



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

November 7, 2022

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

SUBJECT: SEQUOYAH, UNITS 1 AND 2 – INTEGRATED INSPECTION REPORT
05000327/2022003 AND 05000328/2022003

Dear Jim Barstow:

On September 30, 2022, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Sequoyah, Units 1 and 2. On October 20, 2022, 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.

No findings or violations of more than minor significance were identified during this inspection.

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,

A handwritten signature in cursive script that reads "Wesley Deschaine".

Signed by Deschaine, Wesley
on 11/07/22

Wesley D. Deschaine, Chief
Reactor Projects Branch 5
Division of Reactor Projects

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

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV

SUBJECT: SEQUOYAH, UNITS 1 AND 2 – INTEGRATED INSPECTION REPORT
05000327/2022003 AND 05000328/2022003 DATED NOVEMBER 7 2022

DISTRIBUTION:

M. Kowal, RII

S. Price, RII

N. Doiley, RII

M. Toth, RII

PUBLIC

RidsNrrPMSequoyah Resource

RidsNrrDro Resource

ADAMS ACCESSION NUMBER: **ML22307A038**

<input checked="" type="checkbox"/> SUNSI Review		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available	
OFFICE	RII/DRP	RII/DRP			
NAME	D. Hardage	W. Deschaine			
DATE	11/03/2022	11/07/2022			

OFFICIAL RECORD COPY

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

Docket Numbers: 05000327 and 05000328

License Numbers: DPR-77 and DPR-79

Report Numbers: 05000327/2022003 and 05000328/2022003

Enterprise Identifier: I-2022-003-0027

Licensee: Tennessee Valley Authority

Facility: Sequoyah, Units 1 and 2

Location: Soddy Daisy, TN 37379

Inspection Dates: July 01, 2022 to September 30, 2022

Inspectors: C. Fontana, Emergency Preparedness Inspector
D. Hardage, Senior Resident Inspector
N. Lacy, Operations Engineer
A. Price, Resident Inspector
S. Sanchez, Senior Emergency Preparedness Insp
R. Smith, Senior Resident Inspector
J. Walker, Emergency Response Inspector

Approved By: Wesley D. Deschaine, 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

No findings or violations of more than minor significance were identified.

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
URI	05000327/2022003-01	1B-B centrifugal charging pump (CCP) unable to maintain Pressurizer Level at power	71153	Open

PLANT STATUS

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

Unit 2 began the inspection period at RTP. On July 30, 2022, the unit reduced power to 80 percent RTP to maintain NPDES limits. On July 31, 2022, the unit was returned to RTP. 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

External Flooding Sample (IP Section 03.03) (1 Sample)

- (1) The inspectors evaluated that flood protection barriers, mitigation plans, procedures, and equipment are consistent with the licensee's design requirements and risk analysis assumptions for coping with external flooding on September 22, 2022.

71111.04 - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (3 Samples)

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

- (1) Vital Battery V alignment to Battery Board I during Vital Battery I surveillance testing on August 30, 2022
- (2) Inverter 0-III aligned to Vital Instrument Board 1-III and Spare Charger 2-S aligned to Vital Battery Board III for Inverter 1-III and Vital Charger III maintenance on September 12, 2022.
- (3) Inverter I-III aligned to Vital Instrument Board 1-III and Vital Charger III aligned to Vital Battery Board III following maintenance on September 20, 2022.

Complete Walkdown Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated system configurations during a complete walkdown of the Component Cooling Water System "B" Train on September 21-23, 2022.

