



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

January 28, 2011

Mr. R. M. Krich
Vice President, Nuclear Licensing
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

**SUBJECT: SEQUOYAH NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT
05000327/2010005, 05000328/2010005**

Dear Mr. Krich:

On December 31, 2010, 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 discussed on January 4, 2010 with Mr. K. Langdon 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.

This report documents three NRC-identified findings of very low safety significance (Green), all of which involved violations of NRC requirements. Additionally, a licensee-identified violation which was determined to be of very low safety significance is 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 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 Sequoyah Nuclear Plant.

In addition, if you disagree with the characterization of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector at the Sequoyah Nuclear Plant. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

TVA

2

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 Publicly 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/

Eugene F. Guthrie, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Docket Nos.: 50-327, 50-328
License Nos.: DPR-77, DPR-79

Enclosure: Inspection Report 05000327/2010005, 05000328/2010005
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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3

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4

Letter to R. M. Krich from Eugene Guthrie dated January 28, 2011

SUBJECT: SEQUOYAH NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT
05000327/2010005, 05000328/2010005

Distribution w/encl:

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-327, 50-328

License Nos.: DPR-77, DPR-79

Report Nos.: 05000327/2010005, 05000328/2010005

Licensee: Tennessee Valley Authority (TVA)

Facility: Sequoyah Nuclear Plant, Units 1 and 2

Location: Sequoyah Access Road
Soddy-Daisy, TN 37379

Dates: October 1, 2010 – December 31, 2010

Inspectors: C. Young, Senior Resident Inspector
M. Speck, Resident Inspector
W. Deschaine, Project Engineer (1R20)
R. Williams, Reactor Inspector (1R01, 1R06)
L. Lake, Sr. Reactor Inspector, (1R08, 4OA5.3)
R. Baldwin, Senior Operations Engineer (1R11)
R. Aiello, Senior Operations Engineer (1R11)
M. Riches, Operations Engineer (1R11)
S. Sandal, Senior Reactor Inspector (4OA5.4)
P. Higgins, Senior Reactor Inspector (4OA5.4)
R. Williams, Reactor Inspector (4OA5.4)
R. Patterson, Reactor Inspector (4OA5.5)
L. Mahlahla, Sr. Health Physicist (2RS1, 4OA1, 4OA5.2)
W. Loo, Sr. Health Physicist (2RS8)
R. Hamilton, Sr. Health Physicist (2RS2, 2RS3, 4OA1,
4OA5.2)

Approved by: Eugene F. Guthrie, Chief
Reactor Projects Branch 6
Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000327/2010005, 05000328/2010005; 10/01/2010 – 12/31/2010; Sequoyah Nuclear Plant, Units 1 and 2; Fire Protection, and Other Activities

The report covered a three-month period of inspection by resident inspectors and announced inspections by regional inspectors. Three Green findings 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. The inspectors identified a Green non-cited violation of 10 CFR 50 Appendix R, Section III.O, "Oil collection system for reactor coolant pump," for the licensee's failure to ensure the capability of the reactor coolant pump (RCP) oil collection system to collect and drain all RCP oil leakage. System configuration and procedural deficiencies resulted in the inability of the oil collection system to collect and drain all RCP oil leakage. Approximately 2-3 gallons of oil leakage were identified on the containment floor following Unit 1 shutdown for a refueling outage. The licensee entered this issue into their corrective action program as PERs 270216, 278689, and 284244. Corrective actions included revision to applicable plant procedures to prevent the condition from occurring, as well as plans to evaluate a design change to modify the system configuration.

The finding was determined to be greater than minor because it was associated with the protection against external factors attribute of the initiating events cornerstone, and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety function during shutdown as well as power operations. Specifically, the likelihood of a fire in the containment building was elevated due to the failure to maintain combustible material (RCP oil) within the boundaries of the oil collection system. Using IMC 0609 Appendix F, "Fire Protection Significance Determination Process," the inspectors assumed that the condition represented a low degradation of the fire protection program element of fire prevention through control of combustible materials. Therefore, the finding was determined to be of very low safety significance (Green). No cross-cutting aspect was identified. The issue was not reflective of current licensee performance, since both the bowl drain line configuration (last modified in 1993) and the seal standpipe filling procedure (in place since at least 2000) had been in place for a number of years. (Section 1R05)

Enclosure

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green non-cited violation of Technical Specification 6.8.1(c), "Procedures and Programs," for the failure to establish surveillance test procedures to verify that ECCS piping systems were full of water by venting accessible piping high points on the suction side of the ECCS pumps as required by Surveillance Requirement (SR) 4.5.2.b.1. The licensee has entered this issue into their corrective action program as service request 291511.

The finding was determined to be greater than minor because it adversely affected the equipment performance attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to perform surveillance tests on the ECCS system reduced the assurance that the system could respond to initiating events to prevent undesirable consequences. Using IMC 0609, "Significance Determination Process," Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance (Green) since it was not a design or qualification deficiency, it did not represent the loss of a system safety function or the loss of any equipment trains, and is not potentially risk significant due to seismic, flooding or severe weather initiating events. Because site interdepartmental communication, coordination, and cooperation were not sufficient to identify the impact of changes to ECCS surveillance requirements on existing surveillance test procedures, the cross cutting aspect in the work control component of the human performance area applies to this finding [H.3(b)]. (Section 40A5.4)

- Green. The inspectors identified a Green non-cited violation of 10 CFR 50, Appendix B, Criterion III, Design Control, for the licensee's failure to assure that applicable regulatory requirements and the design basis for structures, systems, and components are correctly translated into specifications, drawings, procedures, and instructions. Specifically, the licensee failed to assure that applicable regulatory requirements for undervoltage (degraded) voltage protection, including those prescribed in TS section 3.3.14, table 3.3.14-2, were correctly translated into design calculation, SQNETAPAC, "AC Auxiliary Power System Analysis", Rev. 36, which evaluated transient motor starting voltages at the beginning of a design basis loss of coolant accident (LOCA). The licensee has entered this into their corrective action program as PER 297671

This finding is more than minor because it affects the Design Control attribute of the Mitigating Systems Cornerstone. It impacts the cornerstone objective of ensuring the availability, reliability, and operability of the 6900 VAC safety buses to perform its intended safety function during a design basis event. The potential availability, reliability, and operability of the 6900 VAC safety buses during a potential degraded voltage condition was impacted as the licensee calculation used a non conservative degraded voltage input, with respect to the values specified in TS, into their safety-related motor starting and running calculations. The inspectors assessed the finding using the SDP and determined that the finding was of very low safety significance (Green) because the finding represented a design deficiency confirmed not to result

Enclosure

in the loss of functionality of safety-related loads due to the availability of load tap changers (LTCs) that are installed to improve a degraded voltage condition.
(Section 4OA5.5)

The inspectors reviewed the performance deficiency for cross-cutting aspects and determined that none were applicable since this performance deficiency was not indicative of current licensee performance as the design calculation discussed above was not recently performed.

REPORT DETAILS

Summary of Plant Status:

Unit 1 began the inspection period operating at approximately 80 percent rated thermal power (RTP) until October 1, 2010, when Unit 1 was shut down for a planned refueling outage. Following the outage, Unit 1 achieved criticality on November 15, 2010. While operating at approximately 24 percent RTP on November 16, 2010, Unit 1 was manually tripped due to a loss of steam generator level control which occurred following a main generator turbine trip. Unit 1 achieved criticality on November 17, 2010, and reached 100 percent RTP on November 20, 2010. On December 20, 2010, Unit 1 was manually tripped due to a fire in a main generator output neutral bus bushing. Following repairs, Unit 1 achieved criticality on December 24, 2010, and reached 100 percent RTP on December 25, 2010, where it operated for the remainder of the inspection period.

Unit 2 began the inspection period operating at approximately 84 percent RTP while repairing a condensate booster pump. Unit 2 power was raised to 100 percent RTP on October 6, 2010, where it remained for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection

.1 Tornado Warning

a. Inspection Scope

The inspectors observed the licensee's response to a tornado warning on October 25, 2010. The inspectors reviewed licensee Procedure AOP-N.02, Tornado Watch/Warning, Revision 24, to assess its effectiveness in limiting the risk of tornado-related initiating events and adequately protecting mitigating systems from the effects of a tornado. The inspectors also verified the licensee's performance of required actions. In addition, the inspectors verified that no loose debris was in the 500kV and 161kV Switchyards which would serve as missile hazards during a tornado. This activity constituted one inspection sample.

b. Findings

No findings were identified.

.2 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors reviewed design features and licensee preparations for protecting the essential raw cooling water (ERCW) intake structure and both Unit 1 and 2 refueling water storage tanks (RWSTs) from extreme cold and freezing conditions. The

Enclosure

inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and Technical Specifications (TS), reviewed implementation of licensee freeze protection procedures, walked down portions of the systems to assess deficiencies and system readiness for extreme cold weather and discussed prioritization and status of correcting deficiencies with licensee personnel. The inspectors completed one sample.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Complete System Walkdown

a. Inspection Scope

The inspectors performed a complete system walkdown of the Unit 1 and 2 Train A 69000 Volt AC (VAC) Shutdown Boards and support systems 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. The inspectors completed one sample.

b. Findings

No findings were identified.

.2 Partial System Walkdown

a. Inspection Scope

The inspectors performed partial walkdowns of the following two systems to verify the operability of redundant or diverse trains and components when safety equipment was inoperable. The inspectors focused on identification of 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 determined whether 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

Enclosure

cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program (CAP). Documents reviewed are listed in the Attachment. The inspectors completed two samples.

- Spent Fuel Pool Cooling trains A and B following Unit 1 core offload
- Unit 2 Residual Heat Removal System train B during train A maintenance

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Fire Protection Tours

a. Inspection Scope

The inspectors conducted a tour of the five areas important to safety listed below to assess the material condition and operational status of fire protection features. The inspectors evaluated whether: combustibles and ignition sources were controlled in accordance with the licensee's administrative procedures; fire detection and suppression equipment was available for use; passive fire barriers were maintained in good material condition; and 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. The inspectors completed five samples.

- Unit 1 Lower Containment
- Control Building Elevation 749 (Reactor MOV Board Rooms, Transformer Rooms, Battery Rooms)
- Control Building Elevation 706 (Cable Spreading Room)
- Control Building Elevation 669 (Mechanical Equipment Room, 250 VDC Battery and Battery Board Rooms)
- Control Building Elevation 685 (Auxiliary Instrument Rooms)

b. Findings

Introduction. The inspectors identified a Green non-cited violation of 10 CFR 50 Appendix R, Section III.O, "Oil collection system for reactor coolant pump," for the licensee's failure to ensure the capability of the reactor coolant pump (RCP) oil collection system to collect and drain all RCP oil leakage. Consequently, approximately 2-3 gallons of oil were identified on the containment floor following Unit 1 shutdown for a refueling outage.

Description. On October 2, 2010, the inspectors conducted a fire protection walkdown of Unit 1 lower containment as part of the initial containment tour following shutdown for a refueling outage. The inspectors identified the presence of approximately 2 to 3 gallons

of oil on the floor beneath the loop 3 reactor coolant pump (RCP), along with several gallons of water. The inspectors questioned the source of the oil and water, and whether it represented a challenge to the required capability of the RCP oil collection system.

The licensee determined that the RCP oil, discovered outside the boundaries of the oil collection system, came from the lower RCP motor bearing oil reservoir leakage which had collected in the motor support housing bowl area (at the base of the support housing). This "bowl" area serves as a 30-gallon capacity catch basin designed to collect lower reservoir leakage. The licensee determined that the installed drain line, which was designed to drain accumulated fluid from this bowl area, was configured such that approximately half of the bowl capacity could be filled without draining, thereby permitting the accumulation of several gallons of fluid at this location, including any lower reservoir oil leakage.

The licensee's procedure for responding to a RCP seal standpipe level alarm included actions to fill the standpipe with water. During the seal standpipe filling process, the filling procedure allowed water to overflow from the top of the RCP seal package (above the #3 seal) into the motor support housing bowl area, described above, in sufficient quantity to overwhelm the drain line capacity and result in overflow of the bowl area. This resulted in flushing out any oil leakage which had accumulated in the bowl.

The licensee entered this issue into their corrective action program as PERs 270216, 278689, and 284244. Corrective actions included revision to the seal standpipe filling procedure to prevent overflow, as well as revision to other plant procedures to verify the RCP bowls are free of oil and water prior to Mode 4 entry. Additionally, the licensee issued a corrective action to evaluate a design change to modify the bowl drain line configuration, which would be implemented in upcoming refueling outages for both Units.

Analysis. The licensee's failure to ensure the RCP oil collection system capable of collecting and draining all RCP oil leakage was a performance deficiency. The finding was determined to be greater than minor because it was associated with the protection against external factors attribute of the initiating events cornerstone, and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety function during shutdown as well as power operations. Specifically, the likelihood of a fire in the containment building was elevated due to the failure to maintain combustible material (RCP oil) within the boundaries of the oil collection system. Using IMC 0609 Appendix F, "Fire Protection Significance Determination Process," the inspectors assumed that the condition represented a low degradation of the fire protection program element of fire prevention through control of combustible materials. Therefore, the finding was determined to be of very low safety significance (Green).

No cross-cutting aspect was identified. The issue was not reflective of current licensee performance, since both the bowl drain line configuration (last modified in 1993) and the seal standpipe filling procedure (in place since at least 2000) had been in place for a number of years.

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Enforcement. 10 CFR 50 Appendix R, Section III.O required, in part, that the reactor coolant pump oil collection systems shall be capable of collecting lube oil from all potential pressurized and unpressurized leakage sites in the reactor coolant pump lube oil systems, and that such leakage shall be collected and drained. Contrary to this, prior to November 3, 2010, the reactor coolant pump oil collection systems were not capable of collecting lube oil from all potential pressurized and unpressurized leakage sites in the reactor coolant pump lube oil systems. Specifically, during RCP seal standpipe filling, any lower reservoir leakage which had been collected in the motor support stand bowl area could not be assured to remain within the boundaries of the RCP oil collection system. As a result, approximately 2-3 gallons of oil were found on the containment floor following a refueling outage shutdown. Because this violation was determined to be of very low safety significance and has been entered into the licensee's corrective action program as PERs 270216, 278689, and 284244, it is being treated as an NCV consistent with the NRC Enforcement Policy: NCV 05000327,328/2010005-01, "Failure to Collect Reactor Coolant Pump Oil Leakage."

1R06 Flood Protection Measures

.1 Internal Flooding

a. Inspection Scope

The inspectors reviewed one internal flood protection measures sample for the Emergency Diesel Generator (EDG) Building internal flood design to verify that flood mitigation plans were consistent with the design requirements and risk analysis assumptions and that equipment essential for reactor shutdown was properly protected from a flood caused by pipe breaks in the building. Specifically, the inspectors reviewed the licensee's moderate energy line break flooding study to fully understand the licensee's flood mitigation strategy, reviewed licensee drawings and then verified that the assumptions and results remained valid. The inspectors walked down the EDG Building to verify the assumed flooding sources, adequacy of common area drainage, and flood detection instrumentation to ensure that a flooding event would not impact reactor shutdown capabilities. The inspectors completed one sample.

b. Findings

No findings were identified.

.2 Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

The inspectors conducted a review of licensee inspections of safety-related cables located in underground bunkers/manholes subject to flooding. Specifically, inspectors reviewed maintenance records of inspections of emergency diesel generator cable manholes 7B, 8B, 9A, and 10A and directly inspected underground off-site power supply cables to CSST-C to determine if water was present and, if found, whether it would affect safety-related system operation. In addition, the inspectors reviewed the

Enclosure

licensee's corrective action program to ensure that the licensee was identifying underground cabling issues and that they were properly addressed for resolution. Documents reviewed are listed in the Attachment. The inspectors completed one sample.

b. Findings

No findings were identified.

