U.S. NUCLEAR REGULATORY COMMISSION

REGION II

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Licensee:	Tennessee Valley Authority (TVA)
Facility:	Sequoyah Nuclear Plant, Units 1 & 2
Location:	Sequoyah Access Road Hamilton County, TN 37379
Dates:	September 28 through November 8, 1997
Inspectors:	M. Shannon, Senior Resident Inspector R. Starkey, Resident Inspector S. Sparks, Project Engineer, Region II, (Section O1.3) G. Wiseman, Reactor Inspector, Region II, (Sections F1.1 through F8.1)
Approved by:	M. Lesser, Chief Reactor Projects Branch 6 Division of Reactor Projects

Enclosure

EXECUTIVE SUMMARY

Sequoyah Nuclear Plant, Units 1 & 2
NRC Inspection Report 50-327/97-14, 50-328/97-14

This integrated inspection included aspects of licensee operations, maintenance, engineering, plant support, and effectiveness of licensee controls in identifying, resolving, and preventing problems; in addition, it includes the results of an announced fire protection inspection by a Region II reactor engineer.

Operations

- Operations' performance during the plant shutdown, outage and startup was considered to be very good and contributed to a successful 30-day refueling outage. In addition, the licensee's preparation and procedural controls for reduced inventory operations were good (Sections O1.2 and O1.3).

- A non-cited violation was identified for failure to follow TS 3.6.3 regarding administrative controls while performing a Local Leak Rate Test on a containment penetration (Section O1.4).

- A non-cited violation was identified for failure to follow a procedure during alignment of the component cooling water system, and operators did not ensure proper valve alignment prior to starting the containment spray pump (Sections O1.6 and O1.5).

- A non-cited violation was identified for examples of failure to approve overtime prior to it being worked. The inspector noted that the administrative procedure for controlling overtime was adequate and outage overtime was not excessive (Section O6.1).

- Changes in organization, personnel, planning and management oversight resulted in improved operations performance during the Unit 2 refueling outage (Section O6.2).

- The Management Review Committee (MRC) was effectively performing its duties and plant management was actively involved with the MRC (Section O7.1).

- A strength was noted in that the Quality Assurance organization was aggressively identifying areas in need of improvement (Section O7.2).

Maintenance

- In general, the conduct of maintenance during the Unit 2 refueling outage was considered to be very good (Section M1.1).

- A weakness was identified for the lack of planning and coordination of surveillance activities that resulted in the generation of an unexpected reactor trip signal and tripping of the reactor trip breakers (Section M1.1).

- A weakness was identified for not using test leads of sufficient length, resulting in a blown fuse on one of the three loss of voltage sensors on the 2A-A 6.9 kv shutdown boards and entry into a TS action statement (Section M1.2).

- The licensee has made significant improvements to the freeze protection program, most notably at the ERCW pumping station (Section M2.1).

- The licensee appropriately addressed issues related to the inappropriate "D" station air compressor high oil temperature set points, unexpected automatic closure of the air compressor ERCW cooling valve, and drifting of the service air isolation valve pressure switch set points (Section M2.2).

- Changes in maintenance oversight, planning and work practices resulted in improved maintenance performance during the Unit 2 refueling outage (Section M6.1).

Engineering

- Modifications implemented during the refueling outage appeared to be correcting/addressing many long-standing plant deficiencies (Section E2.1).

Plant Support

- Functional testing for the modifications to the high pressure fire protection water system was being performed in accordance with the licensee's test documents. Good cooperation and communications between test personnel was observed during pre-job briefings and data collection activities (Section F1.2).

- The fire protection program implementation was effective in the continued reduction of inoperable or degraded fire protection components and open fire protection related maintenance work requests. The material condition of the fire protection components was good and the operable components were well maintained (Section F2.1).

- Appropriate surveillance tests and inspections were being performed on the fire protection features and systems. The surveillance tests and inspections of the fire protection systems and features met the requirements specified by plant procedures (Section F2.2).

- Implementation of the fire protection transient combustible control program and the general housekeeping for control of combustibles within

the plant were satisfactory. Transient combustible evaluations met the licensee's procedural requirements (Section F3.1).

- The fire brigade organization and training met the requirements of the site procedures and the performance by the fire brigade as documented by drill evaluations was good (Section F5.1).

- The coordination and oversight of the facility's fire protection program met the licensee's procedures and commitments to the NRC in the Fire Protection Report. The personnel assigned various fire protection related functions within Operations/Fire Protection organization were working together as a team and with coordination by the onsite fire protection engineers and fire protection specialist to implement the fire protection program at the site (Section F6.1).

- The licensee's 1997 Nuclear Assurance and Licensing assessment of the facility's fire protection program was comprehensive and effective in identifying fire protection program performance to management. The licensee corrective actions in response to the identified issues were comprehensive and timely (Section F7.1).

- During the U2C8 outage, the total estimated TLD exposure was 140 rem which was the site's best ALARA performance for an outage by more than 70 rem (Section R1.1).

- The inspector concluded that when airborne radiation was detected in the control room, the airborne radiation levels were well below established limits and that the control room ventilation system functioned as designed (Section R1.2).

Report Details

Summary of Plant Status

Unit 1 operated at full power for the entire inspection period.

Unit 2 began the inspection period at 74% power, coasting down for the U2C8 refueling outage. The unit began the refueling outage on October 5. Following refueling activities, on October 22 core reload was completed and Mode 5 was entered on October 26. Mode 4 was entered on October 30 followed by Mode 3 on October 31. On November 1, the unit was taken back to Mode 4 to perform a missed surveillance on the pressurizer power operated relief valves (PORVs). Mode 3 was entered on November 2. Mode 2 was entered on November 3 and the generator was synchronized to the grid on November 4. The turbine was manually tripped due to a stator cooling water leak in the exciter cabinet and following repairs, was placed back in service on November 4. The turbine was taken out of service to perform overspeed testing and then synchronized back on the grid on November 5. The refueling outage was completed in approximately 30 days.

Review of Updated Final Safety Analysis Report (UFSAR) Commitments

While performing inspections discussed in this report, the inspectors reviewed the applicable portions of the UFSAR that were related to the areas inspected. The inspectors verified that the UFSAR wording was consistent with the observed plant practices, procedures, and/or parameters.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

Using Inspection Procedure 71707, the inspectors conducted frequent reviews of ongoing plant operations. In general, the conduct of operations, during the refueling outage, was considered to be very good.

O1.2 Plant Outage and Startup Observations, Unit 2

a. Inspection Scope (71707)

The inspectors observed various outage and startup activities during the Unit 2 refueling outage.

b. Observations and Findings

During the inspection period, the inspectors observed portions of receipt of new fuel, Unit 2 down power and plant shutdown, initiation of RHR cooling, core off-load, core reload, reduced inventory operations,

plant heat up, reactor coolant pump starts, reactor startup, physics testing, and power increase to 100%. The inspectors noted that the evolutions were well controlled, with a significant level of senior management present in the control room. The inspectors observed an increased level of self checking prior to performing various evolutions, including management/peer review of switch manipulations. Overall, operations' performance was considered to be very good and contributed to a successful 30-day outage.

