



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

Report Nos.: 50-327/89-09, 50-328/89-09

Licensee: Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Square
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: March 5, 1989 thru April 5, 1989

Inspectors: B.B. Desur for 5/3/89
K. Jenison, Senior Resident Inspector Date Signed

Inspectors: P. Harmon, Senior Resident Inspector
P. Humphrey, Resident Inspector
D. Loveless, Resident Inspector

Accompanying Personnel: P. Balmain, Reactor Engineer

Approved by: J B Brady 5/3/89
J B Brady, Acting Chief, Project Section 1
TVA Projects Division Date Signed

Summary

Scope: This routine monthly inspection by the Resident Inspectors was in the area of operational safety verification including operations performance, system lineups, radiation protection, safeguards, and housekeeping inspections. Other areas inspected included maintenance observations, surveillance testing observations, refueling activities, review of previous inspection findings, follow-up of events, review of licensee identified items, and review of inspector follow-up items.

Results: The licensee's performance in the areas of operational safety verification, and maintenance and surveillance obser:ations was generally adequate, except as noted below, and was fully capable of supporting plant operations. Management participation in the outage was positive. The area of vendor manual control and validation is of concern. The radiation protection and security areas were adequate.

The licensee had on three occasions failed to establish, implement and/or maintain procedures. These examples, described below, were identified as violation 50-327 328/89-09-03.

- Failure to establish an adequate slave relay performance testing procedure which resulted in inadvertent initiation of reactor trip signals (paragraph 12.a).
- Failure to establish adequate procedures to control the activities affecting the operability and configuration of tornado dampers resulting in an inadvertent entry into an LCO. (paragraph 13.b).
- Failure to follow procedures relative to maintaining vendor manuals in a technically adequate status (paragraph 14.b).

Two Non-cited violations were identified:

- Erroneous Response Time Test procedure (paragraph 4).
- Introduction of argon gas into the hydraulic actuator bladder of an UHI valve (paragraph 5.b).

Two unresolved items were identified:

- Operability of fan motors for certain ECCS room coolers (paragraph 2.a).
- Operability of UHI valve with scaffolding interference (paragraph 5.b).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*J. Bynum, Vice President, Nuclear Power Production
*J. LaPoint, Site Director
*S. Smith, Plant Manager
T. Arney, Quality Assurance Manager
R. Beecken, Maintenance Superintendent
*M. Cooper, Compliance Licensing Manager
D. Craven, Plant Support Superintendent
S. Crowe, Site Quality Manager
R. Fortenberry, Technical Support Supervisor
*J. Holland, Corrective Action Program Manager
J. Patrick, Operations Superintendent
R. Pierce, Mechanical Maintenance Supervisor
M. Burzynski, Site Licensing Staff Manager
*A. Ritter, Engineering Assurance Engineer
*R. Rogers, Plant Support Superintendent
*M. Sullivan, Radiological Controls Superintendent
S. Spencer, Licensing Engineer
*P. Trudel, Project Engineer
C. Whittemore, Licensing Engineer

NRC Attendees

*J. Brady, Acting Chief, Projects Section 1, TVA Projects Division

*Attended exit interview

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

2. Operational Safety Verification (71707)

a. Plant Tours

The inspectors observed control room operations and reviewed applicable logs including the shift logs, night order book, clearance hold order book, configuration log and TACF log. No issues were identified with these specific logs.

The inspectors also conducted discussions with control room operators, verified that proper control room staffing was maintained, observed shift turnovers, and confirmed operability of instrumentation. The inspectors verified the operability of selected emergency systems, and verified compliance with TS LCOs.

Tours of the diesel generator, auxiliary, control, ERCW and turbine buildings, were conducted to observe plant equipment conditions, including potential fire hazards, fluid leaks, and excessive vibrations and plant housekeeping/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 inspectors walked down accessible portions of the following safety-related systems on Unit 1 and Unit 2 to verify operability and proper valve alignment:

- Containment Spray (Unit 1)
- Emergency Gas Treatment System (Units 1 & 2)
- Upper Head Injection (Units 1 & 2)
- Chemical and Volume Control (Unit 1, Train A)
- Residual Heat Removal System (Unit 2)

On March 7, 1989 the licensee determined that 13 fan motors from ECCS room coolers had not been lubricated in accordance with the licensee's Qualified Maintenance Program approved for meeting the requirements of 10 CFR 50.49. The program required lubrication schedules for the motors to be performed by August 19, 1988. On August 19, 1988, DNE issued a memorandum to plant maintenance allowing an extension of these dates by three months. This extension expired for all motors by December 16, 1988.

