



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

April 30, 2008

Mr. William R. Campbell, Jr.
Chief Nuclear Officer and Executive Vice President
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: SEQUOYAH NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT
05000327/2008002 AND 05000328/2008002

Dear Mr. Campbell:

On March 31, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Sequoyah Nuclear Plant, Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on April 9, 2008, with Mr. Timothy Cleary and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

The report documents two self-revealing findings of very low safety significance, which were determined to be violations of NRC requirements. Additionally, two licensee-identified violations, which were determined to be of very low safety significance, are listed in this report. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Sequoyah Nuclear Plant.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publically Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Rebecca L. Nease, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Docket Nos.: 50-327, 50-328

License Nos.: DPR-77, DPR-79

Enclosure: Inspection Report 05000327/2008002 and 05000328/2008002
w/Attachment: Supplemental Information

cc: w/encl: (See page 3)

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Letter to William R. Campbell, Jr. from Rebecca L. Nease dated April 30, 2008

SUBJECT: SEQUOYAH NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT
05000327/2008 AND 05000328/2008

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos: 50-327, 50-328

License Nos: DPR-77, DPR-79

Report No: 05000327/2008002 and 05000328/2008002

Licensee: Tennessee Valley Authority (TVA)

Facility: Sequoyah Nuclear Plant

Location: Sequoyah Access Road
Soddy-Daisy, TN 37379

Dates: January 1, 2008 – March 31, 2008

Inspectors: S. Freeman, Senior Resident Inspector
M. Speck, Resident Inspector

Approved by: R. Nease, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000327/2008-002, IR 05000328/2008-002; 01/01/2008 - 03/31/2008; Sequoyah Nuclear Plant, Units 1 and 2; Fire Protection, Surveillance Testing.

The report covered a three-month period of inspection by resident inspectors. Two Green findings, both of which were non-cited violations (NCVs), were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. A self-revealing NCV was identified for failure to properly follow procedure when calibrating Loop 3 Steam Pressure Channel 1 on Unit 1. Because of failure to follow procedure, automatic steam generator level control rapidly reduced feedwater flow to the point where programmed level could not be maintained and caused the operators to manually trip the reactor. The licensee entered the problem into their corrective action program and initiated actions to prevent recurrence.

The finding was more than minor because it was associated with the human performance attribute of the Initiating Events Cornerstone and resulted in an upset in plant stability by causing a reactor trip. While the finding resulted in an actual trip, the finding was determined to be of very low safety significance, because it did not contribute to the likelihood of a loss of coolant accident, contribute to a loss of mitigation equipment functions, or increase the likelihood of a fire or flood. The cause of the finding was associated with the human error prevention techniques aspect of the human performance cross-cutting area, because the involved instrument technicians failed to follow proper placekeeping practices and failed to verify and validate the proper starting place in the procedure after taking a break. (Section 1R22).

Cornerstone: Mitigating Systems

- Green. A self-revealing NCV was identified for an inadequate tagging procedure that resulted in a failure to properly isolate a fire hydrant before maintenance. Because of the failure, the hydrant was forced off the associated fire protection system header, depressurized the system, and rendered it inoperable. The licensee entered the problem into their corrective action program and initiated actions to prevent recurrence.

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This finding was more than minor because it affected the mitigating system cornerstone objective of availability of systems, i.e. Fire Protection System, and was associated with the protection against fire, an external hazards attribute. While the finding caused the fire protection system to be inoperable, the inspectors determined that the degradation rating used for the significance determination process was low. Therefore, the finding was considered to be of very low safety significance. The cause of the finding was associated with the accurate and up-to-date procedures and work packages aspect of the human performance cross-cutting area. The clearance procedure and Work Order (WO) were not sufficient to ensure continued fire protection system operability during hydrant maintenance.

B. Licensee-Identified Violations.

Violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective action are listed in Section 4OA7.

REPORT DETAILS

Summary of Plant Status:

Unit 1 operated at or near 100% rated thermal power (RTP) until January 16, 2008, when an error during steam pressure calibration resulted in a manual reactor trip. Following repair, the unit was restarted on January 18, 2008 and returned to 100% RTP on January 19, 2008. The unit remained at 100% RTP through the end of the inspection period.

Unit 2 operated at or near 100% RTP for the entire inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

The inspectors observed the licensee response to a tornado watch and subsequent tornado warning on February 6, 2008. The inspectors reviewed licensee Procedure AOP-N.02, Tornado Watch/Warning, Revision 20 for its effectiveness to limit the risk of tornado-related initiating events and to adequately protect mitigating systems from the effects of a tornado and verified licensee performance of required actions. In addition, the inspectors verified that no loose debris was in the 500kV and 161kV Switchyards which could serve as missile hazards during a tornado.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

a. Inspection Scope

Partial System Walkdowns. The inspectors performed a partial walkdown of the following four systems to verify the operability of redundant or diverse trains and components when safety equipment was inoperable. The inspectors attempted to identify any discrepancies that could impact the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, walked down control system components and verified that selected breakers, valves, and support equipment were in the correct position to support system operation. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program. Documents reviewed are listed in the Attachment.