Approximately 3.5 hours after synchronizing the generator to the grid, the main turbine was manually tripped due to a stator cooling water leak in the exciter cabinet. The licensee noted that work had been performed in the area during the outage, but no indications of a leak were present when the exciter cabinet was closed out. The leak was subsequently repaired.

When the unit was taken off-line to repair the stator cooling leak, the condenser steam dumps were used to maintain reactor power at approximately 10%. During repairs to the exciter, the steam dumps went closed and the atmospheric dumps opened due to a loss of condenser signal (C-9). The licensee found that the sensing line to the condenser vacuum instrument had failed. A briefing was held in the control room and it was discussed that no work was to be started on the failed sensing line until the control room operator had reset the steam dump controls. A few minutes later, the inspector noted that the steam dumps had opened and then had to be isolated by the control room operator. It was subsequently noted that a licensed reactor operator, in the field, had reconnected the sensing line, which generated a condenser available signal. This allowed the steam dumps to automatically reopen. After the sensing line was repaired and the steam dumps were placed back in service, the licensee noted that the steam dump flow was inducing a relatively high vibration on the sensing line, which may have contributed to the failure. The failure of the line was still under review at the close of the inspection period.

c. Conclusions

Operational performance during the plant shutdown, outage and startup was considered to be very good and contributed to a successful 30-day refueling outage.

Unintentional steam dump operation occurred when a licensed operator attempted to reconnect the condenser vacuum sensing line without being directed by the control room.

01.3 Outage Inspections - Reduced Inventory Operations, Unit 2

a. Inspection Scope (71707)

During this period the inspectors reviewed the licensee's preparations for operation in reduced inventory and midloop operations. The inspection included a review of the licensee's responses to Generic

Letter 88-17, LOSS OF DECAY HEAT REMOVAL. Unit 2 entered reduced inventory on October 25, 1997, after completion of core reload, and exited the condition on October 26, 1997.

b. Observations and Findings

Specific items reviewed by the inspectors included a detailed review of procedure 0-GO-13, Rev. 12, REACTOR COOLANT SYSTEM DRAIN AND FILL OPERATIONS to ensure that the procedure required the following: appropriate guidance and directives for RCS drain down, reduced inventory, and midloop conditions; directions for adequate configuration control; guidance to ensure at least two exit thermocouples were operable and RCS temperature was tracked and recorded; a minimum of two RCS level indicators were in service and that level was tracked and recorded; that level instruments were in agreement to within required tolerances; that outage activities did not lead to perturbations in the RCS system; that RCS inventory could be accomplished by at least two additional means in addition to the RHR system; that the hot legs were not blocked unless a vent path was available; that containment closure capability was maintained; and that the required power sources were maintained and appropriate switchyard controls were in place. In addition, the inspectors discussed special training received by Operations crews prior to entering midloop conditions.

c. Conclusions

The inspectors concluded that the licensee's preparations and procedural control for reduced inventory operations were good. The inspectors noted that the subsequent reduced inventory operations were accomplished in a very good manner.

01.4 Lack of Administrative Controls During Local Leak Rate Test (LLRT)

a. Inspection Scope (71707)

The inspector reviewed the circumstances of an LLRT which was performed on a containment isolation valve without Technical Specifications (TS) required administrative controls being in place.

b. Observations and Findings

On September 25, 1997, PER No. SQ972181PER was initiated by a Quality Assurance (QA) inspector to identify an adverse condition noted while observing an LLRT on September 15. During the review of the draft PER, the licensee determined that TS required administrative controls had not been in place during the containment penetration LLRT on September 15. Subsequently, the licensee noted that the procedure used for the LLRT on penetration X-48B, SI-158.1, Containment Isolation Valve Leak Rate Test, did not provide assurance that the administrative controls, required by TS 3.6.3, were implemented prior to starting an LLRT surveillance in Modes 1-4. Additionally, the licensee noted that the test director had failed to inform the control room that the test had started.

During the subsequent review, the licensee noted that prior to performing the surveillance, the test director had gone to the Unit 2 main control room (MCR) to brief the operators on the LLRT. The unit supervisor (US) instructed the test director to go to the work control center (WCC) to get the work approval portion of the test package signed. When the test director left the WCC he assumed that the WCC would inform the MCR of the test approval and therefore did not return to the MCR prior to beginning the test. Thinking that all necessary briefings and approvals had been completed, the test director, with the assistance of an assistant unit operator (AUO), started the LLRT. The test director stopped the test when he identified that the penetration being tested was not completely full of water. Prior to stopping the test, a test connection isolation valve, 2-VLV-72-544, which breached containment, had been open for approximately 25 minutes. During that time, an assistant unit operator AUO was stationed at the valve for all but approximately 30 seconds. The test director returned to the MCR to request that operators fill the header water column to the proper level. It was at that time that the control room operators first became aware that the test had been in progress.

TS 3.6.3, Containment Isolation Valves, requires that each containment isolation valve shall be operable. The TS states that penetration flow path(s) may be unisolated intermittently under administrative controls. The Basis for TS 3.6.3 indicates that the opening of penetration flow path(s) on an intermittent basis under administrative control includes sever considerations which the licensee did not implement. The inspector concluded that the licensee failed to ensure that administrative controls, as required by TS 3.6.3, were in place while an LLRT was performed on containment penetration X-48B, based on the control room not being aware that testing was underway and that containment had been breached.

During the subsequent investigation the licensee determined that the root cause for the event was that adequate guidance was not provided in SI-158.1 to assure administrative controls required by TS 3.6.3 were implemented. Several significant contributing factors were also documented in the PER evaluation. The licensee's corrective actions included: counseling the personnel involved in the event and revising SI-158.1 and other procedures to ensure that adequate guidance was provided to meet TS administrative control requirements during the performance of LLRTs during modes 1 through 4. The licensee was also reviewing the need for a more formal change management process pertaining to outage activities which are changed to on-line activities, and, based on this review, plans on developing corrective actions, if needed. This non-repetitive, licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (NCV 50-217, 328/97-14-01).

c. Conclusions

One non-cited violation was identified for failure to follow TS 3.6.3 regarding administrative controls while performing an LLRT on a containment penetration.

O1.5 Misalignment of the 2B-B Containment Spray (CS) Pump

a. Inspection Scope (71707)

The inspector reviewed the circumstances which resulted in running the 2B-B CS pump with its suction valve closed.

b. Observations and Findings

On October 22, 1997, with Unit 2 in Mode 6, an operator started the 2B-B CS pump with its suction valve closed (CS pumps are not required to be operable in Mode 6). The pump start, required as part of the in-progress ESF testing, was performed using system operating instruction 0-SO-72-1, Containment Spray System, Revision 12. Prior to running the pump, a temporary hold order lift had been issued on the preceding midnight shift which restored power to the containment spray system components. During the hold order release, the power to the pump suction valve was inadvertently omitted. The control room hand-switch was placed in the correct position (open), but there was no power on the valve at the time. When the mistake was realized, a hold order revision was made and power was placed on the valve. This resulted in the hand switch being in the correct position but the valve itself was still closed as a result of the improper sequence performed during the temporary lift of the hold order.

