



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

May 7, 2015

Mr. Joseph W. Shea
Vice President, Nuclear Licensing
Tennessee Valley Authority
1101 Market Street, LP 3D-C
Chattanooga, TN 37402-2801

**SUBJECT: SEQUOYAH NUCLEAR PLANT - AMENDED NRC INTEGRATED INSPECTION
REPORT 05000327/2014003 AND 05000328/2014003**

Dear Mr. Shea:

This letter reissues Inspection Report 05000327/2014003 and 05000328/2014003 (ADAMS Accession Number ML14213A166) with an amendment to add Section 4OA5.2. This amendment adds documentation of the follow-up inspection of confirmatory action letter for Watts Bar Nuclear Plant Unit 1, and Sequoyah Nuclear Plant, Units 1 and 2, Commitments to Address External Flooding Concerns (CAL Number NRR-12-001) (ADAMS Accession Number ML12165A527).

On June 30, 2014, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Sequoyah Nuclear Plant, Units 1 and 2. On July 9, the NRC inspectors discussed the results of this inspection with Mr. Simmons and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented two findings which were determined to be of very low safety significance (Green) in this report. These findings involved violations of NRC requirements.

If you contest the violation or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC resident inspector at the Sequoyah Nuclear Plant.

If you disagree with a cross-cutting aspect assignment 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.

J. Shea

2

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," 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's Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Documents Access and Management 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/

Michael F. King, Chief
Reactor Projects Branch 6
Division of Reactor Projects

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

Enclosure:
IR 050003272014003, 05000328/2014003
w/Attachment: Supplementary Information

cc via ListServ distribution

J. Shea

2

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," 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's Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Documents Access and Management 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/

Michael F. King, Chief
Reactor Projects Branch 6
Division of Reactor Projects

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

Enclosure:
IR 05000327/2014003, 05000328/2014003
w/Attachment: Supplementary Information

cc via ListServ distribution

PUBLICLY AVAILABLE NON-PUBLICLY AVAILABLE SENSITIVE NON-SENSITIVE

ADAMS: Yes ACCESSION NUMBER: _____ SUNSI REVIEW COMPLETE

FORM 665 ATTACHED

| | | | | | | |
|--------------|--------------|--------------|--------------|--------|--------|--------|
| OFFICE | RII:DRP | RII:DRP | RII:DRP | | | |
| SIGNATURE | /RA By CRK1/ | .RA By SRS5/ | /RA By MFK1/ | | | |
| NAME | CKontz | SSandal | MKing | | | |
| DATE | 3/6/2015 | 3/7/2015 | 5/6/2015 | | | |
| E-MAIL COPY? | YES NO | YES NO | YES NO | YES NO | YES NO | YES NO |

OFFICIAL RECORD COPY DOCUMENT NAME:
\\NRC.GOV\NRC\IR2\OFFICE\DRPI\RPB6\SEQUOYAH\REPORTS\2014\003\AMENDED SEQUOYAH IR
2014-003.DOCX

J. Shea

3

Letter to Joseph W. Shea from Michael F. King dated May 7, 2015.

SUBJECT: SEQUOYAH NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT
05000327/2014003 AND 05000328/2014003

Distribution:

D. Gamberoni, RII

L. Gibson, RII

OE Mail

RIDSNRRDIRS

PUBLIC

RidsNrrPMSequoyah Resource

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-327, 50-328

License Nos.: DPR-77, DPR-79

Report Nos.: 05000327/2014003, 05000328/2014003

Licensee: Tennessee Valley Authority (TVA)

Facility: Sequoyah Nuclear Plant, Units 1 and 2

Location: Sequoyah Access Road
Soddy-Daisy, TN 37379

Dates: April 1 – June 30, 2014

Inspectors: G .Smith, Senior Resident Inspector
W. Deschaine, Resident Inspector
P. Braaten, Reactor Inspector (1R04)
C. Kontz, Senior Project Engineer (1R05, 1R11, 4OA5.2)
R. Hamilton, Senior Health Physicist (2RS02)
W. Pursley, Health Physicist (2RS01, 2RS03, 2RS04)
R. Kellner, Health Physicist (2RS05)
A. Butcavage, Reactor Inspector (1R08)
A. Sengupta, Reactor Inspector (1R08)
B. Collins, Reactor Inspector (4OA5.1)

Approved by: Michael F. King, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Enclosure

SUMMARY

IR 05000327/2014-003, 05000328/2014-003; 4/1-6/30/2014; Sequoyah Nuclear Plant, Units 1 and 2; In-Service Inspection; Radiological Hazard Assessment and Exposure Controls

The report covered a three-month period of inspection by resident and regional inspectors. Two findings/violations 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: Mitigating Systems

- Green: An NRC-identified Green non-cited violation (NCV) of 10 CFR 50.55a(g)(4), "Inservice Inspection Requirements" was identified for the licensee's failure to perform visual examinations of the control rod drive mechanism (CRDM), American Society of Mechanical Engineers (ASME) Class 1, seismic plate supports as required by the ASME Code, Section XI. The licensee entered this issue into their corrective action program (CAP) as Problem Evaluation Report (PER) 889400. The licensee developed an operability evaluation and concluded that the supports remained functional. The licensee also initiated corrective actions to perform the required visual examinations of the CRDM seismic plate supports before the end of the current inservice inspection (ISI) interval in April 2016.

The finding was more than minor because it was associated with the protection against external factors attribute of the mitigating systems cornerstone, and affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequence. The inspectors screened this finding as Green because the finding did not involve the loss or degradation of equipment or function specifically designed to mitigate a seismic initiating event. A crosscutting aspect was not assigned to this finding in accordance with IMC 0612, Appendix B, because the exclusion of the CRDM seismic plate supports from the scope of the ISI Program occurred outside of the nominal 3-year period for present performance, and therefore it was not reflective of present licensee performance. (Section 1R08)

Cornerstone: Occupational Radiation Safety

- Green: The inspectors identified a Green, self-revealing, NCV of Technical Specification (TS) 6.12.1, "High Radiation Area", for two examples where workers made entries into High Radiation Areas (HRA) on May 16, 2014, without meeting the entry requirements specified therein. Specifically, these workers, while performing decontamination activities and moving materials in the upper reactor containment, entered a posted HRA: 1) without knowledge of the current radiological conditions in

the actual work area, 2) not using a radiological work permit (RWP) approved for HRA entry, and 3) without wearing the prescribed electronic dosimetry for an HRA. The licensee entered these events into the Corrective Action Program (CAP) as Problem Evaluation Reports (PERs) Numbers 886668 and 886160. Immediate corrective actions included restricting worker access to the Radiologically Controlled Area (RCA) and issuance of communications to the site and within the Radiation Protection organization to reinforce roles in RWP adherence and access control.

This finding was more than minor because it is associated with the Occupational Radiation Safety Cornerstone attribute of Human Performance and adversely affects the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. The finding was not related to As Low As Reasonably Achievable planning, nor did it involve an overexposure or substantial potential for overexposure and the ability to assess dose was not compromised. Therefore, the finding was determined to be of very low safety significance (Green). This finding involved the cross-cutting aspect of Human Performance, Avoid Complacency [H.12] because workers failed to apply appropriate error reduction tools during participation in the pre-job brief and prior to crossing the HRA boundaries. (2RS1)

B. Licensee-Identified Violations

None.

REPORT DETAILS

Summary of Plant Status:

Unit 1 operated at or near 100 percent rated thermal power (RTP) for the entire inspection period.

Unit 2 operated at or near 100 percent RTP until April 12, 2014, when the unit entered a power coast down period. On May 12, with the unit at 76 percent RTP, Unit 2 was shut down for a refueling outage. Unit 2 returned to 100 percent RTP on June 21, where it operated for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment

.1 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 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. This activity constituted two inspection samples.

- Spent fuel pool cooling system during Unit 2 core empty period
- Unit 1 B-train High Head Safety Injection system during A-train planned maintenance

b. Findings

No findings were identified.

.2 Complete System Walkdown

a. Inspection Scope

The inspectors performed a complete system walk down of the Unit 2 Main Steam 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. During the walkdown, the inspectors reviewed the following:

- Valves were correctly positioned and did not exhibit leakage that would impact the functions of any given valve.
- Electrical power was available as required.
- Major system components were correctly labeled, lubricated, cooled, ventilated, etc.
- Hangers and supports were correctly installed and functional.
- Essential support systems were operational.
- Ancillary equipment or debris did not interfere with system performance.
- Valves were locked as required by the locked valve program.
- Major system components were correctly labeled.
- Visible cabling appeared to be in good material condition.

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. This activity constituted one inspection sample.

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

Enclosure

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. This activity constituted five inspection samples.

- Control Building Elevation 669 (Mechanical Equipment Room, 250 VDC Battery and Battery Board Rooms)
- Control Building Elevation 685 (Auxiliary Instrument Rooms)
- Turbine Building Elevation 706
- Control Building Elevation 706 (Cable Spreading Room)
- Control Building Elevation 732 (Mechanical Equipment Room and Relay Room)

b. Findings

No findings were identified.

1R06 Flood Protection Measures

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 for the previous 12 months to determine if water was present and, if found, whether it would affect safety-related system operation. In addition, the inspectors reviewed the licensee's corrective action program (CAP) 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. This activity constituted one inspection sample.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities

a. Inspection Scope

Non-Destructive Examination Activities and Welding Activities: From May 19, 2014, through May 30, 2014, the inspectors conducted an onsite review of the implementation of the licensee's in-service inspection (ISI) program for monitoring degradation of the reactor coolant system (RCS), risk-significant piping and components, and containment systems in Unit 2. The inspectors' activities included a review of selected samples of non-destructive examinations (NDE) to evaluate compliance with the applicable edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel

Code (BPVC), Section XI, and to verify that indications and defects (if present) were appropriately evaluated and dispositioned, in accordance with the requirements of the ASME Section XI acceptance standards.

The inspectors directly observed the following NDE, mandated by the ASME Code, to evaluate compliance with the ASME Code Section XI, and Section V requirements, and if any indications or defects were detected, to evaluate if they were dispositioned in accordance with the ASME Code, or an NRC-approved alternative requirement.

- Visual Examination (VT) - 3, Steam Generator (SG) Upper Lateral Restraint SGH-4-1, ASME Code Class 2
- General Visual Examination, Containment Moisture Barrier, Examination Category E-A, Item No E1.30

Inspectors directly observed the calibration of Ultrasonic Test (UT) equipment, and later reviewed UT examination results for welds associated with a feedwater elbow attachment to the SG safe end.

- Equipment Calibration for UT, Feedwater Piping Weld FDF-011A, ASME Code Class 2, Augmented Inspection
- Equipment Calibration for UT, Feedwater Piping Weld FDF-010C, ASME Code Class 2, Augmented Inspection

The inspectors reviewed records of the following NDE inspections and methods mandated by the ASME Code Section XI or augmented inspections, in order to evaluate compliance with the ASME Code Section XI and Section V requirements, and if any indications and defects were detected, to evaluate if they were dispositioned in accordance with the ASME Code or NRC-approved alternative requirements.

- VT-3, Pipe Support, 2-CVCH-585, ASME Code Class 2
- VT-3, Pipe Support, 2-CVCH-584, ASME Code Class 2
- VT-3, Pipe Support, 2-CVCH-586, ASME Code Class 2
- Penetrant Testing (PT), Integral Attachment Weld, 2-CVCH-006-IA, Code Class 1
- UT, Feedwater Piping Weld FDF-011A, ASME Code Class 2, (Augmented)
- UT, Feedwater Piping Weld FDF-010C, ASME Code Class 2, (Augmented)

The inspectors reviewed the following surface examination records with recordable indications that were analytically evaluated and accepted for continued service, against the ASME Code Section XI, or an NRC-approved alternative.

