



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

December 13, 2021

Ms. Cheryl Gayheart  
Regulatory Affairs Director  
Southern Company Nuclear  
3535 Colonnade Parkway  
Birmingham, AL 35243

**SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT – DESIGN BASIS ASSURANCE  
INSPECTION (PROGRAMS) INSPECTION REPORT 05000348/2021011 AND  
05000364/2021011**

Dear Ms. Gayheart:

On November 16, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Joseph M. Farley Nuclear Plant and discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

One finding of very low safety significance (Green) is documented in this report. This finding involved a violation of NRC requirements. 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 Joseph M. Farley Nuclear Plant.

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. 05000348 and 05000364  
License Nos. NPF-2 and NPF-8

Enclosure:  
As stated

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SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT – DESIGN BASIS ASSURANCE INSPECTION (PROGRAMS) INSPECTION REPORT 05000348/2021011 AND 05000364/2021011 – DATED December 13, 2021

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DATE	12/07/2021	12/08/2021	12/08/2021	12/13/2021	

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

Docket Numbers: 05000348 and 05000364

License Numbers: NPF-2 and NPF-8

Report Numbers: 05000348/2021011 and 05000364/2021011

Enterprise Identifier: I-2021-011-0024

Licensee: Southern Company Nuclear

Facility: Joseph M. Farley Nuclear Plant

Location: Columbia, AL

Inspection Dates: October 18, 2021 to November 05, 2021

Inspectors: C. Baron, Contractor  
P. Carman, Senior Reactor Inspector  
R. Patterson, Senior Reactor 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 design basis assurance inspection (programs) inspection at Joseph M. Farley Nuclear Plant, 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 Properly Categorize MOVs 8809A & B or Check Valve Q1(2)E11V0028 in the IST Program			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000348,05000364/2021011-01 Open/Closed	None (NPP)	71111.21N.02
The inspectors identified a Green NCV of 10 CFR 50.55a(f), "Inservice Testing Requirements," subsection (4) for the licensee's failure to categorize any Unit 1 & 2 RHR pump suction isolation valves (MOVs 8809A & B or check valve Q1(2)E11V0028) as inservice test (IST) Class "A" for which seat leakage is limited to a specific maximum amount in the closed position. Specifically, the licensee's inservice testing program did not test safety-related valves in accordance with, ASME OM code Subsection ISTC-1300, "Valve Categories," to ensure they could meet seat leakage requirements.			

### 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.

## REACTOR SAFETY

### 71111.21N.02 - Design-Basis Capability of Power-Operated Valves Under 10 CFR 50.55a Requirements

#### POV Review (IP Section 03) (8 Samples)

The inspectors:

- a. Determined whether the sampled POVs are being tested and maintained in accordance with NRC regulations along with the licensee's commitments and/or licensing bases.  
Specific Guidance
- b. Determined whether the sampled POVs are capable of performing their design-basis functions.
- c. Determined whether testing of the sampled POVs is adequate to demonstrate the capability of the POVs to perform their safety functions under design-basis conditions.
- d. Evaluate maintenance activities including a walkdown of the sampled POVs (if accessible).

- (1) Q2E21MOV8108, Chemical and Volume Control System (CVCS) Charging Pump Discharge to Regenerative Heat Exchange (HX)
- (2) Q2N11PV3371A, Main Steam Line Atmospheric Vent Valve
- (3) Q2N23MOV3209A, Motor Driven Auxiliary Feedwater (MDAFW) Pump Service Water (SW) Inlet
- (4) Q1N12HV3226, Main Steam to Turbine Driven Auxiliary Feedwater Pump
- (5) Q2E21MOV8108, CVCS Charging Pump Discharge to Regenerative HX
- (6) Q2E11MOV8889, Residual Heat Removal (RHR) HX Discharge to Reactor Coolant System (RCS) Hot Leg
- (7) Q2E11MOV8887A, RHR to RCS Cross-Connect
- (8) Q1E21MOV8803B, High Head Safety Injection (HHSI) to RCS Cold Leg Isolation Valve