When the on-coming day shift operator completed the control board walk-down, he noted that the CS suction valve was closed with power "ON". Later, during the scheduled ESF testing, the same operator started the CS pump but did not verify that the CS suction valve was open. After starting the pump, the operator noted that flow was decreasing and stopped the pump. After securing the CS pump, the operator realized that the suction valve was closed. The licensee later determined that the pump had been run for 46 seconds with the suction valve closed. During the course of the day shift, several other operators had walked by the control board and did not notice or question the valve misalignment. Although 0-SO-72-1 did not require verification of suction valve position prior to starting the pump, it did require the suction valve to be opened per the system standby alignment.

The inspectors noted that each CS pump is equipped with a minimum flow line for pump protection. The minimum flow valve was verified by operators to have opened during this event, following its designed 10 second time delay. As a precautionary measure to verify no pump damage, the licensee manually rotated the pump to check for rubs or interference. Additionally, an ASME Section XI test of the pump was successfully completed on October 27, 1997.

c. Conclusions

The inspector concluded that operators did not ensure correct system alignment prior to starting a containment spray pump for testing while in Mode 6.

01.6 Misalignment of 2B-B Component Cooling Water System (CCS) Pump

a. Inspection Scope (71707)

The inspector reviewed the circumstances related to the valve misalignment of the 2B-B CCS pump which resulted in running the pump with its discharge valve closed.

b. Observations and Findings

On October 16, 1997, two AUOs were dispatched to align the 2B-B CCS pump from "A" train to "B" train per system operating instruction (SO) 0-SO-70-1, Component Cooling Water System "B" Train, Revision 10. Various breakers were closed, then transfer switches were placed in the "AUX" positions and finally the valves were positioned individually in sequence in preparation to align the pump to the "B" train. The SO, which only required a single party sign off, was performed by two AUOs. One AUO read the procedure steps aloud while the other AUO manipulated the various components. The AUO reading the procedure apparently skipped one valve in the sequence, but initialed the step as completed. This led to a failure to open valve 2-FCV-7-28, CCS Pumps 2A-A and 2B-B Discharge Crosstie to C-S Outlet Isolation. After the lineup was thought to be completed, control room operators started the 2B-B CCS pump and then immediately stopped the pump after observing no change in CCS parameters.

The inspectors concluded that the failure to follow procedure steps 0-SO-70-1 was a violation. This non-repetitive, licensee identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII. B.1 of the NRC Enforcement Policy (NCV 50-327, 328/97-14-02).

c. Conclusions

One non-cited violation was identified for failure to follow a procedure during alignment of the component cooling water system.

03 Operations Procedures and Documentation

03.1 Start of All Four Emergency Diesel Generators (EDG) Unexpected by Operators

a. Inspection Scope (71707)

The inspectors reviewed the reason for the start of all four EDGs, which was unexpected by operators, during ESF testing.

b. Observations and Findings

On October 7, 1997, during performance of 2-SI-OPS-082-026.A, Loss of Offsite Power With Safety Injection-DG 2A-A Containment Isolation Test, Revision 12, Section 6.3, Safety Injection/Phase B Actuation, Test Sequence Three, all four EDGs automatically started. Due to recent procedure changes which prevented multiple EDGs actuations during performance of different sections of this surveillance, operators expected only one EDG would start during the safety injection actuation section of this surveillance. In addition, operators noted that there was a step which had been added inadvertently by the procedure writers which also contributed to the operator's confusion. Although not specifically stated, it was the intent of Section 6.3 that all four EDGs would start during the safety injection actuation test.

The inspector reviewed Section 6.3 of the procedure and noted that it did not identify that all four EDGs would start during the test. Section 6.3 only discussed the starting and required run time of the 2A-A EDG. The procedure apparently assumed that operators would recall, from previous tests, that all four diesels would start. The licensee initiated PER No. SQ972292PER to document the procedure discrepancy.

c. Conclusions

The inspector concluded that 2-SI-OPS-082-026.A, Section 6.3, did not include steps to indicate that all EDGs would start during a simulated safety injection test. The lack of procedure clarity resulted in operator confusion during the test and is identified as a weakness in the procedure writing process.

O6 Operations Organization and Administration

O6.1 Review of Overtime

a. Inspection Scope (71707)

The inspectors reviewed the licensee's program for administratively controlling overtime to meet regulatory requirements as specified in TS and reviewed overtime records for the Unit 2 outage.

b. Observations and Findings

On October 8, 1997, the licensee placed in effect a new procedure, Standard Programs and Processes (SPP)-1.5, Overtime Restrictions (Regulatory), which established TVAN's revised program to meet regulatory requirements for overtime as specified TS. SPP-1.5 replaced SSP-1.7, Overtime Restriction (Regulatory) which was previously used to address the subject of overtime. SPP-1.5 implemented the guidelines of TS 6.2.2.g regarding working hours of the unit staff who perform safety related functions. The inspector reviewed SPP-1.5 and concluded that it adequately implemented the TS guidelines for the use of overtime.

The inspector reviewed the Overtime Limitation Exception Reports (from SPP-1.5) which were initiated during the Unit 2 (U2C8) refueling outage (for the period October 1-31, 1997). Exception reports were generated for those employees who exceeded the guideline overtime hours of SPP-1.5. The inspector reviewed approximately 75 exception reports, some of which granted approval to groups of employees rather than individuals. However, the inspector identified 11 examples where approval was not granted, by the plant manager or the site vice president or their designees, until after the overtime had been worked, which did not meet the requirements of TS 6.2.2.g and SPP-1.5.

The licensee failed to follow the requirements of TS 6.2.2.g which states that any deviation from the overtime guidelines shall be authorized in advance by the plant manager or his designee, in accordance with approved administrative procedures. SPP-1.5, Section 3.0.E, states that the Overtime Limitation Exception Report form must be filled out and approved before the individual(s) exceed(s) the overtime limit. This failure constitutes a violation of minor significance and is being treated as a Non-Cited Violation, consistent with Section IV of the NRC Enforcement Policy (NCV 50-327, 328/97-14-03).

When informed by the inspector of the findings, the licensee promptly initiated a PER, No. SQ972537PER and a Standing Order, SO 97-084, to address the necessity of approval prior to exceeding the overtime limits. Corrective actions included reminding all departments of the requirement to approve overtime prior to exceeding overtime limits.

c. Conclusions

One non-cited violation was identified for failure to approve overtime prior to it being worked. The inspector concluded that the licensee has an adequate administrative procedure in place to control the use of overtime and that overtime, as a whole, did not appear to be excessive.