- PT, Lug to Pipe Weld, 2-SIH-020-IA, ASME Code Class 1

No ASME Class 1, 2, or 3 welding activities were in progress during the NRC ISI inspector site visit. Therefore, the inspectors reviewed the previously completed welding activity work order (WO), referenced below, in order to evaluate compliance with the intent of procedures, and the ASME Code. Specifically, the inspectors reviewed the WO package, the WO VT-2 leakage examination requirements and results.

- WO No. 112354373, SQN-2-VLV-0012-0817, Valve Replacement, ASME Class 2

Pressurized Water Reactor Vessel Upper Head Penetration Inspection Activities: For the Unit 2 reactor vessel head, a full bare metal visual (BMV) examination was not required this outage pursuant to 10 CFR 50.55a. Therefore, no reviews were conducted for this inspection attribute. A volumetric examination of the Unit 2 vessel upper head penetration (VUHP) was required this outage. Therefore, inspectors observed and reviewed a sample of the Unit 2 UT examination results, which included NDE reports for VUHP Nos. 53, 56, and 60. The inspectors also performed a comparison of the current UT results to the previous UT examination results for the sample penetrations. These comparisons were used to determine if the activities, including the disposition of indications and defects, were conducted in accordance with the requirements of ASME Code Case N-729-1 and 10 CFR 50.55a(g)(6)(ii)(D). In particular, the inspectors evaluated if the required UT examination scope/coverage was achieved and limitations (if applicable) were recorded in accordance with the licensee procedures. The licensee did not identify any relevant indications that needed to be accepted by analysis for continued service during the UT examination. Additionally, the licensee did not perform any welding repairs to the vessel head penetrations since the beginning of the last Unit 2 refueling outage; therefore, no NRC review was completed for these inspection procedure attributes.

Boric Acid Corrosion Control Inspection Activities: The inspectors reviewed the licensee's boric acid corrosion control (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 onsite record review of procedures and the results of the licensee's containment walkdown inspections performed during the current spring refueling outage. The inspectors also interviewed the BACC program owner, conducted an independent walkdown of two levels of containment, in order to evaluate compliance with the licensee's BACC program requirements, and verify 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 program (CAP).

The inspectors reviewed the following problem evaluation report (PER), and associated corrective actions related to evidence of boric acid leakage, to evaluate if the corrective actions completed were consistent with the requirements of the ASME Code Section XI, and 10 CFR Part 50, Appendix B, Criterion XVI, and Industry Guidelines.

- PER 743110, Degraded Non-conforming condition for PDO on RCS leakage and Ice on Intermediate Deck Doors (IDD), 7/19/13

The inspectors reviewed the following engineering evaluations completed for evidence of boric acid leakage to determine if degraded components were documented in the CAP. The inspectors also reviewed corrective actions for any degraded components to determine if they met the applicable requirements of the ASME Code, Section XI, and/or NRC-approved alternatives.

- PER 888330, Boric Acid Leakage Evaluation, Reactor Cavity Nozzle Cover Seal Leaking into Keyway, 6/24/14
- PER 890230, Evaluation of Boric Acid Corrosion Damage, 2-SNUB-068-RCH30, 6/7/14
- SR 889942, Determine Available Margins in Pipe Support Attributes, 2-RCH-0028, 5/26/14

Steam Generator Tube Inspection Activities: The inspectors reviewed the eddy current (EC) examination activities performed in Unit 2 SGs 1, 2, 3, and 4 during the end-of-cycle 19 refueling outage, to verify compliance with the licensee's Technical Specifications, ASME BPVC Section XI, and Nuclear Energy Institute (NEI) 97-06, "Steam Generator Program Guidelines." The inspectors interviewed licensee personnel and vendor staff responsible for the SG inspection project, and reviewed documentation associated with the SG inspections and integrity assessments, as described in this report section.

The inspectors reviewed the scope of the EC examinations to verify that known and potential areas of tube degradation were inspected. The inspectors also verified that inspection scope expansion criteria were implemented based on inspection results, as directed by the Electric Power Research Institute (EPRI) "Pressurized Water Reactor Steam Generator Examination Guidelines, Revision 7."

The inspectors reviewed documentation for a sample of EC data analysts, EC probes, and EC testers to verify that personnel and equipment were qualified to detect the existing and potential degradation mechanisms applicable to Sequoyah's SG tubes, in accordance with the EPRI Examination Guidelines. This review included a sample of site-specific Examination Technique Specification Sheets (ETSSs) that were selected based on plant-specific and industry operating experience, to ensure that their qualification and site-specific implementation were consistent with Appendix H or I of the EPRI Examination Guidelines. The selected ETSSs for review consisted of bobbin and rotating probe techniques that were used to detect wear at the tube interface with support structures (i.e., tube support plates, anti-vibration bar (AVB), and flow distribution baffle plate), and wear associated with foreign objects.

The inspectors also reviewed a sample of EC data with a qualified data analyst to confirm that data analysis was performed in accordance with the applicable ETSS's and site-specific analysis guidelines. The inspectors verified that the equipment configuration was consistent with the essential parameters of the applicable technique.

The inspectors also verified that recordable indications were detected and sized in accordance with vendor procedures. As part of the EC data review, the inspectors verified that the EC indications on each selected tube were consistent with historical data relative to the number of indications, location, and size. The sample of EC data selected for review is listed below:

| Steam Generator | Tube Row/Column | Eddy Current Probe | Indication Type |
|------------------------|------------------------|---------------------------|--------------------------|
| 2 | R93/C59 | Bobbin | AVB wear |
| 2 | R93/C59 | MRPC + point | AVB Wear |
| 2 | R93/C59 | Array | AVB Wear |
| 2 | R89/C59 | Bobbin | AVB Wear |
| 2 | R89/C59 | MRPC + point | AVB Wear |
| 4 | R93/C47 | Bobbin | Proximity Signal |
| 4 | R93/C47 | Array | Proximity Signal |
| 2 | R5/C101 | Bobbin | Distorted Support Signal |
| 2 | R5/C101 | MRPC + point | Distorted Support Signal |

The inspectors selected a sample of wear degradation mechanisms from the Steam Generator Degradation Assessment, and verified that the in-situ pressure testing criteria were determined, in accordance with the EPRI Tube Integrity Guidelines. Additionally, the inspectors reviewed EC indication reports to determine whether tubes with relevant indications were appropriately screened for in-situ pressure testing.

The inspectors compared the recent EC examination results with the last Operational Assessment report for SGs to assess the licensee's prediction capability for maximum tube degradation, and number of tubes with indications. The inspectors verified that the licensee's evaluation was conservative and that current examination results were bound by the Operational Assessment projections.

The inspectors also compared past examination results discussed in the latest Degradation Assessment with the recent EC examination results to verify that new degradation mechanisms, if any, were identified and evaluated before plant startup. The review of EC examination results included the disposition of potential loose part indications on the SG secondary side, to verify that corrective actions for evaluating and retrieving loose parts were consistent with the EPRI Guidelines. The inspectors also reviewed a sample of primary-to-secondary leakage data for Unit 2 to confirm that operational leakage in all SGs remained below the action level threshold during the previous operating cycle.

Based on the review of the final EC examination results for all SGs and interviews with the licensee, the inspectors confirmed that no EC scope expansion was required, and none of the SG tubes examined met the criteria for plugging or in-situ pressure testing.

Furthermore, the inspectors interviewed licensee staff and reviewed a sample of secondary side visual inspection results for the SGs 1, 2, 3, and 4 upper bowl areas, to verify that potential areas of degradation based on site-specific operating experience were inspected, and appropriate corrective actions were taken to address degradation indications. This review included the results of Foreign Object Search and Retrieval (FOSAR) activities in all SGs, and an evaluation for loose parts in the secondary side of SGs 1, 2, 3, and 4.

Identification and Resolution of Problems: The inspectors reviewed a sample of ISI-related problems which were identified by the licensee, and entered into the CAP as 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. Documents reviewed are listed in the Attachment.

b. Findings

Introduction: An NRC-identified Green NCV of 10 CFR 50.55a (g)(4), "Inservice Inspection Requirements" was identified for the licensee's failure to perform visual examinations of the control rod drive mechanism (CRDM), ASME Class 1, seismic plate supports as required by the ASME Code, Section XI.

Description: The Sequoyah Unit 2 ISI program for the current interval (third interval) was prepared in accordance with the 2001 Edition of the ASME Section XI Code, with addenda through 2003. Article IWF-2000 of ASME Section XI, Table IWF-2500-1, Examination Category Item Number F1.40, requires, in part, periodic VT-3 visual examinations of supports (other than piping supports) in Class 1 components. The examinations provide reasonable assurance that the supports can continue to perform their intended function.

The CRDM assemblies are ASME Class 1 pressure retaining components that contain a series of seismic plate supports to ensure that the allowable design stress limits for the CRDM assemblies are not exceeded during a seismic event, which in turn provides reasonable assurance that the RCS pressure boundary and control rod function is maintained.

The inspectors identified that the Sequoyah Unit 2 ISI program did not meet the requirements of ASME Section XI in that the Class 1 CRDM seismic plate supports, and associated load path components, which meet the examination category F1.40, were not included in the scope of the program for the first, second, and third ISI intervals. The inspectors also identified that this issue applied to the Unit 1 ISI Program.

The licensee entered this issue into their CAP as PER 889400. The licensee developed an operability evaluation and concluded that the supports were operable but non-conforming. The evaluation considered previous dimensional verifications of the reactor vessel head lift rig components in the area of the CRDM seismic support plates, and as-

found settings of the seismic plates from a modification project WO package associated with Unit 1 and 2 cables in the seismic plate area of the lift rig. The WO package included requirements to insert a gap gauge at each seismic plate screw pad gap to verify the correct gap was present on Unit 1. The results of Unit 1 as-found gap settings provided reasonable assurance that the as-found gap settings were adequate for Unit 2 based on the similarities in design, operating conditions, and implementation of outage maintenance activities. The evaluation also considered that no degradation of the lift rig intervening steel components in the support load path between the seismic plates and lift rig struts had been reported in previous outages through the CAP. The licensee also initiated corrective actions to perform the required visual examinations of the CRDM seismic plate supports before the end of the current ISI interval in April 2016.

Analysis: Failure to perform the required visual examinations of the CRDM seismic plates and associated load path components, as required by the ASME Section XI Code, was a performance deficiency (PD). In accordance with Inspection Manual Chapter (IMC) 0612 Appendix B, "Issue Screening," the PD was more than minor because it was associated with the protection against external factors attribute of the mitigating systems cornerstone, and affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequence. Specifically, the licensee failed to perform examinations required to provide reasonable assurance that the support components can perform their intended function during design basis seismic events, and therefore maintain the stresses in the CRDM assembly within the allowable design limits, which in turn provides reasonable assurance that the RCS pressure boundary and control rod function is maintained. The inspectors screened this finding as Green in accordance with IMC 0609, Appendix A, Exhibit 2, Mitigating Systems, because the finding did not involve the loss or degradation of equipment or function specifically designed to mitigate a seismic initiating event. A crosscutting aspect was not assigned to this finding in accordance with IMC 0612, Appendix B, because the exclusion of the CRDM seismic plate supports from the scope of the ISI Program occurred outside of the nominal 3-year period for present performance, and therefore it was not reflective of present licensee performance.

Enforcement: Title 10 CFR 50.55a(g)(4), "Inservice Inspection Requirements," requires in part that throughout the service life of a boiling or pressurized water-cooled nuclear power facility, components (including supports) that are classified as ASME Code Class 1, must meet the requirements, except design and access provisions, and preservice examination requirements set forth in Section XI of editions and addenda of the ASME BPVC that become effective subsequent to editions specified in paragraphs (g)(2) and (g)(3) of this Section, and that are incorporated by reference in paragraph (b) of this Section, to the extent practical within the limitations of design, geometry, and materials of construction of the components. Section XI of the ASME BPVC, 2001 Edition with 2003 Addenda, Table IWF-2500-1, Examination Category F-A Supports, requires a VT-3 examination of 100 percent of the ASME Class 1 supports, other than piping supports, every ISI Interval (examination item F1.40), as modified by Notes 1, 2, 3 and 5 of Table IWF-2500-1.

