



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
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ATLANTA, GEORGIA 30303-1200

July 31, 2023

Jim Barstow  
Vice President, Nuclear Regulatory Affairs  
and Support Services  
Tennessee Valley Authority  
1101 Market Street  
LP 4A-C  
Chattanooga, TN 37402-2801

**SUBJECT: SEQUOYAH, UNITS 1 AND 2 – INTEGRATED INSPECTION REPORT  
05000327/2023002 AND 05000328/2023002**

Dear Jim Barstow:

On June 30, 2023, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Sequoyah, Units 1 and 2. On July 18, 2023, the NRC inspectors discussed the results of this inspection with Mr. Tom Marshall and other members of your staff. The results of this inspection are documented in the enclosed report.

Three findings of very low safety significance (Green) are documented in this report. Three of these findings involved violations of NRC requirements. We are treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violations or the significance or severity of the violations documented in this inspection report, 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; and the NRC Resident Inspector at Sequoyah, Units 1 and 2.

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 U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; and the NRC Resident Inspector at Sequoyah, Units 1 and 2.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,



Signed by McKown, Louis  
on 07/31/23

Lou J. McKown, II, Chief  
Reactor Projects Branch #5  
Division of Reactor Projects

Docket Nos. 05000327 and 05000328  
License Nos. DPR-77 and DPR-79

Enclosure:  
As stated

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SUBJECT: SEQUOYAH, UNITS 1 AND 2 – INTEGRATED INSPECTION REPORT  
05000327/2023002 AND 05000328/2023002 Dated July 31, 2023

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DATE	7/31/2023	7/31/2023	7/31/2023		

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**U.S. NUCLEAR REGULATORY COMMISSION  
Inspection Report**

Docket Numbers: 05000327 and 05000328

License Numbers: DPR-77 and DPR-79

Report Numbers: 05000327/2023002 and 05000328/2023002

Enterprise Identifier: I-2023-002-0036

Licensee: Tennessee Valley Authority

Facility: Sequoyah, Units 1 and 2

Location: Soddy Daisy, TN 37379

Inspection Dates: April 01, 2023 to June 30, 2023

Inspectors: D. Hardage, Senior Resident Inspector  
A. Price, Resident Inspector

Approved By: Lou J. McKown, II, Chief  
Reactor Projects Branch #5  
Division of Reactor Projects

Enclosure

## SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee’s performance by conducting an integrated inspection at Sequoyah, Units 1 and 2, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC’s program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

### List of Findings and Violations

Failure to Identify the Installation of Non-Conforming Parts in a Safety-Related System			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000328,05000327/2023002-01 Open/Closed	None (NPP)	71111.12
A self-revealed Green finding and an associated non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion XV, “Nonconforming Materials, Parts, or Components,” was identified when the licensee failed to identify the installation of non-conforming parts in a safety-related system. Specifically, the licensee failed to identify control devices in safety-related 6.9kV breakers that were known to be defective from a previously issued Part 21 report. This defective control device caused a breaker to fail in a manner that prevented an automatic start of a centrifugal charging pump on a safety injection signal.			

Failure of Fuel Transfer Tube Isolation Valve results in Unrecognized Loss of Containment Closure			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000328/2023002-02 Open/Closed	[H.14] - Conservative Bias	71111.20
A self-revealed Green finding and associated non-cited violation (NCV) of Unit 2 Technical Specification (TS) 5.4.1, “Procedures,” was identified when the licensee failed to implement procedure 0-GO-15, “Containment Closure.” Specifically, 0-GO-15 requirements for containment closure control were not implemented for containment penetration X-3 Unit 2 Fuel Transfer Tube being breached after 2-VLV-78-610, Unit 2 Fuel Transfer Tube Isolation Valve failed in a partially open configuration.			

Failure to identify ice condenser intermediate deck door failed acceptance criteria			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000328/2023002-03 Open/Closed	[H.8] - Procedure Adherence	71111.24
The inspectors identified a Green finding and associated non-cited violation (NCV) of Sequoyah Unit 2 Technical Specification (TS) 5.4.1, “Procedures,” wherein the licensee failed to identify that the acceptance criteria in procedure 0-SI-MIN-061-109.0, “Ice Condenser Intermediate and Lower Inlet Doors and Vent Curtains,” was not met and the licensee subsequently failed to comply with TS 3.0.4 such that a Limiting Condition for Operation (LCO) was not met during entry into a mode specified in the applicability section of that LCO.			

Specifically, the licensee failed to identify that four intermediate deck doors had failed to meet TS Surveillance Requirement (SR) 3.6.13.6 acceptance criteria during the performance of O-SI-MIN-061-109.0.

