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

Report Nos.: 50-327/90-28 and 50-328/90-28

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: August 6, 1990 - September 5, 1990

Lead Inspector: J B Brady for
P. Harmon, Senior Resident Inspector — Date Signed 9/27/90

Inspectors: D. Loveless, Resident Inspector
S. Shaeffer, Resident Inspector
J. Beall, Senior Resident Inspector
J. Brady, Project Engineer

Approved by: W. S. Little
W. S. Little, Chief, Project Section 1
TVA Projects — Date Signed 9/28/90

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 conditions adverse to quality. Other areas inspected included surveillance testing observations, maintenance observations, review of previous inspection findings, follow-up of events, review of licensee identified items, and review of inspector follow-up items. An inspection of cable separation criteria compliance was conducted by a Region I inspector with experience in this area.

Results:

One violation was identified which involved a failure to promptly identify and implement corrective actions for gas binding in the centrifugal charging pumps, paragraph 7a.

One unresolved item was identified, pertaining to the lack of fire barrier wrapping on cable tray supports in applications where Kaowool is used as a fire barrier, described in paragraph 9.

No deviations or inspector follow-up items were identified.

Four events that occurred during the inspection period are described in paragraph 7. The events were centrifugal charging pump gas binding, unidentified leakage above T.S. limits when the positive displacement charging pump was started on Unit 1, a secondary side transient on Unit 2, and TS 3.0.5 entry when control room ventilation was inoperable.

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

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*C. Brimer, Acting Lead Mechanical Nuclear Engineer
*J. Bynum, Vice President, Nuclear Power Production
*W. Byrd, Manager, Project Controls/Financial Officer
*R. Beecken, Maintenance Manager
L. Bryant, Work Control Superintendent
*M. Cooper, Site Licensing Manager
*T. Flippo, Quality Assurance Manager
*J. Gates, Technical Support Manager
G. Hipp, Licensing Engineer
W. Lagergren, Jr., Operations Manager
M. Lorek, Operations Superintendent
*R. Lumpkin, Site Quality Manager
*R. Proffitt, Compliance Licensing Manager
R. Rogers, Technical Support Program Manager
M. Sullivan, Radiological Control Manager
R. Thompson, Licensing Engineer
P. Trudel, Project Engineer
*C. Vondra, Plant Manager
C. Whittemore, Licensing Engineer

NRC Employees

B. A. Wilson, Chief TVA Projects
*W. S. Little, Chief, Project Section 1
J. E. Beall, Senior Resident Inspector, Beaver Valley

*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 attentiveness was commensurate with the plant configuration and plant activities in progress, and with on-going control room operations. The operators were observed adhering to appropriate, approved procedures, including Emergency Operating Procedures, for the on-going activities. The inspectors observed upper management in the control room on a number of occasions.

The inspector verified that the licensee was operating the plant in a normal plant configuration as required by TS and that the operators were complying with the appropriate LCO action statements when abnormal conditions existed. The inspector verified that RCS leak rate calculations were performed and that leakage rates were within the TS limits.

The inspectors observed 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. 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 identified.

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 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 was actively pursuing correction to conditions requiring TACFs. No issues were identified with these specific logs.

Plant secondary chemistry reports were reviewed. The inspector verified 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 identified.

c. ECCS System Alignment

The inspectors walked down accessible portions of the Unit 2 Containment Spray system to verify operability, flow path, heat sink, water supply, power supply, and proper valve and breaker alignment.

The inspectors verified that a selected portion of the containment isolation lineup was correct.

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 visually inspected the major components for leakage, proper lubrication, cooling water supply, and any general condition that might prevent fulfilling their functional requirements.

The inspector observed shift turnovers and determined that necessary information concerning the plant systems status was addressed.

No violations or deviations were identified.

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.

No violations or deviations were identified.