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- Unit 1 Containment Spray (CS) Train B during Train A Maintenance
- Unit 2 Emergency Core Cooling System (ECCS) and CS Pump Train B during Maintenance on ECCS and CS Train A
- Unit 2 ECCS Train A during Maintenance on Safety Injection Train B
- Emergency Gas Treatment System Train B during Maintenance on Train A

Complete System Walkdown. The inspectors performed a complete system walk-down of the Auxiliary Building Gas Treatment System to verify proper equipment alignment, to identify any discrepancies that could impact the function of the system and increase risk, and to verify that the licensee properly identified and resolved equipment alignment problems that could cause events or impact the functional capability of the system.

The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), system procedures, system drawings, and system design documents to determine the correct lineup and then examined system components and their configuration to identify any discrepancies between the existing system equipment lineup and the correct lineup. In addition, the inspectors reviewed outstanding maintenance work requests and design issues on the system to determine whether any condition described in those work requests could adversely impact current system operability. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors conducted a tour of the six areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that combustibles and ignition sources were controlled in accordance with the licensee's administrative procedures, fire detection and suppression equipment was available for use; that passive fire barriers were maintained in good material condition; and that compensatory measures for out-of-service, degraded, or inoperable fire protection equipment were implemented in accordance with the licensee's fire plan. Documents reviewed are listed in the Attachment.

- Control Building Elevation 749 (Reactor Motor Operated Valve Board Rooms, Transformer Rooms, Mechanical Equipment Rooms)
- Essential Raw Cooling Water Building
- Auxiliary Building Elevation 653 (Residual Heat Removal and CS Pump Rooms, General Areas)
- Control Building Elevation 669 (Mechanical Equipment Room, 250 VDC Battery and Battery Board Rooms)
- Control Building Elevation 685 (Auxiliary Instrument Rooms)

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- Control Building Elevation 706 (Cable Spreading Room)

The inspectors also reviewed the switchyard fire hydrant incident described in Problem Evaluation Report (PER) 138670 to determine the effect on the fire protection system.

b. Findings

Introduction: A green self-revealing NCV was identified for failure to properly isolate a fire hydrant before maintenance. Because of failure to properly isolate, the hydrant was forced off the associated header and rendered the fire suppression system inoperable.

Description: On February 3, 2008, operations personnel tagged out Fire Hydrant 0-26-901 to isolate it from fire header pressure so it could be replaced. On February 21, 2008, when maintenance technicians removed the support structure, system pressure forced the hydrant off the header, which allowed water to flood the hole where the work was ongoing and caused the electric fire pump to start on low header pressure. Fire header pressure dropped to approximately 10psig. Fire operations personnel restored the system by stopping the fire pump and isolating the header on either side of the junction for the hydrant.

The licensee's review of the incident showed that the hydrant and connecting isolation valve were connected to the header via a slip-fit arrangement that was held in place by the support structure and the surrounding soil. Because the equipment clearance (tag out) was placed on the connecting isolation valve, system pressure forced the hydrant off the end of the pipe when the soil and support structure were removed.

As a follow-up to this incident, the inspectors interviewed personnel involved, reviewed the licensee's evaluation, and reviewed Procedure Standard Programs and Processes (SPP)-10.2, Clearance Procedure to Safely Control Energy, Revision 11. The inspectors noted that the slip-fit design was a common design for underground fire piping and that fire operations personnel were aware of the design. Further, the drop in header pressure made the fire protection system inoperable from the time of the incident until operators could restore pressure, approximately 15 minutes. The inspectors also noted that the stated purpose of Procedure SPP-10.3 was to ensure equipment was isolated from any energy source and rendered non-operative before performing work. Based on all these factors, the inspectors determined that the tag out for Hydrant 0-26-901 did not meet the standard described in Procedure SPP-10.2.

Analysis: This finding was more than minor because it affected the mitigating system cornerstone objective of availability of systems, i.e. Fire Protection System, and was associated with the protection against fire, an external hazards attribute. The fire protection system was considered inoperable for approximately 5 minutes. Based on the minimal amount of time that the fire protection system was inoperable, the inspectors determined that the degradation rating used for the SDP was low. Therefore, the finding was considered to be of very low safety significance (Green).

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The cause of the finding was associated with the accurate and up-to-date procedures and work packages aspect of the human performance cross-cutting area. The clearance procedure and WO were not sufficient to ensure continued fire protection system operability during hydrant maintenance. The licensee's root cause evaluation for this incident attributed the root cause to inadequate corrective action from a similar event in 1996. However, the same root cause evaluation also attributed the event to several failed barriers, including work order planning, and to latent weaknesses in the excavation permit process. Based on this, the inspectors determined that the resources available to maintenance personnel working on the hydrant were a significant contributor to the inspection finding (H.2.c).