06.2 Operations Performance During the Unit 2 Refueling Outage

a. Inspection Scope (71707 and 40500)

The inspectors reviewed the organizational and planning changes made by operations for the outage.

b. Observations and Findings

The inspectors reviewed the Unit 2 cycle 8 outage related changes in the area of operations. Discussions with operations management indicated significant changes were made in the areas of organization, personnel, preparation and management oversight. In the area of organization, changes were made to have separate shift managers for Unit 1, Unit 2 and the Work Control Center, with each having responsibility for oversight. In addition, the work control center was staffed with adequate personnel to complete the large amount of work. Personnel were selected for the outage staff based on individual skills. There was extensive operations

involvement in the outage schedule development, clearance development, and work package review. Managers were assigned to observe a significant number of ongoing activities with the guidance to remove barriers for getting the job done right. Although the inspectors noted it would be difficult to evaluate any individual change, overall, the sum of the changes resulted in a successful 30 day refueling outage with a limited number of operational errors/deficiencies.

c. Conclusions

Changes in organization, personnel, planning and management oversight resulted in improved operations performance during the Unit 2 refueling outage.

O7 Quality Assurance in Operations

O7.1 Review of the Management Review Committee (MRC)

a. Inspection Scope (40500)

The inspectors observed the performance of the Management Review Committee.

b. Observations and Findings

The inspectors attended several MRC meetings over the course of the inspection period. The purpose of the MRC is to review problem evaluation reports (PER) and to approve the disposition of PERs. The inspectors noted that the makeup of the MRC had changed. In its present form, the committee is chaired by the plant manager and is attended by the site vice president and various department managers. The inspectors noted that the senior managers closely review the root causes and corrective actions associated with the individual PERs to ensure that the deficient condition is adequately addressed. Over the last several months, this overview has resulted in a higher quality of root causes and corrective actions, that should ultimately result in improved plant performance.

c. Conclusions

The inspectors concluded that the MRC is effectively performing its duties and that plant management is actively involved in the MRC.

O7.2 Quality Assurance Observations of Outage Activities (40500)

The inspectors reviewed the QA department's findings and observations of outage activities for the first four weeks of the Unit 2 outage.

The QA Summary documented several problems associated with clearance, status control, poor labelling and verification. The QA organization was aggressively identifying areas in need of improvement.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (61726 & 62707)

Using inspection procedures 61726 and 62707, the inspectors conducted frequent reviews of ongoing maintenance and surveillance activities. The inspectors observed and/or reviewed all or portions of the following work activities and/or surveillances:

• WO 97-001409	Alignment of 2A-A MDAFW
• 1-SI-OPS-082-007.B	Diesel Generator 1B-B Operability Test
• 0-MI-MXX-062-001.0	Centrifugal Charging Pump Speed Increaser Inspection and Maintenance
• WO 97-001091	Change CCP Speed Increaser Oil
• WO 97-005723	MDAFW 1A-A Change Oil, Inspect Packing
• 0-PI-OPS-000-006.0	Freeze Protection
• 0-RT-NUC-000-003.0	Low Power Physics Testing
• 2-SI-OPS-082-026.A	Loss of Offsite Power With Safety Injection-DG 2A-A Containment Isolation Test
• M&AI-27	Freeze Protection
• 2-SI-OPS-003-118.R	TDAFW Pump Automatic Start and Roll
• 2-SI-SXP-003-201.5	TDAFW Pump 2A-S Performance Test
• 2-PI-ICC-085-051.0	Calibration (Initial Cold/Final Hot) Of Rod Position Indication Channels
• 0-SI-IFT-099-093.1	Functional Tests of Turbine Auto Stop Oil Dump and Throttle Valves Reactor Trips
• 0-SI-SXV-001-266.0	ASME Section XI Valve Testing 2-FCV-1-25

- 2-SI-IFT-092-N35.1 Functional Test of 2XX-92-5003 IR Nuclear Instrument System Channel I
- 2-SI-IFT-092-N36.2 Functional Test of 2XX-92-5003 IR Nuclear Instrument System Channel II
- 2-SI-IFT-092-N44.4 Functional Test of Power Range Nuclear Instrument System Channel 44
- 2-SI-IFT-092-N43.3 Functional Test of Power Range Nuclear Instrument System Channel 43
- 2-SI-OPS-068-137.0 Leak Rate Calculation

b. Observations and Findings

The inspectors noted that in most cases, the work activities and the performance of the surveillance activities were adequately performed. While observing various activities and/or by reviewing control room logs, the inspectors noted some instances where deficient conditions occurred during surveillance activities.

On October 29, with Unit 2 in Mode 5, a reactor trip signal was initiated and the reactor trip breakers automatically opened. The reactor trip breakers had been closed to perform AMSAC testing. The unit supervisor subsequently authorized surveillance testing for two overtemperture delta T channels. When both delta T channels were tested with the reactor trip breakers closed, a reactor trip signal was generated. The licensee did not consider this to be a reportable event.

During testing on the main turbine control and trip circuits, the inspector observed that an unexpected turbine trip/reactor trip signal was generated. An actual trip did not occur because the plant was in Mode 3. The licensee subsequently determined that a pressure surge occurred when the pressure switch being tested was valved in and actuated the second pressure switch.

c. Conclusions

In general the conduct of maintenance during the Unit 2 refueling outage was considered to be very good.

A weakness was identified for the lack of planning and coordination of surveillance activities that resulted in the generation of an unexpected reactor trip signal and tripping of the reactor trip breakers.

M1.2 Maintenance Activity Results in Blown Fuse on Shutdown Board

a. Inspection Scope (62707)

The inspector reviewed the event which resulted in a blown fuse in one of three loss of voltage sensors on the 2A-A 6.9 kV shutdown board.

b. Observations and Findings

On October 20, 1997, with Unit 2 in Mode 6, electricians connected test equipment to the kw meter located on the front of the 2A-A centrifugal charging pump breaker cubicle on the 2A-A 6.9 kV shutdown board to measure parameters during a pump full flow test. Three leads, one from each phase, were connected to test instrumentation which was on a moveable cart positioned adjacent to the cubicle. On October 21, 1997, the "C" phase lead became disconnected from the test equipment and shorted to ground which resulted in blowing a fuse in one of the three loss of voltage sensors for the shutdown board. Transmission and Power Supply (TPS) notified the control room of the blown fuse condition. Unit 1 entered the action of TS 3.3.2.1, Engineered Safety Feature Actuation System Instrumentation, which required that all three loss of voltage sensors be operable. Subsequently, operations and engineering developed an action plan to replace the blown fuse and the voltage sensor was restored within the allowed outage time of the TS.

The inspector reviewed PER No. SQ972454PER which documented the event and discussed the event with TPS management. The inspector was informed that the cart had moved (5-6 inches) when electricians attempted to lock the cart wheels to prevent cart movement. The "C" phase electrical lead became disconnected from the test equipment when the cart moved and resulted in the grounded condition. The discussion revealed that the leads did not have sufficient length to allow for movement of the cart. Furthermore, the "C" lead was connected to the test equipment with a banana jack. The other two leads were connected with spade leads. All three leads had been taped to the front of the breaker cubicle to restrict their movement. Although either type of connector is acceptable, apparently the electricians were only able to find two spade type connectors when setting up the test equipment. The short length of the leads, in addition to the use of the banana jack, allowed the "C" phase lead to become disconnected when the cart was moved.

c. Conclusions

The inspector concluded that electrical leads of insufficient length were used while performing a maintenance activity which ultimately resulted in a disconnected and grounded lead and the uplannned entry into a TS action statement. The use of electrical leads of insufficient length to safely perform a maintenance activity is identified as a work practice weakness.