**Additional Tracking Items**

Type	Issue Number	Title	Report Section	Status
LER	05000328/2023001-00	LER 2023-001-00 for Sequoyah Nuclear Plant, Unit 2, Inoperable Ice Condenser Intermediate Deck Doors Results in Condition Prohibited by Technical Specifications	71153	Closed

## PLANT STATUS

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

Unit 2 began the inspection period shutdown for refueling outage 2R25. Reactor startup was performed on April 14, 2023 and the unit returned to RTP on April 18, 2023. The unit remained at or near RTP for the remainder of the inspection period.

## INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed activities described in IMC 2515, Appendix D, "Plant Status," observed risk significant activities, and completed on-site portions of IPs. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

## REACTOR SAFETY

### 71111.01 - Adverse Weather Protection

#### Seasonal Extreme Weather Sample (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated readiness for seasonal extreme weather conditions prior to the onset of seasonal summer temperatures including reviewing the material condition of the plant's offsite AC power systems and onsite alternate AC power systems, including the switchyard and transformers on June 14, 2023.

### 71111.04 - Equipment Alignment

#### Partial Walkdown Sample (IP Section 03.01) (6 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) Unit 2 residual heat removal (RHR) system with both trains aligned for low pressure safety injection in Mode 1 following realignment from 2R25 on April 18, 2023
- (2) Unit 2 auxiliary feedwater (AFW) system alignment for normal standby readiness following 2R25 on April 19, 2023
- (3) Unit 1 'B' train AFW and the turbine driven AFW train during emergent inoperability of 'A' train AFW on May 8, 2023
- (4) Vital Battery V alignment to Battery Board IV during Vital Battery IV surveillance testing on May 23, 2023
- (5) 1A emergency diesel generator (EDG) and 1B EDG following 7-day tank inspections on May 31, 2023

- (6) Unit 1 AFW system alignment for normal standby readiness following maintenance on motor driven auxiliary feedwater (MDAFW) Loop 1 level control valve 1-LCV-3-164, on June 28, 2023

#### 71111.05 - Fire Protection

##### Fire Area Walkdown and Inspection Sample (IP Section 03.01) (5 Samples)

The inspectors evaluated the implementation of the fire protection program by conducting a walkdown and performing a review to verify program compliance, equipment functionality, material condition, and operational readiness of the following fire areas:

- (1) Unit 2 Reactor Building Annulus on April 9, 2023
- (2) Unit 2 Lower Containment on April 10, 2023
- (3) Unit 2 Upper Containment on April 11, 2023
- (4) EDG Building, Elevation 740.5 on May 28, 2023
- (5) Unit 1 and Unit 2 Auxiliary Building, Elevation 690 on June 11, 2023

##### Fire Brigade Drill Performance Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated the onsite fire brigade training and performance during an unannounced fire drill on May 9, 2023

#### 71111.07A - Heat Exchanger/Sink Performance

##### Annual Review (IP Section 03.01) (1 Sample)

The inspectors evaluated readiness and performance of:

- (1) 1A1 component cooling water system (CCS) heat exchanger on May 1, 2023

#### 71111.11Q - Licensed Operator Requalification Program and Licensed Operator Performance

##### Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (1 Sample)

- (1) The inspectors observed and evaluated licensed operator performance in the main control room during plant startup following 2R25 on April 13, 2023

##### Licensed Operator Requalification Training/Examinations (IP Section 03.02) (1 Sample)

- (1) The inspectors observed and evaluated a simulator training scenario including a loss of vacuum and a reactor coolant system leak on May 30, 2023

#### 71111.12 - Maintenance Effectiveness

##### Maintenance Effectiveness (IP Section 03.01) (1 Sample)

The inspectors evaluated the effectiveness of maintenance to ensure the following structures, systems, and components (SSCs) remain capable of performing their intended function:



- (1) Maintenance rule functional failure of 2A centrifugal charging pump (CCP) due to demand failure (CDE 3207) on March 19, 2023

#### 71111.13 - Maintenance Risk Assessments and Emergent Work Control

##### Risk Assessment and Management Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated the accuracy and completeness of risk assessments for the following planned and emergent work activities to ensure configuration changes and appropriate work controls were addressed:

- (1) Unit 1 and 2, the week of April 9-15, including Unit 2 Yellow shutdown risk and unit transitions from Mode 5 through Mode 2
- (2) Unit 1 and 2, week of May 1-6, 2023, including protection equipment reviews for scheduled maintenance on the 1A1 CCS heat exchanger, 1A RHR pump, and emergent failure of the 2A control rod drive mechanism (CRDM) cooler
- (3) Unit 1 and 2, week of May 7-12, 2023, including protection equipment reviews for scheduled maintenance on the 1B containment spray pump, 1B safety injection pump, 2B RHR pump, and emergent failure of the 1A motor driven AFW train
- (4) Unit 1 and 2, week of May 21-27, 2023, including protection equipment reviews for scheduled maintenance on the 2B CCS pump, 1B EDG and vital battery IV