Enforcement: Technical Specification (TS) 6.8.1.a requires that procedures recommended in Appendix A to Regulatory Guide 1.33, Revision 2, be established and implemented. Paragraph 1c of Appendix A requires a procedure for equipment control, (e.g., locking and tagging). The stated purpose of Procedure SPP-10.2, which implemented the tagging requirement, was to ensure that equipment would be isolated from its energy source and rendered inoperative before performing work on the equipment. Contrary to this, on February 3, 2008, Procedure SPP-10.2 failed to provide adequate guidance to properly isolate Fire Hydrant 0-26-901 from its energy source. When work began to replace the hydrant it came off the header and rendered the Fire Protection System inoperable. Because this finding was of very low safety significance and because it was entered into the licensee's corrective action program as PER 138670, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000327, 328/2008002-01, Inadequate Tagging Procedure.

1R11 Licensed Operator Regualification Program

a. Inspection Scope

The inspectors observed as-found simulator training on March 17, 2008. The training involved an isolable Reactor Coolant System (RCS) leak followed by a steam generator tube rupture. Operators initiated a manual reactor trip and safety injection and plant cooldown and depressurization. Anomalies included loss of the overcurrent trip of Motor Driven Auxiliary Feedwater Pump 1A, the Emergency Diesel Generator 1B failing to auto-start, and failure of the steam dump system. The inspectors observed crew performance in terms of communications; ability to take timely and proper actions; prioritizing, interpreting and verifying alarms; correct use and implementation of procedures, including the alarm response procedures; timely control board operation and manipulation, including high risk operator actions; oversight and direction provided by shift manager, including the ability to identify and implement appropriate TS actions; and group dynamics involved in crew performance. The inspectors also observed the evaluators' critique and reviewed simulator fidelity to verify that it matched actual plant response. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

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1R12 Maintenance Effectivenessa. Inspection Scope

The inspectors reviewed the following two maintenance activities to verify the effectiveness of the activities in terms of: 1) appropriate work practices; 2) identifying and addressing common cause failures; 3) scoping in accordance with 10 CFR 50.65 (b); 4) characterizing reliability issues for performance; 5) trending key parameters for condition monitoring; 6) charging unavailability for performance; 7) classification in accordance with 10 *Code of Federal Regulations* (CFR) 50.65(a)(1) or (a)(2); 8) appropriateness of performance criteria for structure, system, or components (SSCs) and functions classified as (a)(2); and 9) appropriateness of goals and corrective actions for SSCs and functions classified as (a)(1). Documents reviewed are listed in the Attachment.

- Safety-related Penetration Room and Pipe Chase Coolers
- 480V Board Room Ventilation

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Controla. Inspection Scope

The inspectors reviewed the following five activities to verify that the appropriate risk assessments were performed prior to removing equipment from service for maintenance. The inspectors verified that risk assessments were performed as required by 10 CFR 50.65 (a)(4), and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors verified the appropriate use of the licensee's risk assessment tool and risk categories in accordance with Procedure SPP-7.1, On-Line Work Management, Revision 10, and Instruction O-TI-DSM-000-007.1, Risk Assessment Guidelines, Revision 8. Documents reviewed are listed in the Attachment.

- Elevated Offsite Power Risk Due to Maintenance on 500kV Line and Solid State Protection System Testing
- Unit 2 ECCSs and CS Train A Systems Outage
- Unit 1 Elevated Risk Profile Due to Turbine Driven Auxiliary Feedwater Scheduled Testing
- Emergent Work On Main Control Room Chiller B and Motor Driven Auxiliary Feedwater Level Control Valve 1-LCV-3-156
- Emergent Work On Common Service Station Transformer -C Supply Breaker PCB 948

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b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

For the six operability evaluations described in the PERs listed below, the inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available, such that no unrecognized increase in risk occurred. The inspectors reviewed the UFSAR to verify that the system or component remained available to perform its intended function. In addition, the inspectors reviewed compensatory measures implemented to verify that the compensatory measures were adequate and the measures were properly controlled. The inspectors also reviewed a sampling of PERs to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment.

- PER 135407, ABGTS Train B Supply Pressure Controller Found In Manual
- PER 137693, Dampers Failed to Open on Recovery from Tornado Warning
- PER 137649, AFW Valve 1-LCV-3-156 Stroke Length Did not Match Drawing
- PER 139157, Low Oil in CCS Pump 1B Motor Bearing
- PER 138008, Temporary Gas Bottle in Auxiliary Building not Secured
- PER 136654, CS 2A Room Cooler Tubing Broke Off

b. Findings

No findings of significance were identified.

1R18 Plant Modifications

a. Inspection Scope

The inspectors reviewed the two temporary modifications listed below and the associated 10CFR50.59 screenings, and compared each against the UFSAR and TS to verify that the modification did not affect operability or availability of any safety system. The inspectors walked down each modification to ensure it was installed in accordance with the modification documents and reviewed post installation and removal testing to verify the actual impact on permanent systems was adequately verified by the tests. The inspectors also verified that permanent plant documents were updated to reflect the modification to ensure that plant configuration control was maintained.