On March 10, 1989 DNE issued a second memorandum extending the due date for all motors to April 15, 1989. This memo and the associated review meet the requirements of GL 88-07. The operability of the motors from the end of the original extension until the March 10 memo, along with the timeliness of the DNE analysis, will be reviewed by NRR/Headquarters EQ group. These items are considered unresolved and will be tracked as URI 327,328/89-09-01, Motor Lubrication.

No deviations or violations were identified.

b. Safeguards Inspection

In the course of the monthly activities, the inspectors included a review of the licensee's physical security program. The performance of various shifts of the security force was observed in the conduct of daily activities including: protected and vital area access controls; searching of personnel and packages; 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. Specifically, the Resident Inspectors:

1. interviewed individuals with security concerns
2. inspected security during outages
3. visited central and secondary alarm stations
4. verified protection of Safeguards Information
5. verified onsite/offsite communication capabilities

No violations or deviations were identified.

c. 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 that the activities were conducted in accordance with the applicable RWPs. Selected radiation protection instruments were verified operable and calibration frequencies were reviewed and found acceptable. The following RWPs and RIR reports were reviewed in detail:

(1) Radiological Work Permits

RWP 89 20250 00 00 Timesheet 25, U-2 Aux. Bldg. pipechases, charge pump rooms, HX Rooms, Penetration Rooms and UHI.

RWP 89 00108 00 00 Timesheet 3, NRC inspection, all areas.

(2) Radiological Incident Reports

- (a) The inspector reviewed RIRs 89-30,31,& 33, which documented an occurrence on February 24, 1989 that involved three individuals that were found in a C-Zone area and had failed to sign in on the RWP. However, the individuals were dressed in the proper protective clothing as required by the RWP. Immediate corrective actions were taken and the individuals were removed from the area and disciplinary actions are pending.

The individuals involved were laborers that were hired by the licensee for the outage work. Each had received the General Employee Training designed to inform workers of the plant rules and safety requirements, specifically those in area of radiation protection. The incident was attributed to a failure to follow procedure.

The inspector observed the on-scene prompt and adequate corrective actions taken by the licensee and had no further questions pertaining to this issue.

No violations or deviations were identified.

No trends were identified in the operational safety verification area. The licensee continued to perform plant operations in an adequate manner. General conditions in the plant were acceptable and conditions identified by the NRC were promptly resolved by the licensee. Radiation protection and security are adequate to continue two unit operations.

3. Engineered Safety Features Walkdown (71710)

The inspector verified operability of the Emergency Gas Treatment System on Units 1 and 2 by completing a walkdown of the systems. Minor drawing errors were noted and discussed with the licensee. Additionally, the inspector noted discrepancies between the SOI configuration and the flow diagram configuration. These were reviewed by the licensee and corrections to the checklist and drawings will be accomplished.

4. Surveillance Observations and Review (61726)

Licensee activities were directly observed/reviewed to ascertain that surveillances of safety-related systems and components were 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 requirements 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-60, Automatic Transfer of 6.9 kv Unit Boards With Unit on Backfeed.

As per SI-94.5 Reactor Trip Instrumentation Refueling Outage Channel Calibration (S/G Feedwater Flows), the inspector reviewed activities in progress, the calibration of the reactor trip instrumentation. During the process, the inspector noted that precaution 3.1 stated that "Only one protection set can be functionally tested at any one time. All other protection set cabinet doors shall be closed." However, the inspector noted that in addition to the Protection Set I cabinet doors being open, the Protection Set II cabinet door was also open and efforts associated with SI-247.2.921A, Response Time Test, Containment Sump Level Channel II, were in progress.

The inspector questioned the technicians and was told that it was acceptable to have more than one set of cabinet doors open at a time while in Mode 6. The test procedure was erroneous in that the precaution was applicable only while the plant was in Mode 1-5 and not in Mode 6 as mentioned in the procedure. The procedure has been updated. This item will be tracked as NCV 327,328/89-09-04. The resolution was deemed by the inspector to be adequate and the violation is not being cited because the criteria specified in Section V.G. of the Enforcement Policy were satisfied.