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 area barrier integrity. The inspectors verified interfaces between the security organization and both operations and maintenance. The Resident Inspector interviewed individuals with security concerns, visited central and secondary alarm stations, and verified protection of Safeguards Information

No violations or deviations were identified.

g. Conditions Adverse to Quality

The inspectors reviewed selected items to determine that the licensee's problem identification system as defined in Site Standard Practice SSP-3.2, Problem Reporting, Evaluation, and Corrective Action, was functioning. CAQR's were routinely reviewed for adequacy in addressing a problem or event. Management Review Committee meetings were attended to determine the level of management involvement in the CAQR process. A sample of the following documents were reviewed for adequate handing:

- Work Requests
- Conditions Adverse to Quality, CAQRs
- Radiological Incident Reports
- Problem Evaluation Reports
- Correct-on-the-Spot Documents
- Licensee Event Reports

Of the items reviewed, each was found to have been identified by the licensee with immediate corrective action in place. For se issues that required long term corrective action the licensee was making adequate progress.

No violations or deviations were identified.

No trends were identified in the operational safety verification area. General conditions in the plant were adequate.

Radiation protection and security were 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.

No adverse trends were identified in the area of surveillance performance during this inspection period. The area of surveillance scheduling and management was observed to be adequate and improving.

No deviations or violations were identified.

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.

No deviations or violations were identified in the area of Maintenance.

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

(Closed) TI 2515/101,103, Loss of Decay Heat Removal (GL 88-17)

The inspector performed the review of this item in NRC IR 327,328/90-17 and concluded that the licensee fully met the requirements for resolution of this issue with the single exception of adequate procedures. The inspector concluded that the procedures were individually adequate and complete for routine and emergency situations during reduced inventory conditions. However, due to the large number of procedures, procedure tiering and numerous references, the license should combine the various procedures into a single document, or collect all the applicable procedures into a single controlled book for ready access. The licensee agreed at the Exit meeting for NRC IR 327,328/90-17 to combine the procedures into a single book prior to the planned reduced RCS inventory for the Unit 2 refueling outage.

The inspector reviewed the specially prepared book containing all applicable procedures pertaining to reduced RCS inventory, and concluded that the procedures were present and were current. The book will be maintained in two locations during the evolution; main control room and work control center. The licensee considers this arrangement to be temporary, and is pursuing combining the procedures into a single procedure for future evolutions.

TI 2515/101,103, Loss of Decay Heat Removal (GL 88-17) is closed.

(Closed) URI 327,328/89-27-02, Unit 1 RHR Pumps

This issue involved the potential inoperability of the Unit 1 RHR pumps due to deadheading when an automatic start signal is received. This issue was addressed in NRC IR 327,328/90-01 at the same time as URI 327,328/89-29-04 was addressed. The licensee determined on December 5, 1989 that on receipt of an automatic start signal during a small break LOCA that the weaker RHR pump would deadhead and result in pump damage after 11 minutes of operation in the deadheaded condition. The licensee placed one RHR pump in pull-to-lock until the emergency procedures were revised. The final emergency procedure revision required one pump to be shut off prior to 11 minutes of operation if the RHR pumps were not injecting. The operability issue was considered as part of violation 327,328/90-01-03, Inadequate Corrective Action for RHR Pump Deadheading and 327,328/90-01-01, Inadequate Safety Evaluation for Emergency Instruction Revision. These violations were issued on April 12, 1990 as a Notice of Violation and Proposed Imposition of Civil Penalty. These violations will track this issue to closure. This URI is closed.

(Closed) VIO 327,328/90-17-01 Failure to Follow Test Director Requirements Caused Reactor Trip

This violation resulted when performing SI-90.82, Surveillance Testing of the Unit 2 Train B SSPS, because the requirements of AI-47, Conduct of Testing, were not followed when it was discovered that steps had been performed out of sequence. The licensee's corrective action included disciplinary action against the test director and supervisor involved and a sitewide message from the Site Director (April 10, 1990) describing the event, its cause, and emphasizing personal responsibility for proper work performance. A Human Performance Enhancement System (HPES) program is also being implemented. These corrective actions were adequate. This violation is closed.