- WO 07-776212-000, Temporary Charcoal Filter Units in Unit 2 Upper Containment
- Temporary alteration Control form 2-08-001-030, Plug Tubes in CS 2A Room Cooler, Revision 1

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b. Findings

No findings of significance were identified

1R19 Post-Maintenance Testinga. Inspection Scope

The inspectors reviewed the six post-maintenance tests listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the licensee's test procedure to verify that the procedure adequately tested the safety function(s) that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed the test data, to verify that test results adequately demonstrated restoration of the affected safety function(s). Documents reviewed are listed in the Attachment.

- WO 07-774059-000, Containment Spray Pump 1A Oil Change
- P2676, SI Scheduler, Electric Pulse Repair of Rod Position Indicator Connections
- WO 07-774578-000, Safety Injection System Pump Room Cooler 2A-A
- WO 07-780683-000, Replace 2A-A Emergency Diesel Starting Air Tank Pressure Control Valve
- WO 06-780937-000, Channel Calibration of 0-RM-90-101 Auxiliary Building Ventilation Radiation Monitor
- WO 07-774851-000, Inspect/Clean Component Cooling Heat Exchanger 1A1

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activitiesa. Inspection Scope

Following the manual trip of Unit 1 on January 16, 2008, the licensee remained in Mode 3 and entered a forced outage to inspect the RCS inside of lower containment. The inspectors observed containment entry controls and reviewed Procedure 0-SI-OPS-000-011.0, Containment Access Control During Modes 1-4, Revision 32, to ensure that all items that entered containment were removed so nothing would be left that could affect performance of the containment sump.

b. Findings

No findings of significance were identified.

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1R22 Surveillance Testinga. Inspection Scope

For the six surveillance tests identified below, the inspectors verified that the SSCs involved in these tests satisfied the requirements described in the TS surveillance requirements, the UFSAR, applicable licensee procedures, and that the tests demonstrated that the SSCs were capable of performing their intended safety functions. This was accomplished by witnessing testing and/or reviewing the test data. Documents reviewed are listed in the Attachment. Those tests included the following:

- 2-SI-MIN-061-108.0, Ice Condenser Intermediate Deck Doors Weekly Inspection, Revision 2
- 1-SI-ICC-001-20A.1, Channel Calibration of Steam Generator Loop 3 Steam Pressure Channel 1, Rack 4 Loop P-1-20A (P-534), Revision 11
- 2-SI-SXP-003-201.S, Turbine Driven Auxiliary Feedwater Pump 2A-S Performance Test, Revision 22*
- 0-SI-FPU-247-004.0, Auxiliary Building Appendix R Emergency Lighting Discharge Test, Revision 11
- 2-SI-SXP-072-201.B, Containment Spray Pump 2B-B Performance Test, Revision 13
- 0-SI-OPS-068-137.0, Reactor Coolant System Water Inventory, Revision 21**

*This procedure included inservice testing requirements..

**This procedure included an RCS leakage detection surveillance.

b. Findings

Introduction: A green self-revealing NCV was identified for failure to properly follow procedure when calibrating Loop 3 Steam Pressure Channel 1 on Unit 1. As a result, automatic steam generator level control rapidly decreased feedwater flow to the point where programmed level could not be maintained and caused the operators to manually trip the reactor.

Description: On January 16, 2008, instrument technicians performed Procedure 1-SI-ICC-001-20A.1, Channel Calibration of Steam Generator Loop 3 Steam Pressure Channel 1 Rack 4 Loop P-1-20A, Revision 11. This procedure calibrated the transmitter and associated electronics that, among others, provided the density compensation for the steam line flow signal used to control level in Steam Generator No. 3. After completing the rack portion of the procedure and a lunch break, the technicians began calibrating the transmitter itself. In doing this, they lost track of their actual location in the procedure and neglected to select a different channel than the one under calibration to control the unit. When they removed the transmitter from service the control system responded to the perceived reduction in steam flow by reducing feedwater flow. Because steam flow actually remained at full power level, steam generator level dropped. The operators recognized the situation, but could not recover the steam generator level and manually tripped the unit. The licensee identified the cause of the

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event to be failure to follow procedure due to improper placekeeping. After their break, instrument technicians assumed that a Post-it note placed in the procedure marked the correct place to resume work. However this was an inaccurate assumption and resulted in technicians skipping two pages in the procedure sequence. The licensee also determined that an inadequate pre-job brief was a contributing cause.

The inspectors reviewed the root cause and procedure instructions and agreed that the licensee did not properly follow Procedure 1-SI-ICC-001-20A.1. When performing the transmitter calibration section, instrument technicians started on Step 6 instead of Step 1 and did not remove the transmitter from plant control.

Analysis: The finding was more than minor because it was associated with the human performance attribute of the Initiating Events Cornerstone and resulted in an upset in plant stability by causing a reactor trip. While the finding resulted in an actual trip, the inspectors determined that it did not contribute to the likelihood of a loss of coolant accident, did not contribute to a loss of mitigation equipment functions, and did not increase the likelihood of a fire or flood. Thus, the finding was considered to be of very low safety significance (Green).

The cause of the finding was associated with the human error prevention techniques aspect of the human performance cross-cutting area because the involved craft failed to follow proper placekeeping practices and failed to verify and validate the proper starting place in the procedure after taking a break (H.4.a).