M1.3 Missed TS Surveillance for the Pressurizer PORVs

a. Inspection Scope (61726)

The inspectors reviewed the licensee's activities associated with the missed stroke testing of the pressurizer PORVs required to be tested in Mode 4.

b. Observations and Findings

At 2:52 p.m., on November 1, with Unit 2 in Mode 3, the licensee identified that testing of the pressurizer PORVs did not comply with the requirements of TS Surveillance Requirement 4.4.3.2.1.b. Unit 2 was taken from Mode 3 to Mode 4 and the stroke testing of the PORVs was completed at 12:45 a.m., on November 2.

TS Surveillance Requirement 4.4.3.2.1.b requires that each PORV shall be demonstrated OPERABLE at least once per 18 months by operating the valve through one complete cycle of full travel during Mode 4. Due to a scheduling error the licensee had completed this surveillance activity on October 28, 1997, with the unit in Mode 5. The pressurizer did have a steam bubble and plant pressure was at 350 psig; however, RCS temperature was below 200 degrees F. The inspectors noted that conditions in the pressurizer could have been identical in Mode 4 or Mode 5 for purposes of testing the PORVs. Further review by the licensee noted that the Unit 1 PORVs were also tested in Mode 5 during the last refueling outage and that the 18-month surveillance interval for testing of the PORVs in Mode 4 will expire in January 1998. This issue is being identified as an Unresolved Item pending further review of corrective actions (URI 50-328/97-14-04).

c. Conclusions

A weakness was identified in the licensee's scheduling process for not properly scheduling the PORV surveillance activities for both units in Mode 4 as required.

An Unresolved Item was identified for the missed TS surveillance requirement of SR 4.4.3.2.1.b.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Cold Weather Preparations

a. Inspection Scope (71714)

The purpose of this inspection was to determine whether the licensee has effectively implemented a program to protect safety-related systems against extreme cold weather.

b. Observations and Findings

The inspectors reviewed 0-PI-OPS-000-006.0, Freeze Protection, Revision 13. This procedure was performed in its entirety during the during week of October 1. Appendices E through H of the procedure were performed weekly starting November 1, 1997 and will be performed weekly through March 31, 1998

Two additional procedures are also used during freeze protection activities. Modifications and Additions Instructions (M&AI)-27, Freeze Protection Revision 3, described the activities required for installing and removing temporary freeze protection measures to protect plant equipment that is subject to potential damage from abnormally cold weather (such as main steam pressure transmitters and other instruments in the east and west main steam valve vaults and MSR dog houses). The instruction may also be used for temporary installation of freeze protection in other areas of the plant when normal freeze protection fails. Procedure 1/2-PI-EFT-234-706.0, Freeze Protection Heat Trace Functional Test, functionally tests heat trace and cabinet heaters associated with feedwater flow transmitters, refueling water storage tank level transmitters, condensate storage tank level transmitters, and high pressure fire protection discharge pressure switches and pressure control valve sense lines along with other miscellaneous plant equipment.

The inspectors walked down several areas of the plant, including the ERCW pumping station, refueling water storage tanks and condensate storage tanks, and feedwater flow transmitter areas, to verify that the licensee had taken action to ensure operable heat tracing or to provide compensatory freeze protection measures. Notable improvements had been made to heat trace on piping at the ERCW pumping station including replacing all heat trace, all heat trace controllers and thermocouples which were not useable. The new ERCW heat trace system also provides input to the plant integrated computer system which is accessible to control room operators.

Previous problems with the licensee's freeze protection program were documented in Inspection Reports 96-01, 96-04, 96-14, and 97-01. The inspectors had classified the freeze protection program, as it existed during the winter of 1995/1996, as weak and an Inspector Followup Item (IFI) 50-327, 328/96-04-13, was opened. That IFI will remain open until the inspectors evaluate the effectiveness of the freeze protection program during the winter months of 1997/1998.

c. Conclusions

The licensee has made significant improvements to freeze protection systems, most notably at the ERCW pumping station.

M2.2 Service Air Isolation Valve Unexpectedly Reopens Following Automatic Closure

a. Inspection Scope (62707)

The inspector reviewed the circumstances related to the tripping of the "D" station air compressor and the automatic reopening of the service air isolation valve, 0-PCV-33-4, following a valid service air isolation condition.

b. Observations and Findings

On October 11, 1997, when the 2B start buss was transferred to its alternate power supply during a residual voltage decay test, the "D" station air compressor tripped due to an apparent low voltage condition. The "A" and "B" station air compressors automatically started and carried the control air system load. The service air system isolated when control air pressure decreased to less than 88 psig, the setpoint for service air system isolation. When the control air system pressure began to increase, due to the operation of the "A" and "B" air compressors, the service air isolation valve automatically reopened at approximately 86 psig. The valve reopening was unanticipated by operators since the isolation valve normally requires a manual reset of the local pressure switch (0-PS-33-4) to allow it to open.

The inspector, who was in the control room immediately following the loss of the air compressor, observed that the control air system pressure decreased to approximately 83 psig. When the "D" air compressor tripped, the ERCW cooling water supply valves to the compressor closed as designed. Without cooling water, the air compressor oil temperature increased to 132 F which was above the high oil temperature trip setpoint of 125 F. The high oil temperature prevented a restart of the air compressor until operators were able to cool the compressor oil cooler by spraying raw service water from a nearby hose onto the outside of the cooler. Approximately 25 minutes after it tripped, the "D" air compressor was restarted by operators.

As part of the corrective action for this event, the licensee increased the high oil temperature setpoint to 135 F, which corresponded to the trip setpoint as stated in the control room alarm response procedure (ARP). The licensee also modified the ERCW cooling valve logic to prevent valve closure upon a trip of the air compressor.

The inspectors were concerned that a system design problem permitted the automatic reopening of the service air isolation valve following the isolation signal. The licensee confirmed that the service air isolation valve is designed to remain closed until manually reset by operators. The licensee's investigation revealed that the setpoint for 0-PS-33-4 had drifted 14 psig low (from its setpoint value of 88 psig). Therefore, the pressure switch (PS) never saw the low air pressure condition and did not initiate closure of the isolation valve. In addition to the PS, the service air isolation valve is operated by a

pressure indicating controller (PIC), 0-PIC-33-4, which also has a setpoint of 88 psig. The PIC initiates either a close or open signal to the isolation valve depending upon control air system pressure. The PIC closure signal does not seal-in as does the signal from the PS. It was the PIC which initiated closure of the service air system isolation valve and then allowed the valve to reopen when control air system pressure increased.