5. 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. Temporary Alterations (TACFs)

The following TACFs were reviewed:

TACF 82-97-87

No violations or deviations were identified.

b. Work Requests

The following work requests were reviewed:

WR B283321 SIS Accumulator Tank #2

WR B783822 MS drain high level

WR B237670 Lower Compartment Moisture High

WR B797907 Letdown Relief to the PRT

WR B238391 Pressurizer Spray Temperature

WR B775052 UHI Isolation Valve Accumulator Nitrogen Leak

On March 16, 1989, the inspector witnessed licensee efforts to identify a nitrogen leak on the Unit 1 UHI isolation valve 1-FCV-87-24 accumulator. This WR was written to replace either the whole accumulator and bladder assembly or the Schrader valve. At approximately 9:30 a.m. the licensee determined that nitrogen was leaking from the accumulator Schrader valve and made the decision to replace only the Schrader valve.

At 10:00 a.m., nitrogen was bled from the accumulator and UHI isolation valve 1-FCV-87-24 was declared inoperable with the valve open. Consequently, Unit 1 entered TS LCO 3.5.1.2 action statement "a". The existing Schrader valve was removed at 10:12 a.m. and replaced with a new Schrader valve at 10:14 a.m. At approximately 10:15 a.m., precharging of the 1-FCV-87-24 was initiated using a gas cylinder and precharging rig which had been placed in the Unit 1 UHI room prior to working WR B-775052. This gas cylinder charged the 1-FCV-87-24 accumulator to approximately 1300 psig and not 1467 psig as required. At approximately 10:30 a.m., the licensee's test director ordered additional nitrogen cylinders be brought to complete precharging. During this time the inspector noted that gas cylinder No. 1CC-3A2015, which was used to precharge the accumulator, was labeled as argon and not nitrogen as specified. The inspector asked the licensee's test director why argon had been used instead of nitrogen. The test director was unaware that argon had been used and immediately ordered the maintenance team to bleed the argon from the accumulator.

Technical Specification (TS) 6.8.1.a requires that procedures recommended in Appendix "A" of Regulatory Guide (RG) 1.33, Revision 2, February 1978, be established, implemented, and maintained. This includes procedures for performing maintenance. The requirements of TS 6.8.1.a are implemented in part by procedures included as work instructions within work request WR No. B-775052, "UHI isolation valve accumulator nitrogen leak."

WR No. B-775052, work instruction step 9, required that after 1-FCV-87-24 isolation valve accumulator repair or Schrader valve installation, a nitrogen (N₂) precharge (to 1467 psi) must be established.

Failure to precharge the 1-FCV-87-24 isolation valve accumulator with nitrogen as specified in WR B-775052 is a violation of the above requirements. The licensee reviewed the incident as documented in

PQIR-NE-MTB-SQP MM 89 011 RO, Possible Effect of Inadvertent Introduction of Argon Gas into the Hydraulic Actuator Bladder of UHI Valve 1-FCV-87-24. The calculations showed that the valve would respond similarly with an Argon charge as it would with a Nitrogen charge. Therefore, it would be categorized as an issue with low safety significance. This item will be tracked as NCV 327,328/89-09-05. This violation is not being cited because the criteria specified in Section V.G. of the Enforcement Policy were satisfied.

All maintenance work as specified in WR B-775052 with the exception of post maintenance testing was completed at approximately 11:26 a.m. The licensee test director then informed the control room to make preparations to perform SI-166.6 to verify the operability of 1-FCV-87-24. Prior to performing SI-166.6, a member of the maintenance team informed the test director that a temporary tubular scaffolding support was installed through the yoke of isolation valve 1-FCV-87-24 in such a way that the shaft to valve stem coupling would have impinged on the scaffolding support before the valve stroked fully closed. The test director instructed the maintenance workers to disassemble the scaffolding and remove the tubular support. The inspector questioned how long this situation had existed and whether the valve had been operable during that period of time. After removal of the scaffolding the control room was informed that 1-FCV-87-24 was clear and SI-166.6 was performed successfully. At 12:27 p.m. 1-FCV-87-24 was declared operable.

This event is currently under licensee and vendor review. Following this review a decision will be made as to the operability of the valve while the scaffolding was attached to it. This item is unresolved and is identified as URI 327,328/89-09-02.

c. Hold Orders

The inspectors reviewed the following HOs to verify compliance with AI-3, Revision 38, Clearance Procedure, and that the HOs contained adequate information to properly isolate the affected portions of the system being tagged. Additionally the inspectors verified that the required tags were installed on the affected equipment.

<u>Hold Order</u>	<u>Equipment</u>
HO 2-89-416	ERCW Pump Motor, 6.9 KV Shutdown Board, 2B-B C/8.
HO-1-89-150	1-FCV-1-16, Loop 4 Steam Supply to TDAFW Pump

No violations or deviations were identified.