Contrary to the above, from initial commercial operation until present, the licensee failed to perform the required VT-3 examination of ASME Class 1 supports, other than piping supports, (i.e., seismic support plates and associated load path components) on the CRDM assemblies of Units 1 and 2. The licensee entered the issue into the CAP as PER 889400. The licensee initiated corrective actions to perform the required VT-3 examinations during the next refueling outage in order to restore compliance with the 10 CFR 50.55a regulations. Because this violation was determined to be of very low safety significance (i.e., Green), and the licensee entered the issue in the CAP, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy, dated July 9, 2013. This finding will be tracked as NCV 05000327, 328/2014003-01, Failure to Perform Visual Examination of the Unit 1 and Unit 2 CRDM Seismic Plate Supports.

1R11 Licensed Operator Regualification Program

Quarterly Review

a. Inspection Scope

On June 24, 2014, the inspector observed an evaluated simulator scenario and the evaluators' critique of crew performance. The exercise was performed to provide practice to the operating crews in longer duration "CPE style" scenarios. The inspector 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 inspector observed the ability of the licensee to administer the evaluation and quality of the evaluators' critique. The inspector observed scenario operations for simulator fidelity to verify that it matched actual plant response. Based on crew performance and scenario administration issues, the inspector also reviewed the follow-up actions taken to address operator deficiencies and identified administration issues. Documents reviewed are listed in the Attachment. This activity constituted one inspection sample.

b. Findings

No findings were identified

.2 Quarterly Review of Licensed Operator Performance

a. Inspection Scope

The inspectors observed and assessed licensed operator performance in the main control room during periods of heightened activity or risk. The inspectors reviewed various licensee policies and procedures such as OPDP-1, Conduct of Operations, NPG-SPP-10.0, Plant Operations, and 0-GO-5, Normal Power Operation. The

inspectors utilized activities such as post-maintenance testing, surveillance testing, unplanned transients, infrequent plant evolutions, plant startups and shutdowns, reactor power and turbine load changes, and refueling and other outage activities to focus on the following conduct of operations as appropriate:

- operator compliance and use of procedures
- control board manipulations
- communication between crew members
- use and interpretation of plant instruments, indications and alarms
- use of human error prevention techniques
- documentation of activities, including initials and sign-offs in procedures
- supervision of activities, including risk and reactivity management
- pre-job briefs

Specifically, the inspectors observed licensed operator performance during the following activities:

- Unit 2 reactor shut down and cool down
- Unit 2 reactor start up

Documents reviewed are listed in the Attachment. This activity constituted one inspection sample.

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. This activity constituted one inspection sample.

- Cause Determination Evaluation 2741 associated with failure of flow switch (FS) 2-FS-74

b. Findings

No findings were identified.

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

The inspectors reviewed the 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 NPG-SPP-07.1, "On-Line Work Management," Revision 3, and Instruction 0-TI-DSM-000-007.1, "Risk Assessment Guidelines," Revision 9. Documents reviewed are listed in the Attachment. The inspectors completed five samples.

- Unit 1 Yellow probabilistic safety assessment (PSA) risk associated with 1B Residual Heat Removal (RHR) pump planned maintenance
- emergent work due to failure of Individual Rod Position Indication (IRPI) E-5
- maintenance risk review U2R19 Outage Schedule
- emergent work due to failure of "CS" Component Cooling System (CCS) swing pump hand switch
- emergent work due to failure of Unit 2 vacuum breaker (2-30-573)

b. Findings

No findings were identified.

1R15 Operability Evaluationsa. Inspection Scope

For the four 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. This activity constituted four inspection samples.

- PER 855557/864224: Operation Decision Making Instruction (ODMI) for Unit 2 Power Range Overpower Rod Stop Deviation Alarms
- PER 886167: ODMI for Unit 1 Cavity Seal Leakage
- PER 855850: Past operability evaluation (POE) associated with 2B RHR 2-FS-74-24A failure
- PER 897994: Prompt Determination of Operability (PDO) for Unit 2 Turbine Driven AFW pump

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors reviewed the post-maintenance tests associated with the six 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. This activity constituted six inspection samples.

- WO 115149300, Rx Vessel Wide Range Level Failed High
- WO 115806034, Unit 1 Electric Pulse Repair of IRPI Connectors
- WO 114973816, Unit 1 RHR Mini Flow Valve environmental qualification maintenance and Inspection
- WO 113877775, RHR Return Valve Leak Rate Test for FCV-74-1 and FCV-74-2
- WO 113880726, SIS/RHR Hot Leg Check Valve Backseat Test
- WO 113875488, Post Maintenance Local Leak Rate Test (as-left) for 2-FCV-63-71, 2-FCV-63-84, & 2-FCV-63-23

b. Findings

No findings were identified.

1R20 Refueling and Outage Activities

Unit 2 Refueling Outage Cycle 19

a. Inspection Scope

For the Unit 2 refueling outage that began on May 12, the inspectors evaluated licensee activities in order 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 2 not normally accessible during at-power operations to verify that safety-related and risk-significant SSCs were maintained in an operable condition. Specifically, between May 12 and June 30, the inspectors performed inspections and reviews of the following outage activities. This activity constituted 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 cool down 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), 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 inspectors also observed a tag-out (2-TO-2014-0039, Tag-out of 2B-B Centrifugal Charging Pump) to verify that the equipment was appropriately configured to safely support the work and 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 drain-down, verified that operators properly set level alarms to procedurally required set-points, 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 reduced inventory 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. 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. In order to reduce outage risk, the licensee elected to not put the plant into mid-loop conditions during this particular refueling outage.
- **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. Prior to plant startup, the inspectors performed a detailed tour of containment to ensure no debris existed that could affect containment sump performance given a design basis accident. The inspectors also inspected the primary system in containment during Mode 3 with the plant at normal operating pressure and temperature in order to verify the leak tightness of the RCS.

b. Findings

No findings were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the 11 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. This activity constituted 11 inspection samples.

In-Service Tests:

- 2-SI-SXP-063-202.0, Safety Injection Pumps 2A-A and 2B-B Comprehensive Performance and Check Valve Test, Revision 5

Routine Surveillance Tests:

- 0-SI-OPS-092-078.0 Power Range Neutron Flux Channel Calibration by Heat Balance Comparison, Revision 23
- 0-SI-NUC-000-038.0 Unit 2 Shutdown Margin, Revision 75
- 2-SI-OPS-082-026.B, Loss of Offsite Power with Safety Injection – D/G 2B-B Test, Revision 43
- 2-SI-OPS-088-001.0, Phase A Isolation Test, Revision 20
- 2-SI-OPS-082-026.A, Loss of Offsite Power with Safety Injection – D/G 2A-A Test, Revision 47
- 2-SI-OPS-000-009.0, Actuation of ECCS and Boron Injection Flow path valves via Safety Injection Signal, Revision 9

Ice Condenser Surveillance Test:

- 0-SI-MIN-061-107.0, Ice Condenser Floor Drains, Revision 2
- 0-SI-MIN-061-109.0, Ice Condenser Intermediate and Lower Inlet Doors and Vent Curtains, Revision 5

Containment Isolation Valve (CIV) Surveillance Tests:

- 0-SI-SLT-062-258.1, Containment Isolation Valve Local Leak Rate Test Chemical and Volume Control System, Revision 11
- 2-SI-OPS-088-003.0, Phase B Containment Isolation Test, Revision 10

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

Resident inspectors evaluated the conduct of a routine licensee emergency drill on April 1, 2014, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation (PAR) development activities. This drill involved beyond design basis events and utilized the licensee's severe accident mitigation

guidelines (SAMG). The inspectors evaluated emergency response operations in the simulated control room, as well as the technical support center, to verify that event classification and notifications were performed in accordance with EPIP-1, Emergency Plan Classification Matrix, Revision 51. The inspectors verified that the licensee properly utilized the SAMGs. The inspectors also attended the licensee critique of the drill to compare any inspector observed weakness with those identified by the licensee in order to verify whether the licensee was properly identifying deficiencies. This activity constituted one inspection sample.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY (RS)

Cornerstones: Occupational Radiation Safety and Public Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls

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 Unit 2 (U2) upper and lower containments, Auxiliary Building and Dry Active Waste (DAW) Storage Facility. The inspectors independently measured radiation dose rates or directly observed conduct of licensee radiation surveys for selected RCA areas, including the Independent Spent Fuel Storage Installation (ISFSI). 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 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., U2 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 multi 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 Radiation Protection (RP) supervisors. During plant walk downs of the U2 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 radiological waste 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 RP 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 and Upper and Lower Containments in high radiation and contaminated areas. The inspectors also observed health physics technicians (HPTs) providing pre-job/RWP briefings, releasing material from the RCA, and providing field coverage of jobs. Occupational workers' adherence to selected RWPs and HPT proficiency in providing job coverage were evaluated through direct observations and interviews with licensee staff. 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-22-300, Corrective Action Program, (CAP) Revision (Rev.) 1. 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 Updated Final Safety Analysis Report (UFSAR) Section 12; Technical Specifications (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 the Attachment.

b. Findings

Introduction: The inspectors identified a Green, self-revealing, Non-cited Violation (NCV) of TS 6.12.1, "High Radiation Area," for two examples of individuals entering an HRA without meeting the entry requirements as specified in TS 6.12.1.b and e.

Description: On May 16, 2014, with the U2 reactor shutdown for refueling, a contract employee who was staging equipment and two contract decontamination technicians, working on separate jobs in the upper reactor containment, entered the same posted HRA near the reactor cavity. One of the decontamination technicians and the contractor staging equipment received dose rate alarms shortly after crossing the HRA boundary. Upon receiving the alarms, both individuals exited the area and contacted health physics (HP) as required. The two decontamination technicians were on RWP Number (No.) 210061 with a dose setpoint of 31 mrem and dose rate setpoint of 91 milli-rem per hour (mrem/hr). The decontamination worker's ED indicated a maximum dose rate of 97 mrem/hr. The worker staging equipment was on RWP No. 240051 with a dose setpoint of 21 mrem and dose rate setpoint of 81 mrem/hr. That worker's ED indicated a maximum dose rate of 133 mrem/hr. Accessible general area dose rates based on surveys in the area near the time of the event were as high as 160 mrem/hr at 30 centimeters (cm).

In both cases the workers had only been briefed for entry into "Radiation Areas" in the upper reactor containment and that expected dose rates in this area were 3-10 mrem/hr. They were not wearing the prescribed alarming dosimetry for an HRA entry, were not on an RWP that allowed HRA entry, and were not knowledgeable of the actual dose rates in the area. The licensee entered these events into their CAP (PERs 886668 and 886160). Immediate corrective actions included restricting worker access to the RCA and issuance of communications to the site and within the RP organization to reinforce roles in RWP adherence and access control.

Analysis: The inspectors determined that entry into a HRA without meeting the entry requirements specified in TS 6.12.1 was a performance deficiency. This finding is more than minor because it is associated with the Occupational Radiation Safety Cornerstone attribute of Human Performance and adversely affects the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Workers permitted entry into HRAs with inadequate knowledge of actual radiological conditions could receive unintended occupational exposures. The finding was evaluated using the Occupational Radiation Safety Significance Determination Process (SDP). The finding was not related to ALARA planning, nor did it involve an overexposure or substantial potential for overexposure, and the ability to assess dose was not compromised. Therefore, the inspectors determined the finding to be of very low safety significance (Green). The inspectors noted that the workers responded properly to the ED dose rate alarms thereby limiting their potential for unintended exposure. This finding involved the cross-cutting aspect of Human Performance, Avoid Complacency [H.12] because workers failed to apply appropriate error reduction tools while participating in pre-job briefs and prior to crossing the HRA boundaries.