## INSPECTION RESULTS

Failure to Properly Categorize MOVs 8809A & B or Check Valve Q1(2)E11V0028 in the IST Program			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating	Green	None (NPP)	71111.21N.0

Systems	NCV 05000348,05000364/2021011-01 Open/Closed		2
<p>The inspectors identified a Green NCV of 10 CFR 50.55a(f), "Inservice Testing Requirements," subsection (4) for the licensee's failure to categorize any Unit 1 &amp; 2 RHR pump suction isolation valves (MOVs 8809A &amp; B or check valve Q1(2)E11V0028) as inservice test (IST) Class "A" for which seat leakage is limited to a specific maximum amount in the closed position. Specifically, the licensee's inservice testing program did not test safety-related valves in accordance with, ASME OM code Subsection ISTC-1300, "Valve Categories," to ensure they could meet seat leakage requirements.</p>			
<p><u>Description:</u> The inspectors noted that a refueling water storage tank (RWST) leakage inflow rate of 3.5 gallons per minute (gpm) was assumed in final safety analysis report (FSAR) Table 15.4-14, Parameter Used in the Loss of Coolant Accident (LOCA) analysis and that the other potential leakage paths from the emergency core cooling system (ECCS) to the vented RWST included valves that were subject to leak testing. The inspectors also noted that calculation BM-98-1711-001, Reverse Flow Evaluation of RWST Check Valves, revision 2 (approved on October 24, 2001) determined that the post-accident containment pressure could be approximately 8 psid greater than the RWST static head at the time of ECCS recirculation transfer. However, this potential leakage path from the ECCS to the RWST did not include any isolation valves that were subject to leak testing to ensure that the 3.5 gpm leakage parameter assumed in the site boundary and control room radiation dose analyses would not be exceeded.</p>			
<p>The NRC issued Information Notice (IN) 91-56, "Potential Radioactive Leakage to Tank Vented to Atmosphere," alerting licensees to potential problems resulting from the leakage of isolation valves in ECCS recirculation lines to the RWST, which is vented to the atmosphere. The NRC informed licensees of corrective actions that could address the leak path vulnerabilities, by incorporating the valves identified in the leak path into the inservice testing program and categorizing them as Category "A" valves. The NRC noted 10 CFR 50.55a, which references the ASME OM Code, and subsection ISTC- 1300 "Valve Categories" stipulates that Category "A" valves are valves for which seat leakage is limited to a specific maximum amount in the closed position for fulfillment of their required functions. The inspectors determined the licensee did not leak test MOVs 8809A &amp; B or check valve Q1(2)E11V0028, to assure that following a design basis accident, during ECCS recirculation, the leakage of containment sump water to the RWST is maintained within the values assumed in the calculation of site boundary and control room doses. The licensee entered the issue into their CAP as CR 10840257 on November 9, 2021.</p>			
<p>Corrective Actions: The licensee entered the issue into their CAP as CR 10840257 on November 9, 2021. The licensee provided additional information supporting the operability and functionality of MOVs 8809A &amp; B or check valve Q1(2)E11V0028 to prevent excessive backflow from the containment sump to the RWST. Specifically, MOVs 8809A &amp; B are required to be closed prior to opening the associated containment sump isolation valves and check valve Q1(2)E11V0028 has been periodically tested to verify its reverse flow closure.</p>			
<p><u>Performance Assessment:</u></p> <p>Performance Deficiency: The failure of the licensee to properly categorize MOVs 8809A &amp; B or check valve Q1(2)E11V0028 in their inservice testing program to ensure they could perform their safety function was a performance deficiency.</p> <p>Screening: The inspectors determined the performance deficiency was more than minor</p>			

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.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Specifically, the finding was a deficiency affecting the design of a mitigating SSC, and the SSC did maintain its operability and functionality.

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.