6. 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 appear to be knowledgeable and involved in the day to day activities of the plant. Management response to those plant activities and events that occurred during this inspection period appeared timely and effective. An example of this management action was the professional and conservative approach to resolution of the leaking flux thimbles and management response to the NRC in-plant and refueling initiatives.

7. NRC Inspector Follow-up Items, URIs, Violations (92701, 92702)

(Closed) VIO 327,328/88-44-02, Failure to Follow Incore Probe Work Instructions

On September 9, 1988, the licensee reported an incident involving the accidental removal of a Unit 1 incore flux detector from the core during the performance of troubleshooting and repair activities per WR B296449. The incident was determined to have resulted from an inadequate instruction and failure to follow the precautions listed in the instruction.

The inspector reviewed the licensee's corrective actions implemented to prevent reoccurrence of the incident which consisted of a new procedure, MI-13.3.8, Incore Flux Detectors Removal and Installation. The specific purpose was to provide detailed instruction and precautions for the incore work activity.

The licensee's corrective actions were determined to be acceptable. This violation is closed.

(Closed) VIO 327,328/88-29-04, Inadequate Weld and Valve Testing Procedures

The violation identified two examples of inadequate procedures. The first example involved the adequacy of TVA general construction specification G-29, Radiographic Examination on Welded Joints. The second example involved the adequacy of Technical Instruction TI-89, Inservice Inspection.

Corrective actions in the first example included the documentation of weld thickness measurements in the individual work packages in accordance with procedure SQM-17, General Requirements for Welding, Heat Treatment and Allied Field Operations at Sequoyah and the performance of inspections on ten similar welds.

Corrective actions on the second example included the revision of TI-89 and the verification that testing was actually performed under work plans WP 6813-01 and WP 12309 for Units 1 and 2 respectively.

The inspector reviewed appropriate portions of the above procedures, work plans, and test results and had no further questions. The licensee's corrective actions appear to be adequate. This violation is closed.

8. Licensee Event Report Followup (92700)

UNIT 1

(Closed) LER 327/87012 Loss of Decay Heat Removal Resulting from False Indications of RCS Level in Sight Glass Due to Debris Accumulation.

This LER described the event of January 28, 1987, during which RHR suction was lost for a period of 1.5 hours while the RCS was partially drained for Steam Generator tube repairs. Operators were maintaining level in the RCS at elevation 695 feet-6 inches by a sight glass indicator with remote video monitor displayed in the control room. RHR pump 1A-A was running in the cold leg recirculation mode with very low decay heat rates due to the extended shutdown. The RCS level was verified and logged at 30 minute intervals by the UO. At 1:30 a.m., the UO observed level out of sight high and directed an AOU to go to containment to verify actual level in the sightglass. The AOU reported that level was indicating 696 feet-6 inches, 12 inches above normal. The UO began lowering level back to 695 feet-6 inches at a rate of 30 gpm at 3:30 a.m. At 6:20 a.m., the running RHR pump began exhibiting signs of cavitating and lost suction. The pump was immediately stopped and the level was checked. At the time, level was at 696 feet-4 inches by the sight glass, a change of only 2 inches from the initial level. The UO entered AOI-14, Loss of RHR Shutdown Cooling, and began to raise level back up in the RCS. At 7:14 a.m., maintenance personnel in containment reported to the UO that water was rising in the S.G. bowl as observed through the open manways. The UO stopped filling the RCS but the level continued to the point of spillover from the S.G. manways. The water spilled from the manways for approximately 10 minutes, and was later estimated to be a spill of approximately 500 gallons. At 7:50 a.m., the 1B-B RHR pump was started and the loss of RHR event terminated.

After regaining RHR shutdown cooling, operators flushed the sight glass connection and saw some suspended solid-type debris flushed from the connection. RCS water level was then raised and lowered to verify correct operation of the sight glass.

Although 1.5 hours elapsed before RHR cooling was reestablished, RCS temperature increased only 20 degrees, from 95 to 115 degrees. The root cause of this event was determined to be a partially plugged sight glass connection which caused the UO to change level resulting in both the loss

of suction to the RHR pump, and the subsequent spill when he tried to recover. No equipment damage, loss of shutdown margin, or personnel contamination or injury resulted from this event. The licensee instituted corrective action to add a redundant level indicator in the form of a Tygon hose connected to another RCS loop, and will also periodically flush the indicator connections. In addition, procedures were revised to add details of the elevation of pertinent design features, and the approximate gallons per inch between those features. The corrective actions are considered adequate to prevent recurrence of this event.

This LER is closed.