#### 71111.15 - Operability Determinations and Functionality Assessments

##### Operability Determination or Functionality Assessment (IP Section 03.01) (6 Samples)

The inspectors evaluated the licensee's justifications and actions associated with the following operability determinations and functionality assessments:

- (1) 2-PCV-068-0334B will not indicate closed when the hand switch is in the closed position on April 7, 2023
- (2) Significant emergency raw cooling water (ERCW) leak on 2A-A CRDM cooler inside the polar crane wall on May 2, 2023
- (3) Unit 2 690 Pen Room Cooler leak worsening on May 6, 2023
- (4) Oil samples reveal incorrect oil in Unit 1 turbine driven AFW pump inboard and outboard bearing reservoirs on May 17, 2023
- (5) Low ERCW flowrates to 2A and 2B RHR pump room coolers on June 14, 2023
- (6) Oil leak on 1A CCP coming from conduit junction box near 1-TE-62-108J on June 27, 2023

#### 71111.20 - Refueling and Other Outage Activities

##### Refueling/Other Outage Sample (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated refueling outage 2R25 activities from April 1 – April 15, 2023

#### 71111.24 - Testing and Maintenance of Equipment Important to Risk

The inspectors evaluated the following testing and maintenance activities to verify system operability and/or functionality:

Post-Maintenance Testing (PMT) (IP Section 03.01) (9 Samples)

- (1) Work order (WO) 123560939, Repair Excess Letdown Heat Exchanger Inlet Isolation Valve 2-FCV-070-0143-A on April 2, 2023
- (2) WO 123126434, Replace rotating element 2B-B CCP on April 3, 2023
- (3) WO 122809557, 2-VLV-62-525 CCP discharge check valve inspection on April 8, 2023
- (4) WO 120012132, 2-FCV-74-002, RHR supply from Loop 4 Hot Leg, repack valve on April 11, 2023
- (5) WO 120056454, 2-VLV-063-0634, RHR pump discharge check valve on April 12, 2023
- (6) WO 122809015, Install refurbished and certified Pressurizer Safety Valve, 2-VLV-68-563 on April 13, 2023
- (7) WO 122806959, Remove and reinstall Unit 2 Pzr PORV, 2-PCV-68-334 on April 13, 2023
- (8) WO 122737604, Perform a clam and mic inspection on 1A1 CCS Heat Exchanger, on May 3, 2023
- (9) WO 123799773, LCV-3-164A, Steam Generator #1 AFW flow control valve, actuator has air leak at bolt 20 at the flange area of the clamshell, on June 16, 2023

Surveillance Testing (IP Section 03.01) (2 Samples)

- (1) 2-SI-SXI-068-201.0, Leakage Test of the Reactor Coolant Pressure Boundary on April 13, 2023
- (2) 0-SI-MIN-061-109.0, Ice Condenser Intermediate and Lower Inlet Doors and Vent Curtains, on April 14, 2023

Ice Condenser Testing (IP Section 03.01) (1 Sample)

- (1) 0-SI-MIN-061-105.0 Ice Condenser – Ice Weighing on April 7, 2023

Diverse and Flexible Coping Strategies (FLEX) Testing (IP Section 03.02) (1 Sample)

- (1) 0-PI-SFT-360-001.0, Flex Pumps Operations for Maintenance Activities, on June 29, 2023

71114.06 - Drill Evaluation

Select Emergency Preparedness Drills and/or Training for Observation (IP Section 03.01) (1 Sample)

- (1) Emergency preparedness training drill including a loss of offsite and power and a general emergency resulting from a loss of coolant accident with fuel failure and potential containment failure conducted on May 24, 2023

**OTHER ACTIVITIES – BASELINE**

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

IE01: Unplanned Scrams per 7000 Critical Hours Sample (IP Section 02.01) (2 Samples)

- (1) Unit 1 (April 2022 through March 2023)
- (2) Unit 2 (April 2022 through March 2023)

IE03: Unplanned Power Changes per 7000 Critical Hours Sample (IP Section 02.02) (2 Samples)

- (1) Unit 1 (April 2022 through March 2023)
- (2) Unit 2 (April 2022 through March 2023)

IE04: Unplanned Scrams with Complications (USwC) Sample (IP Section 02.03) (2 Samples)

- (1) Unit 1 (April 2022 through March 2023)
- (2) Unit 2 (April 2022 through March 2023)

71152A - Annual Follow-up Problem Identification and Resolution

Annual Follow-up of Selected Issues (Section 03.03) (1 Sample)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issues:

- (1) 1A MDAFW pump to #1 steam generator level control valve air leak on June 23, 2023

71152S - Semiannual Trend Problem Identification and Resolution

Semiannual Trend Review (Section 03.02) (1 Sample)

- (1) The inspectors reviewed the licensee's corrective action program for potential adverse trends with Unit 1 reactor cavity leakage that might be indicative of a more significant safety issue on June 28, 2023

71153 - Follow Up of Events and Notices of Enforcement Discretion

Event Report (IP section 03.02) (1 Sample)

The inspectors evaluated the following licensee event reports (LERs):

- (1) Licensee Event Report 50-328/2023-001-00, Inoperable Ice Condenser Intermediate Deck Doors Results in Condition Prohibited by Technical Specifications (ADAMS accession: ML23158A170). The inspection conclusions associated with this LER are documented in this report under the Inspection Results.