Enforcement: TS 6.8.1.c requires that procedures covering surveillance activities on safety-related equipment to be established and implemented. Procedure 1-SI-ICC-001-20A.1, which implemented surveillance requirements, required the controlling channel to be selected out of control of the unit before proceeding with transmitter calibration. Contrary to this, on January 16, 2008, technicians failed to follow procedure by removing the Loop 3 Steam Pressure Channel 1 from service without selecting a different channel to control the unit resulting in a reactor trip. Because this finding is of very low safety significance and because it was entered into the licensee's corrective action program as PER 136660, this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000327/2008002-02, Failure to Follow Calibration Procedure.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

Resident inspectors evaluated the conduct of a routine licensee emergency drill on February 20, 2008, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation (PAR) development activities. The inspectors observed emergency response operations in the simulated control room to verify that event classification and notifications were done in accordance with EPIP-1, Emergency Plan Classification Matrix, Revision 40. The inspectors also attended the

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licensee critique of the drill to compare any inspector-observed weakness with those identified by the licensee in order to verify whether the licensee was properly identifying failures.

On March 12, 2008, and in accordance with inspection Procedure 71114.07, the inspectors observed the emergency preparedness component of a force-on-force security exercise to verify licensee self-assessment of classification, notification, and PAR development activities during a simulated terrorist event. The inspectors observed emergency response operations in the simulated control room to verify that event classification and notifications were done in accordance with Procedure EPIP-1. The inspectors also attended the licensee critique of the drill to compare any inspector-observed weakness with those identified by the licensee in order to verify whether the licensee was properly identifying failures.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

The inspectors sampled licensee submittals for the two PIs listed below for the period from January 1, 2007 through December 31, 2007 for both Unit 1 and Unit 2. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, Regulatory Assessment Indicator Guideline, Revision 5, were used to verify the basis in reporting for each data element.

Cornerstone: Barrier Integrity

- Reactor Coolant System Activity
- Reactor Coolant System Leakage

The inspectors reviewed portions of the operator and chemistry logs to verify that the licensee had accurately determined the RCS activity and leakage during the previous four quarters for both units. The inspectors observed chemistry technicians perform RCS activity analyses and also observed the performance of Procedure 0-SI-OPS-068-137.0, RCS Water Inventory, which determines the amount of RCS leakage. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

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4OA2 Identification and Resolution of Problems

Daily Review

As required by Inspection Procedure 71152, Identification and Resolution of Problems, and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. This was accomplished by reviewing the description of each new PER and attending daily management review committee meetings.

4OA3 Event Followup

(Closed) Licensee Event Report (LER) 05000327/2008-001-00, Reactor Trip on Loop 3 Steam Generator Low Level

On January 16, 2008, following a Unit 1 manual reactor trip due to decreasing steam generator level, the inspectors evaluated plant status, mitigating actions, and the licensee's classification of the event, to enable the NRC to determine an appropriate NRC response. Inappropriate actions by instrumentation technicians caused the feedwater regulating valve to close on Loop 3. The event was reported to the NRC as event notification (EN) 43909 and documented in the licensee corrective action program as PER 136660.

The inspectors reviewed the LER and PER 136660 to verify that the cause of the reactor trip was identified and that corrective actions were appropriate. The inspectors also verified that timely notifications were made in accordance with 10 CFR 50.72, that licensee staff properly implemented the appropriate plant procedures, and that plant equipment performed as required. The analysis and enforcement details of this incident are included in Section 1R22. This LER is closed.

4OA5 Other Activities

(Closed) Unresolved Item URI 05000328/2006005-02, Appendix R Manual Isolation Valve Failure to Close Within the Required Time Text

In this URI, the licensee identified that valve 2-VLV-62-527, Coolant Charging Pump 2B Discharge Valve, could not be closed within the 10-minute period prescribed by licensee Procedure AOP-N.08, Appendix R Fire Safe Shutdown. The inspectors performed a Special Inspection (IR 05000327, 328/2007007), and completed a Phase II Fire Protection Significance Determination Process evaluation of the issue. Licensee corrective actions, as described in PERs 115490 and 116166, included industry benchmarking, improvements in time-critical manual valve maintenance, periodic verification of the ability to operate these valves within required times, and changes to AOP-N.08 to reduce the reliance on manual operator actions. The inspectors determined that the corrective actions were adequate. The enforcement aspects of this finding are discussed in Section 4OA7. This URI is closed.

Enclosure

4OA6 Meetings, Including Exit

.1 Exit Meeting Summary

On April 9, 2008, the resident inspectors presented the inspection results to Mr. Timothy Cleary and other members of his staff, who acknowledged the findings. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Annual Assessment Meeting Summary

Subsequent to the end of this inspection period, on April 8, 2008, the NRC's Chief of Reactor Project's Branch 6 and the Senior Resident Inspector assigned to the Sequoyah Nuclear Plant met with the TVA to discuss the NRC's Reactor Oversight Process and the Sequoyah annual assessment of safety performance for the period of January through December 2007. The major topics addressed were: the NRC's assessment program, the results of the Sequoyah assessment, and NRC security activities. Attendees included Sequoyah site management, members of site staff, and corporate management.