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 1 and Unit 2 Auxiliary Building, Elevation 653 on July 18, 2022
- (2) Unit 2 Auxiliary Building, Elevation 734 non-RCA areas on August 1, 2022
- (3) Unit 1 Auxiliary Building, Elevation 734 non-RCA areas on August 4, 2022
- (4) Emergency Diesel Generator Building Elevation 722 on August 31, 2022
- (5) Essential Raw Cooling Water (ERCW) Building on September 20, 2022

71111.06 - Flood Protection Measures

Inspection Activities - Internal Flooding (IP Section 03.01) (3 Samples)

The inspectors evaluated internal flooding mitigation protections in the:

- (1) 6.9Kv Shutdown Board rooms A and B and 480 volt Shutdown Boards rooms (734.0-A2, -A5, -A6, -A8, -A9, -A18, -A19, -A20, -A21, -A24) on August 3, 2022
- (2) 480 volt board rooms, mechanical equipment rooms, transformer rooms, and vital battery rooms Auxiliary Building El. 749 on August 4, 2022
- (3) Inaccessible ERCW power cable routing in underground manway 0-MNWX-317-MH31A2 on September 12, 2022

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 testing to support the one-time alternative code relief request for CCP 1B-B on July 24, 2022.

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

- (1) The inspectors observed and evaluated a simulator training scenario including loss of component cooling water, reactor cooling pump (RCP) seal failure, and loss of coolant accident on August 9, 2022.

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (3 Samples)

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

- (1) 2C-A lower containment cooler temperature control valve 2-TCV-067-0092-A failed stroke test (CDE 3129) on January 19, 2021
- (2) B main control room chiller tripped due to oil pump failure (CDE 3122) on October 12, 2020
- (3) 1-LI-3-148 and 1-LI-3-171, steam generator level indication for 1B-B auxiliary feedwater (AFW), reading low (CDE 3172) on November 17, 2021

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, week of July 17- 23, 2022, including emergent maintenance on '1B' charging pump, and the 'D' station air compressor including protection equipment reviews and a transmission system power supply alert.
- (2) Unit 1 and 2, week of July 24 - 30, 2022, including planned maintenance on 'N-B' and 'P-B' ERCW pumps, 2B motor-driven auxiliary feedwater pump and the 'D' station air compressor including protection equipment reviews.
- (3) Unit 1, August 14 – 18, 2022 including emergent failure of vital transfer switch II and planned maintenance on 1A centrifugal charging pump.
- (4) Unit 1 and 2, week of August 28 – September 3, 2022, including scheduled surveillance testing on Vital Battery 1 and Battery Charger 1 and 'P-B' ERCW pump motor replacement including protection equipment reviews.

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (3 Samples)

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

- (1) Prompt Determination of Operability for ERCW leak on 1A-A residual heat removal (RHR) room cooler on July 7, 2022
- (2) 1B-B Charging not able to maintain Pressurizer level in a normal configuration. 1B-B Charging pump would only deliver 80 gpm which does not support stable pressurizer level control with a 75 gpm letdown orifice in service on July 27, 2022.
- (3) Unit 2 containment leakage on August 24, 2022

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (4 Samples)

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

- (1) Work Order (WO) 123048176, Reassemble 1B-B Charging Pump, on July 23 and 24, 2022
- (2) WO 122386350, TCV-67-197 control room air conditioner condenser 'A' supply valve on August 31, 2022
- (3) WO 121827902, Perform vendor recommended maintenance on 120VAC Vital Inverter 1-III on September 16, 2022
- (4) WO 123094884, Rework splice in motor junction box for K-A ERCW pump on August 20, 2022

71111.22 - Surveillance Testing

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

Surveillance Tests (other) (IP Section 03.01) (2 Samples)

- (1) 1-SI-MIN-061-108.8, Ice Condenser Intermediate Deck Door Weekly Inspection, on August 18, 2022
- (2) 2-SI-OPS-082-024.B, 2B-B D/G 24 Hour Run and Load Rejection Testing, on September 7-8, 2022

RCS Leakage Detection Testing (IP Section 03.01) (1 Sample)

- (1) 0-SI-OPS-068-137.0, Reactor Coolant System Water Inventory, on September 7, 2022

71114.01 - Exercise Evaluation

Inspection Review (IP Section 02.01-02.11) (1 Sample)