**INSPECTION RESULTS**

Failure to Identify the Installation of Non-Conforming Parts in a Safety-Related System
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Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000328,05000327/2023002-01 Open/Closed	None (NPP)	71111.12
<p>A self-revealed Green finding and an associated non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion XV, "Nonconforming Materials, Parts, or Components," was identified when the licensee failed to identify the installation of non-conforming parts in a safety-related system. Specifically, the licensee failed to identify control devices in safety-related 6.9kV breakers that were known to be defective from a previously issued Part 21 report. This defective control device caused a breaker to fail in a manner that prevented an automatic start of a centrifugal charging pump on a safety injection signal.</p>			
<p><u>Description:</u> On March 19, 2023, during the performance of 2-SI-OPS-082-026.A, Loss of Offsite Power with Safety Injection – D/G 2A-A Test, the 2A centrifugal charging pump (CCP) supply breaker failed to close on demand during performance of station blackout testing concurrent with a safety injection (SI) signal. Subsequent attempts to start the 2A CCP from an auto start signal and manually from the main control room also failed. Operators declared the 2A CCP inoperable.</p>			
<p>The breaker which failed was an ABB HK breaker and had been installed in the 2A CCP position on August 17, 2022. The breaker had been operated 6 times between then and the beginning of the test on March 19, 2023. The 2A CCP successfully started in automatic earlier on March 19, 2023 during performance of an earlier section of the test. The initial cause investigation for the breaker failure indicated a problem with the control unit. When the breaker control device was removed, excessive movement on one set of contacts due to a break in the limit switch contact carrier was identified.</p>			
<p>Part 21 report 2012-39-00 on ABB HK safety related breaker control devices had identified failures of safety related breaker control devices that caused Technical Specification equipment to become inoperable at Comanche Peak Nuclear Power Plant (CPNPP). Failure analysis concluded that these failures were caused by a material weakness of the control devices' contact carrier frames due to a manufacturing defect. Less than adequate control of the manufacturing process increased the susceptibility to shock loading of the cured phenolic material used to make the contact carrier frames. The specific part number of the failed control device was 191921T06. ABB redesigned this subcomponent with stronger material in 2014.</p>			
<p>In accordance with NPG-SPP-02.3, Operating Experience Program the licensee entered Part 21 report 2012-39-00 into the Sequoyah corrective action program on September 20, 2012. NPG-SPP-04.3, Material Storage and Handling, requires that if material is identified as nonconforming after receipt or prior to issue (i.e., vendor notification of product defect, 10 CFR Part 21 notice, damaged material, etc.) the material involved shall be immediately segregated or identified as nonconforming. However, the licensee evaluation concluded that Sequoyah storeroom did not stock and had not received any of the part number so no action was taken on the parts in stores or installed in the plant and no hold was placed on future receipts. This conclusion was in error. The ABB HK safety related breaker control device identified in 10 CFR Part 21 report 2012-39-00 was in use at Sequoyah. On March 19, 2023, the failed control device for the 2A CCP breaker was part number 191921T06 and same control device was found to still be in use in various safety related and non-safety related 6.9KV distribution boards at Sequoyah.</p>			

Corrective Actions: The licensee replaced the control device for the 2A CCP breaker with an upgraded ABB part. Twelve safety related breakers still are installed having part number 191921T06. The licensee has generated work orders to change the control device with the upgraded ABB part in the remaining safety related breakers.

Corrective Action References: CR 1843763, CR1851366, WO123552540

Performance Assessment:

Performance Deficiency: Failure to identify the installation of non-conforming parts in a safety-related system is a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, one of the installed defective control devices failed resulting in a loss of auto and manual start capability of the 2A CCP. Additionally, twelve other safety related breakers had the non-conforming control device installed which reduced the reliability of the associated safety-related equipment.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The issue screened as Green because the inspectors answered "No" to all the questions in Exhibit 2, Section A.

Cross-Cutting Aspect: Not Present Performance. No cross-cutting aspect was assigned to this finding because the inspectors determined the finding did not reflect present licensee performance. Specifically, the evaluation which failed to identify the nonconforming parts occurred in 2012.

