



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

April 21, 2021

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

SUBJECT: SEQUOYAH NUCLEAR PLANT, UNITS 1 & 2 – NRC INSPECTION REPORT
05000327/2021010 AND 05000328/2021010

Dear Mr. Barstow:

On March 12, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Sequoyah Nuclear Plant, Units 1 & 2. On April 14, 2021, the NRC inspectors discussed the results of this inspection with Mr. John Taylor - Senior Manager SQN Design Engineering and other members of your staff. The results of this inspection are documented in the enclosed report.

No NRC-identified or self-revealing findings were identified during this inspection.

A licensee-identified violation which was determined to be of very low safety significance and Severity Level IV is documented in this report. We are treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violation or the significance or severity of the violation 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 Nuclear Plant, Units 1 & 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,

/RA/

James B. Baptist, Chief
Engineering Branch 1
Division of Reactor Safety

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

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV

SUBJECT: SEQUOYAH NUCLEAR PLANT, UNITS 1 & 2 – NRC INSPECTION REPORT
05000327/2021010 AND 05000328/2021010 Dated April 21, 20201

DISTRIBUTION:

J. Baptist, RII

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N. Morgan, RII

T. Fanelli, RII

M. Greenleaf, RII

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RidsNrrPmSequoyahResource

RidsNrrDroResource

ADAMS ACCESSION NUMBER: **ML21112A344**

<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/DRS/EB1	RII/DRS/EB1	RII/DRS/EB1	RII/DRS/EB1	RII/DRS/EB1
NAME	J. Baptist	D. Ward	N. Morgan	T Fanelli	M. Greenleaf
DATE	4/21/21	4/19/21	4/16/21	4/19/21	4/19/21

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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: 05000327/2021010 and 05000328/2021010

Enterprise Identifier: I-2021-010-0035

Licensee: Tennessee Valley Authority

Facility: Sequoyah Nuclear Plant, Units 1 & 2

Location: Soddy Daisy, TN

Inspection Dates: March 08, 2021 to March 12, 2021

Inspectors: T. Fanelli, Sr. Construction Inspector
M. Greenleaf, Reactor Inspector
N. Morgan, Reactor Inspector
D. Terry-Ward, Construction Inspector

Approved By: James B. Baptist, Chief
Engineering Branch 1
Division of Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a NRC inspection at Sequoyah Nuclear Plant, Units 1 & 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. A licensee-identified non-cited violation is documented in report section: 71111.17T.

List of Findings and Violations

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

Additional Tracking Items

None.

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 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.

Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the coronavirus (COVID-19), inspectors were directed to begin telework. In addition, regional baseline inspections were evaluated to determine if all or portion of the objectives and requirements stated in the IP could be performed remotely. If the inspections could be performed remotely, they were conducted per the applicable IP. In some cases, portions of an IP were completed remotely and on site. The inspections documented below met the objectives and requirements for completion of the IP.

REACTOR SAFETY

71111.17T - Evaluations of Changes, Tests, and Experiments

Sample Selection (IP Section 02.01) (20 Samples)

The inspectors reviewed the following evaluations, screenings, and/or applicability determinations for 10 CFR 50.59 from [enter dates].

