, paragraph 4.
327/91-31-03	Apparent Violation - Failure to take adequate corrective actions for previous similar events, paragraph 4.

The weaknesses summarized in the results paragraph were discussed in detail.

Licensee management was informed of the items closed in paragraphs 6 and 7.

9. List of Acronyms and Initialisms

AI - Administrative Instruction
ASME - American Society of Mechanical Engineers
CFR - Code of Federal Regulations
DRP - Division of Reactor Projects
EPRI - Electric Power Research Institute
ERCW - Essential Raw Cooling Water
ESF - Engineered Safety Feature
ESFAS - Engineered Safety Feature Actuation System
GOI - General Operating Instruction
LCO - Limiting Condition for Operation
LER - Licensee Event Report
MSIV - Main Steam Isolation Valve
NOUE - Notice of Unusual Event
NRC - Nuclear Regulatory Commission
PER - Problem Evaluation Report
PMT - Post Maintenance Test
RCA - Radiation Control Area
RCS - Reactor Coolant System
RM - Radiation Monitor
RWP - Radiation Work Permit
RWST - Refueling Water Storage Tank
SG - Steam Generator
SSP - Site Standard Practice
SI - Surveillance Instruction
SOS - Shift Operating Supervisor
SRO - Senior Reactor Operator
STI - Special Test Instruction
TS - Technical Specifications
TVA - Tennessee Valley Authority
URI - Unresolved Item
WO - Work Order