Enforcement:

Violation: Title 10 of CFR Part 50, Appendix B, Criterion XV, "Nonconforming Materials, Parts, or Components," requires, in part, that measures shall be established to control components which do not conform to requirements in order to prevent their inadvertent use or installation. Contrary to the above, from September 21, 2012, to March 19, 2023, the licensee failed to control components which did not conform to requirements in order to prevent their inadvertent use or installation. Specifically, the licensee failed to identify non-conforming control devices in a safety-related 6.9kV breakers, which were identified to be defective by a Part 21 report. One of the non-conforming control devices subsequently failed causing the 2A CCP to be non-functional.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Failure of Fuel Transfer Tube Isolation Valve results in Unrecognized Loss of Containment Closure

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
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Barrier Integrity	Green NCV 05000328/2023002-02 Open/Closed	[H.14] - Conservative Bias	71111.20
<p>A self-revealed Green finding and associated non-cited violation (NCV) of Unit 2 Technical Specification (TS) 5.4.1, "Procedures," was identified when the licensee failed to implement procedure 0-GO-15, "Containment Closure." Specifically, 0-GO-15 requirements for containment closure control were not implemented for containment penetration X-3 Unit 2 Fuel Transfer Tube being breached after 2-VLV-78-610, Unit 2 Fuel Transfer Tube Isolation Valve failed in a partially open configuration.</p>			
<p><u>Description:</u> On March 21, 2023, Unit 2 was in Mode 6 with reactor vessel water level below the flange for reactor head disassembly. The spent fuel pool (SFP) transfer canal was drained and containment penetration X-3, fuel transfer tube, was open to perform dry checks of the fuel transfer system prior to core offload. The licensee was maintaining containment closure control in accordance with 0-GO-15 and penetration X-3 was being tracked by operations as an open penetration. 2-VLV-78-610, Fuel Transfer Tube Isolation Valve (Wafer Valve) was the designated isolation for this penetration. 2-VLV-78-610 is a 20" gate valve that is operated by a reach rod. The valve requires high torque and can be manually manipulated with two operators or manipulated with an electric operator. The valve stroke is 79 turns. If the electric operator is used, the final 5 turns are performed by hand. There is no remote position indication. At 16:57 operators were dispatched to close 2-VLV-78-610 prior to filling the SFP transfer canal. During the closure of the valve, the stem nut that holds the extension stem lower circular hub onto the stem bushing loosened, resulting in the extension shaft becoming disconnected from the valve's stem. Licensee operators believed they had completed valve closure but 2-VLV-78-610 was in an intermediate position. Operations considered penetration X-3 isolated and containment closure satisfied for penetration X-3 in accordance with 0-GO-15.</p> <p>Penetration X-3 was not isolated; 2-VLV-78-610 was failed in an intermediate position and was unable to be operated in the open or closed direction. In this configuration, not only was the licensee unaware that the penetration had failed in a breached condition, but the licensee would not have been able to close the penetration if they had been aware. In accordance with I-PI-OPS-000-020.2, Attachment 2, "SQN Defense-in-Depth Assessment," the outage risk for containment was Orange because the licensee did not meet containment closure requirements and the reactor water level was below the reactor flange.</p> <p>On March 21 at 18:10 operators began filling the transfer canal from the 'B' holdup tank. The licensee believed the closed 2-VLV-78-610 valve was isolating the transfer canal which is in the auxiliary building from the refueling cavity in the containment. On March 22 at 01:07 the licensee commenced lifting the reactor head and filling the reactor cavity from the Refueling Water Storage Tank (RWST). At 03:35 reactor cavity level was greater than 23 feet above the flange and fill was secured. At 03:47 fill of the transfer canal from the 'B' holdup tank was secured. During the fill of the reactor cavity and transfer canal, operators noted that the source of water for the cavity, the RWST, lowered further than expected and the 'B' holdup tank lowered less than expected. Based on this observation, operators suspected 2-VLV-78-610 was not closed. Operators and Maintenance personnel were dispatched to 2-VLV-78-610 and reported the handwheel was turned an additional five turns in the closed direction with no noted resistance that would be expected when the valve was fully seated. Additionally, operators noted that the reach rod connection felt "sloppy".</p> <p>On March 22 at 0518, based on this report, operations initiated a condition report on 2-VLV-78-610. At this time, the licensee outage defense in depth for containment was Green</p>			

because the refuel cavity water provided an integral barrier for the open fuel transfer tube, satisfying containment closure for penetration X-3.

Corrective Actions: The stem nut and bushing were replaced by divers.