(Open) URI 327,328/90-22-05, Unissued Calculation for 1E Cable Testing

During discussions with licensee representatives, the inspector was told that several prior versions of the unissued calculation existed. Although the licensee has been unable to find the written review comments for this calculation, the inspector determined that significant differences existed between the 7/7/87 version and the 7/13/87 version. Although the first 12 cables were the same in the two versions, the following 28 were entirely different. The criteria for selecting the following 28 must have been different between the two versions. The differences are assumed to be a result of licensee review comments in relation to how the selection criteria were applied. This URI will remain open pending furthur review of selection criteria applications.

(Closed) SSOMI Item U-2.5.1, Effect of Loose Control Room Electrical Panel Doors on Seismic Qualification

(Closed) URI 327,328/86-68-18, Effect of Loose Control Room Door Electrical Panel Doors on Seismic Qualifications

IR 327,328/86-68 addressed item U-2.5-1, Effect of Loose Control Room Electrical Panel Doors on Seismic Qualification. This item was later identified as URI 327,328/86-68-18 for tracking purposes.

Under WP 11915, the inspectors found that hinge pins had backed out on several control room panel doors to the point at which the pins were not engaged with the lower hinge hole on the panels. Several instances of this apparent condition were also noted in the auxiliary control room. Since these panels are seismically qualified, the inspector determined that the licensee should investigate whether this lack of engagement would invalidate the seismic qualification of the panels. The licensee determined that the hinge pin only affects the lateral restraint of the door, and that the potential failure mechanism would be seen only by a significant change in the panel's natural frequency causing excessive panel vibrations. The lack of hinge pin engagement with the lower hole was determined not to cause a significant change in the panel natural frequency or cause an increase in panel frame stress because doors are not load carrying members. This determination was based on WCAP-8501, Correlation Study of a Full Size Main Control Board Section.

The inspector had no further questions. URI 86-68-18 and U-2.5-1 is considered closed.

(Closed) IFI 327,328/90-06-05, Resolution of SSOMI Issues.

IR 327,328/86-68 addressed item U-2.3-1, Failure to include Vendor Instructions in Work Procedures. This item was later identified as URI 327,328/86-68-13 for tracking purposes.

MR-271500 removed a seized bolt stub from Unit 2 Steam Generator No. 4 hot leg primary manway. When the bolt stud was finally removed, several threads were damaged which necessitated installing a Helicoil insert. Combustion Engineering (CE) was contracted to determine if the Helicoil would provide adequate strength and to provide installation instructions. The detailed instruction provided by CE, including precautionary statements and limitations were largely ignored by Sequoyah when their own detailed instructions were included in the MR. A critical step (6.0) in the MR, which involved a QC measurement of the repaired hole, including calibration date of the inspection tool, prior to installing the Helicoil, was missed by Sequoyah personnel. Sequoyah personnel were requested to determine whether this information was recorded on some other document or to evaluate the consequence of the missed step.

The inspector reviewed the MR and SMI-2-68-12, Removal of Seized Primary Manway Bolt from Steam Generator, with the licensee. The steps included in section 6.0 were not performed and documented in the body of the procedure. However, these steps were signed as complete in the copy of Plant Instruction Change Form (ICF) 84-1767 to this procedure. Additionally, the inspector reviewed the questions asked associated with vendor instructions being incorporated in work procedures. These

questions have been reviewed by the NRC during the restart efforts at Sequoyah, and most recently in NRC IR 327,328/90-25.

URI 327,328/86-68-13 and U-2.3-1, Failure to include Vendor Instructions in Work Procedures, is presently being tracked under the licensee's Tracking/Reporting of Open Items (TROI) list. Due to the low safety significance and the licensee's tracking to final resolution, the final SSOMI item, IFI 327/328-90-06-05 is administratively closed.

6. Licensee Event Report Followup (92700)

The following LERs were reviewed and closed. The inspector verified that: reporting requirements had been met, causes had been identified, corrective actions appeared appropriate, generic applicability had been considered, the LER forms were completed, no unreviewed safety questions were involved, and violations of regulations or Technical Specification conditions had been identified.