- (1) 10 CFR 50.59 Evaluation - DCN SQN-19-308, Diesel Generator 2A-A VORD Removal, Rev. 2
- (2) 10 CFR 50.59 Evaluation - ECP 100098, NIS Time Delay Relay Project, Rev. 2
- (3) 10 CFR 50.59 Evaluation - DCN 100069, Upgrade the Turbine Driven Auxiliary Feedwater Speed Governor and Flow Controller, Rev. 3
- (4) 10 CFR 50.59 Evaluation - DCN D23216, 1,2-HS-062-0104C, -108C, -003-0118C, -0128C, -068-0341AC, -0341DC, Admin. Change #04, Rev. A
- (5) 10 CFR 50.59 Evaluation - D22501, Increase the Capability of 2-FCV-63-72 & -73 to Operate Under Differential Pressure, Rev. A
- (6) 10 CFR 50.59 Evaluation - DCN D23085, Replace Breaker Handle, Breaker Operating Mechanism and Remove Kirk-Key Interlocks, Rev. A
- (7) 10 CFR 50.59 Screen - D23623-01, Charging Flow Isolation Valve 1-FCV-062-0091-B, Rev. A
- (8) 10 CFR 50.59 Screen - EC 23699-03, Change to Allow Flow Element Removal, Rev. B
- (9) 10 CFR 50.59 Screen - DCN 23885, Issue "Emergency and Abnormal Operating Procedure Setpoints" Calculation SQS20110, Revision 30, Design Output, Rev. 0
- (10) 10 CFR 50.59 Screen - DCN 22778, Auxiliary Feedwater Min-Flow Protection, Rev. A
- (11) 10 CFR 50.59 Screen - DCN 21892, Install CCUS 2-XC-43-55, -58, -61, and -64 in the Circuit Before Solenoid Valves 2-FSV-43-55, -58, -61, and -64 to Regulate Current And Reduce Heat Rise, Rev. A

- (12) 10 CFR 50.59 Screen - ECP 10068-01, Motor Operated Potentiometers (MOP) Replacement, Rev. 2
- (13) 10 CFR 50.59 Screen - ECP SQN-19-785, ECP That Will Eliminate the Need for the Current SBO Diesel Generators by Crediting the FLEX Program, Rev. 1
- (14) 10 CFR 50.59 Screen - DCN SQN-19-856, Replace Obsolete EQ Transmitter 2-FT-3-163-B, Rev. 1
- (15) 10 CFR 50.59 Screen - DCN 23813, Replace Steam Generator Blowdown Containment Isolation Sample Valves 1- & 2-FSV-043-0055-B, -0058-A, -0061-B, -0064-A, Rev. 5
- (16) 10 CFR 50.59 Screen - DEC SQN-19-699, EQ Binder Revisions for SG Level Transmitter 1-LT-003-0097-G, Rev. 0
- (17) 10 CFR 50.59 Screen - EDC E21192, WO 09-779231-000, Replace solenoid (per Engineering request), Per MI-10.38 and EDC E21192 with appropriate replacement, acceptance by OPS 6/27/19, Rev. A
- (18) 10 CFR 50.59 Screen - DCN 22346, Replace 480V Board Room Air Conditioners & Associated Equipment, Rev A
- (19) 10 CFR 50.59 Screen - DEC SQN-18-226, Limit Switch Variation for 2-FCV-67-91, Rev. 1
- (20) 10 CFR 50.59 Screen - DEC 100075, B Train Shutdown Board Cleaning Maintenance Crosstie, Rev. 0

INSPECTION RESULTS

Licensee-Identified Non-Cited Violation	71111.17T
This violation of very low safety significance was identified by the licensee and has been entered into the licensee corrective action program and is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.	
<p>Violation: The licensee performed design change DCN SQN-19-308 which removed the Voltage Overshoot Reduction Device (VORD) from the 2A-A Emergency Diesel Generator (EDG) after the VORD was damaged in 2015. The function of the VORD is to reduce the overvoltage developed by the EDG's voltage regulation system during sequence loading during design basis accidents. The DCN incorrectly determined that the VORD removal was acceptable with respect to their licensing and design bases acceptance criteria.</p> <p>The station correctly determined that the licensee's commitment to Regulatory Guide (RG) 1.9, "Selection, Design, and Qualification of Diesel-Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," was a commitment to a Revision 0 of RG 1.9 with the exception of the portion of the RG related to load sequencing. The licensee had been allowed by the NRC to deviate from Rev. 0's 40% load sequence interval acceptance criteria to Rev. 1's acceptance criteria of 60% (as described in NUREG-1232). The licensee determined that they had incorrectly determined that they were allowed to use a provision of RG 1.9 Rev. 1 to exceed the 60% acceptance criteria. To support the modification, the licensee also determined that they had incorrectly altered Section 8.3.1.2.1 of their Updated Final Safety Analysis Report (UFSAR) stating that: "A greater percentage of the time interval may be used if it can be justified by analysis."</p> <p>10 CFR 50.59(c)(2)(ii) required, in part, that a licensee to obtain a license amendment pursuant to Section 50.90 prior to implementing a proposed change if the change would result in a more than minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety previously evaluated in the final safety analysis report (as updated).</p>	