Corrective Action References: CR 1844444, CR 1845232, WO 123555397

Performance Assessment:

Performance Deficiency: The licensee's failure to evaluate and maintain containment closure control of Penetration X-3 in accordance with 0-GO-15, Containment Closure Control, was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Configuration Control attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, on March 22, 2023, 2-VLV-78-610, Unit 2 Fuel Transfer Tube Isolation Valve was discovered to be failed in a partially open configuration. Failure of the licensee to recognize the partially open configuration resulted in a loss of containment closure control with the reactor coolant system inventory below the reactor flange and an entry into an Orange outage defense in depth risk condition which the licensee did not recognize.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix G, "Shutdown Safety SDP." Using Attachment 1 "Phase 1 Initial Screening and Characterization of Findings," Exhibit 4 "Barrier Integrity Screening Questions" the inspectors were directed to IMC 0609 Appendix H "Containment Integrity Significance Determination Process," because the finding degraded the physical integrity of reactor containment (valves, penetrations, containment isolation components). Using IMC 0609 Appendix H, since the finding only affects LERF, and not CDF, it is considered a Type B shutdown finding and is evaluated per Section 07.02, "Approach for Assessing Type B Findings at Shutdown." Per Step 2.1, the finding occurred within eight days of the outage in POS 2, so the inspectors continued to Step 2.2. Containment status was determined to be intact, based on Note 1 of Table 7.3, Phase 1 Screening-Type B Findings at Shutdown. (An intact containment is one in which, the licensee intends to: (1) close all containment penetrations with a single barrier or can be closed in time to control the release of radioactive material, and (2) maintain the containment differential pressure capability necessary to stay intact following a severe accident at shutdown. A Type B performance deficiency results when a licensee intends to have an intact containment but cannot maintain that capability due to a performance deficiency). Step 2.2.A directs the inspectors to use Table 7.3. Table 7.3 directs a Phase 2 evaluation to be performed. Table 7.4, "Phase 2 Risk Significance -Type B Findings at Shutdown (For POS 1/TW-E and POS 2/TW-E in which the finding occurs during the first eight days of the outage)," qualitatively screens the performance deficiency to White since this a PWR with in-depth shutdown capability. Since the duration of this type B finding existed for less than eight hours, then the color finding is reduced by one order of magnitude. Therefore, the finding screens to Green.

Cross-Cutting Aspect: H.14 - Conservative Bias: Individuals use decision making-practices that emphasize prudent choices over those that are simply allowable. A proposed action is determined to be safe in order to proceed, rather than unsafe in order to stop. Specifically,

change in the operating characteristics of 2-VLV-78-610 was not challenged by operators positioning the valve when the reach rod became disconnected from the stem.

Enforcement:

Violation: TS 5.4.1, "Procedures," requires, in part, that the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978, be established, implemented, and maintained. Regulatory Guide 1.33 discusses procedures for maintaining containment integrity. Procedure 0-GO-15, Containment Closure Control implements penetration closure requirements to establish containment integrity. 0-GO-15, requires in part that when breaching the containment during modes 5 and 6, the breach is evaluated to ensure the breach can be closed within an allowed closure time and an owner is assigned to close the breach if containment closure is required.

Contrary to the above, from 16:57 on March 21, 2023 until 05:18 on March 22, 2023, 0-GO-15 was not implemented in that a breach of penetration X-3 existed and was not evaluated and no owner responsible to close the penetration was assigned.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Failure to identify ice condenser intermediate deck door failed acceptance criteria

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000328/2023002-03 Open/Closed	[H.8] - Procedure Adherence	71111.24

The inspectors identified a Green finding and associated non-cited violation (NCV) of Sequoyah Unit 2 Technical Specification (TS) 5.4.1, "Procedures," wherein the licensee failed to identify that the acceptance criteria in procedure 0-SI-MIN-061-109.0, "Ice Condenser Intermediate and Lower Inlet Doors and Vent Curtains," was not met and the licensee subsequently failed to comply with TS 3.0.4 such that a Limiting Condition for Operation (LCO) was not met during entry into a mode specified in the applicability section of that LCO. Specifically, the licensee failed to identify that four intermediate deck doors had failed to meet TS Surveillance Requirement (SR) 3.6.13.6 acceptance criteria during the performance of 0-SI-MIN-061-109.0.

Description: On April 10, 2023, the licensee completed 0-SI-MIN-061-109.0 following maintenance on the Unit 2 ice condenser during refueling outage 2R25. On April 11, 2023, all licensee reviews for 0-SI-MIN-061-109.0 were signed for completion with TS acceptance criteria marked as satisfactory. This procedure tests for compliance with TS SR 3.6.13.6, among others. Sequoyah Unit 2 entered Mode 4 on April 11, 2023 at 20:35.

On April 14, 2023, with Sequoyah Unit 2 in Mode 2, the inspectors were performing ice condenser surveillance document reviews and identified that intermediate deck door 2 lifting force of 34.7 lb, 34.0 lb, 33.6 lb, and 34.1 lb in ice condenser bays 13, 15, 16, and 17, respectively, did not meet the acceptance criteria of a lifting force less than or equal to 33.3 lb. Thus, ice condenser bays 13, 15, 16, and 17 failed to meet SR 3.6.13.6. Unit 2 TS LCO 3.6.13 requires ice condenser doors to be operable in Modes 1,2,3, and 4. TS LCO 3.0.4 requires that all LCOs be met when entering a mode or other specified condition stated in the applicability section.