9. NRC Bulletins and Generic Letters (92703)

IEBs and GLs are documents issued by the NRC which require certain specific actions of the addressee. The inspector has reviewed the actions taken by the licensee as a response to the IEB and GL listed below. The inspector verified that: the licensee had performed the specific actions required by the bulletin; corrective actions appeared appropriate; generic applicability had been considered; licensee had reviewed the event and that appropriate plant personnel were knowledgeable; no unreviewed safety questions were involved; and that violations of regulations or TS conditions did not appear to occur.

(Closed) Generic Letter 81-07, Control of Heavy Loads. The inspector reviewed Generic Letter 81-07 and discussed the issues with Mr. K. Sang of NRR. Based on the NRC Safety Evaluation Report dated March 26, 1985, "Control of Heavy Loads," the NRC staff has concluded that the issue as it relates to the Sequoyah is closed.

(Open) IEB 88-11, Pressurizer Surge Line Thermal Stratification. On March 3, 1989 the inspector observed inspections of the pressurizer surge line performed by the licensee under SMI-0-68-4, Examination of the Reactor Coolant System Pressurizer Surge Lines. Additionally, the inspector independently verified certain measurements taken as a result of the bulletin. The inspector did not identify any deficiencies. NRR review of the licensee's submittal on this bulletin remains open.

10. Cold Weather Preparations (71714)

Through several inspection periods, the inspectors reviewed the licensee's program of protective measures for extreme cold weather as proceduralized in GOI-6, Freeze Protection. The inspector verified that the licensee was inspecting systems susceptible to freezing to ensure the presence of heat tracing, space heaters, and/or insulation; the proper setting of thermostats; and that the heat tracing and space heating circuits have been energized. These inspections were performed by the licensee on a weekly basis throughout periods of freezing temperatures.

No violations or deviations were noted. This inspection activity is closed and will be performed again at the onset of freezing temperatures.

11. Temporary Instructions

(Closed) TI 2515/94, Inspection for Verification of Licensee Changes Made to Comply with PWR Moderator Dilution Requirements, Multi-Plant Action Item B-03.

The inspector reviewed this item and determined that it was not applicable to the Sequoyah Nuclear Plant.

This item is closed.

12. Event Follow-up (93702)

a. The inspector reviewed two incidents that occurred on March 25, 1989, at Unit 2 while it was in cold shutdown for refueling which resulted in an SI/Reactor trip signal initiation during the performance of IMI-99, RT-601A, Rev. 6, Response Time Testing Engineered Safety Features Actuation Slave Relays (K601, K620, K-621). Both incidents resulted from the failure to reset permissives P-11 and P-12 when returning the SSPS to normal upon completion of the response time testing. The first incident occurred when the SSPS was returned to service after being taken out for the test and a trip signal was made up through a pressurizer low pressure. The second signal was initiated as a result of a low Tave and an indicated high steam flow. The high steam flow signal was initiated when the bistable for one steam transmitter was tripped for backfilling and a second steam flow transmitter drifted upward and indicated a high steam flow. The upward drift was caused by the changing conditions in the system. During a review of the procedure RT-601A, it was determined that no requirement for resetting the permissives existed and this resulted in the two trip signal initiations. T.S. 6.8.1, Procedures and Programs, requires that written procedures be established, implemented and maintained for certain activities including maintenance and testing. Contrary to this requirement, the procedure used in performance of the testing of the slave relays, IMI-99, RT-601A, Rev. 6 was inadequate as evidenced by the initiation of the reactor trip signals as described above. This issue is identified as an example of VIO 327,328/89-09-03 for failure to have an adequate test procedure.

b. During turbine generator maintenance activities, the licensee identified indentations on some of the turbine blades and suspected it to be erosion-induced porosity. The vendor was contacted through a technical response request and after analyzing the blades, made the determination that the indentations were casting markings and that the blades were acceptable to use-as-is.

The licensee's actions appear to be adequate.

c. During the refueling outage for Unit 2, the incore flux thimbles were inspected by an eddy current technique. As a result, 16 thimbles were replaced. Following replacement, new high pressure seals were installed by the vendor. When the RCS was refilled, leaks were identified on six of the new seals. Plant management decided to drain down the RCS and inspect the new seals rather than re-torque as recommended by the vendor. The inspection revealed minor scratches and other physical indications at the seal areas of each of the six leaking thimbles. These indications were removed and new seals installed. After refilling the RCS, the seals were hydrostatically tested to approximately 400 psig without any indication of leaks. The licensee's actions to resolve the problem appeared to be both prudent and conservative.