Contrary to the above, since the completion of DCN SQN-19-308, Diesel Generator 2A-A VORD Removal, in June of 2019, the licensee failed to obtain a license amendment prior to implementing the DCN which allowed the emergency diesel generator to exceed its licensing basis acceptance criteria to which they were committed, thereby resulting in a more than minimal increase in the likelihood of occurrence of a malfunction of the emergency diesel generator 2A-A. Specifically, the licensee was committed to Regulatory Guide (RG) 1.9, Selection, Design, and Qualification of Diesel-Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants, Rev. 0, with an allowance to exceed 10% of nominal voltage for up to 60% of the load sequence interval, and the licensee inappropriately determined they could apply portions of RG 1.9, Rev. 1, instead of the specific deviation from Rev. 0 criteria that was previously accepted by the NRC without prior approval.

Significance/Severity: Green. Severity Level IV. The inspectors assessed the significance of the finding using SDP Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2 - Mitigating Systems Screening Questions, dated January 1, 2021. The inspectors determined that the finding was of very low safety significance (Green) as the finding was a deficiency affecting the design or qualification of the emergency diesel generator 2A-A, but the emergency diesel generator maintained its operability. In accordance with Section 6.1.d.2 of the NRC Enforcement Policy (dated January 15, 2020) this violation is categorized as Severity Level IV because the resulting changes were evaluated by the SDP as having very low safety significance (i.e., green finding).

Corrective Action References: CR 1641119

EXIT MEETINGS AND DEBRIEFS

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

- On April 14, 2021, the inspectors presented the NRC inspection results to Mr. John Taylor - Senior Manager SQN Design Engineering and other members of the licensee staff.
- On March 12, 2021, the inspectors presented the Onsite Exit inspection results to Thomas Marshall – Site Vice President Sequoyah Nuclear Plant and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.17T	Calculations	1-FCV-62-091	Documentation of Design Basis Review, Required Thrust Cale and Valve and Actuator Capability Assessment for 1-FCV-62-091 (GL 89-10)	Rev. 6
		31C-D053-EPM-RG-060987	HVAC Equipment Requirements Evaluation: Turbine Driven Auxiliary Feedwater Pump Room	Rev. 6
		DS-M18.2.21	Motor Operated Valve Thrust and Torque Calculations	07/24/2020
		ED00009992018000092	Turbine Driven Auxiliary Feedwater Dedication, Qualification, and Software Verification & Validation Documentation	Rev. 0
		MDQ0000032015000278	Auxiliary Feedwater Pump Alternate Min-flow Relief Valve Sizing	Rev. 0
		N2-62-7A	Summary of Piping Analysis N2-62-7A	
		NDQ0063980038	RWST and Containment RHR Sump Safety and Operational Limits, RWST Setpoint Required Accuracy and LBLOCA, SBLOCA Sump Minimum Levels	Rev. 12
		SQN-CPS-051	Circuit Protection Device Evaluation	Rev. 68
		SQN-CPS-057	Vital Control Power System Loading Channel I And Continuous Loading Evaluation of Protective Devices in the 120v Ac Vital Instrument Power Boards	Rev. 103
		SQN-CPS-058	Vital Control Power System Loading Channel II and Continuous Loading Evaluation of Protective Devices in the 120v Ac Vital Instrument Power Boards	Rev. 119
		SQN-CPS-059	Vital Control Power System Loading Channel III and Continuous Loading Evaluation of Protective Devices in the 120v Ac Vital Instrument Power Boards	Rev. 103
		SQN-CPS-060	Vital Control Power System Loading Channel IV and Continuous Loading Evaluation of Protective Devices in the 120v Ac Vital Instrument Power Boards	Rev. 109
		SQN-E3-002	Diesel Generator Loading Analysis	Rev. 63
		SQN-E3-011, App. K	Overvoltage Analysis	01/22/1988
		SQN-EEB-ETR	Demonstrated Accuracy Calculation ETR	Rev. 2
		SQN-MEB-2-FCV-67-	Documentation of Design Basis Review, Required	Rev. 1