Corrective Actions: The licensee reformed 0-SI-MIN-061-109.0, Ice Condenser Intermediate and Lower Inlet Doors and Vent Curtains, Revision 8, on the affected doors with 3 of the 4 meeting the acceptance criteria. Maintenance was performed on the final door, resulting in all doors meeting the acceptance criteria and restoring operability of the ice condenser.

The licensee submitted Licensee Event Report (LER) 2-2023-001 in accordance with 10CFR50.73(a)(2)(i)(B) – Any operation or condition which was prohibited by the plant's Technical Specifications. The SI procedure was also revised to list the acceptance criteria specific to each door being surveilled.

Corrective Action References: CR 1849888, WO 123604322

Performance Assessment:

Performance Deficiency: The inspectors determined that declaring the Ice Condenser as operable after failing to meet the acceptance criteria in 0-SI-MIN-061-109.0 was a performance deficiency. Specifically, the licensee declared the Ice Condenser operable while intermediate deck door 2 in ice condenser bays 13, 15, 16, and 17 did not meet the SR 3.6.13.6 acceptance criteria in 0-SI-MIN-061-109.0 for lifting force of less than or equal to 33.3 lb.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Human Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, inspectors identified four intermediate deck doors in the Unit 2 ice condenser that had failed to meet the SR 3.6.13.6 acceptance criteria for lifting force in 0-SI-MIN-061-109.0.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The inspectors determined that the finding screened to Green in accordance with Exhibit 2, Mitigating Systems Screening Questions, Section A, Mitigating SSCs and PRA Functionality, because the finding did not represent a loss of the PRA function of a single train TS system for greater than its TS allowed outage time.

Cross-Cutting Aspect: H.8 - Procedure Adherence: Individuals follow processes, procedures, and work instructions. Specifically, the licensee failed to properly execute the procedure ensuring operability of the ice condenser intermediate deck doors at four door locations at each of the data capture, data review, and data verification steps.

Enforcement:

Violation: Unit 2 TS 5.4.1 requires that written procedures shall be established, implemented, and maintained as recommended by Appendix A of Regulatory Guide 1.33, Revision 2. Appendix A requires operating procedures for the ice condenser.

Section 6.3.2 acceptance criteria of 0-SI-MIN-061-109.0, Revision 8, requires a lifting force of less than or equal to 33.3 pounds for door 2 of each ice condenser bay.

Unit 2 TS LCO 3.6.13 requires that the ice condenser inlet doors, intermediate deck doors,

and top deck doors shall be OPERABLE and closed for APPLICABILITY: MODES 1, 2, 3, and 4.

Unit 2 TS LCO 3.0.4 requires that when an LCO is not met, entry into a Mode or other specified condition in the Applicability shall only be made: a. when the associated Actions to be entered permit continued operation in the Mode or other specified condition in the Applicability for an unlimited period of time; b. after performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the Mode or other specified condition in the Applicability, and establishment of risk management actions, if appropriate (exceptions to this Specification are stated in the individual Specifications); or c. when an allowance is stated in the individual value, parameter, or other Specification.

Contrary to the above, on April 10, 2023, and April 11, 2023, the licensee failed to properly implement 0-SI-MIN-061-109.0, a procedure designed to verify operability of ice condenser intermediate deck doors in the Unit 2 ice condenser and failed to comply with TS LCO 3.0.4. Specifically, the unit entered Mode 4, a mode in which TS LCO 3.6.13 applied, with four inoperable intermediate deck doors on April 11 and continued into prohibited Modes 3 and 2. Because the unit entered an applicable Mode without meeting TS LCO 3.6.13, this condition was prohibited by TS LCO 3.0.4. Corrective actions to restore operability for all ice condenser doors were completed at 14:46 on April 14, 2023.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

## **EXIT MEETINGS AND DEBRIEFS**

The inspectors verified no proprietary information was retained or documented in this report.

- On July 18, 2023, the inspectors presented the integrated inspection results to Mr. Tom Marshall and other members of the licensee staff.