13. Refueling Activities (60710)

a. The inspector continued to monitor the Unit 2, cycle 3 outage activities. Plant management was involved in the day to day plant activities. Management was observed to be technically competent and their decisions did not sacrifice quality to meet schedules. Based on those activities reviewed, the inspector judged management's participation in the outage to be very positive. In addition, management was found to be very responsive to NRC initiatives.

Surveillance activities were reviewed on a regular basis and were found to be in compliance with TS requirements. Of those reviewed, strict procedure compliance was observed in all instances except as noted in NCV 327,328/89-09-04. However, based on the number of surveillances observed, overall performance was determined to be acceptable.

The inspector witnessed day to day involvement by the Quality Control personnel in various plant activities and reviewed documented inspection results and their dispositions to verify that the quality assurance program was effective. It was concluded that these programs were properly implemented and were effective.

Fuel handling was reviewed and was determined to be weak in the area of refueling operation. The handling equipment appeared to be marginally adequate for the operation and various interlocks were by-passed. This also contributed to the incident during which the fuel transfer cart was bent in the upender and the issuance of VIO 327,328/89-07-01. However, during core loading, the inspector verified that continuity was maintained between the fuel and excore monitors, communication with the control room was maintained, fuel accountability methods were established, and TS requirements implemented and that this part of the operation was performed in an acceptable manner.

In general, radiation contamination was kept to a minimum with work areas and personnel being closely monitored. Radiological controls were in place for the various activities and measures were implemented to insure compliance. However, some problems were experienced with airborne radiation resulting from improper installation of air eductors to the RCS and the use of portable vacuum systems with missing filters. These problems were identified and were corrected early in the outage and resulted in the improvement of airborne contamination conditions.

Radiation protection was determined to be carried out in an acceptable manner.

Housekeeping was sufficiently maintained in the thoroughfare areas. However, work areas, specifically the RHR pump and heat exchanger rooms, were not maintained at the same high standard during the outage. This was brought to the attention of the maintenance superintendent and immediate corrective actions were taken. Overall housekeeping conditions improved to an acceptable level in these areas.

The inspector determined that the training and staffing of plant personnel was adequate for the outage activities.

In summary, refueling activities were determined to be adequately performed. Management appeared knowledgeable of the plant status at all times and activities were conducted in a safe and responsible manner.

- b. The inspector reviewed the incident involving closure of the two tornado dampers that occurred on March 20, 1989, which placed the plant in a Limited Condition of Operation for a period of 6 hours and 20 minutes without the condition being recognized by the operating personnel. The dampers were closed to accommodate replacement of smoke detectors O-XS-31A-3 and O-XS-31A-4 that are located in the ducts that supply suction for the control building pressurizing fans. Operations personnel did not realize that closing the tornado dampers rendered both trains of the control room emergency ventilation system inoperable. With both trains inoperable, the action statement for LCO 3.7.7 could not be met and therefore LCO 3.0.3 was applicable. The dampers were closed at 8:30 a.m. on March 20, 1989. The condition was discovered and the dampers were reopened at 2:50 p.m. on the same day. The time limits for LCO 3.0.3 would have been exceeded if the condition had continued for an additional 40 minutes.

The craft workers related the problem of replacing the smoke detectors with high air flow in the ducts. The ASOS reviewed the applicable ventilation drawings and determined that the suction to the duct could be isolated by closing the tornado dampers. Handswitch

O-HS-31A-180A, which would be utilized to close and isolate the duct, identified that power to the switch was supplied from vent board 1A1-1. Upon reviewing the vent board, a placard was found on the door of the tornado damper control transformer which stated; "breaker normally open per SOI-30.7 reference SCR SQNEB86136." The ASOS reviewed SOI-30.7, Onsite Electrical Power Systems Board Rooms Heating, Venting, and Cooling, and found nothing related to the dampers to prevent their closure. In addition, SOI-30.1, Control Building and Control Room Heating, Air Conditioning and Ventilation System, was reviewed which required the normal breaker position to be open. Review of the SOI revealed that no warnings were included to prevent breaker closure to allow operation of the handswitch and closure of the dampers.

At that time, the ASOS closed the dampers which resulted in isolating the suction of the control room pressurizing fans. This was not realized until 6 hours and 20 minutes later and the plant was in LCO 3.0.3.

This issue resulted from inadequate procedures, SOI-30.1 and SOI-30.7, that failed to address the necessary precautions to prevent the incident stated above. T.S. 6.8.1, Procedures and Programs, requires that written procedures be established, implemented and maintained for certain activities including maintenance. Contrary to this requirement, procedures to control the activities affecting the operability and configuration of the tornado dampers were not adequate as evidenced by the inadvertent entry into LCO 3.0.3. This is identified as a second example of VIO 327,328/89-09-03 for failure to have an adequate procedure.