Enforcement: TS 6.12.1, "High Radiation Area", requires in part, entries into HRAs be controlled by means of an RWP, associated radiation surveys, and other appropriate radiation protection equipment and measures and except for individuals qualified in RP procedures or escorted by such individuals, entry into such areas shall only be made after dose rates in the area have been determined and entry personnel are made knowledgeable of them. Contrary to the above, on May 16, 2014, workers entered a HRA using an RWP that did not allow HRA access, without using the proper alarming dosimetry, and without knowledge of the actual dose rates in the area. Because this violation was of very low safety significance and it was entered into the licensee's CAP (PERs 886668 and 886160), this violation is being treated as an NCV, consistent with the Enforcement Policy: NCV 05000327/328, 2014003-02, Failure to Comply with Entry requirements to a HRA.

2RS2 Occupational ALARA Planning and Controls

a. Inspection Scope

Work Planning and Exposure Tracking: The inspectors reviewed work activities and their collective exposure estimates associated with the previous Unit 1 (U1) refueling outage, as well as the current U2 refueling outage 19 (U2R19). The U1 refueling outage 19 (U1R19) and U2R19 ALARA planning packages (ALARA Plans) were reviewed for the following high collective exposure tasks: Refueling operations, Mechanical Maintenance, Plant Services, RP and Modifications. For the selected tasks, 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 evaluated the incorporation of exposure reduction initiatives and operating experience, including historical post-job reviews, into RWP requirements. Collective dose data for selected tasks were compared with established dose estimates and evaluated against procedural criteria (trigger points) for additional ALARA review. Where applicable, changes to established estimates were discussed with ALARA planners and evaluated against work scope changes or unanticipated elevated dose rate. The inspectors discussed the operation of the Station ALARA Committee with the Site Vice President, the RP Manager and the ALARA Health Physicist. For ALARA Plans from U1R19, the inspectors compared the results achieved in terms of actual dose versus (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 ALARA Plans associated with U2R19, the inspectors reviewed dose-to-date on select jobs, comparing estimates with actuals, and observed development of selected in-progress reviews.

Source Term Reduction and Control: The inspectors reviewed the collective exposure three-year rolling average (TYRA) from 2011 - 2013 and reviewed historical outage collective exposure trends. Through interviews with licensee staff and document review, the inspectors assessed the licensee's current activities related to source term reduction, including elevated zinc injection on U2, on-line chemistry using pH 7.4 to minimize corrosion product transport, extended reactor coolant pump run time to allow better

cleanup during shutdown, ultrasonic fuel cleaning, and response to fuel defects during previous operating cycles. The inspectors discussed the unexpectedly high activity of shutdown crud burst and changes expected in the short and long term relative abundances of Cobalt-58 and Cobalt-60 that would result from the change in the steam generator tube alloys and increasing the number of steam generator tubes by about a third. The dose implications of the various cobalt reduction activities coupled to the change in tube alloys for the next few outages was also discussed

Radiation Worker Performance: Radiation worker performance was also observed and evaluated as part of Inspection Procedure 71124.01 and is documented in section 2RS1. While observing job tasks, the inspectors evaluated the use of remote technologies to reduce dose including teledosimetry and remote visual monitoring. Jobs observed were associated with the refueling and maintenance outage.

Problem Identification & Resolution: Licensee CAP documents associated with ALARA planning and controls were reviewed and assessed. This included a review of selected Action Requests (PERs), 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-22.300, Corrective Action Program, Rev. 1. The inspectors also evaluated the scope and frequency of the licensee's self-assessment program and reviewed recent assessment results.

ALARA program activities were evaluated against the requirements of UFSAR Section 12, Radiation Protection; TS Section 6.8, Procedures and Programs; 10 CFR Part 20; and approved licensee procedures. Documents reviewed are listed in the Attachment.

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 U2R19 for steam generator (S/G) and U2 Thimble eddy current testing and the DAW Storage Building. The use of the U2 Containment Purge to minimize airborne concentrations in containment during refuel activities was discussed with licensee personnel. In addition, inspectors observed the placement and use of high efficiency particulate air negative pressure units, and air sampling equipment during observations of jobs in-progress.

Use of Respiratory Protection Devices & Self-Contained Breathing Apparatus for Emergency Use: Inspectors reviewed the use of respiratory protection devices to limit the intake of radioactive material, including devices used for routine tasks and devices stored for use in emergency situations. Inspectors observed the physical condition of Self-Contained Breathing Apparatus (SCBA) units, negative pressure respirators (NPR)s, powered air purifying respirators and device components staged for routine and

emergency use throughout the plant. SCBA bottle air pressure, the number of units, and the number of spare masks and air bottles available was also evaluated by inspectors. The inspectors reviewed maintenance records for selected SCBA units for the past year and evaluated SCBA and NPR compliance with National Institute for Occupational Safety and Health certification requirements. The inspectors also reviewed records of Grade D (or better) air quality testing for supplied-air devices and SCBA bottles. In addition, the inspectors walked-down the compressor used for filling SCBA bottles. 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 and selected locations.

The inspectors verified the licensee had procedures in place to ensure that the use of respiratory protection equipment was ALARA when engineering controls were not practicable. Control room operators and fire brigade were interviewed on the use of the devices including SCBA bottle change-out and use of corrective lens inserts. Respirator qualification records were reviewed and cross checked for several control room operators. In addition, qualifications for individuals responsible for testing and repairing SCBA vital components were evaluated through review of training records. Selected maintenance records for SCBA units and air cylinder hydrostatic testing documentation were reviewed.

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 selected 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 SCBA use had completed the required training, fit-test, and medical evaluation.

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 PERs 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-22-300, Corrective Action Program, Rev.1. 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 UFSAR Section 12; 10 CFR Parts 19 and 20; and approved licensee procedures. Documents and records reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment

a. Inspection Scope

External Dosimetry: The inspectors reviewed National Voluntary Laboratory Accreditation Program certification data and discussed program guidance for storage, processing, and evaluation of results for active and passive personnel dosimeters currently in use. Comparisons between ED and thermo-luminescent dosimeter data were discussed in detail. The inspectors reviewed ED alarm logs and reviewed licensee's dosimeter incident reports and assessment actions for selected alarm events.

Internal Dosimetry: Program guidance and assessment results for internally deposited radionuclides were reviewed. The inspectors reviewed selected Whole Body Count (*in vivo*) analyses from September 2012 to May 2014 as well as in-vitro assessments of tritium exposures to workers entering Unit 2 containment at power during this period. The licensee's methods used in these assessments as well as the programs for collection and analysis of special bioassay samples were discussed with licensee staff.

Special Dosimetric Situations: The inspectors evaluated the licensee's use of multi-badging, extremity dosimetry, and dosimeter relocation within non-uniform dose rate fields and reviewed assessments for U2R19 for S/G maintenance workers. Worker monitoring in neutron areas was discussed with licensee staff. The inspectors also reviewed records of monitoring for declared pregnant workers from September 2012 to May 2014 and discussed monitoring guidance with dosimetry staff. In addition, methods for shallow dose assessments were reviewed and discussed.

Problem Identification and Resolution: The inspectors reviewed and discussed selected CAP documents associated with occupational dose assessment. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure NPG-SPP-22-300, Corrective Action Program, Rev.1. The inspectors also discussed the scope of the licensee's internal audit program and reviewed recent assessment results.

Occupational dose assessment activities were evaluated against the requirements of UFSAR Section 12; TS Section 6; 10 CFR Parts 19 and 20; and approved licensee procedures. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2RS5 Radiation Monitoring Instrumentation

a. Inspection Scope

Radiation Monitoring Instrumentation: During walk-downs of the auxiliary building and the RCA exit point, the inspectors observed installed radiation detection equipment. These included area radiation monitors (ARMs), liquid and gaseous effluent monitors,

personnel contamination monitors (PCMs), small article monitors (SAMs), and portal monitors (PMs). The inspectors observed the physical location of the components and noted their material condition.

In addition to equipment walk-downs, the inspectors reviewed source checks of various portable and fixed detection instruments, including ion chambers, teletectors, PCMs, SAMs, PMs, and an iSOLO alpha/beta counting system. The inspectors reviewed calibration records and evaluated alarm set-point values for PCMs, PMs, effluent monitors, an ARM, and a SAM. This included a sampling of instruments used for post-accident monitoring such as a containment high-range radiation monitor and effluent monitors for noble gas and iodine. The radioactive source used to calibrate an effluent monitor was evaluated for traceability to national standards. Calibration stickers on portable survey instruments were noted during inspection of the storage area for ready-to-use equipment. The most recent 10 CFR Part 61 analysis for DAW was reviewed to determine if calibration and check sources are representative of the plant source term. The inspectors also reviewed count room calibration records for a gamma spectroscopy germanium detector and a liquid scintillation detector.

Effectiveness and reliability of selected radiation detection instruments were reviewed against details documented in the following: 10 CFR Part 20; NUREG-0737, Clarification of TMI Action Plan Requirements; UFSAR Chapters 11 and 12; and applicable licensee procedures.

Problem Identification and Resolution: The inspectors reviewed selected PER reports in the area of radiological instrumentation. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure NPG-SPP-22.300, Corrective Action Program, Rev. 1. Documents and records reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Security

40A1 Performance Indicator (PI) Verification

a. Inspection Scope

The inspectors sampled licensee submittals for the five PIs listed below for the period from January 2013 through March 2014 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: Initiating Events

- Unplanned Scrams per 7000 Critical Hours
- Unplanned Scrams with Complications
- Unplanned Power Changes per 7000 Critical Hours

The inspectors reviewed selected Licensee Event Reports (LERs) and portions of operator logs to verify whether the licensee had accurately identified the number of scrams and unplanned power changes that occurred during the previous four quarters for both units. The inspectors also reviewed the accuracy of the number of critical hours reported and the licensee's basis for addressing the criteria for complications for each of the reported scrams. Documents reviewed are listed in the Attachment.

Cornerstone: Occupational Radiation

- Occupational Exposure Control Effectiveness

The inspectors reviewed PI data collected from November 2013 through May 2014, 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 RCA exit transactions with exposures in excess of 100 milli-rem in order to determine compliance 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. 6.

Cornerstone: Public Radiation Safety

- Radiological Control Effluent Release Occurrences

The inspectors reviewed the Radiological Control Effluent Release Occurrences PI results for the Public Radiation Safety Cornerstone from November 2013, through May 2014. 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.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution

.1 Daily Review

a. Inspection Scope

As required by Inspection Procedure 71152, Identification and Resolution of Problems, and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's 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: Pressurizer Thermal Limit Exceeded

a. Inspection Scope

The inspectors performed an in-depth review of PER 809100. On November 9, 2013, during a plant heat-up on Unit 1, the pressurizer thermal limits were exceeded on two separate occurrences, contrary to the Technical Requirements Manual (TRM) Section 3.9.2. Westinghouse performed an analysis of the event and determined that the existing pressurizer design basis analysis bounded this event and there was no increase in the limiting primary stress or the primary-plus-secondary stress range from this event. As a result of this event, the licensee developed an Apparent Cause Analysis (ACE). The inspectors reviewed the actions taken to determine if the licensee had adequately addressed the following attributes.