UNIT 2

328/90-001	LCO 3.0.3 Entered When Lower Compartment Coolers Were Declared Inoperable Because of a Missed Lubrication Resulted in Exceeding 50.49 Requirements
328/90-007	Two Ventilation Isolations Occurred During Purge Activities as a Result of Inadequate Procedural Guidance for Setpoint Determination
328/90-008	Sequoyah Unit 2 Reactor Trip from General Warning Alarm on Both Trains of Solid State Protection System as a Result of Performing Surveillance Test Steps Out of Sequence

7. Event Follow-up (93702)

a. On August 20, 1990, the licensee was in the process of securing the 2A-A CCP and starting the 2B-B CCP during set-up for performance of SI-40, Centrifugal Charging Pump Test. During the evolution, with the 2B-B CCP running, the 2B-B CCP pump was started. The 2A-A CCP was then secured. The 2B-B CCP began to cavitate as noted by the control room operator by observation of erratic motor amps and the pump was immediately shut down and the 2A-A CCP was restarted. The operators suspected gas binding of the 2B-B pump and proceeded to vent the pump casing and discharge piping per SI 40.1, Centrifugal Charging Pump Casing and Discharge Piping Venting. Following this venting, the pump was again started and the same symptoms were exhibited. It was discovered that the suction piping, not covered by the venting procedure, contained a gas accumulation, presumed to be hydrogen. The suction piping to the charging pump was then vented at several locations with noticeable amounts of gas and increased

airborne contamination being observed. The licensee was unable to quantify the amount of gas vented from the CCP suction taken from the RHR to CCP cross-tie line. The Unit 1 RHR to CCP cross-tie line was also determined to have gas accumulation and was vented. Immediate corrective actions included periodic venting of both units' charging pump suction lines and initiation of an event investigation to identify the root cause and alternate sources of the gas accumulation other than the VCT.

The licensee suspected that gas generation was an operational characteristic of the CCPs. Subsequently, the licensee started utilizing both units' positive displacement (PD) pumps to possibly alleviate any hydrogen formation problems due to system configuration. The running of the PD pump reduced the degassing rate and the need for periodic venting. At the end of the inspection period, the licensee was adequately controlling the gas accumulation by periodic venting of the suction lines, and running the PD pumps as often as possible until a permanent corrective action method would be in place.

Due to this event, the licensee made a 50.72 call to the NRC on August 22, which declared the 2B-B charging pump in an unanalyzed condition for the period of time when the quantity of gas accumulation was unknown. The specific mode of operation in question was that which requires the RHR pumps to provide suction to the CCPs for recirculation phase cooldown during a loss of coolant accident. This report was made by the licensee based on a conservative analysis using changes in VCT level indication after venting and known RHR/CCP cross connect piping configurations. The analysis indicated the amount of entrapped gas to be greater than the maximum amount recommended by the pump manufacturer.

Prior to this event, the licensee received and evaluated information relative to the possibility of this type of hydrogen gas binding at their facility. NRC Information Notice 88-023, dated May 12, 1988 and INPO Operating Experience Review OE 88-2477, dated March 17, 1988, were both received and evaluated by the licensee. These addressed the accumulation of hydrogen gas in high points of the fluid filled header and connected system piping at the suction of the centrifugal charging/high head safety injection pumps. These pumps are utilized for CVCS injection functions, including the post accident recirculation mode of operation where charging pump suction is provided by the RHR pumps. In order to evaluate the potential for a similar problem at Sequoyah, a review of various flow diagrams and corresponding as-built system piping layout drawings was performed through the TVA Nuclear Experience Review (NER) Program. The inspector reviewed the documentation associated with the NER review of this issue. The licensee's conclusion was that the mechanism of void formation was primarily a function of piping layout. A review of the various system lines was then performed by the licensee to show their relative layout to the VCT, which was assumed to be the

source of the hydrogen gas. It was concluded that the piping configuration at Sequoyah did not provide a comparable condition to the facility system layout presented in IEN 88-023 or OER 88-2477. The facility described in IEN 88-023 has the RHR/CCP cross-tie above the VCT and then connected into the CCP suction header creating an inverted loop configuration which was prone to gas entrapment. No portions of the Sequoyah system were located at an elevation higher than the normal operating band of the VCT. TVA's Nuclear Experience Review dated 12/12/88 and 6/21/89 concluded that the potential for gas binding was not expected.