Enforcement:

Violation: Title 10 CFR 50.55a(f), "Inservice testing requirements," subsection (4) requires in part, that pumps and valves which are classified as ASME Class 1, Class 2, and Class 3 must meet the inservice test requirements set forth in the ASME OM Code and addenda that become effective subsequent to editions and addenda specified in paragraphs (f)(2) of this section and that are incorporated by reference in paragraph (a)(1)(iv) of this section. Furthermore, subsection (f)(4)(ii) requires, "inservice tests to verify operational readiness of pumps and valves, whose function is required for safety, conducted during successive 120-month intervals must comply with the requirements of the latest edition and addenda of the ASME OM Code incorporated by reference in paragraph (a)(1)(iv) of this section 18 months before the start of the 120-month interval." The ASME Code of record for Farley for Operation and Maintenance of Nuclear Power Plants (OM) is the 2004 Edition with Addenda through Omb-2006. Subsection ISTC- 1300, "Valve Categories," requires in part, that valves within this subsection shall be placed in one or more of the following categories. Category "A" is for valves for which the seat leakage is limited to a specific maximum amount in the closed position for fulfillment of their required function(s), as specified in ISTA-1100.

Contrary to the above, since 2001, the licensee did not categorize MOVs 8809A & B or check valve Q1(2)E11V0028 as Category "A" valves to ensure the ASME OM test requirements were met by leak testing the valves to ensure the dose remains within control room and site boundary limits during a design basis accident. This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy. The violation was entered into the licensee's CAP as CR 10840257. (NCV 05000348, 364/2021011-01 Failure to Properly Categorize MOVs 8809A & B or Check Valve Q1(2)E11V0028 in the IST Program)

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 November 16, 2021, the inspectors presented the design basis assurance inspection (programs) inspection results to Cheryl Gayheart and other members of the licensee staff.



## DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.21N.02	Calculations	BM-98-1711-001	Reverse Flow Evaluation of RWST Check Valves	Rev. 2
71111.21N.02	Calculations	F-RIE-IEIF-MOVR-RNK	Farley Farley Nuclear Plant Units 1 and 2 Risk Ranking for Motor-Operated and Air-Operated Valves (Following Rev. 9 Version 3 Model update)	Version 1
71111.21N.02	Calculations	F-RIE-VALVERISK-U00	Farley Unit 1 and 2 Valve Risk Ranking Evaluation	Version 1
71111.21N.02	Calculations	FNP-Q1E21MOV8803B	Thrust and Torque Calculation	Rev. 2
71111.21N.02	Calculations	FNP-Q1N23MOV3209A	Thrust and Torque Calculation	Rev. 2
71111.21N.02	Calculations	FNP-Q2E11MOV8887A	Thrust and Torque Calculation	Rev. 1
71111.21N.02	Calculations	FNP-Q2E11MOV8889	Thrust and Torque Calculation	Rev. 1
71111.21N.02	Calculations	SE-91-1925-14-PE	MOV 3232A,B,C: Terminal Voltage at End of Stroke	Rev. 1
71111.21N.02	Calculations	SE-94-0-0378-001	MOV Combination Starter Component Sizes and Settings	Rev. 5
71111.21N.02	Calculations	SE-94-0470-001	Unit 1 As-Built Load Study	Rev. 10
71111.21N.02	Calculations	SE-SNC529029-001	Unit 1 Minimum Expected Voltage Study	Rev. 2
71111.21N.02	Calculations	SM-04-4801-002	AOV Design Basis Review - Setpoints for Q1N12HV3226	Version 2.0
71111.21N.02	Calculations	SM-90-1653-001	MOV Thrust Requirements for Gate & Globe Valves	Version 17
71111.21N.02	Calculations	SM-90-1653-002	Reduced Voltage Torque/Thrust Capability for Gate & Globe Valves in the FNP MOV Program	Version 23
71111.21N.02	Calculations	SM-90-1653-002	Reduced Voltage Torque/Thrust Capability for Gate & Globe Valves in the FNP MOV Program	Rev. 23
71111.21N.02	Calculations	SM-90-1653-003	Design Basis Differential Pressure for the MOV Program	Rev. 15
71111.21N.02	Calculations	SM-90-1653-003	Design Basis Differential Pressure for the MOV Program	Version 15
71111.21N.02	Calculations	SM-99-2189-007	AOV Design Basis Review – Setpoints for Q2N11PV3371A/B/C	Version 2
71111.21N.02	Corrective Action Documents	10835846	Discrepancy Between the Values for Required Voltage for MOV8803B	10/20/2021