- Complete, accurate and timely identification of the problem
- Evaluation and disposition of operability and reportability issues
- Consideration of previous failures, extent of condition, generic or common cause implications
- Prioritization and resolution of the issue commensurate with safety significance
- Identification of the root cause and contributing causes of the problem
- Identification and implementation of corrective actions commensurate with the safety significance of the issue

b. Findings

There were no findings identified during this review. The inspectors determined that the ACE was probing and involved an extent of condition review, a safety culture analysis, and operating experience review. The ACE also brought to light that the crew that performed the pressurizer heat up did not realize the limit violation. This fact was actually noted by the night shift crew when reviewing data. The ACE also analyzed a near miss that occurred on November 13, 2013. In this instance, the plant was being

returned to cold iron conditions due to a pressurizer power operated relief failure and the operators were challenged in maintaining cool-down limits of the pressurizer. Although no limits were exceeded the November 13 incident, the ACE noted several weaknesses in the evolution. The ACE ultimately led to the development of several corrective actions; including procedural changes designed strengthen the operators' awareness of pressurizer pressure control, development of a vendor-performed stress analysis of the event, and addition of the event to the operations training program in order to share information with other crews.

.3 Semi-Annual Trend Review

a. Inspection Scope

As required by Inspection Procedure 71152, the inspectors performed a semi-annual review of the licensee's corrective action program and associated 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 twelve-month period of July 2013 through June 2014, although some examples expanded beyond those dates when the scope of the trend warranted. Specifically, the inspectors considered the results of daily inspector screening discussed in Section 4OA2.1 and reviewed licensee trend reports for the period in order to determine the existence of any adverse trends that the licensee may not have previously identified. This activity constituted one inspection sample for Semi-annual Trend Review.

b. Findings and Observations

No findings were identified. The inspectors noted a negative trend regarding human performance errors. During the daily reviews, the inspectors noted an increase in human error events. The inspectors then performed a more detailed review of the trend under the semi-annual trend review required by IP 71152. The inspectors concluded there were at least eleven of these events that occurred in the last three months. The inspectors noted this was more than the typical amount of error-related incidents observed during a quarter. The below abbreviated list of PERs involved several human performance related and mis-positioning events as well as procedural non-compliance.

- PER 868301, EDG 1B and 2B Fan Switch in Incorrect Position, (April 4, 2014)
- PER 876825, Vent Valve Found in Wrong Position, (April 25)
- PER 877256, 'A' EGTS damper switch found in incorrect Position, (April 27)
- PER 878321, 'B' Train Purge Aligned with 'A' Train Radiation Monitor, (April 30)
- PER 878588, Missing Locking Mechanism on Charging Valve (April 30)
- PER 882745, Switch Error Alignment of Inverter during Testing, (May 9)
- PER 884002, Boric Acid Valve Found in Wrong Position, (May 13)
- PER 884012, Danger-Tagged Switch Found in Wrong Position, (May 13)
- PER 885856, Incorrect Pressurizer Safety Valve Removed, (May 16)

- PER 886066, Missed QC Hold Point, (May 17)
- PER 886765, RHR Valves Found in Wrong Position, (May 19)

The residents discussed this negative human performance trend with site management. Most of the errors involved some form of procedural non-compliance. The licensee concurred with the observation and noted that they had also concurrently and independently (of the NRC resident staff) identified the same trend. This was documented in PER 884559 and generated on May 14. Immediate corrective actions to these errors included “stand-downs” emphasizing procedural compliance with the craft personnel and site-wide communications to remind staff to use “error reduction” tools when performing high risk activities. The inspectors noted that the licensee was aggressively dealing with these human performance deficiencies and a reasonable assurance exists that the trend can be reversed. Although these issues should be corrected, they constitute violations of minor significance that are not subject to enforcement action in accordance with Section 2 of the Enforcement Policy.

40A5 OTHER ACTIVITIES

.1 (Closed) Temporary Instruction 2515/182 – Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks

a. Inspection Scope

The inspectors conducted a review of records and procedures related to the licensee’s program for buried piping and underground piping and tanks in accordance with Phase II of temporary instruction (TI) 2515/182 to confirm that the licensee’s program contained attributes consistent with Sections 3.3.A and 3.3.B of Nuclear Energy Institute (NEI) 09-14, “Guideline for the Management of Buried Piping Integrity,” Revision 3, and to confirm that these attributes were scheduled and/or completed by the NEI 09-14 deadlines. The inspectors interviewed licensee staff responsible for the buried piping program and reviewed program related activities to determine if the program attributes were accomplished in a manner which reflected acceptable practices in program management.

The licensee’s buried piping and underground piping and tanks program was inspected in accordance with paragraph 03.02.a of the TI and it was confirmed that activities, which correspond to completion dates specified in the program which have passed since the Phase 1 inspection was conducted, have been completed. The licensee’s buried piping and underground piping and tanks program was inspected in accordance with paragraph 03.02.b of the TI and responses to specific questions found in <http://www.nrc.gov/reactors/operating/ops-experience/buried-pipe-ti-phase-2-insp-req-2011-11-16.pdf> were submitted to the NRC headquarters staff. Additionally, the inspectors reviewed the licensee’s risk ranking process and implementation of the inspection plan using the guidance of paragraph 03.04 and 03.05 of the TI.

b. Findings

No findings were identified. Based upon the scope of the review described above, Phase 2 of TI-2515/182 was completed.

.2 Follow-up on Confirmatory Action Letter (IP 92702)

a. Inspection Scope

The inspector reviewed the progress TVA has made in the implementation of commitments associated with the Confirmatory Action Letter – Watts Bar Nuclear Plant (WBN) Unit 1, And Sequoyah Nuclear Plant (SQN), Units 1 and 2, Commitments to Address External Flooding Concerns (CAL no. NRR-12-001) (ADAMS Accession No. ML12165A527).

Using the guidance of IP 92702, this inspector verified the following for selected actions of the licensee's commitments 2, 4, 5, 6, 10, 11, and 12:

- Ensured required actions are completed.
 - Verified the adequacy of implementation of required actions.
 - Confirmed that the licensee has instituted appropriate corrective and preventive measures.
2. By August 10, 2012, TVA will submit a License Amendment Request to update the SQN, Units 1 and 2, Unit 1 Updated Final Safety Analysis Report to reflect the updated hydrologic analysis methods and results, including the analysis of the rim leakage paths discussed at the May 31, 2012, public meeting between TVA and NRC staff.
 4. By August 31, 2012, TVA will issue and initially perform a procedure for a semi-annual inspection to verify the condition of the SQN, Units 1 and 2, Spent Fuel Pit Cooling Pump Enclosure caps. Inspections will continue until the design change is completed to document the SQN, Units 1 and 2, Spent Fuel Pit Cooling Pump Enclosure caps as a permanent plant feature.
 5. By August 31, 2012, TVA will issue and initially perform a procedure for a semiannual inspection to verify the inventory, storage, physical protection, and condition of the materials and consumables required to implement the compensatory measure for the common SQN, Units 1 and 2, Diesel Generator Building. Inspections will continue until the compensatory measure is replaced by a permanent plant modification.
 6. By August 31, 2012, TVA will perform an analysis of the Design Basis Flood for SQN, Units 1 and 2, and WBN, Unit 1 that assumes a failure of a section of the HESCO flood barriers [sand baskets] and earthen embankments at Fort Loudon, Cherokee, Tellico, and Watts Bar dams.

10. By March 31, 2013, TVA will install a permanent plant modification to provide flood protection with respect to the Design Basis Flood level for the common SQN, Units 1 and 2, Diesel Generator Building.
11. By March 31, 2013, TVA will implement the design change to document the SQN, Units 1 and 2, Spent Fuel Pit Cooling Pump Enclosure caps as a permanent plant feature.
12. By April 30, 2013, TVA will provide the results of the evaluation conducted in compliance with the National Environmental Policy Act (NEPA) Environmental Impact Statement (EIS) Status to define the permanent modifications to prevent overtopping the embankments of the Cherokee, Fort Loudon, Tellico, and Watts Bar dams.

Additionally, this inspection reviewed plans and progress of open commitments 7, 13, 14, 15, and 16, to ensure current understanding and scheduled completion were consistent between the NRC and TVA.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On July 9, 2014, the resident inspectors presented the inspection results to Mr. Simmons and other members of his staff, who acknowledged the findings. No proprietary information was discussed.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

J. Carlin, Site Vice President
A. Day, Chemistry Manager
D. Erb, Work Control Manager
B. Gann, Dosimetry/Instruments Supervisor
M. Henderson, ISI Program Engineer
J. Johnson, Program Manager Licensing
T. Johnston, Radiation Protection Support Manager
K. Loomis, Site Program Owner
T. Marshall, Operations Manager
M. McBrearty, Licensing Manager
T. Noe, Director Safety and Licensing
W. Pierce, Site Engineering Director
P. Pratt, Maintenance Manager
R. Rice, Radiation Protection Manager
J. Rolph, Radiation Protection Technical Support Superintendent
P. Simmons, Plant Manager
K. Smith, Director of Training
C. Summers, Health Physicist-ALARA

NRC personnel

S. Lingam, Project Manager, Office of Nuclear Reactor Regulation

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

| | | |
|-------------------------|-----|---|
| 05000327,328/2014003-01 | NCV | Failure to Perform Visual Examination of the Unit 1 and Unit 2 CRDM Seismic Plate Supports (Section 1R08) |
| 05000327,328/2014003-02 | NCV | Failure to Comply with Entry requirements to a HRA. (Section 2RS1) |

Closed

| | | |
|----------|----|---|
| 2515/182 | TI | Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks, Phase II (Section 4OA5.1) |
|----------|----|---|

LIST OF DOCUMENTS REVIEWED

Section R04: Equipment Alignment

Procedures

0-GO-16, System Operability Checks, Rev 19

Section R05: Fire Protection

Procedures

SQN-FPR-Part-II, SQN Fire Protection Report Part II – Fire Protection Plan, Revision 28

Other documents

TUR-0-706-01, Fire Protection Pre-Fire Plans Turbine Building - El. 706, Revision 3

TUR-0-706-02, Fire Protection Pre-Fire Plans Turbine Building - El. 706, Revision 3

CON-0-706-00, Fire Protection Pre-Fire Plans Control Building - El. 706, Revision 6

CON-0-706-00, Fire Protection Pre-Fire Plans Control Building - El. 732, Revision 7

Section R06: Flood Protection Measures

Other documents

TVA letter to NRC dated May 4, 2007. TVA response to GL 2007-01

48N1225

47W852-1

SQN-SQS4-0056, Moderate Energy Line Break Flooding Study, Revision 2

Section R08: Inservice Inspection

Drawings

CCD No. 2-2H63-0006-01, Residual Heat Removal System Pipe Support, Rev. 0

CCD No. 2-2-H2O-0020-01, Sequoyah Nuclear Plant, Safety Injection System Pipe Supports, R-0

1095E46, Sequoyah Nuclear Plant No. 2, CRDM Seismic Support Platform General Assembly, Sheet 1 of 2, Rev. 6

1, 2-47W813-1-ISI, Flow Diagram Reactor Coolant System, Rev. 7

2-47K406-112, N2-62-12A Isometric, Static, Thermal, and Seismic Analysis of CVCS Piping, Rev.1

ISI-0401-C-02, Sequoyah Nuclear Plant Unit-2 Steam Generator Replacement, Rev. 3

48N427, Structural Steel Equipment Supports Upper Steam Generator Support, Rev. 15

48N431, Structural Steel Equipment Supports Upper Steam Generator Support Details, Rev. 20

DCA No. D22479-3001, Drawing Change Authorization, DCN D22479A, Page 85, Rev. 2

DCA No. D22479-3002, Drawing Change Authorization, DCN D22479A, Page 86, Rev. 1

DCA No. D22479-3003, Drawing Change Authorization, DCN D22479A, Page 87, Rev. 2

DCA No. D22479-3005, Drawing Change Authorization, DCN D22479A, Page 89, Rev. 2

CCD No. 2-2-H47-0104-01, Steam Generator Blowdown System Pipe Supports, Rev. 0

Procedures

0-PI-SLT-068-200.0, Reactor Building Post Shutdown Leakage Examination, Rev. 4

2-PVC-068-0340B, Preventative Maintenance Work Instruction, PM011442000, Attachment "A" used by WO 114734912, dated 5/12/14