The licensee had also received, during the review process, Westinghouse document TVA-88-825, Potential Gas Binding of SI Pump, dated November 1, 1988. The inspector noted that the vendor document also indicated that hydrogen degassing and accumulation were dependant on specific plant piping layout. However, it also stated that the charging suction piping pressures were difficult to predict based on standard fluid system calculation techniques, and recommended that the most accurate method to determine if gas accumulation was actually occurring was to vent the system high points following operation in various charging configurations. Had venting of the CCP suction lines been performed as recommended by the vendor, the phenomena of gas accumulation would have been more readily detectable. Operational and/or system design changes could then have been utilized to eliminate the gas accumulation problem, i.e. the installation of permanent high point vents. The evaluations performed did not mention or discuss the Westinghouse recommendations and conclusions and failed to identify the problem. The reviews performed relied on engineering analysis rather than actual system operational characteristics. The failure to adequately identify and take corrective actions for a previously known industry problem is identified as Violation 327/328-90-28-01, Failure to Promptly Identify Charging Pump Gas Binding.

This design deficiency was received and distributed through the Nuclear Experience Review program as was the RHR pump deadheading deficiency addressed in IR 327, 328/90-01. The inspector reviewed the NER program process as it related to this issue. The current NER program consists of a corporate and station group whose functions are described in STD-1.3.1, Rev. 0, Nuclear Power Standard on Managing Nuclear Experience Review Program. The corporate NER group is responsible for assigning incoming IENs, SOERs, SERs, etc. while the station NER group is responsible for vendor information, incident investigations, LERs, and violation resolutions. When the corporate NER group receives an IEN, for example, they determine applicability and assign it to the appropriate site NER manager. The issue is then assigned to site groups for review and resolution of the problem. Final evaluations are then routed back through the site and corporate NER groups. STD-1.3.1 states that the NER program should encompass methods to assess the safety significance and applicability of operating experience in order to develop recommendations that provide corrective and preventative actions. It was apparent that a lack of adequate review by either corporate or station management and NER

groups existed in that the decision not to follow the vendor's more accurate problem identification recommendation, in actually venting the charging system piping, and walking down the piping to determine if the actual configuration permitted loop seals to create gas pockets, was not reviewed at the appropriate level considering the potential safety significance of charging pump operability.

The NER program appears to be efficient at distributing and tracking issues to completion. However, it appears that NER issues are not always evaluated to determine if the described conditions constitute a condition adverse to quality. The inspector had several concerns in relation to NER item corrective actions. The inspector was concerned that licensee employees may consider NER as a separate corrective action program from the established corrective action program. The inspector was concerned that procedural requirements may need strengthening to reinforce the requirements for NER issues to be evaluated for conditions adverse to quality. The inspector was also concerned that other corrective actions for NER items may not have been entered into the corrective action program and similarly may not have been adequately evaluated and reviewed.

b. On August 23, at 1:17 p.m., Unit 2 experienced a transient in the #3 heater drain tank level control system. The level control valve, FCV-106B apparently failed open and caused the tank level to drop rapidly. Operators immediately began reducing flow through the parallel valve, FCV 106A and throttling flow at a manual isolation valve. The inspector observed the control room operators and Shift Operations Supervisor during this event. Communications with the turbine building operators and later with the system engineer were crucial to the handling of this event. The operators' quick action prevented a trip or runback. During this event, Operations personnel consulted with the System Engineer, who was very knowledgeable of the system and its operational characteristics. This interaction was observed to be effective in the stabilization of the unit.

c. On August 29, 1990 at 2:23 a.m., the licensee entered a Notification of Unusual Event, NOUE, due to unidentified leakage of greater than 1 gpm on Unit 1. The positive displacement charging pump 1C was started at 1:40 a.m. to provide normal charging and RCP seal injection. The 1C pump was started to allow the centrifugal charging pump to be shut down to reduce the formation of gas in the centrifugal charging pump lines as described in paragraph 7.a.