1R08 Inservice Inspection (ISI) Activities (71111.08P)

.1 Non-Destructive Examination (NDE) Activities and Welding Activities

a. Inspection Scope

From October 11 to October 15, 2009, the inspectors reviewed the implementation of the licensee's In-service Inspection (ISI) program for monitoring degradation of the reactor coolant system (RCS) boundary and risk significant piping boundaries of Unit 1. The inspectors' activities consisted of an on-site review of NDE to evaluate compliance with the applicable edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC), Section XI (Code of record: 2001 Edition with 2003 Addenda), and to verify that indications and defects (if present) were appropriately evaluated and dispositioned in accordance with the requirements of the ASME Code, Section XI acceptance standards.

The inspectors observed and/or reviewed portions of the NDE activities listed below. The review included examination procedures, NDE reports, video of the inspection, equipment and personnel qualification records, and calibration reports (as applicable).

- Ultrasonic Testing (UT) of ASME Class 2 weld MSS-23 in 32 inch main steam piping.
- UT examinations of Pressurizer nozzle weld overlays RCF-24Q, RCF 42B, and RC-35A.

b. Findings

No findings were identified.

.2 PWR Vessel Upper Head Penetration (VUHP) Inspection Activities

a. Inspection Scope

No volumetric/surface or bare metal visual (BMV) inspections were planned this outage. The inspectors reviewed the licensee's scheduled activities for compliance with the requirements of 10 CFR 50.55a and ASME Code Case N-729-1, and reviewed records documenting completion of previous VT-2 examinations.

b. Findings

No findings were identified.

.3 Boric Acid Corrosion Control (BACC) Inspection Activities

a. Inspection Scope

The inspectors reviewed the licensee's BACC program activities to ensure implementation with commitments made in response to NRC Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary," and applicable industry guidance documents. Specifically, the inspectors performed an on-site record review of procedures and the results of the licensee's containment walk-down inspections performed during the current fall outage. The inspectors also interviewed the BACC program owner, conducted an independent walk-down of containment to evaluate compliance with licensee's BACC program requirements, and verified that degraded or non-conforming conditions, such as boric acid leaks, were properly identified and corrected in accordance with the licensee's BACC and corrective action programs.

The inspectors reviewed an engineering evaluation completed for evidence of boric acid found on systems containing borated water to verify compliance with generally accepted industry guidance.

- Boric Acid Leak Evaluation Report, WO 111504156
- Boric Acid Leak Assessment, Pump 28-0001 Pump Seal 9/1/10

b. Findings

No findings were identified.

.4 Steam Generator (SG) Tube Inspection Activities

No SG eddy current testing (ECT) were scheduled this outage.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors performed a review of ISI-related problems which were identified by the licensee and entered into the corrective action program as Problem Evaluation Reports (PERs). The inspectors reviewed the PERs to confirm that the licensee had appropriately described the scope of the problem, and had initiated corrective actions. The review also included the licensee's consideration and assessment of operating experience events applicable to the plant. The inspectors performed this review to ensure compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. The corrective action documents reviewed by the inspectors are listed in the report Attachment.

Enclosure

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program

.1 Quarterly Review

a. Inspection Scope

The inspectors performed one licensed operator requalification program review. The inspectors observed a simulator session on November 23, 2010. The training scenario involved a reactor coolant system leak degrading into a small-break loss-of-coolant accident followed by a failure of the containment vent isolation system. Additional anomalies included a centrifugal charging pump failure, a sheared shaft on a safety injection pump, and a failure of selected B-train engineered safeguards function to start automatically. 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 Technical Specification (TS) action; 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. This activity constituted one inspection sample.

b. Findings

No findings were identified.

.2 Annual Written Test Review

a. Inspection Scope

Annual Review of Licensee Regualification Examination Results December 22, 2010, the licensee completed the comprehensive biennial requalification written examinations and annual requalification operating tests required to be administered to all licensed operators in accordance with 10 CFR 55.59(a)(2). The inspectors performed an in-office review of the overall pass/fail results of the written examinations, individual operating tests and the crew simulator operating tests. These results were compared to the thresholds established in Manual Chapter 609, Appendix I, Operator Requalification Human Performance Significance Determination Process.

b. Findings

No findings were identified

.3 Biennial Inspection

a. Inspection Scope

During the week of December 6, 2010, the inspectors reviewed documentation, interviewed licensee personnel, and observed the administration of simulator operating tests associated with the licensee's operator requalification program. Each of the activities performed by the inspectors was done to assess the effectiveness of the licensee in implementing requalification requirements identified in 10 CFR 55, "Operators' Licenses." The evaluations were performed to determine if the licensee effectively implemented operator requalification guidelines established in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," and Inspection Procedure 71111.11, "Licensed Operator Requalification Program." The inspectors reviewed and evaluated the licensee's simulation facility for adequacy for use in operator licensing examinations. The inspectors observed two crews during the performance of simulator operating tests. Documentation reviewed included written examinations, Job Performance Measures (JPMs), simulator scenarios, licensee procedures, on-shift records, licensed operator qualification records, selected watchstanding and medical records, feedback forms, and remediation plans. The inspectors also reviewed a sample of simulator performance test records (transient tests, malfunction tests, steady state test, and procedure tests), simulator modification request records, and the process for ensuring continued assurance of simulator fidelity to ensure compliance with 10 CFR 55.46 Simulation Facilities. Licensee documents reviewed during the inspection are listed in the Attachment. Corrective action items reviewed as part of this inspection are listed in section 4OA2.

b. Findings

No findings were identified

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the maintenance activities, issues, and/or systems listed below to verify the effectiveness of the licensee's activities in terms of: appropriate work practices; identifying and addressing common cause failures; scoping in accordance with 10 CFR 50.65(b); characterizing reliability issues for performance; trending key parameters for condition monitoring; charging unavailability for performance; classification in accordance with 10 CFR 50.65(a)(1) or (a)(2); appropriateness of performance criteria for structure, system, or components (SSCs) and functions classified as (a)(2); and appropriateness of goals and corrective actions for SSCs and functions classified as (a)(1). Documents reviewed are listed in the Attachment. The inspectors completed three samples.

- System 247, Lighting System
- PER 292451, 1B 480V SDB chiller Tripped While 2A and 2B Chillers Inoperable
- System 88, Containment Isolation - Unit 1

Enclosure

b. Findings

No findings were identified.

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

The inspectors reviewed the three following activities to determine whether appropriate risk assessments were performed prior to removing equipment from service for maintenance. The inspectors evaluated whether 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 reviewed whether plant risk was promptly reassessed and managed. The inspectors also assessed whether the licensee's risk assessment tool use and risk categories were in accordance with Standard Programs and Processes Procedure (SPP)-7.1, "On-Line Work Management," Revision 12, and Instruction 0-TI-DSM-000-007.1, "Risk Assessment Guidelines," Revision 8. Documents reviewed are listed in the Attachment. This inspection satisfied three inspection samples for Maintenance Risk Assessment and Emergent Work Control.

- U1 cycle 17 outage RCS drain to mid-loop risk management actions - ORAM Orange
- Unit 2 special test: Real and Reactive Load Generation Capability
- Yellow PSA Risk – Units 1 and 2 – Turbine-driven AFW Pumps unavailability for scheduled testing

b. Findings

No findings were identified.

1R15 Operability Evaluationsa. Inspection Scope

For the three 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 compared the operability evaluations to UFSAR descriptions to determine if the system or component's intended function(s) were adversely impacted. In addition, the inspectors reviewed compensatory measures implemented to determine whether the compensatory measures worked as stated and the measures were adequately controlled. The inspectors also reviewed a sampling of PERs to assess whether the licensee was identifying and correcting any

deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment. The inspectors completed three samples.

- PER 270216, Reactor coolant pump oil collection system
- PER 285348, Unit 1 Loop 1 Main Steam Safety Valve leaking by
- PER 290603, 1A-A Motor-driven AFW Pump motor bearing degradation

b. Findings

No findings were identified.

1R18 Plant Modifications

.1 Permanent Modifications

a. Inspection Scope

The inspectors reviewed DCN 22419A, Unit 1 start bus replacement and breaker manual transfer scheme modification, Unit 1 unit station service transformer disconnect, and temporary power feed to Unit 1 unit boards. The inspectors walked down installed modifications and interviewed engineering and maintenance personnel regarding the modification and associated post-modification testing to verify that (1) the design bases, licensing bases, and performance capability had not been degraded through this modification, and (2) the modification was not performed during increased risk-significant configurations that placed the plant in an unsafe condition. The inspectors also reviewed applicable sections of the UFSAR, plant modification procedures, system drawings, supporting analyses, and related PERs. Documents reviewed are listed in the Attachment. The inspectors completed one sample.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

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

- WO 09-771009-000, Unit 1 Refueling Outage 17 Ice Condenser Ice Servicing
- WO 09-770751-000/09-770752-000, Repair Actuators on 1-FCV-30-52, 1-FCV-30-53
- WO 111545637, Replace Motor-driven AFW Pump Motor 1A Bearing

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities

.1 Unit 1 Refueling Outage

a. Inspection Scope

For the Unit 1 refueling outage that began on October 2, 2010, the inspectors evaluated licensee activities to verify that the licensee considered risk in developing outage schedules, followed risk reduction methods developed to control plant configuration, developed mitigation strategies for the loss of key safety functions, and adhered to operating license and TS requirements that ensure defense-in-depth. The inspectors also walked down portions of Unit 1 not normally accessible during at-power operations to verify that safety-related and risk-significant SSCs were maintained in an operable condition. Specifically, between October 2, 2010 and November 15, 2010, the inspectors performed inspections and reviews of the following outage activities. Documents reviewed are listed in the Attachment. This inspection satisfied one inspection sample for Refueling Activities.

- **Outage Plan.** The inspectors reviewed the outage safety plan and contingency plans to confirm that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth.
- **Reactor Shutdown.** The inspectors observed the shutdown in the control room from the time the reactor was tripped until operators placed it on the RHR system for decay heat removal to verify that TS cooldown restrictions were followed. The inspectors also toured the lower containment as soon as practicable after reactor shutdown to observe the general condition of the reactor coolant system (RCS) and emergency core cooling system components and to look for indications of previously unidentified leakage inside the polar crane wall.
- **Licensee Control of Outage Activities.** On a daily basis, the inspectors attended the licensee outage turnover meeting, reviewed PERs, and reviewed the defense-in-depth status sheets to verify that status control was commensurate with the outage safety plan and in compliance with the applicable TS when taking equipment out of service. The inspectors further toured the main control room and areas of the plant daily to ensure that the following key safety functions were maintained in accordance with the outage safety plan and TS: electrical power, decay heat removal, spent fuel cooling, inventory control, reactivity control, and containment closure. The

Enclosure

inspectors also observed a tagout of a chemical and volume control system component to verify that the equipment was appropriately configured to safely support the work or testing. To ensure that RCS level instrumentation was properly installed and configured to give accurate information, the inspectors reviewed the installation of the Mansell level monitoring system. Specifically, the inspectors discussed the system with engineering, walked it down to verify that it was installed in accordance with procedures and adequately protected from inadvertent damage, verified that Mansell indication properly overlapped with pressurizer level instruments during pressurizer draindown, verified that operators properly set level alarms to procedurally required setpoints, and verified that the system consistently tracked RCS level while lowering to reduced inventory conditions. The inspectors also observed operators compare the Mansell indications with locally-installed ultrasonic level indicators during entry into mid-loop conditions.

- **Refueling Activities.** The inspectors observed fuel movement at the spent fuel pool and at the refueling cavity in order to verify compliance with TS and that each assembly was properly tracked from core offload to core reload. In order to verify proper licensee control of foreign material, the inspectors verified that personnel were properly checked before entering any foreign material exclusion (FME) areas, reviewed FME procedures, and verified that the licensee followed the procedures. To ensure that fuel assemblies were loaded in the core locations specified by the design, the inspectors independently reviewed the recording of the licensee's final core verification.
- **Reduced Inventory and Mid-Loop Conditions.** Prior to the outage, the inspectors reviewed the licensee's commitments to Generic Letter 88-17. Before entering reduced inventory conditions the inspectors verified that these commitments were in place, that plant configuration was in accordance with those commitments, and that distractions from unexpected conditions or emergent work did not affect operator ability to maintain the required reactor vessel level. While in mid-loop conditions, the inspectors verified that licensee procedures for closing the containment upon a loss of decay heat removal were in effect, that operators were aware of how to implement the procedures, and that other personnel were available to close containment penetrations, if needed.
- **Heatup and Startup Activities.** The inspectors toured the containment prior to reactor startup to verify that debris that could affect the performance of the containment sump had not been left in the containment. The inspectors reviewed the licensee's mode-change checklists to verify that appropriate prerequisites were met prior to changing TS modes. To verify RCS integrity and containment integrity, the inspectors further reviewed the licensee's RCS leakage calculations and containment isolation valve lineups. In order to verify that core operating limit parameters were consistent with core design, the inspectors also observed portions of the low power physics testing, including reactor criticality.

b. Findings

No findings were identified.

Enclosure

.2 Unit 1 Forced Outage

a. Inspection Scope

Following the manual trip of Unit 1 on November 16, 2010, the licensee maintained Unit 1 in Mode 3 until conditions to support restart were established on November 17, 2010. The inspectors reviewed the licensee's mode change checklists to verify that appropriate prerequisites were met prior to changing TS modes. The inspectors observed containment entry controls and reviewed Procedure 0-SI-OPS-000-011.0, "Containment Access Control During Modes 1-4," for the associated containment entries to ensure that all items that entered containment were removed so nothing would be left that could affect performance of the containment sump. The inspectors observed portions of the plant startup including reactor criticality and power ascension. This inspection satisfied one inspection sample for outage activities.

b. Findings

No findings were identified.

.3 Unit 1 Forced Outage

a. Inspection Scope

Following the manual trip of Unit 1 on December 20, 2010, the licensee maintained Unit 1 in Mode 3 until conditions to support restart were established on December 24, 2010. The inspectors reviewed the licensee's mode change checklists to verify that appropriate prerequisites were met prior to changing TS modes. The inspectors observed containment entry controls and reviewed Procedure 0-SI-OPS-000-011.0, "Containment Access Control During Modes 1-4," for the associated containment entries to ensure that all items that entered containment were removed so nothing would be left that could affect performance of the containment sump. The inspectors observed portions of the plant startup including reactor criticality and power ascension. This inspection satisfied one inspection sample for outage activities.

b. Findings

No findings were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the three surveillance tests identified below, the inspectors assessed whether the SSCs involved in these tests satisfied the requirements described in the TS surveillance requirements, the UFSAR, applicable licensee procedures, and whether 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. The inspectors completed three samples.

Enclosure

In-Service Tests:

- 1-SI-SXP-074-202.0, RHR Pump 1A-A and 1B-B Comprehensive Performance and Check Valve Test, Revision 8 (1A-A pump only)

Ice Condenser Test:

- 0-SI-MIN-061-109.0, Ice Condenser Intermediate/Lower Inlet Doors and Vent Curtains, Revision 5

Containment Isolation Valve Test:

- 1-SI-SLT-043-259.1, LOCA Hydrogen Analyzer SLT Train A, Revision 3

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety and Public Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)a. Inspection Scope

Hazard Assessment and Instructions to workers During facility tours, the inspectors directly observed labeled radioactive material and postings for radiation areas and High Radiation Areas (HRAs) established within the Radiologically Controlled Area (RCA) of the U-1 containment, Auxiliary Building and Dry Active Waste Storage Facility. The inspector directly observed conduct of licensee radiation surveys for selected RCA areas. The inspectors reviewed and verified survey records for several plant areas including surveys for alpha emitters, airborne radioactivity, and gamma surveys with a range of dose rate gradients. The inspectors reviewed several radiation work permit (RWP) details to assess communication of radiological control requirements and current radiological conditions to workers. The inspectors reviewed selected Electronic Dosimeter (ED) dose and dose rate alarms, to verify workers properly responded to the alarms and that the licensee's review of the events was appropriate. The inspectors observed jobs in radiologically risk-significant areas including high radiation areas (HRAs) and areas with, or with the potential for airborne activity.