This meeting was open to the public. The presentation material used for the discussion is available from the NRC's document system (ADAMS) as accession number ML031130023. ADAMS is accessible from the NRC Web site at <http://www/nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

4OA7 Licensee-Identified Violations

The following violations of very low significance (Green) were identified by the licensee and are violations of NRC requirements that meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as NCVs. Documents reviewed are listed in the Attachment

10 CFR 50, Appendix B, Criterion XI, requires the licensee establish a test program to assure that all testing required to demonstrate that components will perform satisfactorily in service is identified and performed. Procedure SPP-6.3, Pre/Post-Maintenance Testing, Revision 2, implemented the required testing program and stated that post-maintenance testing was to assure that a new deficiency was not created by maintenance. Contrary to this, packing adjustments made to valve 2-VLV-62-527 in 2004 physically bound the valve, and post-maintenance testing did not verify that it would operate within the time required by licensee Procedure AOP-N.08, Appendix R Fire Safe Shutdown. This finding was determined to be of very low safety significance (Green) because of the very low frequency of fires which would result in a spurious safety injection and disable operation of both pressurizer Power-Operated Relief Valves or block valves.

10 CFR 50, Appendix B, Criterion XI, requires the licensee establish a test program to assure that all testing required to demonstrate that components will perform satisfactorily

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in service is identified and performed. Procedure SPP-6.3, Pre/Post Maintenance Testing, Revision 2 implemented the required testing program for components returned to service after maintenance. Contrary to this, on February 11, 2008, the licensee returned the 2B 480V Board Room Chiller, and associated air handling unit, to service without completing the designated post-maintenance testing. When the testing was later performed, the air handling unit failed to meet acceptance criteria. The licensee restored the air handling unit and entered the issue into the corrective action program as PER 138145. This finding was determined to be of very low safety significance (Green) because the safety-related 480V board room chillers were not contained in the TS and not considered risk significant for the maintenance rule.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

D. Bodine, Chemistry/Environmental Manager
D. Boone, Radiation Protection Manager
M. Button, Maintenance and Modifications Manager
C. Church, Plant Manager
T. Cleary, Site Vice President
L. Cross, Acting Maintenance Manager
K. Jones, Engineering Manager
Z. Kitts, Licensing Engineer
A. Little, Acting Site Security Manager
T. Marshall, Outage and Site Scheduling Manager
M. Palmer, Operations Manager
J. Proffitt, Licensing Engineer
P. Simmons, Operations Superintendent
J. Smith, Licensing Supervisor and Industry Affairs Manager
N. Thomas, Licensing Engineer
R. Thompson, Licensing Supervisor
K. Wilkes, Emergency Preparedness Manager

NRC personnel:

R. Bernhard, Region II, Senior Reactor Analyst
B. Moroney, Project Manager, Office of Nuclear Reactor Regulation

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000327,328/2008002-01	NCV	Inadequate Tagging Procedure (Section 1R05)
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05000327/2008002-02	NCV	Failure to Follow Calibration Procedure. (Section 1R22)
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Closed

05000328/2006005-02	URI	Appendix R Manual Isolation Valve Failure To Close Within the Required Time Text (Section 4OA5)
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Closed

05000327/2008001-00	LER	Reactor Trip on Loop 3 Steam Generator Low Level (Section 4OA3)
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LIST OF DOCUMENTS REVIEWED

Section R04: Equipment Alignment

0-SO-30-18, Auxiliary Building Gas Treatment System, Revision 13
 0-SI-SFT-030-149.A, Auxiliary Building Gas Treatment System Vacuum Test Train A, Revision 16, Data Package 06/06/07
 0-SI-SFT-030-149.B, Auxiliary Building Gas Treatment System Vacuum Test Train B, Revision 15, Data Package 08/10/06
 SQN-DC-V-13.9.4, Auxiliary Building Secondary Containment Ventilation System, Revision 5
 UFSAR Section 6.2.3.1.3, Auxiliary Building Gas Treatment System
 System Health Report Cards, Auxiliary Building Gas Treatment System Safety Functions, 3rd Quarter 2007
 47W866-2, Flow Diagram Heating & Ventilation Air Flow, Revision 13
 47W866-10, Flow Diagram Heating & Ventilation Air Flow, Revision 19
 47W866-11, Flow Diagram Heating & Ventilation Air Flow, Revision 10
 47W611-30-6, Mechanical Logic Diagram Ventilation System, Revision 11
 45N610-30-4, Mechanical Control Diagram Containment Ventilation System, Revision 24
 45N630-4, Wiring Diagrams Ventilation System Schematic Diagram, Revision 7
 45N630-9, Wiring Diagrams Ventilation System Schematic Diagram, Revision 3
 45N779-20, Wiring Diagrams 480V Shutdown Auxiliary Power Schematic Diagram, Revision 14
 System 030, Auxiliary Building Gas Treatment System Completed Work Orders 1/1/06-1/1/08
 System 030, Auxiliary Building Gas Treatment System Open Work Orders as of 1/7/08
 1,2-47W812-1, Flow Diagram Containment Spray System, Revision 43
 0-SO-72-1, Attachment 4, Containment Spray Systems Power Checklist, 4/11/2005
 0-SO-72-1, Attachment 6, Containment Spray Systems Power Checklist, 8/24/2004
 2-47W845-4, Mechanical Flow Diagram Essential Raw Cooling Water, Revision 19
 1,2-47W812-1, Flow Diagram Containment Spray System, Revision 43
 2-47W811-1, Flow Diagram Safety Injection System, Revision 60
 0-SO-65-1, Emergency Gas Treatment System Air Cleanup and Annulus Vacuum, Revision 16
 0-SO-65-1 Attachment 1, Emergency Gas Treatment System Air Cleanup and Annulus Vacuum Power Checklist 0-65-1.01, Change 2
 0-SO-65-1 Attachment 2, Emergency Gas Treatment System Air Cleanup and Annulus Vacuum Power Checklist 0-65-1.02, Change 3