The inspector, in discussions with the licensee, learned that a work request had been written on 0-PS-33-4 in March 1997 for a PS setpoint which had drifted 8 psig high. The inspector also learned that the installed PS model was obsolete and would have to be replaced with a different type. The licensee stated that the PS would be replaced by a different model and that the existing PS would be calibrated at approximate 90 day intervals until such time as the PS is replaced (in January 1998).

c. Conclusions

The licensee appropriately addressed issues related to the "D" station air compressor high oil temperature set points, air compressor ERCW cooling valve automatic closure, and drifting of the service air isolation valve pressure switch setpoint.

M6 Maintenance Organization and Administration

M6.1 Success of Maintenance During the Unit 2 Refueling Outage

a. Inspection Scope(62707)

The inspectors observed and discussed the changes made by the maintenance organization that contributed to the successful 30-day outage.

b. Observations and Findings

The inspectors reviewed the Unit 2 cycle 8 outage related changes in the area of maintenance. Discussions with maintenance management indicated that significant changes were made in the areas of operations' ownership, elimination of milestone managers, increased management in the field, and shifting work to pre-outage time frames. In the area of operations' ownership, operations took a leadership role and ensured hold orders were in place as required and ensured completion of work and post maintenance testing as scheduled. Elimination of milestone managers reduced the number of meetings and allowed management focus on ongoing activities. Increased management in the field helped overcome work obstacles. By shifting work to non-outage time frames, maintenance planning focused on safely performing as much maintenance as possible during non-outage periods.

In addition, maintenance management noted that work packages were generated in time to walk down the packages, housekeeping was stressed daily, planning identified manpower restraints, and 12 hour shifts for the maintenance staff reduced turnover errors.

c. Conclusions

Changes in maintenance oversight, planning and work practices resulted in improved maintenance performance during the Unit 2 refueling outage.

III. Engineering

E2 Engineering Support of Facilities and Equipment

E2.1 Outage Related Engineering Activities

a. Inspection Scope (37551)

The inspectors reviewed the performance of various plant modifications completed during the Unit 2 refueling outage.

b. Observations and Findings

Following the outage, the inspectors reviewed the various modifications that were implemented during the Unit 2 refueling outage. Engineering management indicated that during the outage, 53 outage related modifications were implemented and 38 non-outage related modifications were implemented. During plant startup and initial power operation, the inspectors observed the operation of some of the modifications as follows:

- the obsolete RCP seal leakoff flow indicators were replaced with higher accuracy transmitters and transmitters with a higher range (previously the indicators did not read up to the maximum operating range),
- the rubber hoses on the SG wet layup tell tale drains were replaced with carbon steel drain lines (previously leakage of the drains caused a Main Feedwater Isolation valve to fail on multiple occasions),
- the obsolete nuclear instrument delta flux recorders were replaced with new digital recorders (the inspectors had previously noted non-working recorders on multiple occasions),
- replaced multiple valves in the gland steam system which had resulted in leakage on other equipment and was a priority one work-around (had caused failure of a fire detector and led to failure of the turbine impulse pressure switches in 1996),

- installed new supports for the main steam line drain traps (found broken by the inspectors); however, this modification was not fully successful in that the inspector noted that when the plant approached 100% the main steam line loop 1 steam drains vibrated excessively, further modification/support work was being planned,

- local indicators were installed to identify when the turbine impulse detectors were arming the auxiliary feedwater actuation/turbine runback circuitry (failed impulse detectors led to turbine runback and reactor trip in 1996),

- installed redundant RCS level monitoring connections and instrumentation,

- replaced the pressurizer pressure master controller due to the problem with reset windup in the present controller,

- the main feedwater pump mini-flow valves were changed (due to erosion of the piping); however, during initial startup one of the valves vibrated excessively and the air line to the valve failed, the valves worked well during normal high temperature secondary conditions, further review was planned,

- the steam dump drain tank level controls and sight glass were replaced and the steam dump spargers, located in the condenser, were drilled out (previous steam dump water hammer problems), the licensee identified another potential source of condensation in the steam dump lines due to condensation from the steam dump piping located in the condenser, and

- various feedwater heaters had additional drain lines installed and the heater level switches and sight glasses were replaced (due to previous heater control problems), some problems were noted during startup, further adjustments were being made.

c. Conclusions

Modifications implemented during the refueling outage appeared to be correcting/addressing many long-standing plant deficiencies.

IV. Plant Support

F1 Control of Fire Protection Activities

F1.1 Fire Reports and Investigations

a. Inspection Scope (64704)

The inspectors reviewed the plant fire brigade dispatch and fire incident reports for 1997 to assess maintenance related or material condition problems with plant systems and equipment that initiated fire

events The inspectors verified that plant fire protection requirements were met in accordance with SSP-12.15, Fire Protection Plan, Revision 19, Appendix F, Fire Reports, when fire related events occurred.

b. Observations and Findings

The fire incident reports and fire brigade dispatch logs indicated that there were five incidents of smoke or fire within safety related plant areas in 1997, which required fire brigade response. No safety significant fires had occurred during this period.

c. Conclusions

Good compliance with plant fire prevention procedures resulted in no incidents of a safety significant fire within the plant safety related areas for 1997.

F1.2 High Pressure Fire Protection System Modifications

a. Inspection Scope(64704)

The inspectors reviewed the work in process on the modifications to the high pressure fire protection water system for compliance with the licensee's commitments to the NRC.

b. Observations and Findings

Work was in process on Design Change Notices (DCNs) M-08811, M-08812 and M-08813 which will provide a new fire protection water system. These modifications include the installation of two fire protection water supply tanks, two fire pumps, a fire pump house, and the replacement of piping and valves inside the power block. The new system uses potable water from the Hixson Utility District. Construction of the tanks, fire pumps, underground water supply piping, and connection to the utility district's water system had been completed.

The inspectors performed a walkdown inspection of the two water supply tanks, the fire pump house and the new fire pumps. The inspectors also observed portions of the preoperational water supply functional test, WO-95-06411-010, Revision 0, which verified tank fill capability and tank water level alarm set points for the water storage tanks. The test was performed in accordance with approved test procedures and good test practices. Good cooperation and communications between test personnel was observed during pre-job briefings and data collection activities.

c. Conclusions

Functional testing for the modifications to the high pressure fire protection water system was being performed in accordance with the licensee's test documents. Good cooperation and communications between test personnel were observed during pre-job briefings and data collection activities.

F2 Status of Fire Protection Facilities and Equipment

F2.1 Operability of Fire Protection Facilities and Equipment (64704)

a. Inspection Scope

The inspectors reviewed open maintenance work orders, Problem Evaluation Reports (PERs), and Impairment Summary Reports on the facility's fire protection systems and features. The inspectors also inspected these items to determine the performance trends and the material conditions of this equipment.

b. Observations and Findings

Maintenance Observations:

The total number of open or outstanding maintenance work orders related to the fire protection systems and features was 140. The inspectors noted that 26 of the fire protection water system (System 26) work orders were associated with the ongoing fire protection water system modifications. As of March 1997, the number of open or outstanding work requests related to fire protection components had been approximately 209. Since September 1996, the licensee has placed a strong emphases on reducing the total number of open maintenance work requests. The inspectors' review confirmed that this effort had been effective and had resulted in a continued reduction in open work orders for fire protection features.