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		091	Thrust Call and Valve & Actuator Capability Assessment For 2-FCV-67-091	
		SQS20110	Emergency and Abnormal Operating Procedure Setpoints	Rev. 30
		TIECS55	Summary of Harsh Environment Conditions for Sequoyah Nuclear Plant	Rev. 38
	Corrective Action Documents	0848636 1468371 1380153 1283446 1084295 1084294 1076269 1076179 1064785 1064736 1049129 1464713 1192952 1260178 0801415 1104481 1641119		
	Corrective Action Documents Resulting from Inspection	CR 1677990	SQN 50.59 2021010 CRFSAR SQEP-EEB-88-018 Cannot be Found	03/11/2021
		CR 1678167	NRC SQN 59.59 2021010 inspection	03/11/2021
	Drawings	0-47W610-46-1	Mechanical Control Diagram Feedwater Control System	04/29/2020
		1, 2-45N765-6	Wiring Diagrams, 6900 Shutdown AUX power, Schematic Diagram	Rev. 6
		1,2-45W880-28A	Conduit & Grounding Penetration Sealing	Rev. 8
		1,2-88405-2	Forged Bolted Bonnet Primary Nuclear Motor Operated Gate Valve	Rev. 0

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		1-45N1635	Wiring Diagrams, Local Instrument Panels, Connection Diagrams, SH 3	Rev. 4
		1-47A941-73	Trust Requirements for Motor Operated Valve 1-FCV-62-091	Rev. 4
		2-45W2614-9	Wiring Diagrams Auxiliary Feedwater Pump & Turbine Connection Diagrams	10/20/2020
		2-45W646-6	Wiring Diagrams Feedwater Pump & Turbines Schematic Diagrams	04/29/2020
	Engineering Changes	DCN 100096	NIS Time Delay Relay Project	Rev. 2
		DCN 22346	Replace 480V Board Room Air Conditioners & Associated Equipment (See attached)	Rev. A
		DCN D23085	Replace breaker handle, breaker operating mechanism and remove Kirk-Key Interlocks	Rev. A
		DCN D23216	1,2-HS-062-0104C, -108C, -003-0118C, -0128C, -068-0341AC, -0341DC, Admin. Change #04	
		DCN SQN-19-308	2A-A VORD Removal	Rev. 2
		DCN SQN-19-856-B	Replace Obsolete EQ Transmitter 2-FT-3-168-	Rev. 1
		DCN-D21892	Install CCUS 2-XC-43-55, -58, -61, AND -64 in the Circuit Before Solenoid Valves 2-FSV-43-55, -58, -61, and -64 to Regulate Current and Reduce Heat Rise	Rev. A
		DEC 10075	B Train Shutdown Board Cleaning Maintenance Crosstie	Rev. 0
		DEC SQN-18-226	Limit Switch Variation for 2-FCV-67-91	Rev. 1
		DEC SQN-19-699	EQ Binder revisions for SG Level Transmitter 1-LT-003-0097-G	Rev. 0
		EC 23813	Replace Steam Generator Blowdown Containment Isolation Sample Valves 1- & 2-FSV-043-0055-B, -0058-A, -0061-B, -0064-A	Rev. 5
		ECP 100068	Motor Operated Potentiometers (MOPs) Replacement for the Emergency Diesel Generators (EDGs)	Rev. 2
		ECP 23085-02	Replace breaker handle, breaker operating mechanism and remove Kirk-Key Interlocks	06/27/2019
		ECP 23085-04	Replace breaker handle, breaker operating mechanism and remove Kirk-Key Interlocks	06/25/2019