Section R05: Fire Protection

WO 06-774783-000, Replace Fire Hydrant 1-26-901
 0-TI-GXX-000-074.0, Work Permits, Revision 9
 PER 138670, High Pressure Fire Protection Valve Failure

Section R11: Licensed Operator Regualification

AOP R.01, Steam Generator Tube Leak, Revision 24
 AOP R.05, RCS Leak and Leak Source Identification, Revision 11
 E-0, Reactor Trip or Safety Injection, Revision 29
 E-3, Steam Generator Tube Rupture, Revision 17

Section R12: Maintenance Rule Implementation

SPP-6.6, Maintenance Rule Performance Indicator Monitoring, Trending and Reporting - 10CFR50.65, Revision 9
 TI-4, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting – 10CFR50.65, Revision 20
 PER 119257 - Pipe Chase Cooler Temperature Switch Setpoint As-found Setting Out of Tolerance
 PER 136477, 480V Room Chiller 2B Belt Failure
 0-SO-30-11, Onsite Electrical Board Rooms - Heating, Ventilation, and Cooling, Revision 33
 Maintenance Rule Function 030-L, 480V Aux Board Room A/C, Justification for Non-Risk Significance

Section R13: Maintenance Risk Assessments and Emergent Work Evaluation

Transmission Operator Switching Order, Return 500KV Breaker 5048 from bypass, 1/9/08
 1-45N1504 Sh1, Wiring diagrams Main Single Line 500KV Switchyard, Revision 32
 1-45N1504 Sh2, Wiring diagrams Main Single Line 500KV Switchyard, Revision 18
 SPP-7.1, On Line Work Management, Revision 10
 TVA Daily Schedule 7 Day Bar Chart System 241 Switchyard and Transformers, 1/9-1/17/08
 Sentinel Run for January 15 to January 27, 2008
 TVA Sequoyah Master Daily Schedule Work Week 01/14/2008
 Sentinel Run for January 21 to February 10, 2008
 1-SI-SXP-003-201.S, Turbine Driven Auxiliary Feedwater Pump 1A-S Performance Test, Revision 17
 Sentinel Run for February 4 to February 24, 2008
 Sentinel Run for February 18 to March 9, 2008

Section R15: Operability Evaluations

SQN-DC-V-13.9.4, Auxiliary Building Secondary Containment Ventilation System, Revision 5
 UFSAR Section 6.2.3.1.3, Auxiliary Building Gas Treatment System
 WO 08-772101-000, Tornado Dampers Failed to Open
 1,2-47W866-3, Flow Diagram, Heating Vent & Air Cond Air Flow, Revision 6
 SPP-10.7, Housekeeping/Temporary Equipment Control, Revision 2
 0-TI-DXX-000-013.0, Temporary Equipment Control, Revision 3
 CDN-0020032008001, PER 138008 Study Calculation - Falling Argon Cylinder Evaluation, Revision 0

Section R18: Plant Modifications

Technical Evaluation for Temporary Charcoal Filter Units in Upper Containment
 SPP-10.7, Housekeeping/ Temporary Equipment Control, Revision 2

Section R19: Post Maintenance Testing

0-PI-IXX-085-001.0, Electric Pulse Repair of Rod Position Indicator (RPI) Connections, Revision 17
 SPP-8.2, Surveillance Test Program, Revision 3
 0-TI-MXX-000-096.0, Post-Maintenance Vibration Test of Rotating Equipment, Revision 2
 0-MI-MXX-030-001.0, Pulley Alignment and Belt Tensioning of ESF Coolers, Revision 6
 0-MI-MIN-000-070.0, Cleanliness of Fluid Systems For Maintenance Activities, Revision 8
 TI-70, Cleanliness of Fluid Systems, Revision 26
 0-SI-ICC-090-101.B, Calibration of Auxiliary Building Gaseous Radiation Monitor 0-R-90-101B and Exhaust Vent Flow Monitor 0-F-30-174, Revision 13
 0-SO-90-2, Gaseous Process Radiation Monitoring System, Revision 21
 0-SO-30-10, Auxiliary Building Ventilation Systems, Revision 39