Contamination and Radioactive Material Control The inspectors observed the release of potentially contaminated items from the RCA and from contaminated areas (i.e. U1 containment). The inspectors also reviewed the procedural requirements for, and equipment used to perform, the radiation surveys for release. During plant walk downs, the inspectors evaluated radioactive material storage areas and containers, including satellite RCAs and yard areas, assessing material condition, posting/labeling, and

control of materials/areas. In addition, the inspectors reviewed the sealed source inventory and verified labeling, storage conditions, and leak testing of selected sources.

Radiological Hazards Control and Work Coverage The inspectors evaluated licensee performance in controlling worker access to radiologically significant areas and monitoring jobs in-progress during the week of the onsite inspection. The inspectors also reviewed the procedural guidance for multiple and extremity badging. For HRA tasks involving significant dose rate gradients, the inspectors evaluated the use and placement of whole body and extremity dosimetry to monitor worker exposure. The inspectors reviewed RWPs for use in airborne areas, ensuring the prescribed controls were appropriate for the conditions as identified in radiological surveys and air samples. ED alarm set points and worker stay times were evaluated against area radiation survey results for containment and auxiliary building activities.

Risk Significant High Radiation Areas and Very High Radiation Area Controls The inspectors evaluated access barrier effectiveness for selected Locked High Radiation Area (LHRA) and Very High Radiation Area (VHRA) locations. Changes to procedural guidance for LHRA and VHRA controls were discussed with RP supervisors. During plant walk downs of the Unit 1 Containment and Auxiliary Building, the inspectors verified the posting/locking of LHRA/VHRA areas. Established radiological controls (including airborne controls) were evaluated for selected tasks including work in auxiliary building HRAs, and radwaste processing and storage. In addition, licensee controls for areas where dose rates could change significantly as a result of plant shutdown and refueling operations were reviewed and discussed.

Radiation Worker Performance and Radiation Protection Technician Proficiency The inspectors observed radiation worker performance through direct observation. Jobs observed included routine waste packaging activities in the auxiliary building and routine survey activities in the Auxiliary Building in high radiation and contaminated areas. The inspectors also observed HPTs providing pre-job/RWP briefings, releasing material from the RCA, and providing field coverage of jobs. Occupational workers' adherence to selected RWPs and RP technician proficiency in providing job coverage were evaluated through direct observations and interviews with licensee staff. Electronic dosimeter (ED) alarm set points and worker stay times were evaluated against area radiation survey results for reviewed RWPs.

Problem Identification and Resolution PERS associated with radiological hazard assessment and control were reviewed and assessed. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with procedure NPG-SPP-03.1, Corrective Action Program, (CAP) Rev. 0. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results.

RP activities were evaluated against the requirements of UFSAR Section 12; TS Sections 6.12; 10 CFR Parts 19 and 20; and approved licensee procedures. Licensee programs for monitoring materials and personnel released from the RCA were evaluated against 10 CFR Part 20 and IE Circular 81-07, Control of Radioactively Contaminated Material. Documents reviewed are listed in Section 2RS1 of the Attachment.

Enclosure

The inspectors completed all specified line-items detailed in Inspection Procedure (IP) 71124.01 (sample size of 1).

b. Findings

No findings were identified

2RS2 Occupational ALARA Planning and Controls

a. Inspection Scope

Radiological Work Planning The inspectors reviewed a number of ALARA Planning Reports (APR) associated with the previous refueling outage and the current refueling outage U1C17, the APRs were reviewed with respect to activity evaluation, exposure estimates, and exposure mitigation requirements. The inspectors verified that the plans identified appropriate mitigation features and incorporated lessons learned from previous outages, and defined reasonable dose goals. For APRs from U2C16, the inspectors compared the results achieved in terms of actual dose vs. planned dose and actual hours vs. estimated hours, reviewed in-progress and post-job ALARA reviews, and discussed the job planning, performance, and reviews with ALARA staff. For APRs associated with U1C17, the inspectors tracked dose-to-date on select jobs, comparing estimates with actuals, and observed development of selected in-progress reviews.

Verification of Dose Estimates and Exposure Tracking Systems For the ALARA work plans reviewed, the inspectors reviewed the assumptions and basis for the dose rate and man-hour estimates. The inspectors discussed with ALARA staff the means by which wrench-hours were derived from the work order hours provided by craft supervision to ALARA staff. The inspectors verified the licensee had established several means to track and trend doses for ongoing work activities. The inspectors observed discussions between ALARA staff and job owners related to in-progress reviews and re-planning work when dose/hour budgets were exceeded or when emergent work and/or changes in scope were encountered.

Source Term Reduction and Control The inspectors determined the historical trends and current status of the plant source term through review of records. Through interviews and document review, the inspectors assessed the licensee's current activities and future plans related to source term reduction, including shutdown chemistry and response to problems with fuel in previous cycles.

Radiation Worker Performance The inspectors observed radiation worker performance through direct observation, via remote camera monitoring, and via telemetry. Jobs observed were associated with the refueling outage.

Problem Identification & Resolution Licensee CAP documents associated with ALARA planning and controls were reviewed and assessed. This included review of selected Action Requests (ARs), self-assessments, and audits. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in

accordance with procedure NPG-SPP-03.1, Corrective Action Program, Rev. 1. Licensee CAP documents reviewed are listed in Section 2RS2 of the Attachment.

Radiation protection activities were evaluated against the requirements of UFSAR Section 12; 10 CFR Parts 19 and 20; and approved licensee procedures. Records reviewed are listed in Section 2RS2 of the report Attachment.

The inspectors completed all specified line-items detailed in IP 71124.02 (sample size of 1).

b. Findings

No findings were identified.

2RS3 In-Plant Airborne Radioactivity Control and Mitigation

a. Inspection Scope

Engineering Controls The inspectors reviewed the use of temporary and permanent engineering controls to mitigate airborne radioactivity during the refueling outage including the Auxiliary Building Gas Treatment System (ABGTS). In addition, during observations of jobs in-progress and containment walk-downs, the inspectors observed the placement and use of HEPA negative pressure units, and air sampling equipment. Air sampling analysis results and radiological surveys for selected jobs in contaminated areas with the potential for producing airborne conditions were also reviewed. The inspectors also evaluated the effectiveness of continuous air monitors and air samplers placed in work areas to provide indication of increasing airborne levels.

Use of Respiratory Protection Devices The inspectors reviewed the use of respiratory protection devices to limit the intake of radioactive material. This included review of devices used for routine tasks and devices stored for use in emergency situations. Selected Self-Contained Breathing Apparatus (SCBA) units, negative pressure respirators (NPR)s, and powered air purifying respirators (PAPRs) staged for routine and emergency use in the Main Control Room and other locations were inspected for material condition, SCBA bottle air pressure, the number of units, and the number of spare masks and air bottles available. The inspectors reviewed maintenance records for selected SCBA units for the past two years and evaluated SCBA and NPR compliance with National Institute for Occupational Safety and Health certification requirements. The inspectors also reviewed records of air quality testing for supplied-air devices and SCBA bottles.

The inspectors verified the licensee had procedures in place to ensure that the use of respiratory protection devices was ALARA when engineering controls were not practicable. Due to limited respirator use during the period of inspection, the training curriculum for respiratory protection users was reviewed for various types of respiratory protection devices and radworkers and control room operators were interviewed on the use of the devices including SCBA bottle change-out and use of corrective lens inserts. Respirator qualification records and medical fitness records were reviewed for several

Enclosure

Main Control Room operators and emergency responder personnel in the Maintenance and RP departments. In addition, qualifications for individuals responsible for testing and repairing SCBA vital components were evaluated through review of training records.

The inspectors verified that the licensee has procedural requirements in place for evaluating air samples for the presence of alpha emitters and reviewed airborne radioactivity and contamination survey records for several plant areas to ensure air samples are screened and evaluated per the procedure requirements.

The inspectors walked-down the respirator issue and storage locations and verified that the equipment was appropriately stored and maintained. Records of monthly and quarterly inventory and inspection of the equipment were also reviewed by the inspectors. The inspectors discussed the process for issuing respirators, and verified that selected individuals qualified for respirator and/or self-contained breathing apparatus (SCBA) use had completed the required training, fit-test, and medical evaluation.

In addition, the inspectors walked-down the compressor used for filling SCBA bottles and reviewed records of Grade D air testing for the compressor and instrument air systems. The ability to fill and transport bottles to the control room during an emergency was assessed by the inspectors.

Self-Contained Breathing Apparatus for Emergency Use The inspectors reviewed the status and surveillance records of SCBAs staged for in-plant use during emergencies through review of records and walk-down of SCBA staged in the control room, technical support center, and operations support center. The walk-down verified the appropriate number of SCBA kits were staged as specified by the emergency plan, appropriate mask sizes and types available for use, and, through interviews, that users were knowledgeable of storage locations of SCBA, spare masks, and vision correction, as well as how to don and use the equipment. Selected maintenance records for SCBA units and air cylinder hydrostatic testing documentation were reviewed.

Problem Identification and Resolution Licensee CAP documents associated with the control and mitigation of in-plant radioactivity were reviewed and assessed. This included review of selected ARs related to use of respiratory protection devices including SCBA. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with procedure NPG-SPP-03.1, Corrective Action Program, Rev. 0. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results. Licensee CAP documents reviewed are listed in Section 2RS3 of the Attachment.

Radiation protection activities were evaluated against the requirements UFSAR Section 12; 10 CFR Parts 19 and 20; and approved licensee procedures. Records reviewed are listed in Section 2RS3 of the Attachment.

The inspectors completed all specified line-items detailed in IP 71124.03 (sample size of 1).

Enclosure

b. Findings

No findings were identified.

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

a. Inspection Scope

Waste Processing and Characterization During inspector walk-downs, accessible sections of the liquid and solid radioactive waste (radwaste) processing systems were assessed for material condition and conformance with system design diagrams. Inspected equipment included radwaste storage tanks; resin transfer piping, resin and filter packaging components; and abandoned evaporator equipment. The inspectors discussed component function, processing system changes, and radwaste program implementation with cognizant licensee staff.

The 2009 Effluent Report and radionuclide characterizations from 2009 - 2010 for selected waste streams were reviewed and discussed with cognizant radwaste staff. For primary resin, reactor coolant system filters, and Dry Active Waste (DAW), the inspectors evaluated analyses for hard-to-detect nuclides, reviewed the use of scaling factors, and examined quality assurance comparison results between licensee waste stream characterizations and outside laboratory data. Waste stream mixing and concentration averaging methodology for resins and filters was evaluated and discussed with radwaste staff. The inspectors also reviewed the licensee's procedural guidance for monitoring changes in waste stream isotopic mixtures.

Radwaste processing activities and equipment configuration were reviewed for compliance with the licensee's Process Control Program and Updated Final Safety Analysis Report, Chapter 11. Waste stream characterization analyses were reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 61, and guidance provided in the Branch Technical Position on Waste Classification (1983). Reviewed documents are listed in Section 2RS8 of the report Attachment.

Radioactive Material Storage During walk-downs of indoor and outdoor radioactive material storage areas to include the refuel floor and various other locations in the Auxiliary Building, the inspectors observed the physical condition and labeling of storage containers and the posting of Radioactive Material Areas. The inspectors also reviewed licensee procedural guidance for storage and monitoring of radioactive material.

Radioactive material and waste storage activities were reviewed against the requirements of 10 CFR Part 20. Reviewed documents are listed in Section 2RS8 of the report Attachment.

Transportation There were no significant shipments during the week of the onsite inspection. The inspectors reviewed and discussed with cognizant licensee representatives selected shipping records for consistency with licensee procedures and compliance with NRC and DOT regulations. The inspectors reviewed emergency

Enclosure

response information, DOT shipping package classification, waste classification, radiation survey results, and evaluated whether receiving licensees were authorized to accept the packages. Licensee procedures for handling shipping containers were compared to Certificate of Compliance requirements and manufacturer recommendations. In addition, training records for selected individuals currently qualified to ship radioactive material were reviewed.

Transportation program implementation was reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 71, 49 CFR Parts 172-178, as well as the guidance provided in NUREG-1608. Training activities were assessed against 49 CFR Part 172 Subpart H. Documents reviewed during the inspection are listed in Section 2RS8 of the report Attachment.

Problem Identification and Resolution: The inspectors reviewed Problem Evaluation Reports in the area of radwaste processing, radioactive material storage and transportation. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure SPP-03.1, Corrective Action Program, Revision 0. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results. Licensee corrective action program documents reviewed are listed in Section 2RS8 of the report Attachment.

The inspectors completed all specified line-items detailed in IP 71124.08 (sample size of 1).

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

The inspectors sampled licensee submittals for the six PIs listed below for the period from October 1, 2009, through September 30, 2010, for both Unit 1 and Unit 2. Definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Indicator Guideline, Revision 6, were used to determine the reporting basis for each data element in order to verify the accuracy of the PI data reported during that period.

Cornerstone: Mitigating Systems

- Mitigating Systems Performance Index: Emergency AC Power
- Mitigating Systems Performance Index: High Pressure Injection System
- Mitigating Systems Performance Index: Heat Removal System (AFW)
- Mitigating Systems Performance Index: Residual Heat Removal System

- Mitigating Systems Performance Index: Cooling Water System
- Safety System Functional Failures

The inspectors reviewed portions of the operations logs and raw Performance Indicator (PI) data developed from monthly operating reports and discussed the methods for compiling and reporting the PIs with engineering personnel. The inspectors also independently calculated selected reported values to verify their accuracy and compared graphical representations from the most recent PI report to the raw data to verify that the data was correctly reflected in the report. Specifically, for the Mitigating Systems Performance Index (MSPI), the inspectors reviewed the basis document and derivation reports to verify that the licensee was properly entering the raw data as suggested by NEI 99-02. For Safety System Functional Failures, the inspectors also reviewed LERs issued during the referenced timeframe. Documents reviewed are listed in the Attachment. The inspectors completed twelve samples.

Cornerstone: Occupational Radiation Safety

The inspectors reviewed Performance Indicator (PI) data collected from June 1, 2009, through September 30, 2010, for the Occupational Exposure Control Effectiveness PI. For the reviewed period, the inspectors assessed PER records to determine whether HRA, VHRA or unplanned exposures, resulting in TS or 10 CFR 20 non-conformances, had occurred during the review period. The inspectors reviewed radiologically controlled area exit transactions with exposures greater than 100 mrem to determine if they were consistent with the requirements of the RWP. The reviewed data were assessed against guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Indicator Guideline," Rev. 5. The reviewed documents relative to these PI reviews are listed in Sections 2RS1 and 2RS2 of the Attachment.

Cornerstone: Public Radiation Safety

The inspectors reviewed the Radiological Control Effluent Release Occurrences PI results for the Public Radiation Safety Cornerstone from June 1, 2009, through September 30, 2010. For the assessment period, the inspectors reviewed cumulative and projected doses to the public and PER documents related to Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual issues. Documents reviewed are listed in section 4OA1 of the Attachment.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems

.1 Daily Review

a. Inspection Scope

As required by Inspection Procedure 71152, Identification and Resolution of Problems,
Enclosure

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 CAP. This was accomplished by reviewing the description of each new PER and attending daily management review committee meetings.

b. Findings and Observations

No findings were identified.

.2 Selected Issue Follow-up: Intertie Transformer Fire

a. Inspection Scope

On September 22, 2010, a fire occurred in the 'A' phase intertie transformer in the switchyard, which serves as a connection between the 161-kV and 500-kV switchyards inside the site's protected area. The fire occurred 15 minutes after energizing the transformer from the 500-kV side. The fixed fire suppression system at the transformer was out of service, and fire operations personnel were dispatched to extinguish the fire.