0-MI-MRR-068-006.0, Sequoyah Nuclear Plant, Installation of Reactor Pressure Vessel Head and Attachments, Appendix "G" Seismic Tie Data Sheet, Rev. 38

2-SI-SXI-068-201.0, Leakage Test of the Reactor Coolant Pressure Boundary, 1/21/2014
 N-PT-9, Liquid Penetrant of ASME and ANSI Code Components and Welds, Rev. 0037
 N-VT-1, Visual Examination Procedure for ASME Section XI Preservice and Inservice, Rev. 5
 Areva 03-9052292, Operating Instructions for RANGER in recirculating Steam Generator, Rev. 15
 Areva 03-9187284, Utilizing a Personal Computer Platform for Eddy Current Acquisition Data Functions, Rev. 1
 NEDP-16, Steam Generator Program, Rev. 15
 0-MI-MXX-068-005.0, Steam Generator Primary Side Maintenance Activities, Rev. 24
 0-MI-MXX-003-002.0, Steam Generator Secondary Side Maintenance Activities, Rev. 15
 0-SI-SXI-068-114.3, Steam Generator Tubing Inservice Inspection and Augmented Inspections, Rev. 1
 2-SI-CEM-068-137.5, Primary to Secondary Leakage via Steam Generators, Unit 2, Rev. 13

Engineering/Technical Evaluations

PER 888330, Boric Acid Leakage Evaluation, Reactor Cavity Nozzle Cover Seal leaking into Keyway, 6/24/14
 PER 890230, Evaluation of Boric Acid Corrosion Damage, 2-SNUB-068-RCH30, 6/7/14
 Sequoyah PER 743110, Degraded Unit 2, Ice Condenser Due To Recurring Frost Accumulation on Intermediate Deck Doors, Event Date, 5/08/13
 SQN PER 889645, Equipment Apparent Cause Evaluation for Compression Fitting Leak, Event Date, 6/24/14
 NOI-2-SQ-432, Available Margins in Pipe Support Attributes, 5/26/14

Corrective Action Documents

PER 888991, Observation made during NRC ISI – Boric Acid Inspection, 5/28/14
 PER 889400, Determine whether CRDM Seismic Support should be examined under Section XI, 5/23/14
 PER 899941, Failure to Quarantine Failed Part for Analysis, 6/17/2014
 PER 743110, Degraded Non-conforming condition for PDO on RCS leakage and Ice on Intermediate deck doors (IDD), 7/19/13
 SR888431, Loose Hydraulic lines on Snubbers, 5/22/2014
 PER 487507, SQN review/Westinghouse NSAL-12-1 SG Channel Head Degradation, 2012
 PER 889451, Discoloration in Steam Generator Primary Bowls, 2014
 SR 890656, Steam Generator Secondary Side Inspection and Sludge Lancing
 SR 891631, EPRI ETSS not referred in site ETSS, 2014
 SR 891633, Steam Generator ECT Secondary Analyst did not call wear out and proximity indications, 2014
 SR 900540, Evaluate SEQ Primary to Secondary Leakrate Detection Limits, 2014

Other Documents

Penetration Number 56, RPV Head Penetration UT Data Sheet, 12/7/06
 Penetration Number 56, RPV Head Penetration UT Data Sheet, 05/18/14
 Penetration Number 60, RPV Head Penetration UT Data Sheet, 05/18/14
 Penetration Number 53, RPV Head Penetration UT Data Sheet, 12/06/06
 Penetration Number 53, RPV Head Penetration UT Data Sheet, 05/19/14
 R-6069, TVA Record of Liquid Penetrant Examination, 2SIH-020-IA, 4/30/99

R0114, TVA Liquid Penetrant Examination, Reinspection Summary No. 01961-ISI-SQN, for 2-SIH-020-IA, 5/19/14

R0105, TVA Liquid Penetrant Examination, Inspection Summary No. 01934-ISI-SQN2, or 2-CVCH-006-IA, 5/18/14

NPG-SPP-09.1, ASME Code and Augmented Programs, Attachment 8, Form NPG-SPP-09.1-2, for Component ID, 2-SIH-020-IA, 5/19/14

NPG-SPP-09.1, ASME Code and Augmented Programs, Attachment 8, Form NPG-SPP-09.1-2, for Component ID, 2-CVCH-585, 5/12/14

System 068, Reactor Coolant System Health Report, 2/1/2014 – 5/31/2014

0-SI-DXI-000-114.3, Attachment 5, Unit-2 Examination Schedule for ASME Class 1, 2, 3 Components, 5/9/14

TVA Report No. R0105, Summary No. 01934-ISI-SQN2, Liquid Penetrant Examination Summary for Component ID 2-CVCH-006-IA, Category B-K/B10.20, Integral Attachment, 5/18/14

Work Order No. 112354373, Valve SQN-2-VLV-001-0817 Replacement, 3/25/13

R0041, TVA Record of Visual Examination, 2-CVCH-585, 5/6/2014

R0086, TVA Record of Visual Examination, 2-CVCH-584, 5/15/2014

R0094, TVA Record of Visual Examination, 2-CVCH-586, 5/14/2014

R0151, Ultrasonic Piping Examination Data Sheet, FDF-011A, 5/24/2014

R0152, Ultrasonic Piping Examination Data Sheet, FDF-010C, 5/24/2014

R0170, TVA Record of Visual Examination, SGH-4-1, 5/28/14

Candidate No. 3237861, EPRI Performance Demonstration Initiative Program Qualifications, 1/14/11

MWK7861, IHI Southwest Technologies Inc. Certificate of Qualification, 2/22/2013

H14132981, Certificate of Calibration, M&TE ID No. E41820, 4/14/2013

VT-1, Certificate of Method Qualification Record for BMNO6QGPV, Expires, 11/28/2014

VT-3, Certificate of Method Qualification Record for BMNO6QGPV, Expires, 11/28/2014

VT-3, Certificate of Method Qualification Record for D880WSO0D, Expires, 10/5/2014

0-SI-MFT-000-001.0, Appendix "E" Page 1, Snubber Functional Testing, SQN-2-SNUB-015-SGBH104, 5/18/14

Report No. SCV-0001, Visual Examination of IWE Interfaces, Moisture Barrier, 5/20/2014

Report No. SCV-0004, Visual Examination of IWE Interfaces, Moisture Barrier, 5/5/2014

Report No. SCV-0005, Visual Examination of IWE Interfaces, Moisture Barrier, 5/5/2014

0-TI-DXX-000-097.1, Boric Acid Corrosion Control Program, Rev. 0009

NPG-SPP-09.7.4, Boric Acid Corrosion Control Program, Rev. 0001

0-TI-SPT-000-301.0, ASME Section XI Pressure testing Program Basis Document, Rev. 0004

0-TI-RVI-000-301.0, Sequoyah Unit 1 & 2, PWR Reactor Vessel Internals Inspection Program, Rev. 0

Sequoyah Unit 2 Control Room, Total Unidentified Leakage Logs, 12/28/2012 thru 5/10/2014

Areva Use of Appendix H and Appendix I Qualified Techniques Sequoyah U2R19 Refueling Outage, Rev. 0, May 2014

Areva 51-91988290-00, Sequoyah U2R19 Steam Generator Degradation Assessment, Rev. 0, May 2014

Areva SQN 2C19 Analyst Training Instructions, Rev. 0

Areva 54-ISI-400-021, Eddy Current Inspection Multi-Frequency Eddy Current Examination of Tubing, June 2013

Areva 51-9221442-000, Sequoyah Unit 2 EOC19 SG ECT Inspection Plan

Areva ETSS_BOB1, Areva Examination Technical Specification Sheet for Bobbin Probe, Rev. 0

Areva ETSS_RPC1, Areva Examination Technical Specification Sheet for MRPC Probe, Rev. 0
 Areva ETSS_RPC2, Areva Examination Technical Specification Sheet for MRPC Probe, Rev. 0
 Areva ETSS_Array1, Areva Examination Technical Specification Sheet for MRPC Probe, Rev. 0
 B85 130429 005, Sequoyah Unit 2 Refueling 18 Operational Assessment, Rev. 1
 Calibration Records for Eddy Current Tester Miz80i Serial Numbers: 39, 21, 71, 36, 73, 91
 Certificate of Conformance for Eddy Current Probes, Serial Numbers 653790, 652262, 655350,
 653784, 652251, 653863, 652265, 652242
 Calibration Standard for ASME 21095, 21099, 21100, 21096, EDM 9173936, 21086,
 ARRAY 9173939
 Personnel Qualification Records for Qualified Data Analysts: W. Bridforth, D. Cornell,
 N. Farenbaugh, J. Janet' Sr, R. Lee, G. Manley, W. McMillan, S. Merriam, E. Miranda,
 R. Miranda, J. Parrish, J. Oliver, A. Richardson, T. Shulter, J. Sordini, L. Tobin, D. Torres
 Personnel Qualification Records of TVA Steam Generator Program Personnel: J. Mayo,
 W. James
 SQN-ENG-F-10-02, Self-Assessment on Steam Generator Program, April 2010
 SQN-ENG-S-11-91, Benchmarking Report on U2R17 NRC Inservice Inspection Readiness,
 March 2011
 SQN-CEM-S-10-015, Self-Assessment on EPRI Secondary Water Chemistry Guidelines,
 July 2010
 Sequoyah Nuclear Plant Unit 2, Replacement Steam Generator Eddy Current Examination
 Guideline, Rev. 1
 Structural Integrity Associates, Report No. 1400660.401.R0, Independent Review of
 Westinghouse LTR-SGMMP-14-27, Assessment of Discolorations on Replacement Steam
 Generator Channel Head Cladding at Sequoyah Unit 2, dated May 30, 2014

Section R12: Maintenance Effectiveness

Procedures

TI-4, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting –
 10CFR50.65, Revision 25

Section R13: Maintenance Risk Assessments and Emergent Work Evaluation

Procedures

NPG-SPP-07.0, Work Management, Revision 0
 NPG-SPP-07.1, On Line Work Management, Revision 9
 NPG-SPP-07.3, Work Activity Risk Management Process, Revision 13
 NPG-SPP-07.11.1, Equipment Out of Service Management, Revision 9

Section R15: Operability Evaluations

Procedures

NEDP-22, Functional Evaluations, Rev. 15
 OPDP-8, Limiting Conditions for Operation Tracking, Rev. 16
 NPG-SPP-03.5, Regulatory Reporting Requirements, Rev. 10

Section R19: Post Maintenance Testing

Procedures

MMDP-1, Maintenance Management System, Rev. 20
 MMDP-3, Guidelines for Planning and Execution of Troubleshooting Activities, Rev. 6
 NPG-SPP-6.5, Foreign Material Control, Rev. 4

NPG-SPP-6.1, Work Order Process Initiation, Rev. 2
 NPG-SPP-06.3, Pre-/Post-Maintenance Testing, Rev. 1
 NPG-SPP-06.9, Testing Programs, Rev. 0
 NPG-SPP-06.9.1, Conduct of Testing, Rev. 8
 NPG-SPP-06.9.3, Post-Modification Testing, Rev. 5

Section 2RS1: Radiological Hazard Assessment and Exposure Controls

Procedures, Guidance Documents, and Manuals

NPG-SPP-05.1 Radiological Controls Revision (Rev.) 003
 NPG-SPP-05.1.1, Alpha Radiation Monitoring Program, Rev. 003
 NPG-SPP-05.6, Controlling Byproduct and Source Material, Rev. 002
 O-SI-RCI-000-056.0, Byproduct Material Inventory and Sealed Source Leak Test Rev. 016
 RCI-14, Radiation Work Permit (RWP) Program, Rev. 058
 RCI-15, Radiological Postings Rev. 026
 RCI-21, Control of Radioactive Materials, Rev. 019
 RCI-22, Contamination Control Rev. 024
 RCI-24, Control of Very High Radiation Areas Rev. 014
 RCI-28, Control of Locked High Radiation Areas Rev. 015
 RCI-29, Control of Radiation Protection Keys, Rev. 016
 RCI-201, Radiation and Contamination Surveys, Rev. 015
 RCI-202, Airborne Radioactivity Surveys Rev. 008
 RCI-204, Radiological Surveys of Equipment and Materials Leaving the RCA, Rev. 008
 RCI-404, Radiation Protection Requirements for Remote Job Coverage, Rev. 001
 RCI-417, Radiological Monitoring of the Hydrogen Peroxide Injection Crud Burst, Rev. 001
 RCDP-1, Conduct or Radiological Control Rev. 005