- (1) The inspectors evaluated the conduct of the biennial emergency plan exercise during the week of September 12, 2022. The exercise scenario began with a simulated seismic event, followed by a Unit 1 main turbine trip and anticipated transient without a reactor trip (which met the conditions for declaration of an Alert), in conjunction with an atmospheric relief valve on the #2 steam generator (SG) failing open. A rise in Unit 1 containment radiation monitors met the conditions for declaration of a Site Area Emergency due to the loss of two barriers (reactor coolant system and fuel clad). Lastly, a tube rupture occurred on the #2 SG, which met the conditions for declaration of a General Emergency. This allowed the Offsite Response Organizations to demonstrate their ability to implement emergency actions.

71114.04 - Emergency Action Level and Emergency Plan Changes

Inspection Review (IP Section 02.01-02.03) (1 Sample)

- (1) The inspectors evaluated submitted Emergency Action Level, Emergency Plan, and Emergency Plan Implementing Procedure changes during the week of September 12, 2022. This evaluation does not constitute NRC approval.

71114.06 - Drill Evaluation

Drill/Training Evolution Observation (IP Section 03.02) (1 Sample)

The inspectors evaluated:

- (1) Emergency preparedness training drill including a general emergency resulting from a loss of coolant accident with fuel failure and potential containment failure conducted on August 17, 2022

71114.08 - Exercise Evaluation - Scenario Review

Inspection Review (IP Section 02.01 - 02.04) (1 Sample)

- (1) The inspectors reviewed and evaluated in-office, the proposed scenario for the biennial emergency plan exercise at least 30 days prior to the day of the exercise.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

MS05: Safety System Functional Failures (SSFFs) Sample (IP Section 02.04) (2 Samples)

- (1) Unit 1 (July 1, 2021 through June 30, 2022)
- (2) Unit 2 (July 1, 2021 through June 30, 2022)

MS06: Emergency AC Power Systems (IP Section 02.05) (2 Samples)

- (1) Unit 1 (July 1, 2021 through June 30, 2022)
- (2) Unit 2 (July 1, 2021 through June 30, 2022)

MS07: High Pressure Injection Systems (IP Section 02.06) (2 Samples)

- (1) Unit 1 (July 1, 2021 through June 30, 2022)
- (2) Unit 2 (July 1, 2021 through June 30, 2022)

MS08: Heat Removal Systems (IP Section 02.07) (2 Samples)

- (1) Unit 1 (July 1, 2021 through June 30, 2022)
- (2) Unit 2 (July 1, 2021 through June 30, 2022)

MS09: Residual Heat Removal Systems (IP Section 02.08) (2 Samples)

- (1) Unit 1 (July 1, 2021 through June 30, 2022)
- (2) Unit 2 (July 1, 2021 through June 30, 2022)

MS10: Cooling Water Support Systems (IP Section 02.09) (2 Samples)

- (1) Unit 1 (July 1, 2021 through June 30, 2022)
- (2) Unit 2 (July 1, 2021 through June 30, 2022)

EP01: Drill/Exercise Performance (DEP) Sample (IP Section 02.12) (1 Sample)

(1) July 1, 2021, through June 30, 2022

EP02: Emergency Response Organization (ERO) Drill Participation (IP Section 02.13) (1 Sample)

(1) July 1, 2021, through June 30, 2022

EP03: Alert And Notification System (ANS) Reliability Sample (IP Section 02.14) (1 Sample)

(1) July 1, 2021, through June 30, 2022

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) • CR 1761048 N41 on Unit 2 spiked bringing in rate trip and high flux alarms

71153 - Follow Up of Events and Notices of Enforcement Discretion

Notice of Enforcement Discretion (NOED) (IP Section 03.04) (1 Partial)

(1) (Partial)

The inspectors evaluated the licensee actions and completed portions 03.04 items a and b of the inspection surrounding Notice of Enforcement Discretion EA-2022-072 which can be accessed at <http://www.nrc.gov/reading-rm/doc-collections/enforcement/notices/noedreactor.html>, on July 21, 2022.