The inspectors reviewed licensee actions to determine and correct the cause of the incident. The inspectors reviewed PERs 256450 and 257350 dealing with this event, interviewed engineering and operations personnel, and reviewed several of the corrective actions.

b. Findings and Observations

No findings were identified. The inspectors determined that the licensee's root cause and apparent cause evaluations associated with the above referenced PERs were thorough and that the corrective actions appeared to be adequate to address the identified causes. The licensee's investigation found that the cause of the fire was a phase-to-ground fault on each of two tertiary bushings due to a poor connection associated with a capacitance tap as well as inadequate follow-up on previous out-of-tolerance testing results. The causes of the fire lasting greater than 15 minutes prior to being extinguished were determined to be poor equipment condition of the fixed fire suppression system at the intertie transformer, as well as inadequate planning/coordination between shift operations and fire operations personnel.

The licensee's corrective actions included repair or replacement of affected deluge system valves as well as strengthening coordination with fire operations when energizing transformers. Additional corrective actions included plans to change out all other similar transformer bushings to a newer design, as well as issuing more robust requirements for documentation and resolution of identified deficiencies in TVA's Power System Operations (PSO) group activities.

The inspectors found that the licensee appropriately classified the event as a Notice of Unusual Event in accordance with EPIP-1, "Emergency Plan Classification Matrix," revision 44. The inspectors found that the licensee's event classification and notifications to local authorities and NRC were performed as required by 10 CFR 50.72.

Enclosure

The event was reported to the NRC as EN 46270.

.3 Annual Sample Review of Operator Workarounds

a. Inspection Scope

The inspectors reviewed the operator workaround (OWA) program to verify that OWAs were identified at an appropriate threshold, were entered into the CAP, and that corrective actions were appropriate and timely. Specifically, the inspectors reviewed the licensee's workaround lists and repair schedules, reviewed CAP word searches, conducted tours and interviewed operators and operations department support staff. Additionally, the inspectors checked for undocumented workarounds by observing operators perform rounds, reviewed operator deficiency lists, reviewed appropriate system health documents, attended plant health committee meetings, and verified that identified program deficiencies were corrected. The inspectors evaluated all workarounds for their aggregate impact. Documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings were identified during this review. However, the inspectors noted that plant procedure requirements for tracking time spent by operators performing compensatory measures due to workarounds were not consistently followed. Specifically, OPDP-1, "Conduct of Operations," Revision 18, requires such tracking, and the Operations Directives Manual, Appendix O, Revision 4, assigns that task to a specific crew. The task matrix had not been updated since August 2010. The licensee placed the issue in the CAP as SR 302178 and immediately determined the cumulative time burden on each watchstation. The time burden was found to be minimal. During initial review, an operator workaround associated with an ERCW system valve used in pipe rupture isolation, Work Order 111064760, had been in place since June 14, 2010. The work order stated "This issue needs to be repaired expeditiously." However, it was not scheduled to be worked until March 14, 2011. The licensee determined that operator workarounds were not being appropriately scheduled and initiated SR 301565 to address the issue in the CAP. The work was completed in December. There were no workarounds documented when the inspection sample was completed.

.4 Semi-Annual Trend Review

a. Inspection Scope

As required by Inspection Procedure 71152, the inspectors performed a review of the licensee's CAP and other associated programs and documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also included licensee trending efforts and licensee human performance results. The inspectors' review nominally considered the six-month period of July through December 2010, although some examples expanded beyond those dates when the scope of the trend warranted. Specifically, the inspectors consolidated the results of daily inspector screening discussed in Section

4OA2.1 into a log, reviewed the log, and compared it to licensee trend reports for the period in order to determine the existence of any adverse trends that the licensee may not have previously identified. The inspectors also independently reviewed RCS leakage data for the six-month period of July through December 2010. This inspection satisfied one inspection sample for Semi-annual Trend Review.

b. Findings and Observations

No findings were identified. In general, the licensee had identified trends and appropriately addressed them in their CAP. The inspectors evaluated the licensee trending methodology and observed that the licensee had performed a detailed review. The licensee routinely reviewed cause codes, involved organizations, key words, and system links to identify potential trends in their data. The inspectors compared the licensee process results with the results of the inspectors' daily screening.

During calendar year 2009, the inspectors identified five examples of performance indicator (PI) data that the licensee had failed to report in accordance with NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," revision 6. These included an unplanned scram, an unplanned power change, an unplanned power change that was prevented by a notice of enforcement discretion, a safety system functional failure, and an unplanned scram with complications. The licensee entered these issues into their CAP as PERs 163637, 167436 and 203448.

In 2010, the inspectors identified four examples of discrepancies involving the reporting of PI data. These included an unplanned power change not reported, minor errors in RCS leakage and RCS activity PI data, and no documentation to support a reported drill and exercise performance (DEP) notification success. These observations were entered into the licensee's corrective action program as PERs 244834, 218304, 219556, and 286238, respectively. The licensee performed an apparent cause evaluation under PER 244834, which determined the cause was a lack of adequate training for the personnel involved in the process of identifying and reporting PI data in accordance with applicable reporting criteria. Corrective actions included providing mentoring/training sessions with applicable personnel.

The inspectors also identified four examples of scaffolds constructed in the plant which had the potential to affect the operability of plant systems. These included a scaffold secured to a containment spray heat exchanger drain line, a scaffold blocking an Appendix R light, a scaffold partially obstructing the sprinkler spray pattern in a 250V battery room, and a scaffold in contact with an emergency diesel generator jacket water cooler drain line. The licensee entered this trend into the CAP as PER 259268.

.5 Licensed Operator Requalification Program Review

a. Inspection Scope

- The inspectors selected Problem Evaluation Report (PER) 294939 for a detailed review. The PER was initiated because the inspector identified where in-plant tours were not being adequately documented to support reactivation in accordance with

Enclosure

10 CFR 55.53, Conditions of Licenses. 10 CFR 55.53(f)(2) states, in part, that the 40 hours of shift functions must include a complete tour of the plant. OPDP-10, Licensed Status Maintenance, Reactivation and Proficiency for Non-Licensed Positions, Rev. 2, does not clarify or specify the necessary details of the plant tour on Appendix A of this procedure. Subsequently, some of the reactivation packages were missing door access records or the ones that were provided were illegible. Additionally, tour content and robust was abbreviated in most cases. The facility has committed to reviewing their current practices and procedures to better clarify or specify the 10 CFR 55.53(f)(2) requirements of the plant tour. The inspectors checked that this issue had been completely and accurately identified in the licensee's Corrective Action Program (CAP) and properly classified and prioritized for resolution. Corrective actions have not been verified complete.

- The inspectors selected PER 237850 for a detailed review. The PER was initiated because multiple training self-assessments have identified the need to upgrade the simulator to emulate the Main Control Room (MCR) emergency lighting response during a station blackout. 10 CFR 55.46 (c) (1) (i) states in part that the plant-referenced simulator must be designed and implemented so that it is sufficient in scope and fidelity to allow conduct of evolutions listed in 55.59 (c)(3)(i)(A) through (AA). This list of evolutions includes Loss of Electrical Power. Previous PERs have been initiated to address the emergency lighting issue, but have been closed without providing any analysis relating to training impact beyond a cost estimate to install the upgrade. Previous corrective actions have been closed without specifically addressing when and how the emergency lighting will be incorporated into the simulator design. In this current PER, the facility has committed to installing the emergency lighting in the simulator. The inspectors checked that this issue had been completely and accurately identified in the licensee's Corrective Action Program (CAP) and properly classified and prioritized for resolution. Corrective actions have not been verified complete.
- The inspector raised a concern with the conduct of the 100 percent RTP Static Simulator Test. The inspector identified where data from two different plant reference data sets were used selectively for comparison to meet the acceptance criteria for simulator performance testing. A comparison of the simulator steady state values with the initial plant reference data set identified two data points that exceeded the acceptance criteria. The test performer obtained a second set of plant reference data. However, rather than compare the simulator steady state values with the entire second plant reference data set, the test performer limited the comparison to only the two data points that had exceeded the acceptance criteria during the first test run. TRN-12, Simulator Regulatory Requirements, Rev. 9, does not specify the actions to address modeling discrepancies other than to document the failure in a test report and initiate a Discrepancy Report (DR). The facility has initiated PER 295653 which commits to revising TRN-12 to incorporate the following statement into the procedure:

“Each plant reference value used to evaluate the steady state test variables should be obtained from the same plant data set. If updated plant data is required for any variable, the updated plant data set shall be used for all plant reference values.”

Enclosure

- The inspectors selected PER 295605 for a detailed review. This PER was initiated because the inspector identified where the wording and sequencing of steps in ES-1.4, Transfer to Hot Leg Recirculation, caused confusion for the operators concerning the expected course of action. The licensee has committed in the PER to revising ES-1.4 such that the directions to the user are clear.

The inspectors checked that this issue had been completely and accurately identified in the licensee's Corrective Action Program (CAP) and properly classified and prioritized for resolution. Corrective actions have not been verified complete.

b. Findings

No findings were identified.

4OA3 Event Follow-up

.1 Unit 1 Manual Reactor Trip

a. Inspection Scope

On November 16, 2010, the inspectors responded to a manual trip of Unit 1 due to a loss of steam generator level control that occurred following a manual trip of the main turbine generator. The inspectors discussed the trip with operations, engineering, and licensee management personnel to gain an understanding of the event and assess follow-up actions. The inspectors reviewed operator actions taken to determine whether they were in accordance with licensee procedures and TS, and reviewed unit and system indications to verify whether actions and system responses were as expected and designed. The inspectors found that operators responded to the situation appropriately and in accordance with plant procedures, and that plant systems responded to the trip as designed. The inspectors also reviewed the initial licensee notifications to verify that they met the requirements specified in NUREG-1022, "Event Reporting Guidelines." The event was reported to the NRC as event notification (EN) 46424, and documented in the licensee's CAP as PER 285349.

b. Findings

No findings were identified.

.2 Unit 1 Manual Reactor Trip

a. Inspection Scope

On December 20, 2010, the inspectors responded to a manual trip of Unit 1 due to a fire in a main generator output neutral bus bushing. The inspectors discussed the trip with operations, engineering, and licensee management personnel to gain an understanding of the event and assess follow-up actions. The inspectors reviewed operator actions taken to determine whether they were in accordance with licensee procedures and TS, and reviewed unit and system indications to verify whether actions and system

responses were as expected and designed. The inspectors found that operators responded to the situation appropriately and in accordance with plant procedures, and that plant systems responded to the trip as designed. The inspectors also reviewed the initial licensee notifications to verify that they met the requirements specified in NUREG-1022, "Event Reporting Guidelines." The event was reported to the NRC as event notification (EN) 46492, and documented in the licensee's CAP as PER 299269.

b. Findings

No findings were identified.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings were identified.

.2 (Closed) TI 2515/179 Verification of Licensee Responses to NRC Requirement for Inventories of Materials Tracked in the National Source Tracking System (NSTS) Pursuant to Title 10, Code of Federal Regulations, Part 20.2207 (10 CFR 20.2207)

a. Inspection Scope

The inspectors performed the TI concurrent with IP 71124.01 Radiation Hazard Analysis. The inspectors reviewed the licensee's source inventory records and identified the sources that met the criteria for reporting to the NSTS. The inspectors verified the sources on the licensee's inventory and verified the presence of the sources by direct radiation measurement using a calibrated portable radiation detection survey instrument. The inspectors reviewed the physical condition of the irradiation devices to include documented source leak checks as appropriate. The inspectors reviewed the licensee's procedures for source receipt, maintenance, transfer, reporting and disposal. The inspectors reviewed documentation that was used to report the sources to the NSTS. Documents reviewed are listed in sections 2RS1 of the Attachment.

b. Findings

There were no findings of significance. This completes the Region II inspection requirements.

3. (Closed) Reactor Coolant System Dissimilar Metal Butt Welds (TI 2515/172, Revision 1)

a. Inspection Scope

The inspectors conducted a review of the licensee's activities regarding licensee dissimilar metal butt weld (DMBW) mitigation and inspection implemented in accordance with the industry self imposed mandatory requirements of Materials Reliability Program (MRP) 139, "Primary System Piping Butt Weld Inspection and Evaluation Guidelines." Temporary Instruction (TI) 2515/172, "Reactor Coolant System Dissimilar Metal Butt Welds," Revision 1 was issued May 27, 2010, to support the evaluation of the licensees' implementation of MRP-139.

On December 8, 2010, the inspectors performed a review in accordance with TI 2515/172, Revision 1 as described in the Observation Section below:

b. Observations

The licensee has met the MRP-139 deadlines for baseline examinations of all welds scoped into the MRP-139 program. TI 2515/172, Revision 1 is considered closed. In accordance with requirements of TI 2515/172, Revision 1, the inspectors evaluated the following areas:

i. Implementation of the MRP-139 Baseline Inspections

This portion of the TI was not inspected during the period of this inspection report, but was previously covered in NRC Inspection Report 05000327/2008004.

ii. Volumetric Examinations

This portion of the TI was not inspected during the period of this inspection report, but was previously covered in NRC Inspection Report 05000327/2008004.

iii. Weld Overlays

This portion of the TI was not inspected during the period of this inspection report, but was previously covered in NRC Inspection Report 05000327/2008004.

iv. Mechanical Stress Improvement (SI)

There were no mechanic stress improvement activities performed or planned by this licensee to comply with their MRP-139 commitments.

v. Application of Weld Cladding and Inlays

There were no weld cladding nor inlay activities performed or planned by this licensee to comply with their MRP-139 commitments.

vi. Inservice Inspection Program

During this inspection the inspectors reviewed the licensee's MRP 139 Program procedures and the incorporation of these examinations into the current ISI Program. Also, inspections of the ISI Program were previously covered in NRC Inspection Report 05000327/2008004.

c. Findings

No findings were identified.

.4 (Closed) NRC Temporary Instruction (TI) 2515/177, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems (NRC Generic Letter (GL) 2008-01)"

a. Inspection Scope

The inspectors reviewed the implementation of the licensee's actions in response to GL 2008-01, Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems. The subject systems included the emergency core cooling system (ECCS), residual heat removal system (RHR), and containment spray system (CSS).

The inspectors reviewed the licensing basis of the facility to verify that actions to address gas accumulation were consistent with the operability requirements of the subject systems.

The inspectors reviewed the design of the subject systems to verify that actions taken to address gas accumulation were appropriate given the specifics of the functions, configurations, and capabilities of these systems. The inspectors reviewed the design and operation of the RHR system to determine if flashing in RHR suction lines would challenge system operability. The inspectors reviewed selected analyses performed by the licensee to verify that methodologies for predicting gas void accumulation, movement, and impact were appropriate. The inspectors performed walkdowns of selected subject systems to verify that the reviews and design verifications conducted by the licensee had drawn appropriate conclusions with respect to piping configurations and pipe slope which could result in gas accumulation susceptibility.

The inspectors reviewed testing implemented by the licensee to address gas accumulation in subject systems. A selection of test procedures and completed test results were reviewed to verify that test procedures were appropriate to detect gas accumulations that could challenge subject systems. The inspectors reviewed the specified testing frequencies to verify that the testing intervals had appropriately taken

Enclosure

historical gas accumulation events as well as susceptibility to gas accumulation into account. The inspectors also reviewed the test programs and processes to verify that they were sensitive to pre-cursors to gas accumulation.

The inspectors reviewed corrective actions associated with gas accumulation in subject systems to verify that identified issues were being appropriately identified and corrected. The inspectors reviewed the locations of selected vent valve installations to verify that the locations selected were appropriate based on piping configuration and pipe slopes.

b. Findings

Introduction. The inspectors identified a Green non-cited violation of Technical Specification 6.8.1.c, "Procedures and Programs," for the failure to establish surveillance test procedures to verify that ECCS piping systems are full of water by venting accessible piping high points on the suction side of the ECCS pumps as required by Surveillance Requirement (SR) 4.5.2.b.1.