- c. An RCS water spill of approximately 45 gallons from the number 3 steam generator plenum was experienced during the Unit 2 Cycle 3 Outage. This resulted from the failure of the sump pumps placed in the S/G plenums to operate and remove the leakage emitted from the nozzle dams during S/G tube testing. The pump failures arose from a cross wiring problem that resulted in starting the hot leg sump pump when the cold leg plenum reached a high level and vice versa. A functional test of this equipment, supplied by the Westinghouse Company, failed to expose the problem since all visual inspections indicated the control box to be normal.

Immediate corrective actions were taken by the licensee to clean the spill and to correct the wiring problem. The inspectors were notified and the incident was reviewed. Based on the immediate response of the licensee and the low degree of safety significance, the inspector had no further questions.

14. Plant Startup from Refueling (71711)

- a. The inspector walked down the accessible portions of the Residual Heat Removal System during the Unit 2, cycle 3 refueling outage to determine the adequacy of flow diagram drawing, 1,2,47W810-1, to evaluate the licensee's configuration control, and to determine the overall condition of the system. Results of the walkdown revealed certain drawing discrepancies. Instruments shown to be physically located in the RHR pump rooms were actually outside the rooms. Also, valve leak-off lines, associated with valves 74-524,526,527, and 529 located inside the RHR heat exchanger rooms, returned to the piping system at a location other than that shown on the drawing. These drawing deficiencies were of minor safety significance. However, the licensee is reviewing these drawings to make the necessary corrections.

Some housekeeping deficiencies were identified in the RHR pump rooms at a time when plant outage cleanup was in progress. This item was brought to the attention of the licensee. In particular, the pump rooms were dirty, equipment had been left in the rooms, a rubber hose was left lying on the floor, and water was found running across the floor from the cooler. This information was given to the licensee and immediate corrective actions were taken. The area was again reviewed by the inspector and was found to be clean.

- b. A review of the historical activities on Residual Heat Removal valve, 2-FCV-74-2 (14" Copes-Vulcan gate valve with Limitorque Operator) was performed during this inspection period to determine the acceptability of this valve for its intended function. Work requests and surveillances initiated during the past two years accounted for a major portion of the review. The work requests reviewed included those that had been completed and those that remain outstanding and are listed as follows:

<u>WR Number</u>	<u>Date Initiated</u>	<u>Status</u>	<u>Subject</u>
B210787	12-23-86	Closed	Clean boron and adjust packing
B217092	12-22-86	Closed	Replace electrical splices
B217532	12-22-86	Closed	Replace splice for cable
B210784	1-30-87	Closed	Clean boron from bonnet and stud bolts
B219733	1-27-87	Closed	Replace in-line splices
B211064	4-27-87	Closed	Clean boron from valve external

B203732	10-03-87	Closed	Clean exterior valve surface of boron
B288251	11-03-87	Open	Disassemble and repair
B203736	8-16-88	Open	Repair or replace backseat

No entries were found in the trending program relative to valve 2-FCV-74-2. However, the inspector determined that on four separate occasions, work orders were generated to have boron residue cleaned from this valve during a 10 month time frame. Once the valve was disassembled to replace packing, it was determined that the cause of the leaks was a result of a gouge in the stem. This issue was reviewed with the system engineer who was of the opinion that valve cleaning work requests should not be a part of the trending program. The inspector asked that the issue be reconsidered to which the licensee agreed.

WR package, B288251, was lost during the administrative review cycle by the licensee and therefore created a problem in the work verification process. WR B203736 was initiated to substantiate acceptability of work performed under the lost WR package and to repair backseating problems with the valve. However, work on the replacement WR was not performed until approximately one year later and at that time the valve and bonnet were replaced because the valve mating surface to the bonnet was less than the standard size.

The inspector noted that the work request instructions for the valve operator did not totally agree with those published in the controlled copy of the vendor's manual. The lubrication materials specified in the manual were not correct.

The plant controlled vendor's manual for this valve specified a requirement to lubricate the valve drive sleeve top bearing every six months. The plant schedule was to lubricate this area during each refueling outage (eighteen months). Further review into this area revealed that the maintenance schedule had been implemented from a different vendor manual. However, this different vendor manual had not been included in the controlled copy of the vendor manual utilized for the subject valve.