INSPECTION RESULTS

Unresolved Item (Open)	1B-B centrifugal charging pump (CCP) unable to maintain Pressurizer Level at power URI 05000327/2022003-01	71153
<p><u>Description:</u> On July 18, 2022, operators noted the 1B-B CCP was unable to maintain pressurizer level with downstream charging flow control valve (1-PCV-62-93) full open. Operators placed the 1A-A CCP in service and pressurizer level began to recover and maintained level normally. On July 18, 2022, at 22:30 Eastern Daylight Time (EDT), operators declared the 1B-B CCP inoperable and entered Technical Specification limiting condition for operation (LCO) 3.5.2, "Emergency Core Cooling Systems (ECCS)" required action A for one train of ECCS inoperable.</p> <p>During troubleshooting activities, the licensee determined the direct cause of the 1B-B CCP degradation was most likely pump element wear associated with cyclic fatigue. Repair activities required replacing the pump element. This repair activity was forecast to extend beyond the original Technical Specification 72 hour allowed outage time.</p>		

On July 21, 2022, at 17:30 EDT, the licensee requested that a Notice of Enforcement Discretion (NOED) be issued. The licensee requested the NOED be effective for 69 hours past the TS LCO 3.5.2, Action A expiration, i.e., until 19:30 EDT on Sunday, July 24, 2022.

The licensee exited from Technical Specification LCO 3.5.2, Action A at 16:35 EDT on July 24, 2022. As a result, the NOED terminated at 16:35 EDT on July 24, 2022, within the period of the enforcement discretion.

Planned Closure Actions: This unresolved item was opened to determine if there is a performance deficiency associated the cause of the failed pump. The inspectors will review the licensee's causal evaluation which is in progress.

Licensee Actions: The licensee will complete a causal evaluation of the pump failure.

Corrective Action References: CR 1790511, CR 1792274, WO 123048176, WO 123056776

EXIT MEETINGS AND DEBRIEFS

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

- On October 20, 2022, the inspectors presented the integrated inspection results to Mr. Tom Marshall and other members of the licensee staff.
- On September 16, 2022, the inspectors presented the Emergency Preparedness Exercise Inspection results to Mr. M. Lovitt and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.01	Procedures	0-TI-SXX-000-017.0	Hazard Barriers	Revision 5
		AOP-N.03	External Flooding	Revision 61
71111.04	Procedures	0-SO-250-1	125 Volt DC Vital Power System	Revision 86
		0-SO-250-2	120 Volt AC Vital Instrument Power System	Revision 76
		0-SO-70-1	Component Cooling Water System "B" Train	Revision 50
		0-SO-70-1, Att. 2	Component Cooling Water System "B" Train Valve Checklist	06/30/2011
71111.05	Corrective Action Documents Resulting from Inspection	CR 1790032	2A RHR pump room wall has approximately 3/4 inch gap between the pipe insulation and the wall penetration	07/15/2022
	Fire Plans	AUX-0-653-00	Pre-Fire Plan Auxiliary Building - El. 653	Revision 9
		AUX-0-734-01	Pre-Fire Plan Auxiliary Building- El. 734 Unit 1 side	Revision 10
		AUX-0-734-02	Pre-Fire Plan Auxiliary Building- El. 734 Unit 2 side	Revision 9
		DGB-0-722-00	Pre-Fire Plan Diesel Building- El. 722	Revision 7
71111.06	Calculations	MPN-000-000-2010-0203	SQN Probabilistic Risk Assessment Internal Flooding Analysis	Revision 6
	Procedures	AOP-M.08	Internal Flooding	Revision 7
	Work Orders	WO 122767469	0-MNWX-317-MH31A2 Inspect and repair manhole	09/12/2022
71111.11Q	Miscellaneous	SEG OPL273S2253	Loss of CCS, RCP seal failure, LOCA	Revision 0
71111.12	Corrective Action Documents	1616986	Maintenance Rule Functional Failure for CDE 3115 - A EBR chiller tripped on low oil pressure	10/07/2020
		CAR 1643060-02	Submit PMCRs to replace oil pump and motor every 10 years for MCR, EBR, and SDBR chillers.	10/21/2020
	Work Orders	WO 121868199	Rebuild SQN-2-TCV-067-0092A	11/03/2021
71111.13	Miscellaneous	CNL-22-080	Request for Enforcement Discretion from the Requirements of Technical Specification 3.5.2, "ECCS – Operating"	07/22/2022
	Procedures	0-GO-16	System Operability Checklists	Revision 32
71111.15	Corrective Action Documents	CR 1788094	1A-A RHR Room Cooler Leak	07/06/2022
		CR 1791651	ODMI tracking for 1B CCP	07/24/2022
		CR 1798358	Unit 2 containment leakage	08/24/2022