Description. Technical Specification SR 4.5.2.b.1 requires the licensee, at least once per 31 days, to "Verify ECCS piping is full of water by venting the ECCS pump casings and accessible piping high points". This requirement was established by an amendment to the Technical Specifications approved by the NRC on January 28, 2010, (and implemented by the licensee on March 29, 2010) which included venting of accessible high points on the ECCS suction side piping. Previously, the SR required only the accessible discharge piping high points be vented. The licensee's amendment request contained the following explanation for the proposed change: "TVA is upgrading SQN SR 4.5.2.b to the STS requirements to address the suction piping of ECCS by deleting the word discharge from the SR". However, the licensee's implementing surveillance procedures were not revised to include the suction side vent valves, and as a result, no suction side piping vent valves were included in the 31 day surveillance test procedure. In addition, no evaluation was performed by the licensee to justify excluding any of the suction side valves from the surveillance test procedure.

Therefore, the inspectors determined that the licensee did not meet the provisions of TS 6.8.1.c which requires that procedures be established, implemented and maintained to cover surveillance and test procedures of safety-related equipment.

Additionally, the inspectors concluded that site interdepartmental impact reviews which were performed for the amendment request did not identify or otherwise evaluate the need for possible revisions to existing surveillance test procedures to ensure that applicable surveillance requirements would be met.

Analysis. The licensee's failure to establish surveillance test procedures to vent the suction side of the ECCS piping every 31 days as required by TS SR 4.5.2.b.1 was a performance deficiency. The finding was determined to be greater than minor because it adversely affected the equipment performance attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to perform surveillance tests on the ECCS system reduced the assurance that the

Enclosure

system could respond to initiating events to prevent undesirable consequences. Using the mitigating systems cornerstone column of IMC 0609, "Significance Determination Process," Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance (Green) since it was not a design or qualification deficiency, it did not represent the loss of a system safety function or the loss of any equipment trains, and is not potentially risk significant due to seismic, flooding or severe weather initiating events.

Because site interdepartmental communication, coordination, and cooperation for activities associated with the amendment request were not sufficient to identify the impact of the SR change on existing surveillance test procedures used to assure human and plant performance, the cross cutting aspect in the work control component of the human performance area applies to this finding [H.3(b)].

Enforcement. TS 6.8.1.c requires that written procedures be established, implemented, and maintained covering surveillance and test activities of safety-related equipment. Contrary to the above, since March 29, 2010, the licensee failed to establish surveillance procedures to implement the provisions of SR 4.5.2.b.1 on the suction side of ECCS piping. Specifically, SR 4.5.2.b.1 requires that accessible discharge and suction ECCS piping high points be vented every 31 days. Because this violation was determined to be of very low safety significance and has been entered into the licensee's corrective action program as service request 291511, it is being treated as an NCV consistent with the NRC Enforcement Policy: NCV 05000327,328/2010005-02, "Failure to implement Technical Specification requirements to vent ECCS piping."

.5 (Closed) URI 05000327,328/2010007-01, "Worst Case 6900 VAC Bus Voltage in Design Calculations"

Introduction: The NRC identified a Green non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion III, Design Control, for the failure to correctly translate the 6900 VAC emergency bus undervoltage trip value specified in Technical Specifications (TS) into design calculations for motor starting and loading. The values used by the licensee in the design calculations were non-conservative with respect to the specified TS values. This issue was initially discussed as URI 05000327,328/2010007-01, "Worst Case 6900 VAC Bus Voltage in Design Calculations."

Description: Offsite power at Sequoyah is normally provided to the four Class 1E 6900 VAC buses from the two independent common service station transformers (CSSTs) 'A' and 'D'. Sequoyah TS Section 3.3.14, "Loss of Power Diesel Generator Start Instrumentation", table 3.3.14-2 specifies the undervoltage and degraded voltage relay trip setpoints, including allowable values and time delays associated with the safety-related 6900 VAC buses. These degraded voltage setpoints provide the bases for the minimum voltage available to all safety-related equipment such as motors, contactors, and solenoid valves during a postulated degraded voltage scenario.

The degraded voltage relays initiate the nominal 9.5 second time delay at the TS specified relay voltage setting. When the 9.5 second time delay has elapsed, the plant loads are removed from the offsite power supply and transferred to the onsite

Enclosure

emergency diesel generators. The degraded voltage relays drop-out (de-energize) when sufficient voltage is not available and normally pick-up (energize) if voltage is recovered within the 9.5 second delay on the 6900 VAC bus. The degraded voltage relay settings at Sequoyah are in accordance with TS Table 3.3.14-2 which states the values to be as follows: Nominal Trip Setpoint 6456 V, Allowable Values ≤ 6522.5 V and ≥ 6403.5 V.

The inspector reviewed licensee calculation of record, SQNETAPAC, "AC Auxiliary Power System Analysis", Rev. 36, which evaluated transient motor starting voltages at the beginning of a design basis loss of coolant accident (LOCA). This calculation used the degraded voltage pick-up setpoint of 6558 VAC as the point to analyze post LOCA load motor starting. This voltage of 6558 VAC used in the calculation was non-conservative with respect to the voltage specified in TS which specified a maximum value of 6522 VAC.

Analysis: The failure to use the degraded voltage relay setpoint values as specified in TS and configured in the plant for the 6900 VAC bus electrical design calculation was a performance deficiency. This finding is more than minor because it affects the Design Control attribute of the Mitigating Systems Cornerstone. It impacts the cornerstone objective of ensuring the availability, reliability, and operability of the 6900 VAC safety buses to perform its intended safety function during a design basis event. The potential availability, reliability, and operability of the 6900 VAC safety buses during a potential degraded voltage condition was impacted as the licensee calculation used a non conservative degraded voltage input, with respect to the values specified in TS, into their safety-related motor starting and running calculations. The inspectors assessed the finding using the SDP and determined that the finding was of very low safety significance (Green) because the finding represented a design deficiency confirmed not to result in the loss of functionality of safety-related loads due to the availability of load tap changers (LTCs) that are installed to improve a degraded voltage condition.

The inspectors reviewed the performance deficiency for cross-cutting aspects and determined that none were applicable since this performance deficiency was not indicative of current licensee performance as the design calculation discussed above was not recently performed.

Enforcement: 10 CFR 50, Appendix B, Criterion III, Design Control, states, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis for structures, systems, and components are correctly translated into specifications, drawings, procedures, and instructions. This appendix also states, in part, that measures shall be established for the selection and review for suitability of application of processes that are essential to the safety-related functions of the structures, systems, and components. Sequoyah TS Section 3.3.14-2, "Loss of Power Diesel Generator Start instrumentation," table 3.3.14-2 specifies the 6900 VAC emergency bus undervoltage (degraded) relay trip setpoints to be as follows: Nominal Trip Setpoint 6456 V, Allowable Values ≤ 6522.5 V and ≥ 6403.5 V. Contrary to the above, since at least Sept 2006, the licensee failed to assure that applicable regulatory requirements for undervoltage (degraded) voltage protection, including those prescribed in TS 3.3.14-2, were correctly translated into design calculation, SQNETAPAC, "AC

Enclosure

Auxiliary Power System Analysis”, Revision 36, which evaluated motor starting voltages at the beginning of a design basis loss of coolant accident (LOCA) concurrent with a degraded grid condition. Specifically, the licensee used the input value of 6558 VAC which was higher than the maximum value of 6522.5 VAC specified in TS. Because this finding is of very low safety significance and was entered into the licensee’s corrective action program as PER 297671 this violation is being treated as a NCV, consistent with the NRC Enforcement Policy. This finding is identified as NCV 05000327, 05000328/2010005-03, Failure to Use Worst Case 6900 VAC Bus Voltage in Design Calculations. URI 05000327, 328/2010007-01, Worst Case 6900 VAC Bus Voltage in Design Calculations is closed.

4OA6 Meetings

Exit Meeting Summary

On November 19, 2010, the inspectors discussed results of the onsite radiation protection inspections with Mr. R. Detwiler, Director, Safety and Licensing, and other responsible staff. The inspectors noted that no proprietary information was reviewed during the course of the inspection. An earlier exit occurred on 10/22/10, which discussed the outage related radiation protection inspection results. The inspectors noted that some personally identifiable information was reviewed during the course of the inspection, and that it would be properly destroyed when no longer needed.

An exit meeting with Mr. Ken Langdon and other members of the licensee’s management and staff was conducted on December 3, 2010, to discuss the results of the TI-177 inspection. Proprietary information reviewed by the team as part of routine inspection activities was returned to the licensee in accordance with prescribed controls.

An exit meeting was conducted on December 9, 2010, to discuss the findings of the biennial requalification inspection. The inspectors confirmed that no proprietary information was retained during this inspection.

An interim exit was conducted on December 17, 2010, to discuss the findings of the URI follow-up inspection. Although proprietary information was reviewed during the inspection, no proprietary information is included in this report

On January 4, 2010, the resident inspectors presented the inspection results to Mr. Ken Langdon 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.

4OA7 Licensee-identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements that meet the criteria of Section 2.3.2 of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

On October 15, 2010, a one foot gap was discovered in the structural steel above the Unit 1 keyway inside the locked boundary of the Very High Radiation Area. Access to the Unit 1 keyway is obtained by entering through a locked caged door which provides access to an opening to the keyway. The location of the gap created the potential for individual to bypass the cage door and gain unauthorized access to the opening by climbing on the structural steel. 10 CFR Part 20.1602 requires that in addition to the controls specified in 10 CFR Part 20.1601, Control of access to high radiation areas, the licensee shall institute additional measures to ensure that an individual is not able to gain unauthorized or inadvertent access to Very High Radiation Areas. Contrary to the above, the gap in the structural steel provided a method for an individual to gain unauthorized or inadvertent access to the opening. The licensee identified the gap during routine surveys and checks of LHRAs and initiated immediate corrective action to control the VHRA. The licensee removed the lock from the caged door and relocated it to the metal louver covers directly above the opening to the keyway. Additional chains were added to the covers to reinforce and secure the access point directly above the opening. Although this event involved the failure to appropriately control access to a Very High Radiation Area, this finding is of very low safety significance because there was no substantial potential for overexposure and the licensee's ability to assess dose was not compromised. The immediate corrective actions were documented in PER 266769. The long term corrective actions include fabricating additional materials to secure the area.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

J. Addison, License Operator Requalification Instructor
A. Bergeron, Operations Training
S. Bowden, Accreditation Support Manager
S. Bowman, Licensing Engineer
C. Church, Site Vice President
I. Collins, Engineering Programs
S. Connors, Operations Manager
R. Detwiler, Director, Safety and Licensing
C. Dieckmann, Manager, Maintenance
J. Dvorak, Outage and Site Scheduling Manager
D. Foster, Performance Improvement Manager
J. Furr, Quality Assurance Manager
C. Hawes, Initial Licensing Supervisor
A. Keyser, ISI Engineer
Z. Kitts, Licensing
R. Krich, Licensing Vice President
K. Langdon, Plant Manager
T. Marshall, Maintenance and Modifications Manager
S. McCamy, Radiation Protection Manager
H. McDaniel, License Operator Requalification Instructor
M. McDowell, Corporate Project Manager
W. Nurnberger, Chemistry/Environmental Manager
L. Pate, Site Physician
D. Porter, Operations Procedures
R. Proffitt, Licensing Engineer
J. Reidy, Operations Superintendent
R. Rice, Superintendent, Technical Support, RP
P. Simmons, Operations Manager
S. Smith, License Operator Requalification Supervisor
B. Sowter, Site Physician
J. Stamey, Health Physicist, RP
D. Stevens, Superintendent, Radwaste, RP
M. Stephens, Quality Assurance – Training
D. Sutton, Licensing
N. Thomas, Licensing Engineer
R. Thompson, Emergency Preparedness Manager
O. Triolo, Senior Instructor
B. Wetzel, Director, Safety and Licensing
C. Ware, Training Director
J. Watson, License Operator Requalification Instructor
K. Wilkes, Operations Superintendent
J. Williams, Site Engineering Director
S. Young, Site Security Manager

NRC personnel

W. Rogers, Region II, Senior Reactor Analyst
 S. Lingam, Project Manager, Office of Nuclear Reactor Regulation

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSEDOpened and Closed

05000327,328/2010005-01	NCV	Failure to Collect Reactor Coolant Pump Oil Leakage (Section 1R05)
05000327,328/2010005-02	NCV	Failure to implement Technical Specification requirements to vent ECCS piping (Section 4OA5.4)
05000327,328/2010005-03	NCV	Failure to Use Worst Case 6900 VAC Bus Voltage in Design Calculations (Section 4OA5.5)

Closed

05000327,328/2515/179	TI	Verification of Licensee Responses to NRC Requirement for Inventories of Materials Tracked in the National Source Tracking System (NSTS) Pursuant to Title 10, Code of Federal Regulations, Part 20.2207 (10 CFR 20.2207) (Section 4OA5.2)
05000327, 328/2515/172	TI	Reactor Coolant System Dissimilar Metal Butt Welds (Section 4OA5.3)
05000327, 328/2515/177	TI	Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems (NRC Generic Letter (GL) 2008-01) (Section 4OA5.4)
05000327, 328/2010007-02	URI	Degraded Voltage Relay Issue (Section 4OA5.5)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

AOP N.02, Tornado Watch/Warning, Revision 25
0-PI-OPS-000-006.0, Freeze Protection, Revision 47
1-PI-EFT-234-706.0, Unit 1 Freeze Protection Heat Trace Functional Test, Revision 37
2-PI-EFT-234-706.0, Unit 2 Freeze Protection Heat Trace Functional Test, Revision 22
SPP-10.14, Freeze Protection, Revision 0

Section 1R04: Equipment Alignment

1,2-47W855-1, Mechanical Flow Diagram Fuel Pool Cooling and Cleaning System, Revision 46
0-GO-16, System Operability Checklists, Revision 10
FSAR Section 8.0, Electric Power
IEEE Standard 308-2001, Standard Criteria for Class 1E Power Systems for Nuclear Generating Stations
IEEE Standard 338-2006, Standard Criteria for Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems
RG 1.32, Criteria for Power Systems for Nuclear Power Plants, Revision 3
RG 1.81, Shared Emergency and Shutdown Electric Systems for Multi-Unit Nuclear Plants, Revision 1
WO's: 08-777891-000, 08-770461-000, 07-779206-000, and 07-775068-000
1-45N724-1, Wiring Diagrams 6900V Shutdown Board 1A-A Single Line, Revision 21
2-45N724-3, Wiring Diagrams 6900V Shutdown Board 2A-A Single Line, Revision 23
1,2-45N765-1, Wiring Diagrams 6900V Shutdown Aux Power Schematic Diagram SH-1, Revision 18

Section 1R05: Fire Protection

FPDP-1, Conduct of Fire Protection, Revision 1
DCN M10126B, Reactor coolant pump drains
Calculation SQN-26-D054/EPM-ABB-IMFHA, SQN Fire Hazards Analysis
EWR 10-MEC-068-058, Effects of RCP motor oil fire in bowl area on RCP seal integrity
SQN Fire Protection Report, Revision 27
Drawing 2-47W809-1, Flow Diagram Chemical & Volume Control System, revision 69
1-AR-M5-B, Annunciator Response, revision 37
1-AR-M5-B, Annunciator Response, revision 38