Fire Protection Problem Evaluation Reports (PERs):

The inspectors evaluated 134 fire protection related PERs initiated from January 1996 to September 1997 that were listed in the Tracking and Reporting of Open Items (TROI) database. Most of the identified issues had been resolved and were closed. Only 24 items which had been initiated in 1997 remained open. Discussions with operations fire protection personnel indicated that no adverse trend deficiencies have been identified as part of the problem evaluation process. The inspectors concluded that the number of open Problem Evaluation Report issues associated with the fire protection program or components was small.

Fire Protection System Status:

A review of the Impairment Summary Reports prepared by the Fire Protection Section for September 26 and October 17, 1997 identified 36 impaired or degraded fire protection components or systems. Twenty-four of these items involved temporarily degraded fire protection features that had been taken out of service within the two week period in support of the ongoing Unit 2 refueling outage. The remaining 8 items involved actual components which were degraded or out of service. Appropriate TS required compensatory actions had been implemented for these components.

Overall, the number of degraded fire protection components had continued to decline in recent months. Based on the trend report, currently there was an approximate 30% reduction from the number of impairments identified in April 1997. The inspectors toured the plant and noted that the material condition of the operable fire protection systems was good and the operable components were well maintained.

c. Conclusions

The licensee's fire protection program implementation was effective in the continued reduction of inoperable or degraded fire protection components and open fire protection related maintenance work requests. The material condition of the fire protection components was good and the operable components were well maintained.

F2.2 Surveillance of Fire Protection Features and Equipment

a. Inspection Scope (64704)

The inspectors reviewed the following operations surveillance test procedures and completed periodic inspections for various fire protection systems and features to determine compliance with SSP-12.15, "Fire Protection Plan:"

- 0-SI-FPU-026-167.M, Revision 9, "Fire Header Valve Lineup Inspection," (Monthly), completed September 26, 1997.

- 0-SI-237.1, Revision 16, "Power House CO_2 Fire Protection System Test," (18 Month), completed April 19, 1997.

- 0-PI-FPU-000-001.W, Revision 3, "Operations Fire Protection Unit Weekly Inspection," (Weekly), completed October 19, 1997.

- 0-PI-FPU-247-001.0, Revision 1, "Emergency Lighting (Appendix R)," (3 Months), completed August 29, 1997.

- 0-PI-410-701.M, Revision 4, "Inspection of Fire Doors," (Monthly), completed September 29, 1997.

The frequency of selected surveillance test and periodic inspection procedures was also reviewed.

b. Observations and Findings

The test and inspection procedures were well written and met the fire protection surveillance requirements of the Fire Protection Plan. The completed fire protection surveillance tests reviewed by the inspectors had been completed within the required frequency and had not extended into the allowed grace period. When the acceptance criteria were not met, the licensee properly identified the problem and initiated appropriate corrective actions.

c. Conclusion

Appropriate surveillance tests and inspections were being performed on the fire protection features and systems. The surveillance tests and inspections of the fire protection systems and features met the requirements specified by plant procedures.

F3 Fire Protection Procedures and Documentation

F3.1 Transient Combustibles Program

a. Inspection Scope(64704)

The inspectors reviewed procedures FPI-0100, Revision 0, "Control of Transient Combustibles," and SSP-12.71, Revision 2, "Housekeeping," for compliance with the NRC requirements and guidelines and reviewed the procedures' implementation.

b. Observations and Findings

Procedure SSP-12.71 delineates the duties and responsibilities for implementing the plant general housekeeping requirements.

Procedure FPI-0100 establishes the requirements and controls to be provided for handling and use of transient combustibles associated with maintenance, modifications, and operations activities.

The inspectors toured the Emergency Diesel Generator Building and the Unit 1 and 2 Auxiliary and Control Buildings on October 21-23, 1997, with the licensee's fire protection specialist. The inspectors observed the general housekeeping for a number of licensee work activities in process and reviewed several transient combustible evaluations posted for the use of combustible materials associated with the ongoing Unit 2 refueling outage. No safety significant housekeeping issues were identified.

Even though Unit 2 was in a refueling outage, implementation of the site's transient combustibles program for the control of combustibles, and general housekeeping was good. The accumulation of combustible materials and the number of maintenance activities in process due to the refueling outage were more than anticipated during normal plant operations, however, appropriate program controls were being applied to these activities. The housekeeping for areas containing lubrication oil was controlled. The licensee made use of oil absorption materials to catch and soak up the oil from leaks associated with the diesel generators. The oil absorption materials were being replaced at appropriate intervals.

The transient combustible evaluations reviewed by the inspectors met the licensee's procedural requirements. The evaluations effectively addressed the impact of a potential fire involving the combustibles on the capabilities of the installed fire protection systems and fire

barrier systems. However, the evaluations did not clearly address the impact of a potential fire involving the combustibles on the operation of plant safety related safe shutdown functions and equipment identified in the Appendix R Safe Shutdown Analysis. This was discussed with the licensee Fire Protection Manager who indicated that this item would be evaluated.

c. Conclusions

Implementation of the fire protection transient combustible control program and the general housekeeping for control of combustibles within the plant were satisfactory. The transient combustible evaluations reviewed by the inspectors met the licensee's procedural requirements.

F5 Fire Protection Staff Training and Qualification

F5.1 Fire Brigade

a. Inspection Scope(64704)

The inspectors reviewed the fire brigade organization and training program for compliance with plant procedures and NRC guidelines and requirements.

b. Observations and Findings

The organization and training requirements for the plant fire brigade were established by the Fire Protection Plan, Section 9.0, Emergency Response. The dedicated fire brigade for each shift was composed of four shift fire brigade/emergency response teams composed of an Operations/ Fire Protection team foreman and at least four additional brigade members from the Operations/Fire Protection organization. Each operations shift also had a Unit Supervisor assigned to respond to fires with the fire brigade as an Incident Commander.

A review of the training records for the fire brigade members indicated that the training, drill, respiratory and physical examination requirements for each active member were up to date and met the established site training requirements.

Due to Unit 2 being shutdown and the high priority work in process, a fire brigade drill was not conducted during this inspection. To evaluate drill performance, the fire brigade leaders' reports and fire drill critique data for the shift drills for 1997 were reviewed by the inspectors. The overall fire brigade response and participation for these drills was satisfactory.

c. Conclusions

The fire brigade organization and training met the requirements of the site procedures and the performance by the fire brigade as documented by drill evaluations was good.