Section R22: Surveillance Testing

1-P-1-20A, Loop Setpoint and Scaling Document, Revision 6
 0-SI-FPU-247-006.0, Diesel Generator Building Appendix R Emergency Lighting Discharge Test, Revision 6
 0-SI-FPU-247-005.0, Turbine & Control Building Appendix R Emergency Lighting Discharge Test, Revision 7
 0-SI-FPU-247-003.0, Appendix R Emergency Lighting Diesel Generator Building Quarterly Test, Revision 5
 0-SI-FPU-247-003.0, Appendix R Emergency Lighting Auxiliary Building Quarterly Test, Revision 14
 0-SI-FPU-247-003.0, Appendix R Emergency Lighting Turbine & Control Building Quarterly Test, Revision 7
 WO's 05-776223-000, 07-782776-000, 07-782777-000, 07-782785-000, 07-782786-000, 07-782870-000 – Appendix R Emergency Light Repairs
 PER 138611, Containment Spray Pump 2B-B Differential Pressure Does Not Meet Comprehensive Test Acceptance Criteria

Section 40A1: Performance Indicator Verification

NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 5
 TI-12, Radiological Analytical Methods, Revision 49
 0-SI-CEM-000-050.0, 72-Hour Chemistry Requirements, Revision 26
 1-TI-CEM-000-016.31, Primary Sampling – Reactor Coolant, Refueling Canal and Transfer Canal, Revision 5
 0-TI-CEM-260-049.1, Gamma Spectroscopy Systems Periodic Performance Checks, Revision 5

Section 40A3: Event Followup

PER 136660, Unit 1 Reactor Trip Report, S/G Loop 3 Low Level

Section 40A7: Licensee Identified Violations

SPP-6.3, Pre/Post Maintenance Testing, Revision 2

SQN-26-D054/EPM-ABB-IMPFHA, SQN Fire Hazards Analysis Calculation, Revision 0
 SQNAPPR11, Appendix B, Pressurizer Block Valve and PORV Hot Short Analysis, Revision 0
 SQN-SQS4-0127, Equipment Required for Fire Safe Shutdown Per 10CFR50 Appendix R, Revision 22
 NUREG-1805, Fire Dynamics Tools, Final Report
 2-45E890-313-1, 10CFR50 Appendix R Sec Side Pressure Control Operational & Spurious CA Key 25 & 26, Revision 1
 2-45E890-313-3, 10CFR50 Appendix R Sec Side Pressure Control Operational & Spurious CA Key 25 & 26, Revision 3
 2-45E890-313-4, 10CFR50 Appendix R RCS Pressure Control Operational & Spurious CA Key 25 & 26, Revision 2
 2-45E890-314-3, 10CFR50 Appendix R Sec Side Pressure Control OPR & Spurious Control Key 26, Revision 0
 2-45E890-314-4, 10CFR50 Appendix R Sec Side Pressure Control OPR & Spurious Cables Key 26, Revision 1
 2-45E890-411-1, 10CFR50 Appendix R RCS Pressure Control Operational & Spurious CA Key 28, Revision 0
 2-45E890-411-2, 10CFR50 Appendix R RCS Pressure Control Operational & Spurious CA Key 28, Revision 0
 2-45E890-411-3, 10CFR50 Appendix R RCS Pressure Control Operational & Spurious CA Key 28, Revision 2
 2-45E890-411-4, 10CFR50 Appendix R RCS Pressure Control Operational & Spurious CA Key 28, Revision 1
 2-45E890-412-1, 10CFR50 Appendix R RCS Pressure Control Operational & Spurious CA Key 28, Revision 1
 2-45E890-412-2, 10CFR50 Appendix R RCS Pressure Control Operational & Spurious CA Key 28, Revision 0
 2-45E890-412-3, 10CFR50 Appendix R RCS Pressure Control Operational & Spurious CA Key 28, Revision 2
 2-45E890-412-4, 10CFR50 Appendix R RCS Pressure Control Operational & Spurious CA Key 28, Revision 2
 2-45E890-413-1, 10CFR50 Appendix R RCS Pressure Control Operational & Spurious CA Key 28, Revision 1
 2-45E890-413-2, 10CFR50 Appendix R RCS Pressure Control Operational & Spurious CA Key 28, Revision 0
 2-45E890-413-3, 10CFR50 Appendix R RCS Pressure Control Operational & Spurious CA Key 28, Revision 2
 2-45E890-413-4, 10CFR50 Appendix R RCS Pressure Control Operational & Spurious CA Key 28, Revision 2, Revision 1
 2-45E890-414-3, 10CFR50 Appendix R RCS Pressure Control OPR & Spurious Cables Key 28, Revision 1
 2-45E890-414-1, 10CFR50 Appendix R RCS Pressure Control OPR & Spurious Cables Key 28, Revision 0
 2-45E890-414-2, 10CFR50 Appendix R RCS Pressure Control OPR & Spurious Cables Key 28, Revision 0
 2-45E890-414-4, 10CFR50 Appendix R RCS Pressure Control OPR & Spurious Cables Key 28, Revision 0