Section 1R06: Flood Protection Measures

SQN-SQS40056, Moderate Energy line Break Flooding Study, Revision 14
WO 111013891, Check Standing Water Level in Manholes/Handholes
1,2-47W853-10, Station Drainage Flow Diagram, Revision 23
18N239-1, Miscellaneous Steel ERCW Electrical MH and HH Frames, Covers, and Cable Tray Supports, Revision 3
18N233, Miscellaneous Steel Manhole Cable Tray Supports and Embedded Plates, Revision 8
SR 250632, 287139, 245311, 197424, 197395
TVA letter dated May 4, 2007-TVA Response to Generic Letter 2007-01

Section 1R08: Inservice Inspection (ISI) Activities**Procedures**

N-UT-66, Rev. 06, Generic Procedure for the Ultrasonic Examination of Weld Overlaid Austenitic Pipe Welds
 N-UT-76, Rev. 07, Generic Procedure for the Ultrasonic Examination of Ferritic Pipe Welds
 SPP-9.1, Rev. 09, ASME Section XI
 SI-DXI-000-114.3, Rev. 15, ASME Section XI/NDE Program Unit 1 and Unit 2
 NETP-113, Rev. 0, PWR Alloy 600 Program and Other Augmented Inspection Requirements
 TI-DXX-000-097.1, Rev. 6, Boric Acid Control Program
 SPP-9.7, Rev. 18, Corrosion Control Program
 PI-DXX-068-100.R, Rev. 2, Monitoring of Reactor Head Canopy Seal Welds for Leakage
 PI-SLT-068-200.0, Rev. 2, Reactor Building Post Shutdown Leakage Examination
 PI-DXX-000-105, Rev. 0, Boric Acid Leak Monitoring Program

Corrective Action Documents

PER 265590, Documentation Revisions to the ISI program ASME requires the Code Cases used as part of the site's ISI program to be described in the ISI plan.
 PER 266278, ISI program changes for Containment Moisture Barrier
 PER 264841, Determine if BACCP should be considered a record in TI-DXX-000-97.1
 PER 264670, Review of Data on overlay weld RCF-23A-OL showed incorrect transducer selected for examination

Other

DWG 1.2 – 48N401, Rev. 1, Structural Steel Containment Vessel Sht 1
 BACCP Program Health Report (7/1/2009-12/31/2009)
 BACCP Program Health Report (1/1/2010-06/30/2010)
 Boric Acid Leak Evaluation Report, WO 111504156
 Boric Acid Leak Assessment, Pump 28-0001 Pump Seal 9/1/10
 Self Assessment SQN-ENG-F-09-04, SQN Boric Acid Corrosion Program Implementation August 31, 2009 – September 2, 2009
 Design Criteria Document No. SQN – V-2.3, Rev. 3, Steel Containment Vessels

Section R11: Licensed Operator Regualification

Simulator Exam Guide S-7, Pressurizer Vapor Space Accident, Revision 17
 Simulator Exam Guide S-19a, Small Break Loss of Coolant Accident, Revision 4
 E-0, Reactor Trip or Safety Injection, Revision 33
 E-1, Loss of Reactor or Secondary Coolant, Revision 24
 FR-Z.1, High Containment Pressure, Revision 19
 RO and SRO Examination Comparison Reports
 Annual Exam 1 Item Analyses Report
 Examination Results Spread Sheet
 Sequoyah Nuclear Plant Operations Training Programs Pre-Accreditation Performance Assessment (CRP-PA-I-10-004) Final Report, Sep 23, 2010
 Sequoyah Licensed Operator Regualification Program, SQN-TRN-F-10-03, Rev 2, dated 07/08/10
 Feedback rollup reports
 LOCT Feedback Forms
 2010 LOR Written Examination/JPM Selection Matrix / Sample Plan

Sequoyah Nuclear Station Licensed Operator Qualification Report
 Return to Licensed Duties Certifications
 Remediation Training Records
 10 Licensed Operator Medical Records

Procedures:

OPDP-10, Licensed Status Maintenance, Reactivation and Proficiency for Non-Licensed Positions, Rev. 0
 OPDP-10, Licensed Status Maintenance, Reactivation and Proficiency for Non-Licensed Positions, Rev. 1
 OPDP-10, Licensed Status Maintenance, Reactivation and Proficiency for Non-Licensed Positions, Rev. 2
 NPG-SPP-17.6, Standard Programs and Processes, Evaluation Phase, Rev. 1
 TDM-0.8, Conduct of LOR, Rev. 26
 TRN-11.4, Continuing Training for Licensed Personnel, Rev. 16
 TRN-12, Simulator Regulatory Requirements, Rev. 9
 TRN-11.10, Annual Requalification Examination Development and Implementation, Rev. 16

Written Examinations Reviewed:

Exam Week 1 Shift RO Exam
 Exam Week 1 Shift SRO Exam

Job Performance Measures Reviewed:

JPM74-2AP, Operate the TD AFW Pump Locally, Rev. 9
 JPM79-2, ATWS, Trip the MG Supply Breakers (at 480 V Unit Boards), Rev. 0
 JPM13AP, Transfer to Hot Leg Recirculation, Rev. 11
 JPM28, Startup of A-A Hydrogen Recombiner, Rev. 17
 SRO ADMIN D, Classify the Event per the REP (SGTR with Failed S/G Safety), Rev. 0

Simulator Scenarios:

S5- Steam Generator Tube Rupture, Rev. 15
 S11- LOCA with Loss of RHR Recirculation, Rev. 15

Simulator Testing Reviewed:

Normal Operation Tests:
 Static Test – 100% Power, 12/27/2009
 Static Test – 73% Power, 12/27/2009
 Static Test – 38% Power, 12/31/2009
 Drift Test – 100% Power, 12/27/2009

Transient Tests:

Transient 1 – Manual Reactor Trip, 12/31/2009
 Transient 2 – Loss of Feedwater, 12/31/2009
 Transient 3 – MSIV Closure, 12/31/2009
 Transient 4 – Trip of All RCPs, 12/31/2009
 Transient 5 – RCP #2 Trips, 12/31/2009

Malfunction Tests:

CV04 – Letdown Line Break inside the Auxiliary Building, 11/18/2010

ED104 – Loss of 120V AC Inverter, 07/19/2010

EG01 – Main Generator Trip, 07/19/2010

Simulator Discrepancy Reports (DRs) closed out:

DR 5064, Associated Electrical – Shutdown board 1B-B voltage failed the ANSI 10% non-critical parameter criterion at the 38% power level.

DR 5065, Simulator Tune/Fidelity – Loop 1 and Loop3 Steam Flows Failed the 2% ANSI criteria for critical parameters at 100% power level.

Simulator work requests Still open:

N/A

SRs/PERs' Reviewed:

SR 294241, OPDP 10 guidance is inadequate to ensure license reactivation requirements are satisfied

SR 294812, ES-1.4 Step 3 RNO Part 4 is confusing as written

SR 294847, 10 licensed operators have not completed Job Safety Analysis or Planning Jobs Safely

SR 294991, Update TRN-12 Steady State Test section

PER 172189, Quality of Training Material

PER 172194, Simulator Fidelity

PER 204721, SRO Failed JPM Portion of Annual Operating Exam

PER 217974, LOR Cycle 10-1 Written Exam Failure

PER 227538, SQN Training Audits SSA 1004 Simulator Deficiencies (PDS)

PER 237850, 2010 WANO Performance Deficiency – TRN (Simulator Realism)

PER 238201, 2010 WANO Area For Improvement (TR.1-1), Apparent Cause Evaluation Report, Rev 2

PER 247339, Root Cause Evaluation Report for Initial License Training Class 1009, Missed Transient and Accident Analysis Training

Section 1R12: Maintenance Rule Implementation

TI-4, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting – 10 CFR 50.65, Revision 22

TI-4 Function 030-L, Attachment 7, Heating, Ventilation, and Air Conditioning

CDE's 2315, 2362, 2405, and 2445

System Health Reports System 30

SR 264060, 1A-A 480V BD Room Chiller Tripped

SR 292488 and 292451, 1B 480V Bd Room Chiller Tripped

SR 293090, Oil Protection Switch Wrong QA Level

WO 111701783, Failed Dp Switch for 1B-B 480V SDBD Room Chiller

CDE's 2420, 2419, 2510, 2501, 2508, 2505, 2240

Section 1R13: Maintenance Risk Assessments and Emergent Work Evaluation

0-TI-DSM-000-007.1, Risk Assessment Guidelines, Revision 9

SPP-7.3, Work Activity Risk Management Process, Revision 5

SPP-7.2.4, Forced Outage or Short Duration Planned Outage Management, Revision 1

SPP-7.2, Outage Management, Revision 18
 GOI-6, Apparatus Operations, Revision 134
 Sentinel Risk Model run dated 26 October, 2010
 Sentinel Risk Model run dated 28 October, 2010
 Sentinel Risk Model run dated 1 December, 2010
 Sentinel Risk Model run dated December 29, 2010
 2-PI-ENG-SERC, SERC Real and Reactive Power Generation Capability Verification,
 Revision 0
 2-PI-ENG-SERC 50.59 Screening Review
 GOI-6, Apparatus Operations, Revision 139

Section 1R15: Operability Evaluations

FSAR Section 15, Accident Analysis
 SQN-DC-V-13.9.8, Design Criteria-Auxiliary Feedwater, Revision 22
 0-TI-PDM-000-002.0, Oil Sampling and Monitoring, Revision 4
 PER 267002, 1A-A MDAFWP Motor Oil Sample Degrading Trend

Section 1R18: Plant Modifications

WO 111190313, Install 6.9kV Temporary Power Conduit and Cabling for Start Bus
 Replacement
 WO 111131737, CSST A, A1 and A2 Bus Replacement
 WO 111447535, Install Unit 1 Start Bus 1A and 1B
 DCN 22419 Revision A 50.59 Evaluation
 1,2-15E500-1, Key Diagram Station Aux Power System, Revision 29
 1,2-15E500-2, Key Diagram Station Aux Power System, Revision 12
 0-MA-ESC-317-300.2, Connection of Blackout Diesel Generator to 5th Diesel Generator Board,
 Revision 3
 PER 292953, PMT Preparer Not Documented on DCN Package

Section 1R19: Post Maintenance Testing

MMDP-3, Guidelines for Planning and Execution of Troubleshooting Activities, Revision 5
 SPP-6.5, Foreign Material Control, Revision 14
 MMDP-1, Maintenance Management System, Revision 18
 MMDP-3, Guidelines for Planning and Execution of Troubleshooting Activities, Revision 6
 SPP-6.1, Work Order Process Initiation, Revision 8
 SPP-8.1, Conduct of Testing, Revision 6
 0-SI-SLT-030-258.1, Containment Isolation Valve Local Leak Rate Testing Purge Air,
 Revision 7
 0-SI-MIN-061-105.0, Ice Condenser – Ice Weighing, Revision 7
 Regulatory Guide 1.163 Performance-Based Containment Leak-test Program,
 NEI 94-01, Nuclear Energy Institute Industry Guidelines for Implementing Performance-Based
 Option to 10 CFR Part 50, Appendix J, Revision 1j
 1-SI-SXP-003-202.A, Motor Driven Auxiliary Feedwater Pump 1A-A Comprehensive
 Performance Test, Revision 2

Section 1R20: Refueling and Outage Activities

Tagout 1-TO-2020-0026 Clearance 1-62-0832-RFO
 0-GO-9, Refueling Procedure, Revision 37

FHI-3, Movement of Fuel, Revision 60
 0-GO-15, Containment Closure Control, Revision 31
 0-GO-13, Reactor Coolant System Drain and Fill Operations, Revision 66

Section 1R22: Surveillance Testing

SPP-8.1, Conduct of Testing, Revision 5
 FSAR Section 6.3, Emergency Core Cooling System
 1,2-47W810-1, Flow Diagram Residual Heat Removal System, Revision 53
 1-47W811-1, Flow Diagram Safety Injection System, Revision 72

Section 2RS1: Radiological Hazard Assessment and Exposure Controls

Procedures, Guidance Documents, and Manuals

NQA Form 1.06, Multi-Badge/Extremity Issue Log Sheet
 NQA Form 1.06, Multi-Badge/Extremity Issue Log Sheet
 NQQ Form 1.03, Multi-Badge/Extremity Tracking Form
 NPG-SPP-05.1, Radiological Controls
 NPG-SPP-03.1, Corrective Action Program Rev. 0
 RCI-10, ALARA Planning Checklist for Lower Containment Entries IPCW During Mode 1 Power Operations
 RCI-15, Radiological Postings, Rev. 18
 RCI-24, Control of Very High Radiation Areas, Revision 10
 RCI-31, Diving Operations, Revision 1
 RCI-28, Control of Locked High Radiation Areas, Rev. 11
 RCI-29, Control of Radiation Protection Keys, Rev. 10
 RCI-209, Radiological Surveys of Personnel Leaving the RCA or Protected Area, Rev. 2
 RCDP-1, Conduct of Radiological Controls, Rev. 003
 RCDP-3, Administration of Radiation Work Permits (RWPs), Rev. 2
 RCTP-106, Special Dosimetry Operations, Revision 1

Records and Data

NQA Form 1.06, Multi-Badge/Extremity Issue Log Sheet
 NQA Form 1.06, Multi-Badge/Extremity Issue Log Sheet
 NQQ Form 1.03, Multi-Badge/Extremity Tracking Form
 NPG-SPP-05.1, Radiological Controls
 SQN ALARA Planning Report 2010-37

Radiation Work Permits (RWPs)

RWP # 09047200, U-2 Upper Containment –MODs, Replace RP Cables From Reactor Head Vertical Panel To Devices on the Top of the Reactor
 RWP # 09037020, U-2 Lower Containment Steam Generators 1-4, Full Jump for Installing and Removing Nozzle Dams
 RWP # 1004413, U-1 Upper CTMT/RX Cavity: Remove/Replace CETNAS to Include Cleaning and Associated Work
 RWP#09047062, U-2 Upper Containment: I&C- Remove and Install Thermocouples and Loose Parts Monitors
 RWP 1004413, U-1 Upper CTMT/RX Cavity: LHRA –Remove/Replace CRDM Duct work, Flex Boots and Supports
 RWP # 10044120, U-1 Upper CTMT/RX Cavity/Pressurizer: Install Temporary Shielding

RWP # 10044062, U-1 Upper CTMT: I&C – Remove/Install Thermocouples Connections and Loose Parts Monitors

RWP# 09047143, U-2 Reactor Cavity LHRA-Retrieve Stud Hole Plug

RWP # 09047159, U-2 RX Head Stand Area, Remove RX Head O-RINGS; Perform Manual Cleaning and Honing of Surface; QA/QC Inspections; Inspect RX Vessel Flange in Reactor Cavity

RWP#09047062, U-2 Upper Containment, Remove/Install Thermocouples and Loose Parts Monitors

Surveys

Survey # 042609-2, Unit 1 Letdown Heat Exchanger Room 4/26/09

Survey # 0922210-17, A420 Unit 2 Access Room 9/22/10

Survey # 092310-5, Unit 1 Pipe Chase 9/23/10

Survey # 100810-8, Unit 1 Letdown Heat Exchanger Room 10/8/10

Survey # 100810-13, Cask Loading Area (Truck Bay)

Survey # 101710-4, Waste Compactor Room 10/17/2010

Survey # 101810-9, Unit 1 Pipe Chase 10/18/10

Survey # 10310-7, U1 Inside Polar Crane Wall 10/7/10

Survey # 10310-7, U1 Inside Polar Crane Wall 10/13/10

Survey #101410-7, DAW Bldg. and DAW Yard

PER 206134, RP Key #92 Not in RP Storage Box

PER 211902, High Radiation Area Did Not Have A Barrier Across the Entrance

PER 224531, LHRA/ALARA Issue – Flux Map Surveys

PER 233315 Personnel clothing alarming ACP security Gate house PM-7

PER 237590, Proper Collection of Leaking Water 8/1/10

PER 237977, High Radiation Dose on the Filter

PER 239457, Failure to Use Proper LHRA Key Control Sheet

PER 240082, Inappropriate method used for catch containment

PER 244122, RP Technician Respirator Fit Expired

PER 244851, LHRA/VHRA Stamp for Keys

PER 245243, Job Interrupted due to Electronic Dosimeter Configuration

PER 245569, Dose Overestimated

PER 245573, Qual. cards not submitted to training in a timely manner

PER 248337, Radcon Tech missed scheduled HU training 9/8/10

PER 249245, Pre job Briefing for @BRHR Pump Room Cooler

PER 269800, LHRA Posting For Reactor Cavity

Section 2RS2: Occupational ALARA Planning and Controls

Procedures, Guidance Documents, and Manuals

NPG-SPP-05.2, ALARA Program, Rev. 0

NPG-SPP-05.1, Radiological Controls, Rev. 1

RCI-10, ALARA Program, Rev. 31

RCI-14, Radiation Work Permit (RWP) Program, Rev. 48

RCDP-1, Conduct of Radiological Controls, Rev. 3

RCDP-3, Administration Of Radiation Work Permits (RWPs), Rev. 2

Reports, Records, and Data

Graphs: SQN U1R17 Department Dose vs Goal (rem), 10/2/10-10/19/10

Graphs: SQN U1R17 Area(Craft) Dose vs Goal (rem), 10/2/10-10/19/10

U1R17 Radiation Protection Status Report 10/20/10 (Gives dose status of various ALARA Planning Reports (APR))

Gap Analysis: Comparison Of Various ALARA Initiatives Including Planned Implementation And Cost Benefit Estimates.