Operators noticed that the volume control tank (VCT) level began decreasing immediately after starting the 1C pump, indicating a leak greater than 1 gpm. The 1C pump was shut down at 1:55a.m. and a centrifugal pump was placed in service. The VCT level stabilized, indicating the leak had been terminated. SI 137.1, RCS Unidentified Leakage Measurement, was initiated to quantify the actual leakage. The NOUE was declared at 2:23 a.m. and the NRC was notified. At 6:07 a.m., the SI 137.1 was completed, with an unidentified leakage of .06 gpm indicated. The NOUE was terminated at that time.

The operators walked down the charging system and concluded that the leak was probably through a drain valve on the 1C suction line. The leaking valve was later determined to be FCV 514, a drain valve on the pump suction. The valve was tightened on its seat and the leak terminated. The drain valve is upstream of the pump's discharge check valve, and therefore isolated as a leakage path when the 1C pump is shut down. The licensee is continuing the investigation of this event.

d. On August 28, 1990 at 9:30 a.m. with Diesel Generator 1B-B out of service for routine surveillance the licensee determined that the A train normal control room ventilation was inoperable. This equipment is required to be operable in order to validate the Surveillance performed on the Control Room Emergency Pressurization Fans. LCO 3.0.5 allows train B ventilation to be considered operable only as long as all of the redundant systems are operable. When the A train was determined to be inoperable the licensee entered the action statement of 3.0.5 which requires that within 2 hours action be initiated to place the unit in hot standby within the next 6 hours.

This condition affected both units. At 11:30 a. m. the licensee had determined that they had enough operators on site to shut both units down and were aware that this procedure would take approximately 3 hours. At 1:35 p.m. the A train ventilation was declared operable and LCO 3.0.5 was exited. Shortly after this the 1B-B Diesel Generator was declared operable. The inspector had no further questions.

8. Evaluation of Licensee Self-Assessment Capability (40500)

The inspector observed a meeting of the onsite review committee (PORC). The inspector determined that quorum requirements were met and that the individuals present were adequately qualified to perform as PORC members. Members presented an adequate knowledge of the information discussed and asked probing questions about information presented to them.

9. Cable Separation (71707, 71710)

The inspector conducted a walkdown of selected safety systems with respect to the routing of power and control cables. Physical separation is required for the cable associated with redundant safety related equipment so that a single event or failure could not impact more than one safety train. This requirement is specified in the General Design Criteria (10 CFR 50, Appendix A), the Emergency Core Cooling Systems (ECCS) criteria (10 CFR 50, Appendix K) and the protection systems criteria (10 CFR 50.55a (h). Section 8.3.1.4.2 of the FSAR describes the design measures which satisfy these requirements.

In general, the design criteria for spacing between the two trains (A and B) and the four protection channels (I,II, III and IV) are 3 feet horizontally and 5 feet vertically. In the Annulus and the Auxiliary Instrument Room, the required separation is one foot horizontally and three feet vertically. Within panels, the required spacing is six inches.

There are provisions for the use of barriers where the specified distances are not available. These design criteria are implemented through SQN-DC-V-12.2, Separation of Electric Equipment and Wiring. The inspector reviewed the procedure and found it to be consistent with the FSAR.