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		ECP SQN-19-785	ECP That Will Eliminate the Need for the Current SBO Diesel Generators Creating the FLEX Program	Rev. 1
		EDC E21195	ASCO has discontinued the production of 206-380 & 206-381...	Rev. A
		SQN-0-2015-082-001	Functionally Disabling VORD and DC amp meter for Emergency Diesel 2A-A	Rev. 0
	Miscellaneous		NRC Docket Nos. 50-327 and 328, Renewed Facility Operating License Nos. DPR-77 and DPR-79, Request to Modify Essential Raw Cooling Water Motor Control Center Breakers and to Revise the Updated Final Safety Analysis Report Sequoyah Nuclear Plant Units 1 and 2 (SQN-TS-17-04)	03/09/2018
			Sequoyah Nuclear Plant, Units 1 And 2- Issuance of Amendments Re: Request To Modify Essential Raw Cooling Water Motor Control Center Breakers And To Revise The Updated Final Safety Analysis Report (EPID L-2018-LLA-0060)	05/07/2019
			White Paper, SQN Auxiliary Feedwater System Feasibility Study for Min-flow Design Pressure Increase	11/11/2015
			Updated Final Safety Analysis Report, Chapter 10.4.7.2, Auxiliary Feedwater System	Amd. 30
			Updated Final Safety Analysis Report, Section 15.4.1, Major Reactor Coolant System Pipe Ruptures (Loss of Coolant Accident)	Amd. 30
			Sequoyah Nuclear Plant Units 1 and 2 - Nuclear Steam Supply System Engineering Support Services - Contract No. 2925 - Letter N10562	09/27/2010
		EWR-18-DEC-067-615	Limiterorque SMB-000 actuator	11/06/2018
		EWR-18-DEE-067-616	Limiterorque SMB-000 actuator	Rev. 1
		EWR-18-DEM-067-617	Limiterorque SMB-000 actuator	11/05/2018
		S22 180116 001	Asco Controls, L.P Engineering Report. Rev.3 AQN-18-226, Limit Switch Variation for 2-FCV-67-91	Rev. 1
		SQN FSAR Section 9.3.4	Chemical & Volume Control System	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Procedures	SQN UFSAR Section 10.4.7.2	Auxiliary Feedwater System	
		SQNEQ-SOL-009	Target Rock Corporation Solenoid Valves	Rev. 31
		0-TI-OPS-000-004.0	Time Critical Operator Actions	Rev. 10
		2-SI-EDC-202-220.A	Setpoint Verification and Calibration for Time Delay Relays Associated with Automatic Load Sequence Timers	Rev. 17
		ES-1.3	Transfer to RHR Containment Sump	Rev. 24
		NEDP-2	Design Calculation Process Control	Rev. 18
		NEDP-8.0	Evaluations for Procurement of Materials, Items, and Services	Rev. 7
		NEDP-8.2	Technical Evaluation for Procurement of Safety Related and Quality Related Materials and Items	Rev. 3
		NEDP-8.4	Equivalency Evaluation for Procurement and Replacement of Materials and Items	Rev. 7
		NISP-IP-ENG-001	Standard Design Process (EB-17-06)	Rev. 1
		NPG-SPP-06.9.3	Post-Modification Testing	Rev. 11
		NPG-SPP-09.4	10 CFR 50.59 Evaluations of Changes, Tests, and Experiments	Rev. 15
		PMTI-100069-001	Turbine Driven Auxiliary Feedwater Governor Upgrade	Rev. 0
		TI-28	Curve Book	Rev. 351
		TVA-NQA-PLN89-A	Nuclear Quality Assurance Plan (NQAP) (Quality Assurance Program Description)	Rev. 38
	Work Orders	09-779231-000 112729648 115065173 115065174 115065175 115065176 117222626 118765154 119170828 115144038 120757820		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		112485666 120455241		