F6 Fire Protection Organization and Administration

F6.1 Fire Protection Management and Organization

a. Inspection Scope(64704)

The licensee's management and administration of the facility's fire protection program were reviewed for compliance with the commitments to the NRC and to current NRC guidelines.

b. Observations and Findings

The designated onsite manager responsible for the administration and implementation of the fire protection program was the Operations Manager. This responsibility had been delegated to the Operations/Fire Protection Manager. The Operations/Fire Protection Manager was responsible for implementation of the station fire protection program, general maintenance of fire protection systems and equipment, and ensuring that the appropriate fire prevention procedures and fire brigade programs were implemented. Coordination of the station's Fire Protection Report requirements was provided by two fire protection engineers and a fire protection specialist.

c. Conclusions

The coordination and oversight of the facility's fire protection program met the licensee's procedures and commitments to the NRC in the Fire Protection Report. The personnel assigned various fire protection related functions within Operations/Fire Protection organization were working together as a team and with coordination by the onsite fire protection engineers and fire protection specialist to implement the fire protection program at the site.

F7 Quality Assurance in Fire Protection Activities

F7.1 Fire Protection Audit Reports

a. Inspection Scope (64704)

The inspectors reviewed the Nuclear Assurance and Licensing (NA&L) Audit Report SSA-97-02, Fire Protection Program, dated June 6, 1997, and the status of the corrective actions implemented for the PERs initiated for the audit report.

b. Observations and Findings

The licensee's Nuclear Assurance and Licensing organization performed an assessment of the fire protection program during the time period of March 31, 1997, through May 9, 1997. The report for this assessment was Report No. SSA-9702. This report included an oversight analysis of selected fire protection standards, procedures, self-assessments, observations, regulatory issues, and trend issues for the plant fire protection program. The assessment report identified no audit findings related to the fire protection program, but did identify two audit recommendations and six less significant implementation weaknesses related to minor procedure and drawing discrepancies that were addressed by PERs.

The inspectors reviewed the final audit report, the licensee response to the identified recommendation issues, dated July 12, 1997 and six PER closure packages. Planned corrective actions in response to two identified recommendation issues were addressed in the licensee response and were acceptable. The corrective actions in response to the six identified issues addressed in the licensee PER closure packages were comprehensive and had been implemented in a timely manner.

c. Conclusions

The licensee's 1997 Nuclear Assurance and Licensing assessment of the facility's fire protection program was comprehensive and effective in identifying fire protection program performance to management. The licensee corrective actions in response to the identified issues were comprehensive and timely.

F8 Miscellaneous Fire Protection issues

F8.1 (Closed) EA 96-269 01023: Inoperable CO_2 System. The inspectors reviewed DCN M-12162A, updated drawings, functional testing results and conducted walk down inspections of the plant computer room CO_2 system to verify that the corrective action identified by the licensee's response of December 19, 1996, was reasonable and complete. No similar problems were identified during this inspection.

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 General Comments (71750)

The inspectors performed tours of the control building, auxiliary building, turbine building, ERCW pump house and diesel generator buildings and did not identify any noteworthy deficiencies in housekeeping or radiological controls.

The inspectors noted that during the U2C8 outage that the licensee determined that the total estimated TLD exposure was 140 rem which was the site's best ALARA performance for an outage by more than 70 rem.

R1.2 Airborne Activity Detected in the Main Control Room

a. Inspection Scope (71750)

The inspector reviewed the licensee's technical operability evaluation for the control room emergency ventilation system which was necessitated by detectable levels of airborne contamination in the main control during a time when the normal auxiliary building ventilation system was out of service.

b. Observations and Findings

On October 22, 1997, Xenon was detected in the MCR concurrent with performance of 2-SI-OPS-082-026.A, Loss of Offsite Power With Safety Injection-DG 2A-A Containment Isolation Test, Revision 12. The Xenon in the MCR was at a concentration of approximately 1/2625 (0.038%) of the concentration required to declare an area airborne. During the test the emergency gas treatment system (EGTS) and auxiliary building gas treatment system (ABGTS) were operating and the normal auxiliary building ventilation was shutdown.

The licensee determined that the Xenon originated from the Unit 1 containment via the annulus vacuum fan discharge ducting. The highest levels of Xenon were recorded in the EGTS room. Access doors (used to inspect fire dampers) in the annulus vacuum fan discharge ducting, where it passes through the EGTS room and the shutdown board room mechanical equipment room, were determined to be leaking. Air handling units mixed the air in the EGTS room with the shutdown board room return air and distributed the air into the shutdown board and from there the air entered the MCR as personnel passed through doors C49 and C50. The inspector reviewed UFSAR Section 15.5.3, Environmental Consequences of a Postulated Loss of Coolant Accident, which indicated that doors C49 and C50 will not be used post accident except for special instances.

A work request was initiated to caulk the leaking access doors in the ducting. PER No. SQ972471PER was initiated to document the event. The licensee determined that there were no operability problems associated with the MCR HVAC, and the habitability of the MCR was not in jeopardy, nor would it have been in jeopardy during accident conditions. The licensee's review of the last two performances of the surveillance instructions for the control room emergency ventilation pressure test showed that the pressure in the MCR habitability exceeded the acceptance criteria of 0.125" w.g.

c. Conclusions

The inspector concluded the airborne radiation levels in the main control room were well below established limits and that the control room ventilation system functioned as designed.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on November 18, 1997 and on October 24, 1997 for the fire protection inspection. The licensee acknowledged the findings presented

During the inspection period, the inspectors asked the licensee whether any materials would be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

*Bajestani, M., Site Vice President
Burton, C., Engineering and Support Systems Manager
*Butterworth, H., Operations Manager
*Fecht, M., Nuclear Assurance Manager
Gates, J., Site Support Manager
*Freeman, E. Maintenance and Modifications Manager
*Herron, J., Plant Manager
Kent, C., Radcon/Chemistry Manager
*Koehl, D. Assistant Plant Manager
O'Brien, B., Maintenance Manager
Salas, P., Manager of Licensing and Industry Affairs
*Summy, J., Assistant Plant Manager
Valente, J., Engineering & Materials Manager

* Attended exit interview

INSPECTION PROCEDURES USED

IP 37551: Onsite Engineering
IP 40500: Effectiveness of Licensee Controls In Identifying, Resolving, & Preventing Problems
IP 61726: Surveillance Observations
IP 62707: Maintenance Observations
IP 64704: Fire Protection Program
IP 71707: Plant Operations
IP 71714: Cold Weather Preparations
IP 71750: Plant Support

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

Type	Item Number	Status	Description and Reference
NCV	50-328/97-14-01	OPEN/ CLOSED	Failure to Meet TS 3.6.3 Administrative Controls During LLRT (Section O1.4)
NCV	50-327, 328/97-14-02	OPEN/ CLOSED	Failure to Follow Procedural Requirements For Aligning the 2B-B Component Cooling Water Pump (Section O1.6)
NCV	50-327, 328/97-14-03	OPEN/ CLOSED	Failure to Meet TS 6.2.2.g Overtime Authorization Requirements (Section O6.1)
URI	50-328/97-14-04	OPEN	Missed TS Surveillance Requirement SR 4.4.3.2.1.b For Stroking the Pressurizer PORVs During Mode 4 (Section M1.3)

Closed

Type	Item Number	Status	Description and Reference
VIO	50-327, 328/E 96-269 01023	CLOSED	Inoperable CO_2 System (Section F8.1).