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Corrective Action Documents Resulting from Inspection	CR 1792176	Procedure change request: EA-68-4 100gpm of emergency boration flow not obtainable through normal charging flow path	07/27/2022
	Operability Evaluations	CAR 1788094-001	Prompt Determination of Operability Documentation for CR 1788094	07/07/2022
	Procedures	EA-68-4	Emergency Boration	Revision 17
71111.19	Engineering Evaluations		Pump Reference Value Worksheet 1-PMP-62-104: Centrifugal Charging Pump 1B-B	07/24/2022
	Miscellaneous	CNL-22-079	Sequoyah Nuclear Plant (SQN), Unit 1, American Society of Mechanical Engineers Operation and Maintenance Code, Request for Alternative RP-12	07/20/2022
	Procedures	1-PI-EBT-250-731.0	120 VAC Vital Inverter Functional Test	Revision 24
		1-SI-SXP-062-201.B	Centrifugal Charging Pump 1B-B Performance Test	Revision 26
	Work Orders	WO 120170099	Replace transformers T801, T803, L806 and L804	09/16/2022
71151	Miscellaneous		MSPI Derivation Reports (UAI, URI, PLE) - Unit 1 and Unit 2 High Pressure Injection System (July 1, 2021 - June 30, 2022)	
			MSPI Derivation Reports (UAI, URI, PLE) - Unit 1 and Unit 2 Emergency AC System (July 1, 2021 - June 30, 2022)	
			MSPI Derivation Reports (UAI, URI, PLE) - Unit 1 and Unit 2 Heat Removal System (July 1, 2021 - June 30, 2022)	
			MSPI Derivation Reports (UAI, URI, PLE) - Unit 1 and Unit 2 Cooling Water System (July 1, 2021 - June 30, 2022)	
			Unit 1 Narrative Logs - 7/1/2021 through 6/30/2022	
			Unit 2 Narrative Logs - 7/1/2021 through 6/30/2022	
		NEI 99-02	Regulatory Assessment Performance Indicator Guideline	Revision 7
	Procedures	NPG Standard Programs and Processes, NPG-SPP-09.29	Mitigating System Performance Index	Rev. 0001

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71152A	Corrective Action Documents	CR 1755861	Unexpected annunciators and rate trip for Unit 2 N41 power	02/18/2022
		CR 1756108	Evaluate the detection and prevention strategy for NI's	02/19/2022
		CR 1756389	Received unexpected annunciators 2-XA-55-4B Window D-3 "IPRS NIS Power Range Overpower Rod Withdrawal"	02/22/0222
71153	Corrective Action Documents	CR 1790511	1B CCP degraded flow	07/19/2022
	Miscellaneous	CNL-22-080	Request for Enforcement Discretion from the Requirements of Technical Specification 3.5.2, "ECCS – Operating"	07/22/2022