Records and Data

0-SE-RCI-000-056.0 Byproduct Material Inventory and Sealed Source Leak Test, 11/23/2013
 0-SE-RCI-000-056.0 Byproduct Material Inventory and Sealed Source Leak Test, 05/02/2014
 0-TI-NUC-000-002.0, Storing Material in Spent Fuel Pool or New Fuel Vault, Rev. 0022,
 Attachment-1, Inventory of Materials in Spent Fuel Pool, Cask Loading Area, and New Fuel
 Vault, dated 02/06/2014.
 2013 Sequoyah Radiation Protection Annual Report conducted per NPG-SPP-05.1,
 Radiological Controls, Section 3.2, Program Monitoring Evaluation and Oversight
 Airborne Radiation Survey (ARS) Number (No.) 051514008, U-2 Lower Seal Table During Eddy
 Current Test, dated 05/15/2014
 ARS No. 051514004, U-2 Lower Containment Raceway Routine, dated 05/15/2014
 ARS No. 051514002, U-2 Lower Containment Routine @Elevation 679, dated 05/15/2014
 ARS No. 051514003, U-2 Lower Containment Routine @IPCW, dated 05/15/2014
 ARS No. 052114017, U-2 S/G#1 Laydown Area During Insert Removal, dated 05/21/2014
 ARS No. 052114018, U-2 S/G#1 During Insert Removal, dated 05/21/2014
 ARS No. 052114019, U-2 S/G#4 During Insert Removal, dated 05/21/2014
 ARS No. 052114022, U-2 S/G#3 During Insert Removal, dated 05/21/2014
 ARS No. 052114023, U-2 S/G#2 During Insert Removal, dated 05/21/2014
 ARS No. 052114024, U-2 S/G#3 Laydown Area During Insert Removal, dated 05/21/2014
 ARS No. 052114025, U-2 S/G#1 Laydown Area Back-up Sample, dated 05/21/2014
 ARS No. 052114026, U-2 S/G#3 Laydown Area Back-up Sample, dated 05/21/2014
 ARS No. 052114027, U-2 S/G#3 Primary Platform Back-up Sample, dated 05/21/2014

Annual Inventory Reconciliation Confirmation for License #DRP-77, dated 01/14/2014
 NPG Daily Outage Report, dated 05/12/2014
 NPG Daily Outage Report, dated 05/13/2014
 RWP No. 14000063, LHRA – Plant Filter Change Outs: Seal Water Injection and Return, RCS, SFP, SFP Skimmer, Ion Exchange Filters and Refuel Water Purification Filters: Change Out and Transport.
 RWP No. 14220052, U2 Lower Containment: IPCW – (HRA’s) – MOVATs Testing
 RWP No. 14220103, U2 Lower Containment, Excess LTDWN. HX. RM - LHRA
 RWP No. 14220122, U2 Lower Containment – Seal Table Work to Include Table Roll Back, Tube Extraction, High Pressure Seals, Install Ferrules, Tube Cutting and Recovery Efforts
 RWP No. 14230013, U2 Lower CTMT - Steam Generator Primary Platforms –LHRA
 RWP No. 14230023, U2 Lower Containment - Steam Generator – LHRA - Full Jump for Installing/Removing Nozzle Dams
 Survey No. SQN-M-20140516-20, U2 Upper Containment - All Areas, 05/16/2014
 Survey No. SQN-M-20140527-16, Reactor head move from cavity to head stand, 05/27/2014
 Survey No. SQN-M-20140514-1, U-2 Raceway Elev 679, 05/14/2014
 Survey No. SQN-M-20140515-4, U-2R19 Lower IPCW Floor Area, 05/15/2014
 Survey No. SQN-M-20140515-7, U2 #2 RCP Platform, 05/15/2014
 Survey No. SQN-M-20140521-22, U2 Steam Generator (S/G) Platform, 05/21/2014
 Survey No. SQN-M-20140522-6, U2R19 S/G 1&4 S/G Generator Platform, 05/22/2014
 Survey No. SQN-M-20140605-4, 5&6, SQN ISFSI PAD Quarterly Routine, 06/05/2014
 Survey No. SQN-M-2014021-3, 5&6, SQN ISFSI PAD Quarterly Routine, 02/16/2014
 Survey No. SQN-M-20131020-15, SQN ISFSI PAD Quarterly Routine, 10/20/2013

Corrective Action Program (CAP) Documents

PER-661017
 PER-713213
 PER-776043
 PER-776044
 PER-790597
 PER 805944
 PER-805952
 PER 807919
 PER 827948
 PER 868727
 PER 881321
 PER 886160
 PER 886668
 PER 888770

Section 2RS2: Occupational ALARA Planning and Controls

Procedures, Guidance Documents, and Manuals

CHEM -002, Primary Water Chemistry Program Strategic Plan, Rev. 6
 NPG-SPP-05.2, ALARA Program, Rev. 4
 NPG-SPP-05.2.1, Operational ALARA Planning and Controls, Rev. 2
 NPG-SPP-05.2.2, Establishing Collective Radiation Exposure Annual Business Plan Goals, Rev. 0
 NPG-SPP-05.2.3, Outage Exposure Estimating and Tracking, Rev. 0

RCI-10, ALARA Program, Rev. 35
 RCI-14, Radiation Work Permit (RWP) Program, Rev. 58
 RCI-19, Temporary Shielding Program, Rev. 13
 RCI-417, Radiological Monitoring of the Hydrogen Peroxide Injection Crud Burst, Rev. 1

Reports, Records, and Data

ALARA Committee Meeting Minutes - Meeting Number (No.) 2013-04, 2/22/2013
 ALARA Committee Meeting Minutes - Meeting No. 2013-11, 7/11/2013
 ALARA Committee Meeting Minutes - Meeting No. 2013-19, 10/17/ 2013
 ALARA Committee Meeting Minutes - Meeting No. 2013-22, 11/14/ 2013
 ALARA Plan: 2013-010, Refueling Operations
 ALARA Plan: 2013-011, Mechanical Maintenance Group (MMG)
 ALARA Plan: 2013-012, Electrical Maintenance and RCPs
 ALARA Plan: 2013-015, Plant Services
 ALARA Plan: 2013-017, Radiation Protection
 ALARA Plan: 2013-018, U1R19 MODS Ice Condenser/Snubbers/Insulation/Scaffolds/Painting
 ALARA Plan: 2014-010, Refueling Operations
 ALARA Plan: 2014-011, Mechanical Maintenance Group (MMG)
 ALARA Plan: 2014-015, Plant Services (RCL)
 ALARA Plan: 2014-017, Radiation Protection
 ALARA Plan: 2013-018, Modifications U2R19
 ALARA Work in Progress Review: RWP 2013-011, 10/24/13
 ALARA Work in Progress Review: RWP 2013-018, 11/14/13
 Fiscal Year (FY) Dose Estimate Approval per NPG-SPP-5.2.2 3.1.2
 FY14 RP Dose Reduction Plan
 Graphic Showing Co-58 and Co-60 Trends for 2013-2024 in Both Units
 Report Sequoyah TEDE Year to Date as of 4/24/14
 SQN U1R19 Outage - Dose Reduction Plan
 Slide Show: Sequoyah Nuclear Plant 2011-2015 Business Plan: Collective Radiation Exposure
 2014-2018 SQN Business Plan
 U1R19 ALARA OUTAGE REPORT
 U1R19 Final ALARA Plan Status
 U2R19 ALARA Plan Challenge Numbers Spreadsheet

CAP Documents

2013 Sequoyah Radiation Protection Annual Report, 10/25/2013
 Audit SSA1309, Radiation Protection Sequoyah Nuclear Plant, 8/19-30/2013
 PER 773873
 PER 776064
 PER 776639
 PER 770709
 PER 773258
 PER 724010
 PER 798963
 PER 801067
 PER 886820
 PER 853897

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

Procedures and Guidance Documents

0-PI-FPU-049-401.M, Self-Contained Breathing Apparatus, Rev. 030
 0-PI-RCI-033-001.0, Periodic Monitoring of Service Air System for Use as Breathing Air, Rev. 008
 NPG-SPP-05.10, Radiological Respiratory Protection Program, Rev. 003
 RCI-04.01, Selection, Issue, and Use of Respiratory Protection Devices, Rev. 008
 RCI-04.02, Cleaning/Sanitizing, Maintenance, Inspection, Storage and Inventory of Respiratory Protection Devices, Rev 4
 RCI-04.03, Respiratory Protection Program Periodic Evaluation Rev. 000
 RCI-18.01, DOP Testing of Portable HEPA and Vacuum Cleaners, Rev 001
 UFSAR Chapter 11 & 12

Records and Data Reviewed

AIR/GAS Quality Report and Certificates for SN: 11040, Kit #279317, dated 10/01/2013 and Kit # 286878, dated 03/20/2013
 Assessment SQN-RP-S-14-003, In-Plant Airborne Radioactivity Control and Mitigation, 01/15/2014
 Grade D Certificates for Plant System Air Compressor Equipment ID#s 0-CLR-32-25, 0-CLR-32-26, 0-CLR-32-27 and 0-DS-32-136, dated 09/25/2013
 Grade D Certificates for Plant System Air Compressor Equipment ID#s 0-CLR-32-25, 0-CLR-32-26, 0-CLR-32-27 and 0-DS-32-136, dated 02/13/2012
 HEPA DOP Test Certification for Vacuum Cleaner #s TVA-2 and 1369, dated 05/14/2014
 KeyStone Certifications for Vacuum HEPA Filters #2801, #2787 and #2790, dated 03/13/2014
 MSA MMR Certification Records for TVA SCBA Repair Technicians, Current
 MSA Posi3 USB Complete SCBA Test Results for Units CR06, CR12 and CR13, dated 08/06/2013
 Personnel Contamination Log, 1/2013-5/2014
 UNITECH Services Group DOP Test Results for HEPA #700-7, dated 12/09/2014
 UNITECH Services Group DOP Test Results for HEPA #700-8, dated 11/01/2013
 UNITECH Services Group DOP Test Results for HEPA #700-29, dated 10/02/2013

CAP Documents

PER 660950
 PER 805989

Section 2RS4: Occupational Dose Assessment

Procedures and Guidance Documents

NPG-SPP-05.1.1 Alpha Radiation Monitoring Program, Rev. 003
 RCI-05.304, WBC Routine Operations and DAC-Hr Assignment Evaluation, Rev. 009
 RCI-202, Airborne Radioactivity Surveys, Rev. 008
 RCI-209, Radiological Surveys of Personnel Leaving the RCA or Protected Area, Rev. 004
 RCDP-7, Bioassay and Internal Dose Program, Rev. 005
 RCDP-10, Personnel Contamination Reporting, Rev. 005
 RCTP-106 Special Dosimetry Operations, Rev. 003
 RCTP-113, External Dosimetry MQA Program, Rev. 000