The inspector identified five instances where the required separation had been impaired by the removal of cable try covers. The inspector did not observe any work activity to be in progress associated with the cable trays. The examples, mainly in the cable spreading room, are as follow:

- Tray LL-A lacked a cover as it crossed under tray JO-B
- Tray KX-B lacked a cover as it crossed under tray KM-A
- Tray JZ-B lacked a cover as it crossed under tray KP-A
- Tray JC-A lacked a cover as it crossed under an unlabeled B train tray
- Tray FW-B lacked a cover as it crossed under tray LI-A

The licensee stated that the covers had been removed under recently initiated work packages and that the work was ongoing. The licensee identified the applicable work packages and the inspector had no further questions concerning the tray covers. The inspector also identified examples of potentially inadequate separation of cables in free air. These examples are as follow:

- Cables from conduit MC1834B had less than three feet vertical separation from conduit 2PL5033A in the Auxiliary Instrument Room.
- Cables in tray LS-A had less than three feet vertical separation from cables from conduits MC1231B, MC1232B, MC1230B and MC1229B.
- Cables from conduit 2PL6275B appeared to have less than three feet horizontal separation from cables from conduits 2M2825A and 2PL5100A.
- Cables from conduits feeding trays MS-A and LH-B appeared to have less that three feet horizontal separation.
- Cables from conduits feeding tray MT-A and trays AA-B and FC-B appeared to have less than three feet horizontal separation.

Licensee evaluation of the above examples was still in progress at the end of the inspection. The specific instances of separation deficiencies for cables in free air identified above are being resolved via the licensee's corrective action program in CAQR SQP900347.

The inspector noted that certain electrical conduits were wrapped with fire barrier materials to meet the one hour resistance criteria of 10 CFR 50, Appendix R. These design criteria are presented in SQN-DC-V-24.0, Fire Protection for Appendix R Requirements. The materials used for the barriers varied, with some coated with Thermal System Insulation (TSI) and others with Kaowool. The TSI coated conduits had the associated supports also coated for a distance of 18 inches from the conduit. The Kaowool wrapped conduit supports generally were not wrapped.

Cables in conduit wrapped to provide a one hour fire barrier may be damaged prematurely by heat conducted to the conduit via an unwapped support which contacts the conduit. The inspector reviewed the applicable correspondence and Surveillance Instruction SI-233.4, Visual Inspections of Thermal Fire Barriers. The documents did not address the potential need to protect conduit supports for Kaowool applications. Licensee evaluation of this concern was still in progress at the end of the inspection. The lack of conduit support wrapping where Kaowool is used for Appendix R requirements is being tracked by a Problem Evaluation Report (PER). This item is Unresolved Item 50-327/328,90-28-02.

The inspector concluded that in general, separation criteria at Sequoyah is adequate and that programmatic weaknesses do not exist.

10. Exit Interview (30703)

The inspection scope and findings were summarized on September 5, 1990, 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.

Inspection Findings:

One violation was identified.

VIO 327,328/90-28-01, Failure to Promptly Identify Charging Pump Gas Binding.

One unresolved item was identified.

URI 327,328/90-28-02, Kaowool Wrap on Conduit Supports Not Installed.

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

11. 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
PER - Problem Evaluation Report
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

In completing the detailed engineering and investigating the availability of qualified valves and components to provide these modifications, we have determined that our schedule to install these modifications during the 1991 Unit 1 refueling outage cannot be satisfied. The primary difficulty involves the lead time necessary to procure the safety-related valves needed for these piping changes. Our detailed engineering and design of these modifications was also delayed by other staff commitments. We expect to have the material available to do the Unit 2 modifications in the fall of 1991 as scheduled; however, this letter is to inform you that we are rescheduling these modifications for Point Beach Unit 1 to the spring 1992 refueling outage.

Please contact us if you have any questions concerning this change to our proposed schedule or regarding our proposed modifications as discussed in the referenced letters.

Very truly yours,

C. W. Fay
Vice President
Nuclear Power

Subscribed and sworn to before me
this 5th day of October, 1990.

Notary Public, State of Wisconsin

My Commission expires 5-22-94.

Copy to: Resident Inspector
NRC Regional Administrator Region III