SQN ALARA Planning Report 2010-24, Scaffolding (Modification Carpenters only)

SQN ALARA Planning Report 2010-25, Insulation (Modification Insulators only)

SQN ALARA Planning Report 2010-29, Radiation Protection Surveillance

SQN ALARA Planning Report 2010-31, U1R17 Operations

SQN ALARA Planning Report 2010-37, Diving in reactor cavity to find and mitigate the refueling cavity leakage

Printout Roster of In- Progress Reviews by percentage and date as of 10/20/10 01:53

SQN ALARA Planning Report 2010-10 Post job review. 10/7 and 10/11/10

SQN ALARA Planning Report 2010-11 Post job review. 10/15/10

SQN ALARA Planning Report 2010-14 Post job review. 10/11/10, 10/14/10, and 10/19/10

SQN ALARA Planning Report 2010-15 Post job review. 10/15/10

SQN ALARA Planning Report 2010-16 Post job review. 10/9/10

SQN ALARA Planning Report 2010-17 Post job review. 10/13/10

SQN ALARA Planning Report 2010-19 Post job review. 10/11/10 and 10/18/10

SQN ALARA Planning Report 2010-20 Post job review. 10/9/10 and 10/20/10

SQN ALARA Planning Report 2010-21 Post job review. 10/12/10 and 10/13/10

SQN ALARA Planning Report 2010-22 Post job review. 10/9/10

SQN ALARA Planning Report 2010-25 Post job review. 10/7/10 and 10/17/10

Spreadsheet showing dose rate trending data for various locations for U1C16 covering the period 3/29-4/29/09

Spreadsheet showing dose rate trending data for various locations for U2C16 covering the period 10/26-11/16/10

Spreadsheet showing comparisons of U1C15 to U1C16 and U2 C15 to U2C16

ALARA Meeting Minutes for seven meetings held 2/9/10, 3/9/10, 5/14/10, 6/3/10, 6/4/10, 8/31/10, and 9/2/10

APR 2009-50, U2C16 Refueling Operations

APR 2009-52, U2C16 Steam Generator Primary Inspection and Maintenance

APR 2009-64, U2C16 Scaffold Installation and Removal

APR 2009-65, U2C16 Insulation Removal and Installation

APR 2009-69, U2C16 Radiation Protection Surveillance

APR 2009-75, U2C16 RPI Cable Replacement

TSR10 -04, Install a vendor supplied web support system shield on the reactor head while the head is on the elevated storage stand.

TSR10 -05, Construct free standing shadow shields to be used in various locations in upper containment and in the reactor cavity.

TSR 10-06, Construct free standing shadow shield to be used in front of the Reactor Coolant Drain Tank enclosure

TSR 10-07, Shield Lower Containment CVCS Letdown Piping from RCS Xover Leg 3 through 1-FCV-062-0069 on RCP 2 Platform into Accumulator #2 through 1-FCV-062-0070 to the wall penetration into the regenerative heat exchanger room

TSR 10-08, U1R17 Pre-Outage, Lower Containment Mode 1 and outage - Unit-1 Raceway overhead letdown piping. Install 45 pounds/ft on the CVCS piping in the overhead.
 TSR 10-11, U1R17 Reactor Head CETNA Work Areas - 5 locations on U-1 Head near the top of the CRDM Shroud: Install four 45 pound blankets at each of the CETNA locations.
 TSR 10-12, This TSRF is to support shielding of 1B RHR pump during replacement of pump and motor.
 FY 2009 Annual ALARA Report
 U2C16 ALARA Outage Report

CAP Documents

Assessment: SQN-RP-S-10-25, ALARA Long Term Dose Reduction Program Evaluation, 4/19-22/10 and 8/25-26/10
 Assessment: SQN-RP-S-10-67, Occupational ALARA Planning and Controls, 5/17-21/10
 PER 215405, FY2010 Dose Goals are not Reflective of the Actual Work Being Performed
 PER 215934, The damaged lid boom has a W.O. that was written on 5/1/08 and still has not been addressed which requires maintenance to enter at floor level to change the filter picking up additional dose.
 PER 228158, Examine and document the behaviors and process that produced a total Operations dose of 9 mrem versus a goal of 57 mrem.
 PER 230306, The long term collective radiation exposure reduction plan 2007-2011 has not been reviewed by the site ALARA Committee since September 2008.
 PER243340, Dose over estimated

Section 2RS3: In-Plant Airborne Radioactivity Control and Mitigation

Procedures, Guidance Documents, and Manuals

0-PI-FPU-049-401.W, Self Contained Breathing Apparatus for Fire Brigade Use, Rev. 10
 0-PI-FPU-049-401.Y, Testing and Overhaul Of MSA SCBA Regulators, Rev. 3
 0-PI-FPU-049-401.M, Self Contained Breathing Apparatus, Rev. 28
 NPG-SPP-05.1, Radiological Controls, Rev. 1
 NPG-SPP-05.10, Radiological Respiratory Protection Program, Rev. 0
 RCDP-1, Conduct of Radiological Controls, Rev. 3
 RCDP-8, Radiological Instrumentation/Equipment Controls, Rev. 2
 RCI-04.01, Selection, Issue, and Use of Respiratory Protection Devices, Rev. 2
 RCI-04.02, Cleaning/Sanitizing, Maintenance, Inspection, Storage and Inventory of Respiratory Protection Devices, Rev. 2
 RCI-04, Respiratory Protection Program, Rev. 49
 RCI-05.200, Calibration of Low Volume Air Samplers, Rev. 3
 RCI-05.201, Calibration of High Volume Air Samplers, Rev. 3
 RCI-05.202, Calibration of Radeco Model H-810 Air Samplers, Rev. 2
 RCI-05.203, Calibration and Operation of the Eberline Beta Particulate Monitor Model AMS-4, Rev. 2
 RCI-05.204, Scintrex Model 309a Portable Tritium-In-Air Monitor, Rev. 0
 RCI-05, Radiation Protection Instrumentation Program, Rev. 69
 RCTP-101, Operation of the Mask Fit System, Rev. 0
 RCI-201, Radiation and Contamination Surveys, Rev. 5
 RCI-202, Airborne Radioactivity Surveys, Rev. 2
 RCI-10, ALARA Program, Rev. 31

RCI-14, Radiation Work Permit (RWP) Program, Rev.48
 RCI-32, Alpha Contamination Monitoring and Controls, Rev. 1
 RCI-106, Radiation Protection Standards and Expectations, Rev. 0
 RCI-403, Radiological Surveys During Refueling Cavity Drain Down, Rev. 0
 Lesson Plan, HPT063.002, Self Contained Breathing Apparatus (SCBA) Training, Rev. 7
 NPG-SPP-03.1, Corrective Action Program, Rev. 0
 NPG-SPP-01-14, Service Request Initiation, Rev. 0

Records and Data

Vendor report: Grade D Certificate for Plant System Air Compressors Alpha, Bravo, Charlie and Delta, Dated 9/29/2010
 Air Sample, Survey Number 100810006, U-1 Upper CTMT GA, 10/8/2010
 Air Sample, Survey Number 100810007, U-1 Rx. Cavity, 10/8/2010
 Air Sample, Survey Number 100810008, U-1 Mixed Bed Valve Gallery Breach of 1-62-902, 10/12/2010
 Air Sample, Survey Number 100810009, MBVG, 10/12/2010
 0-S1-SFT-030-132.A, Auxiliary Building Gas Treatment System Filter Train A, 3/2/10
 0-S1-SFT-030-132.B, Auxiliary Building Gas Treatment System Filter Train B, 10/31/08
 0-S1-SFT-030-132.B, Auxiliary Building Gas Treatment System Filter Train B, 7/8/10
 2-SI-SFT-030-002.B, Containment Air Return Fan 2B-B 18 Month Operability Test, 2/19/09
 1-SI-SFT-030-002.B, Containment Air Return Fan 1B-B 18 Month Operability Test, 4/7/10
 Air Quality Analysis, Bauer/87/2200/07, 06/18/09
 Air Quality Analysis, Bauer SN: 7/2200/07, 01/08/10
 Air Quality Analysis, Bauer SN: 7/2209/07, 03/26/09
 Air Quality Analysis, TVA Sequoyah Fire OPS, 09/29/08
 Calibration Reports for Spent Fuel Pool AMS-4 (Continuous Air Monitors) TVA Tracking # 860257, 860258 and 860272
 Self-Assessment: SQN-RP-F-10-001, Radiation Monitoring Instrumentation and Protective Equipment and Performance Evaluation, 5/24-28/2010
 Self-Assessment: SQN-PR-S-10-68, In-Plant Airborne Radioactivity Control and Mitigation, 5/24-28/2010

CAP Documents

PER 215926, 27 records in HIS-20 were found to have respiratory training due dates that were incorrect.
 PER 222647, Routine Tasks not being completed as scheduled.
 PER 224580, MASK FIT data ATIS entry change management not communicated.
 PER 236436, Safety Issue - Empty SCBA Bottles Found in Ready for Use Rack
 PER 226636, This SR was written to address unavailability of Post Accident Sampling Facility Breathing Air.
 PER 231043, Self Assessment #SQN-RP-F-10-02, Identified Areas for Enhancement
 PER 233432, Review OE31303- High Alpha Airborne Levels Require Implementation of Bioassay (in-vitro) Sampling (Oconee Nuclear Station - ONS) and communicate any lessons learned to the RP Staff.
 PER 233625, Review MER ATL 10-252 and communicate any lessons learned to the RP Staff.
 PER 240299, Items in Hot Machine Shop are above limits specified in RCI-201.
 PER 270408, Miscalculation of Air Sample >30% DAC

2RS8: Radioactive Material Processing and TransportationProcedures, Manuals, and Guides

0-SO-77-29, Waste Processing, Revision (Rev.) 18
 Cask Book for Model 10-160B USA/9204B(U)F-96, Rev. 24
 FHI-1, Attachment 1, Unloading, Loading, and Handling of Map 12 Shipping Containers,
 Dated 08/26/09
 NPG-SPP-03.1, Corrective Action Program, Rev. 0
 NPG-SPP-05.6, Controlling Byproduct and Source Material, Rev. 0
 NPG-SPP-05.7, Radwaste Management, Rev. 0
 NPG-SPP-05.8, Special Nuclear Material Control, Rev. 0
 Operating Procedure for Energy Solutions Modular Fluidized Transfer Demineralization System
 at TVA-Sequoyah, DMP-OP-044-49200, Rev. 14
 Process Control Program, Rev. 4
 Radioactive Material Shipment Manual, Vols. II, Rev. 40; and III, Rev. 39
 RCI-06, Receipt of Radioactive Materials, Rev. 19
 RCI-15, Radiological Postings, Rev. 18
 RCI-17, Control of Byproduct and Source Material, Rev. 18
 RCI-21, Control Radioactive Materials, Rev. 14
 RCI-28, Control of Locked High Radiation Areas, Rev. 11
 RCI-204, Radiological Surveys of Equipment and Materials Leaving the RCA, Rev. 2
 RHSI-1, Packaging Dry Active Waste for Shipment to a Waste Processor/Broker or a
 Commercial Radwaste Burial Facility, Rev. 9
 RHSI-1.1, Packaging Filters and Items of High Levels of Radiation, Rev. 5
 RHSI-7, Utilization of Polyethylene High Integrity Containers (HIC) and HIC Overpacks, Rev. 8
 RHSI-11, Control of Radioactive Material and Training, Rev. 5
 RHSI-13, Administration and Control of Onsite Storage of Low Level Radioactive Waste, Rev. 3
 RWTP-100, Radioactive Material/Waste Shipments, Rev. 6
 RWTP-101, 10 CFR 61 Waste Characterization, Rev. 1
 RWTP-102, Use of Casks, Rev. 2
 SPP-3.1, Corrective Action Program, Rev. 1

Radwaste and Shipping Records Data

2009 Annual Radioactive Effluent Release Report for Sequoyah Nuclear Plant
 Certificates of Completion for selected Radwaste Shippers for Radioactive Waste Packaging,
 Transportation and Disposal Training, Radioactive Materials Packaging and
 Transportation IATA Training, and Federal Motor Carrier and Hazardous Materials
 Transportation Standards for Protection Against Shifting and Falling Cargo, Dated
 January and February 2010
 Certificate of Compliance (CoC) No. 9204, Model No. 10-160B Shipping Package, Rev. 14
 CoC No. 9319, Model Numbers (Nos). Map-12 and Map-13 Shipping Package, Rev. 3
 Database Summary for Material Type 20' Sea land, Material Type Characteristic Summary,
 DAW 05/15/09
 Mechanical Flow Diagram Waste Disposal System, CCD Nos: 1, 2-47W830-1, Rev. 32;
 1, 2-47W830-2, Rev. 34; 1, 2-47W830-3, Rev. 34; 1, 2-47W830-4, Rev. 47;
 1, 2-47W830-5, Rev. 6; 1, 2-47W830-6, Rev. 51; 1, 2-47W830-7, Rev. 20;
 1, 2-47W830-38 Rev. 3; and 1, 2-47W830-9, Rev. 1

Sequoyah Nuclear Station VSDS Survey Report, One Liner Survey Report, Survey No. 111410-3, A810 - U-0 734 Reverse Osmosis Room - Laundry – 1st bag, 2nd bag, selected other items, and floor areas; and A320 – U-2 Charging Pump Room 2C-C –Laundry, Dated 11/15/10

Sequoyah Shields Panels and Supports, Drawing No. C-007-161079-001, Rev. 0

Shipment: SNP-09-1124, E/C Equipment, Dated 11/24/09

Shipment: SNP-10-0307, C-Zone Laundry, Dated 03/30/10

Shipment: SNP-10-0706, Long Handle Tools, Dated 07/30/10

Shipment: SNP-10-1008, DAW, Dated 10/18/10

Shipment: SNP-10-1014, Thimble Cutting Equipment, Dated 10/21/10

Training and Development Attendance Records for RWTP-100, Radwaste Environmental Control Training Packaging and Loading of Radioactive Materials, Dated 01/08/09 and 03/27/09

Waste Stream Reports: CVCS Resin 09/30/09; DAW 05/15/09; Raddi Resin CL 40617-5; U1 RCS Filter 01/11/10; and U2 RCS Filter 02/10/10

Work Order (WO) No. 110885694, MMDP-3 Troubleshoot Plan, Engineering to perform leak test checks on the waste gas stream