Records and Data Reviewed

Assessment SQN-RP-S-14-004, Occupational Dose Assessment, 02/10/2014
 Committed Effective Dose Equivalent Assignment Summary for 2013
 Dosimetry Investigation Reports 2014-015, 2014-016 and 2014-017
 Evaluation of the Canberra GEM-5 Portal Contamination Monitor Detection Capabilities for Use as a Passive Whole Body Count Instrument, dated 10/30/2014
 Investigative Whole body Counts (6) for Intakes Occurring on U2 S/G Platform on 05/21/2014
 Multi-Badge EDEX Worksheet for Entry on RWP No. 14240182, dated 05/15/2014
 Multi-Badge EDEX Worksheet for Entry on RWP No. 14240213, dated 05/14/2014
 Multi-Badge EDEX Worksheet for Entry on RWP No. 14240053, dated 05/14/2014
 Multi-Badge EDEX Worksheets (2) for Entries on RWP No. 14240023, dated 05/23/2014 and 05/29/2014
 NVLAP Certification of Accreditation to ISO/IEC 17025-2005 for 2014
 OSL Dosimetry Investigation Summary for 01/2013-05/2014
 SQN TLD Area Monitoring Results for 4th Qtr. 2013

CAP Documents

PER 675250
 PER 753263
 PER 784430
 PER 798104
 PER 829995
 PER 830008
 PER 845120
 PER 857054
 PER 869683
 PER 881323
 PER 888629
 PER 888987

Section 2RS5: Radiation Monitoring InstrumentationProcedures and Guidance Documents

1-SI-ICC-090-400.0, Calibration of Shield Building Vent Radiation Monitor 1-RM-90-400, Rev. 18
 2-SI-ICC-090-400.0, Calibration of Shield Building Vent Radiation Monitor 2-R-90-400, Rev. 18
 CHTP-109, Chemistry QA/QC, Rev. 8
 EPIP-1, Emergency Plan Classification Matrix, Rev. 50
 NPG-SPP-06.7, Instrumentation Setpoint, Scaling and Calibration Program, Rev. 2
 RCI-5, Radiation Protection Instrumentation Program, Rev.77
 RCI-5.100, Operation of Laboratory Counter/ Scalers, Rev. 6
 RCI-5.102, Calibration and Operation of the Canberra iSOLO Model 300G Alpha/Beta Counter, Rev. 5
 RCI-5.300, Calibration and Operation of the Eberline Personnel Contamination Monitor (PCM-1B), Rev. 3
 RCI-05-301, Operational Checks for the GEM-5 Portal Monitor, Rev. 8
 RCI-05.305, Calibration, Response Check, And Operation of the Canberra ARGOS-5AB Personnel Contamination Monitor, Rev.7

RCI-05.306, Calibration, Response Check, and Operation of the Canberra Cronos-4 and Cronos-11 Contamination Monitors, Rev.3
 RCI-05.400, Criteria for Setting Portable Radiation Protection Instrument Response Check Windows, Rev.4
 RCI-05.408, Response Check of Neutron Survey Instruments, Rev. 0
 RCI-05.401, Instrument Response Checks Utilizing the Shepherd Calibrator, Rev.4

Records and Data Reviewed

Apex Gamma Spectroscopy Efficiency Calibration, Detector 2, 1/24/2012
 Calibration Data Records for the following instruments:
 ARGOS-5AB, TVA# 860588, 5/8/2013 and 4/30/2014
 ARGOS-5AB, TVA# 860589, 4/26/2013 and 4/9/2014
 Bicron Analyst [no probe type specified], TVA# 8355305, 7/30/2013
 Bicron Analyst with GM, TVA# 8355305, 2/4/2014
 Bicron Analyst with NaI, TVA# 835539, 6/4/2013 and 1/7/2014
 Cronos, TVA# 860780, S/N 1203-021, 2/5/2013 and 1/27/2014
 Eberline Teletector, TVA# 523331, 8/28/2013 and 2/26/2014
 Eberline Teletector, TVA# 523338, 8/22/2013 and 2/26/2014
 GEM-5, S/N 1203-021, 5/7/2013 and 4/23/2014
 GEM-5, S/N 0909-179, 3/18/2013 and 3/14/2014
 HV-1 [air sampler], TVA# 556318, 10/1/2013 and 3/24/2014
 HV-1 [air sampler], TVA# 860003, 8/30/2013 and 3/27/2014
 Ludlum Model 3 frisker, TVA# 860888, 5/30/2013 and 2/18/2014
 Ludlum 2200, TVA# 860654, 10/17/2012 and 12/3/2013
 Ludlum 3030P, TVA# 951047, 12/17/2014
 Ludlum 9-3, TVA# 860844, 5/22/2013 and 2/4/2014
 Ludlum 9-3, TVA# 861000, 2/25/2013 and 2/5/2014
 MG Telepole WR, TVA# 860096, 3/5/2013 and 1/7/2014
 MG Telepole WR, TVA# 951056, 3/3/2014 and 5/14/2014
 SAIC H-810, TVA# 838786 and TVA# 860029, 6/5/2013 and 2/24/2014
 SAM-11, TVA# 860323, 6/17/2013 and 3/10/2014
 SAM-11, TVA# 860324, 2/4/2013 and 1/30/2014
 PCM-1B, TVA# 576358, 8/16/2012 and 7/26/2013
 PCM-1B, TVA# 484689, 4/19/2012 and 9/23/2013
 Calibration/Efficiency Check, Tri-Carb Model 3100TR, S/N 060450, 6/2/2014
 Calibration Report, Calibration of the "FASTSCAN 1" WBC System at the Dosimetry Lab of the TVA Sequoyah Nuclear Plant, 8/22/2013
 Calibration Report, Calibration of the "FASTSCAN 2" WBC System at the Dosimetry Lab of the TVA Sequoyah Nuclear Plant, 8/22/2013
 Calibration Report, High Range Radiation Monitor Calibrator RT-11, S/N 24, TVA Source # 775N, 3/15/1983
 Certificate of Calibration, Beta Standard Source, S/N G4-973, TVA Source # 2482, 11/15/2009
 Certificate of Calibration, Beta Standard Source, S/N G4-972, TVA Source # 2485, 11/15/2009
 Certificate of Calibration, Standard Radionuclide Source, S/N 86078-166, 10/1/2011
 Certificate of Calibration, Standard Radionuclide Source, S/N 95460, 1/1/2014
 Certificate of Gamma Standard Source, S/N 205-56-4, TVA Source # 1295N, 8/1/1989
 Certificate of Gamma Standard Source, S/N 363-02-3, TVA Source # 1296N, 5/1/1990
 Certificate of Gamma Standard Source, S/N 205-83-5, TVA Source # 1297N, 1/1/1990

Certificate of Gamma Standard Source, S/N M-246, TVA Source # 1297N, 5/15/1990
 Certificate of Gamma Standard Source, S/N M-250, TVA Source # 1299, 5/15/1990
 Certificate of Gamma Standard Source, S/N M-248, TVA Source # 1300N, 5/15/1990
 Certificate of Gamma Standard Source, S/N 349-29-1, TVA Source # 1301, 8/1/1989
 Digital Air Flow Calibrator, TVA# 860169, S/N 3204, Source Check Record, 11/23/13
 F & J Specialty Products, Inc. Certificate of Calibration, Digital Calibrator Model D-828B, Serial # (S/N) 3204, 11/5/2013
 Sequoyah Offsite Dose Calculation Manual (ODCM), Rev. 58
 Source Response and Background Data Sheet, Ludlum 2200 Scaler, TVA# 860654, February and March 2014
 System Health Report, System 90, Radiation Monitoring, 10/1/2013 through 1/31/2014
 White Paper, Waste Stream Analysis (DAW 10/14/2013), 3/15/2014
 White Paper, Sequoyah Whole Body Counter Library Revision, 5/30/2014
 Whole Body Counter Library Listing, Europium -152, 6/4/2014
 Work Order (WO) No. 112807041, 1-SI-ICC-090-400.0 Shield Building Vent Rad Mon 1-RM-90-400 Cal, 10/10/2012
 WO No. 115052959, 1-PI-CEM-043-487.0 U1 Post Accident Sampling Sys Calibration, 1/29/2014
 WO No. 112625727, 0-SI-ICC-090-101.B Aux Bldg Vent Gaseous Rad Mon 0-R-90-101B & Flow Monitor 0-F-30-174 CC, 8/31/2012
 WO No. 114475841, 0-SI-ICC-090-101.B Aux Bldg Vent Gaseous Rad Mon 0-R-90-101B & Flow Monitor 0-F-30-174 CC, 9/6/2013

CAP Documents

Assessment SQN-RP-S-14-002, RP Portable Instrumentation and Calibration, 1/28 to 1/30/2014
 PER 735601
 PER793878
 PER 801879
 PER 832856
 PER 871912

Section 40A1: Performance Indicator Verification

Procedures

NPG-SPP-02.2, Performance Indicator Program, Rev. 2
 NPG-SPP-02.2, Performance Indicator Program, Rev. 6
 NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 6

Records and Data Reviewed

2013 Annual Radioactive Effluent Release Report, 4/16/2014
 2013 Annual Radiological Environmental Operating Report, 4/16/2014
 Gaseous Radioactive Waste Release Permit 2014027.059.014.G
 Liquid Radioactive Waste Release Permit 2013191.007.087.L

CAP Documents

PER 756809
 PER 824084
 PER 788604
 PER 793921

Section 40A5: Temporary Instruction 2515/182 – Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks

Corrective Action Program Documents

PER 175149-002, 4" Diesel Fuel Oil Line Failed Pressure Test

PER 347970, NEI 09-14, NSIAC Buried Piping Completion Dates To Be Assigned as LTCAs

PER 684460, License Renewal NRC Commitment #3: Revise the Buried and Underground Piping and Tanks Inspection Program to Meet License Renewal Requirements

Procedures

0-PI-DXX-000-750, Piping Inspection in Tunnels and Infrequently Accessed Areas, Rev. 0000

0-SI-SXI-067-300.7, System Leakage Test of the Essential Raw Cooling Water System Buried Piping, Rev. 0002

0-TI-DXX-000-915.0, Underground Piping and Tanks Integrity Program, Rev. 0006

G-55, Technical and Programmatic Requirements for the Protective Coating Program for TVA Nuclear Plants, Rev. 19

G-94, Piping Installation, Modification and Maintenance, Rev. 2

NPG-SPP-09.15, Underground Piping and Tanks Integrity Program (UPTI), Rev. 0006

Other Documents

0901186.000, Structural Integrity Associates, Inc. Baseline Risk Implementation Analysis: Sequoyah Nuclear Power Plant, Rev. 0

1200931.401, Sequoyah Nuclear Plant Buried Piping Cathodic Protection Design Study, Rev. 0
Buried Pipe Integrity Program Corrosion Assessment for Buried Piping Systems, dated February 2010

CRP-ENG-F-12-002, Assessment of the Underground Piping and Tanks Integrity Program

SQN-ENG-S-14-016, Self-Assessment: Readiness for NRC TI 2515/182 Phase 2 Inspection

Underground Piping and Tanks Integrity Program Inspection Plan, Rev. 3, dated April 1, 2014

WO 09-777416-005, Perform UT Examination for Wall Thickness of Excavated Bare Metal on Diesel Fuel Oil Line

Follow-up on Confirmatory Action Letter (IP 92702)

DCN 22404

Letter from TVA to NRC, "Commitment to Install Improved Flood Mitigation Systems," dated April 16, 2013

Letter from TVA to NRC, "Progress Update on Improved Flood Mitigation System Project," dated July 1, 2013

Letter from TVA to NRC, "Second Progress Update on Improved Flood Mitigation System Project," dated September 30, 2013

Letter from TVA to NRC, "Third Progress Update on Improved Flood Mitigation System Project," dated December 31, 2013

Letter from TVA to NRC, "Fourth Progress Update on Improved Flood Mitigation System Project," dated March 31, 2014

Letter from TVA to NRC "Completion of Commitments Related to Updated Hydrologic Analysis Results for Sequoyah Nuclear Plant Units I and 2 and Watts Bar Nuclear Plant Unit I," Dated April 29, 2013

Letter from TVA to NRC "Change in Commitment Related to External Flooding Concerns," TVA Letter Dated April 25, 2014