Sequoyah Engineering Procedure, SQEP-39, Review and Approval of Vendor Manuals/Revisions, was established by the licensee to control vendor input and insure that vendor manuals reflected complete information for the equipment specified. Section 3.1 requires the Discipline Lead Engineer to provide the technical review of new vendor manuals and vendor proposed revisions to ensure applicability to the component level where appropriate and verify vendor manual completeness. Two areas in specific to be utilized in the guideline for vendor manual review are periodic testing schedules

and lubrication requirements. Contrary to SQEP-39, Work Package WP B203736 specified a lubrication, Neo Lube Dag 156, which was not on the approved lubrication listed in Copes-Vulcan Vendor Manual for the subject valve. The licensee stated that the Limitorque manual supplied as part of the vendor's manual for the 2-FCV-74-2 valve was a 1971 edition and a 1983 version of the Limitorque manual, SQN-VTD-W120-3620, is used by the work control group to assemble the work packages for valves with Limitorque operators.

T.S. 6.8.1, Procedures and Programs, requires that written procedures be established, implemented and maintained for activities including maintenance and testing. Failure to maintain the 2-FCV-74-2 vendor manual in a technically adequate status is contrary to section 3.1 of SQEP-39 and is identified as a third example of VIO 327,328/89-09-03 for failure to follow procedures.

This violation is similar to URI 327,328/88-50-07 which was also associated with vendor manual control and validation problems. These issues collectively may be indicative of a programmatic deficiency in the licensee's vendor manual control and validation process.

- c. A review of the historical activities on essential raw cooling water pump M-B (0-PMP-067-0444 - Johnston Pump Co. Vertical Turbine Pump Serial No. 1221-1228) was performed during this inspection period to determine the acceptability of this pump for its intended function. Work requests and surveillances initiated during the past two years accounted for a major portion of the review. The work requests reviewed included those that had been completed and those that remain outstanding and are listed as follows:

- B 283562 - Reduce packing leak off to proper amount on ERCW pump M-B.
- B 132009 - ERCW pump M-B pump packing needs adjusting and/or replaced.
- B 209677 - Adjust ERCW pump M-B packing to stop excessive leakage.
- B 295193 - ERCW pump M-B, Adjust packing.
- PM 2806 - ERCW Pump M-B load shed TDR.
- PM 1651 - Lubricate packing box on ERCW pumps.

The licensee's controlled vendor manual for this pump was reviewed and determined to be the most recent revision. No deficiencies were noted during this review.

15. Exit Interview (30703)

The inspection scope and findings were summarized on April 5, 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.

Inspector Findings:

- (Open) URI 327,328/89-09-01, "Motor Lubrication"
- (Open) URI, 327,328/89-09-02, "UHI Valve Operability with Scaffolding Interference"
- (Open) Violation 327,328/89-09-03, "Failure to Establish, Implement and/or Maintain Procedures"
- (Closed) NCV 327,328/89-09-04, "Response Time Test Procedure"
- (Closed) NCV 327,328/89-09-05, "Introduction of Argon instead of Nitrogen into Hydraulic Actuator Bladder of UHI Valve"
- (Closed) Violation 327,328/88-44-02, "Failure to Follow Incore Probe Work Instructions"
- (Closed) Violation 327,328/88-29-04, "Inadequate Weld and Valve Testing Procedures"
- (Closed) TI 2515/94, "Inspection for Verification of Licensee Changes Made to Comply with PWR Moderator Dilution Requirements, Multi-Plant Action Item B-03"
- (Closed) LER 327/87-012, "Loss of Decay Heat Removal"
- (Closed) GL81-07, "Control of Heavy Loads"
- (Open) IEB 88-11, "Pressurizer Surge Line Thermal Stratification"

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

16. 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
AQI	- 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
EGTS	- Emergency Gas Treatment System
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
LOCA	- Loss of Coolant Accident
MCR	- Main Control Room
MI	- Maintenance Instruction
MR	- Maintenance Report
MSIV	- Main Steam Isolation Valve
NB	- NRC Bulletin

NCV	- Non-cited Violations
NQAM	- Nuclear Quality Assurance Manual
NRC	- Nuclear Regulatory Commission
OSLA	- Operations Section Letter - Administrative
OSLT	- Operations Section Letter - Training
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
PRO	- Potentially Reportable Occurrence
QA	- Quality Assurance
QC	- Quality Control
RCDT	- Reactor Coolant Drain Tank
RCP	- Reactor Coolant Pump
RCS	- Reactor Coolant System
RG	- Regulatory Guide
RHR	- Residual Heat Removal
RIR	- Radiological Incident Report
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
TDR	- Time Delay Relay
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