WO No. 110784185, New Rad DI personnel barrier

WO No. 111655083, Install scaffold barrier on top of the Drumming Station well above the RAD DI

Corrective Action Program Documents

Assessment: CPR-TPR-S-10-007, On Site LLW Storage and B/C Waste Minimization Assessment – TVA Fleet - SQN, Dated 09/15/10

Assessment: SQN-RP-S-10-66, Snapshot Self-Assessment, Radiological Hazard Assessment and Exposure Controls, Dated 05/15/10

Assessment: SQN-RP-S-10-69, Snapshot Self-Assessment, Radioactive Solid Waste Processing and Radioactive Material Handling and Storage and Transportation, Dated 09/15/10

Problem Evaluation Report (PER) No. 226106, The WGDT system continues to require that N2 be added to it because of Leaks

PER No. 284241, Investigative survey of protective clothing indicated items above procedure limits

Service Request 285546, Install scaffold barrier on top of the Drumming Station wall above the RAD DI

Section 40A1: Performance Indicator Verification

Procedures

NPG-SPP-02.2, Performance Indicator Program, Rev. 0

Records and Data Reviewed

0-SI-CEM-077-400.1, Liquid Waste Effluent Batch Release, Rev. 0049, for release permit dated 8/14/10

0-SO-77-1 Waste Disposal System (Liquid), Rev. 0047, for release permit dated 8/14/10

Gas Radioactive Waste Release Permit 2010128.027.037.G Consisting of the Following: Surveillance Task Sheet, Containment (Lower Compartment) Vent to Auxiliary Building Exhaust, Dated 9/22/10

0-SI-CEM-030-410.1, Containment (Lower Compartment) Vent to Auxiliary Building Exhaust

Attachment

Gamma Isotopic Analysis Data
 Calculated Doses at the Site Boundary for Noble Gases, Radioiodine and Particulates
 0-SO-30-8, Containment Pressure Control, Rev. 29, Performed 9/14-21/2010
 Chemistry and RP internal Performance Indicator Summaries for September 2010

CAP Documents

PER 206522 Dose Rate Alarm
 PER 207085 Valid Dose Alarm
 PER 216650, Electronic Dosimeter Invalid Alarm due to Anti-theft device and X-ray at gatehouse.
 PER 220125, Radioactivity Detected at Scrap Metal Vendor Facility
 PER 224531, LHRA /ALARA issue –Flux Map Surveys
 PER 246416, Multiple procedure violations and human errors during post resin transfer surveys
 PER 239394, Dose Rate Alarm on Electronic Dosimeter caught by HIS-20
 PER 246375, Unanticipated Dose Rate Alarm During Survey of U1 Lower CTMT raceway
 PER 248463, Worker unable to hear ED alarm on elevation 714
 PER 260323, Invalid dose rate alarm
 PER 262499, Unanticipated Dose Rate Alarm

Section 40A1: Performance Indicator (PI) Verification

SPP-3.4, Performance Indicator Program, Revision 10
 NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 6

Section 40A2: Identification and Resolution of Problems

0-GO-14-1, Auxiliary Building 1 AUO Operator Rounds, Revision 22
 0-GO-14-2, Auxiliary Building 2 AUO Operator Rounds, Revision 26
 AOP-M.01, Loss of Essential Raw Cooling Water, Revision 22
 NPG-SPP-07.1, On Line Work Management, Revision 2
 OPDP-1, Conduct of Operations, Revision 18
 WOs 111714659 and 111064760
 Operations Directive Manual Appendix O, Operations Guide to Daily Work Control, Schedule Review, and Intolerance Item Standards, Revision 4
 MMTP-102, Erection of Scaffold/Temporary Work Platforms and Ladders, revision 4

Section 40A3: Event Follow-up

OPDP-1, "Conduct of Operations," revision 18
 EPIP-1, Emergency Plan Classification Matrix, revision 44
 AOP-S.06, Turbine Trip Below P-9 (50% Power), revision 12

Section 40A5: Other Activities

Records and Data

NRC Form 748, National Source Tracking Transaction Report, License. No. DPR-77, 09/01/2010
 NRC Form 748, National Source Tracking Transaction Report, License. No. DPR-77, 09/16/2009
 SQN Byproduct and Source Material Inventory Sheet

O-SI-RCI-000-056.0, Byproduct Material Inventory and Sealed Source Leak Test, 1/7/10
 O-SI-RCI-000-056.0, Byproduct Material Inventory and Sealed Source Leak Test, 7/11/10

Licensing Bases Documents

- ML0813601011, Browns Ferry Nuclear Plant (BFN) Units 1, 2 And 3, Sequoyah Nuclear Plant (SQN) Units 1 and 2, and Watts Bar Nuclear Plant (WBN) Units 1 And 2 - Initial Response to NRC Generic Letter (GL) 2008-01: Managing Gas Accumulation In Emergency Core Cooling, Decay Heat Removal, And Containment Spray Systems Dated January 11, 2008, May 9, 2008
- ML0816300860, Browns Ferry Nuclear Plant (BFN) Units 1, 2 And 3, Sequoyah Nuclear Plant (SQN) Units 1 and 2, And Watts Bar Nuclear Plant (WBN) Units 1 And 2 - Revised Initial Response to NRC Generic Letter (GL) 2008-01: Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems, Dated January 11, 2008, June 6, 2008
- ML0828905400, Browns Ferry Nuclear Plant (BFN) Units 1, 2 And 3, Sequoyah Nuclear Plant (SQN) Units 1 and 2, and Watts Bar Nuclear Plant (WBN) Unit I - 9 Month Response to NRC Generic Letter (GL) 2008-01: Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, And Containment Spray Systems, Dated January 11, 2008, October 11, 2008
- ML0920804470, 90 Day Follow-Up Response to NRC Generic Letter (GL) 2008-01: Managing Gas Accumulation In Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems, July 24, 2009
- ML092680881, Safety Evaluation of License Amendment Request for Technical Specification Changes NO. 07-05, "Emergency Core Cooling System", Sequoyah Nuclear Plant – Units 1 and 2 (TAC NOs. ME1115 and ME1116)
- ML093310403, Sequoyah Nuclear Plant, Units 1 and 2 – Issuance of Amendments Regarding the Upgrade of Emergency Core Cooling System Requirements per NUREG-1431 (TS 07-05) (TAC NOs. ME1115 and ME1116), January 28, 2010
- ML100541590, Nine-Month Supplemental Response to NRC Generic Letter 2008-01: Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal and Containment Spray Systems, February 19, 2010
- ML1020100610, Response to Request for Additional Information Regarding Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems", July 15, 2010
- ML1030101620, Closure Letter for the Sequoyah Nuclear Plant Response to Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal and Containment Spray Systems", October 29, 2010

Miscellaneous

- SQN-ENG-F-10-15, Focused Self Assessment Report – Readiness of NRC Inspection of SQN Response to Generic Letter (GL) 2008-01 – Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal (or Residual Heat Removal), and Containment Spray Systems, June 18, 2010
- TVA-90-1050, CCP Gas Issue, September 27, 1990
- TVA-92-140, CCP Hydrogen Gas Accumulation, July 23, 1992

Drawings

1-47K406-57-1, Isometric CVCS Suction Piping from RWST Header & RHR HX 1A, Rev. 0
 1-47K432-50, Isometric of Residual Heat Removal Piping, Rev. 1
 1-47K432-50-1, Isometric of Residual Heat Removal Piping, Rev. 0
 1-47K435-53, Isometric of Safety Injection Piping, Rev. 3
 1-47K435-53-1, Isometric of Safety Injection Piping, Rev. 1
 1-47K435-54, Isometric of Safety Injection Piping, Rev. 0
 1-47W406-1, Mechanical Chemical and Volume Control System Piping, Rev. 7
 1-47W809-1, Flow Diagram Chemical & Volume Control System, Rev. 75
 1-47W811-1, Flow Diagram Safety Injection System, Rev. 72
 2-47W809-1, Flow Diagram Chemical & Volume Control System, Rev. 72
 2-47W811-1, Flow Diagram Safety Injection System, Rev. 60
 1,2-47K435-50, Isometric of RHR, CS and SIS Pump Supply Piping, Rev. 1
 1,2-47K435-51, Isometric of RHR, CS and SIS Pump Supply Piping, Rev. 2
 1,2-47K435-51-1, Isometric of RHR, CS and SIS Pump Supply Piping, Rev. 2
 1,2-47W809-2, Flow Diagram CVCS Chemical Control, Rev. 31
 1,2-47W810-1, Flow Diagram Residual Heat Removal System, Rev. 53
 1,2-47W812-1, Flow Diagram Containment Spray System, Rev. 44

Calculations/Functional Evaluations

FAI/08-78 Methodology for Evaluating Waterhammer in the Containment Spray Header and Hot Leg Switchover Piping
 FE 41022, SIS 2A Discharge Pipe Not Water Solid
 FE 42823, Gas Accumulation in Unit 2 Trains A and B CCP Miniflow Line, Rev. 2
 FE 42912, Functional Evaluation for the Effects of Gas Accumulation on the ECCS and Containment Spray System Performance
 MDQ00006320100240, Calculation of Effects of Gas Accumulation in ECCS Piping, Revision 0

PERs Reviewed During Inspection

73203, Gas void below 1-FCV-63-8
 138112, Gas Intrusion in Safety Systems
 151334, Gas void in U1 emergency boration line
 152153, Gas accumulation in 2A CCP recirculation line
 153121, Emergency Boration Line void
 153639, Gas accumulation
 155199, Gas void in the U1 Emergency Boration line
 156322, Gas in CCP emergency boration line
 156798, Gas in CCP emergency boration line
 165645, 1A SI Discharge Vent with 25 sec gas
 172863, Emergency boration line void
 203137, Gas void in the U1 Emergency Boration piping
 226464, Gas Void in Unit 2 Emergency Boration Line
 241940, Deficiency for SQN-ENG-F-10-15, Containment piping walkdown data needs better documentation
 242024, AFI for SQN-ENG-F-10-15 design document for void acceptance criteria
 242026, Deficiency for SQN-ENG-F-10-15, PER 138112 enhancement request for additional vents

242042, Learning Opportunity for SQN-ENG-F-10-15, Independent review of data in FE 42912
 242050, Learning Opportunity for SQN-ENG-F-10-15, Adequacy of one minute vent time
 242231, AFI for SQN-ENG-F-10-15, Use of available vent valves in Fill/Vent procedures
 247942, Performance of 0-PI-ISO-000-001.A identified voids below 1-FCV-63-8 and in
 Emergency Boration line
 258566, Gas void identified in the Unit 1 Emergency Boration piping

Procedures

0-SI-OPS-074-128.A, RHR Pump A-A Casing Vent, Revision 13
 0-SI-OPS-074-128.B, RHR Pump B-B Casing Vent, Revision 15
 0-SO-72-1, Containment Spray Systems, Revision 36
 0-SO-74-1, Residual Heat Removal System, Revision 73
 1-PI-OPS-000-020.1, Operator at the Controls Duty Station Checklists Modes 1-4, Rev. 29
 1-SI-OPS-062-040.A, Centrifugal Charging Pump 1A-A Casing and Discharge Piping Venting,
 Revision 22
 1-SI-OPS-062-040.B, Centrifugal Charging Pump 1B-B Casing Vent, Revision 6
 1-SI-OPS-063-129.A, 1A-A SI Pump Casing and Discharge Piping Vent, Revision 17
 1-SI-OPS-063-129.B, 1B-B SI Pump Casing and Discharge Piping Vent, Revision 17
 1-SI-OPS-074-128.0, Unit 1 RHR Discharge Piping Vent, Revision 26
 1-SO-62-1, Chemical and Volume Control System, Revision 62
 1-SO-62-6, Excess Letdown, Revision 17
 1-SO-63-1, Cold Leg Injection Accumulators, Revision 47
 1-SO-63-5, Emergency Core Cooling System, Revision 51
 2-SI-OPS-062-040.A, Centrifugal Charging Pump 2A-A Casing and Discharge Piping Venting,
 Revision 28
 2-SI-OPS-062-040.B, Centrifugal Charging Pump 2B-B Casing Vent, Revision 12
 2-SI-OPS-063-129.A, 2A-A SI Pump Casing and Discharge Piping Vent, Revision 14
 2-SI-OPS-063-129.B, 2B-B SI Pump Casing and Discharge Piping Vent, Revision 15
 2-SI-OPS-074-128.0, Unit 2 RHR Discharge Piping Vent, Revision 17
 2-SO-62-1, Chemical and Volume Control System, Revision 62
 2-SO-62-6, Excess Letdown, Revision 14
 2-SO-63-1, Cold Leg Injection Accumulators, Revision 36
 2-SO-63-5, Emergency Core Cooling System, Revision 46
 NEDP-22, Functional Evaluations, Rev. 9

Completed Testing

0-PI-ISO-000-001.A, Periodic Check for Presence of Water in Various A Train ECCS Piping
 Locations, 12/01/09
 0-PI-ISO-000-001.A, Periodic Check for Presence of Water in Various A Train ECCS Piping
 Locations, 12/15/09
 0-PI-ISO-000-001.A, Periodic Check for Presence of Water in Various A Train ECCS Piping
 Locations, 7/15/08
 0-PI-ISO-000-001.B, Periodic Check for Presence of Water in Various B Train ECCS Piping
 Locations, 8/19/08
 0-SI-OPS-074-128.A, RHR Pump A-A Casing Vent, 4/23/09
 0-SI-OPS-074-128.B, RHR Pump B-B Casing Vent, 5/2/08
 1-SI-OPS-074-128.0, Unit 1 RHR Discharge Piping Vent, 7/1/09

- 1-SI-OPS-074-128.0, Unit 1 RHR Discharge Piping Vent, 2/5/10
- 1-SI-OPS-062-040.A, Centrifugal Charging Pump 1A-A Casing and Discharge Piping Venting, 11/03/07
- 2-SI-OPS-062-040.A, Centrifugal Charging Pump 2A-A Casing and Discharge Piping Venting, 12/15/09
- 2-SI-OPS-062-040.A, Centrifugal Charging Pump 2A-A Casing and Discharge Piping Venting, 12/30/09
- 2-SI-OPS-062-040.B, Centrifugal Charging Pump 2B-B Casing Vent, 4/30/08
- 2-SI-OPS-063-129.B, 2B-B SI Pump Casing and Discharge Piping Vent, 6/12/08

SRs Generated As a Result of Inspection

- 290242, 7/1/09 ECCS gas vented with no PER written
- 290244, 12/15/09 gas was vented from the 2A CCP
- 290663, Surveillance Instructions for ECCS venting does not require an evaluation to be performed
- 290676, Cumulative effect of gas voiding identified during monthly ECCS venting surveillances
- 291084, 2-SO-62-1 and 2-SO-62-6 don't have gas evaluation steps
- 291195, Gas vented from SI on 6/12/08 not properly evaluated
- 291347, 7/16/08, an ECCS void was identified but no PER
- 291353, RHR cooling suction piping is not vented in emergencies
- 291511, NRC question about compliance with ECCS SR 4.5.2.b.1
- 291747, Question of acceptability of 6 cu ft criteria for CCP suction gas voids
- 291791, Inadequate surveillance procedures

LIST OF ACRONYMS

CAP	Corrective Action Program
CFR	Code of Federal Regulations
ED	electronic dosimeter
HPT	Health Physics Technician
HRA	high radiation area
IP	Inspection Procedure
LHRA	locked high radiation area
NEI	Nuclear Energy Institute
No.	Number
NSTS	National Source Tracking System
PERs	Problem Evaluation Report
PI	Performance Indicator
PM	portal monitor
QA	Quality Assurance
RCA	radiologically controlled area
Rev.	Revision
RS	Radiation Safety
RWP	radiation work permit

TI	Temporary Instruction
TLDs	thermoluminescent dosimeters
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
U1	Unit 1
U2	Unit 2
VHRA	very high radiation area