**DOCUMENTS REVIEWED**

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.01	Corrective Action Documents	CR 1830073	Develop a strategy to identify start bus roof degradation	01/18/2023
	Procedures	NPG-SPP-07.1.6	On Line Work Control Power Alerts / Offsite Power	Revision 11
71111.04	Corrective Action Documents	CR 1850124	Gas vented from RHR suction piping downstream of FCV-63-72	04/15/23
	Procedures	0-SO-250-1	125 Volt DC Vital Power System	Revision 87
		0-SO-74-1	Residual Heat Removal System	Revision 114
		1-SO-3-2	Auxiliary Feedwater System	Revision 62
		1-SO-3-2 Attachment 3	Auxiliary Feedwater System Standby Readiness Checklist	Revision 62
		2-SO-3-2	Auxiliary Feedwater System	Revision 54
71111.05	Fire Plans	AUX-0-690-01	Unit 1 Auxiliary Building El. 690 Pre-Fire Plan	Revision 9
		AUX-0-690-02	Unit 2 Auxiliary Building El. 690 Pre-Fire Plan	Revision 9
		RXB-0-679-02	Unit 2 Reactor Building Lower Containment Pre-Fire Plan	Revision 3
		RXB-0-701-02	Unit 2 Reactor Building Annulus Area Pre-Fire Plan	Revision 3
		RXB-0-734-02	Unit 2 Reactor Building Upper Containment Pre-Fire Plan	Revision 3
	Miscellaneous	OPDP-3-1	Fire Drill Evaluation Report - Control Building 669	04/26/23
	Procedures	DGB-0-740.5-00	Diesel Generator Building El. 740.5 Pre-Fire Plan	Revision 6
71111.12	Corrective Action Documents	CR 1843763	2A CCP did not start during 2-SI-OPS-082-026.A	03/19/2023
		CR 1851366	Part 21 2012-039 evaluation discrepancy	04/20/2023
71111.13	Corrective Action Documents Resulting from Inspection	CR 1854056	Improper storage of scaffold boards in Aux Bldg El. 690 Pipe Chase (CCPIT room)	05/02/2023
	Procedures	0-GO-16	System Operability Checklists	Revision 34
		NPG-SPP-09.11.4	Risk-Managed Technical Specifications Program	Revision 0
71111.15	Corrective Action Documents	CR 1848429	2-PCV-068-334A will not indicate closed with hand switch in closed position	04/07/2023
		CR 1848487	Urgent Change on 0-GO-1 for stuck PORV	04/08/2023
		CR 1853760	Unit 2 received containment pocket sump high level alarm	05/01/2023

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		CR 1853806	Significant Leak on 2A-A CRDM Cooler inside polar crane wall	05/02/2023
		CR 1857092	Drain out oil in both the inboard and outboard pump reservoirs and replace it with STO-3	05/17/2023
		CR 1861937	ACMP tracking CR for 2A RHR Room Cooler Operability	06/12/2023
		CR 1864664	1 DPS oil leak on 1A CCP coming from the conduit junction near 1-TE-62-108J	06/27/23
71111.20	Corrective Action Documents Resulting from Inspection	CR 1849195	15 dpm leak from DI water valve 2-VLV-59-647	04/11/2023
		CR 1849888	Acceptance Criteria was not met for 0-SI-MIN-061-109.0 Ice Condenser Intermediate Deck Door (SR 3.6.13.6)	04/14/2023
	Engineering Evaluations	EWR 23-DEM-067-093	Operability Assessment for Low ERCW Flow Rates	06/06/2023
71111.24	Corrective Action Documents	CR 1847354	PCR: 2-SI-SXP-062-203.0 CCP comprehensive test	04/03/2023
		CR 1865495	Clean and Inspect 1-CKV-360-HP26, Unit 1 Flex HP Pump Check Valve for Reactor Water Makeup	06/29/23
		CR 1865500	Procedure Change Request for 0-PI-SFT-360-001.0	06/29/2023
	Corrective Action Documents Resulting from Inspection	CR 1866619	PCR learnings from 0-PI-SFT-360-001.0 for FSI-1.8	07/06/2023
	Procedures	0-SI-SLT-070-258.1	Containment Isolation Valve Local Leak Rate Test Component Cooling	Revision 19
		0-SI-SXV-000-206.0	Testing of Category A and B Valves after Work Activities upon release from a Hold Order or when transferred from Other Documents	Revision 7
		0-SI-SXV-070-266.0	ASME Code Valve Testing	Revision 31
		2-SI-SXP-062-203.0	Centrifugal Charging Pump 2A-A and 2B-B Comprehensive Pump Test and Check Valve Test	Revision 15
		2-SI-SXP-074-202.0	RHR Pump 2A-A and 2B-B Comprehensive Performance and Check Valve Test	Revision 13
		2-SI-SXV-000-204.0	Remote Valve Position Indication Verification	Revision 19

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71152A	Corrective Action Documents	CR 1854992	1A MDAFW pump to #1 SG LCV has failed open	05/08/2023
		CR 1862719	1-LCV-3-164 has an air leak at bolt 20 at the flange area of the clamshell	06/15/2023
71152S	Corrective Action Documents	CR 1813272	Improve Unit 1 reactor cavity leakage	10/30/2022
		CR 1813347	Increased potential for PCE's in lower containment from cavity water leakage	10/30/2022
		CR 1813417	Unit 1 Sandbox Cover CL Loop 2 is leaking	10/30/2022
		CR 1816195	Unit 1 Cavity Leakage during 1R25	11/11/2022