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Resulting from Inspection			
71111.21N.02	Corrective Action Documents Resulting from Inspection	10837853	Revision Requested for NMP-ES-017-008	10/29/2021
71111.21N.02	Corrective Action Documents Resulting from Inspection	10840257	Maximum Allowable Leakage from the Containment Sump to RWST	11/09/2021
71111.21N.02	Corrective Action Documents Resulting from Inspection	10840275	Incorrect Test Methodology for Category A/C Check Valves	11/09/2021
71111.21N.02	Corrective Action Documents Resulting from Inspection	CR 10835850	10835850 – Discrepancy in the Electrical Inspection Procedure	10/20/2021
71111.21N.02	Drawings	D-175033	Main Steam and Auxiliary Steam Systems	Version 12
71111.21N.02	Drawings	D-175038	Sht. 1, P&ID - Safety Injection System	Rev. 44
71111.21N.02	Drawings	D-205007	P&ID – Auxiliary Feedwater System, Sheet 1	Version 29.0
71111.21N.02	Drawings	D-205033	P&ID – Main Steam and Auxiliary Steam System, Sheet 1	Version 43.0
71111.21N.02	Drawings	D-205038	Sht. 1, P&ID - Safety Injection System	Rev. 39.0
71111.21N.02	Drawings	D-205038	Sht. 2, P&ID - Safety Injection System	Rev. 24.0
71111.21N.02	Drawings	D-205039	P&ID Chemical and Volume Control System, Sheet 6	Version 11.0
71111.21N.02	Drawings	U-176883	Outline & Dimensions for HV-3226	Version 2.0
71111.21N.02	Drawings	U-205093	8" 150# OSY Gate Valve	11/25/1975
71111.21N.02	Drawings	U-277627	Atmosphere Relief Valve	Version 13.0
71111.21N.02	Drawings	U-611878	3" 1500# Bolted Bonnet Gate Valve Q2E21MOV8106, Q2E21MOV8107, & Q2E21MOV8108 (V265, V257, & V258)	Version 1.0
71111.21N.02	Miscellaneous	ALA-10-147	Summary of Seismic and Weak Link Calculation Performed for Valves at Locations 8106, 8107 and 8108	11/18/2020
71111.21N.02	Miscellaneous	ALA-11-89	Increase of Weak Link Closing Trust for Farley Units 1 and	10/27/2011

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			2 Valve Locations 8106, 8107, and 8108	
71111.21N.02	Miscellaneous	LDCR 20-044	Removal of Containment Penetrations 23, 24, 28, 42, 43, 44, 45, 46, 61a, 61b, 66 and 67 from the Requirements of Technical Specification 5.5.17, Containment Leakage Test Program	Version 1.0
71111.21N.02	Procedures	FNP-1-EEP-1	Loss of Reactor or Secondary Coolant	Rev. 35.0
71111.21N.02	Procedures	FNP-1-ESP-1.2	Post LOCA Cooldown and Depressurization	Rev. 26.0
71111.21N.02	Procedures	FNP-1-ESP-1.3	Transfer to Cold Leg Recirculation	Rev. 25.0
71111.21N.02	Procedures	FNP-1-ESP-1.4	Transfer to Simultaneous Cold and Hot Leg Recirculation	Rev. 16.0
71111.21N.02	Procedures	FNP-1-SOP-7.0	Residual Heat Removal System	Rev. 112.0
71111.21N.02	Procedures	FNP-1-STP-11.17	RHR RWST Suction Check Valve Reverse Closure Test	10/09/19
71111.21N.02	Procedures	FNP-1-STP-21.3	TDAFWP Steam Supply Valve IST	06/28/2021
71111.21N.02	Procedures	FNP-1-STP-4.10	Reverse Flow Testing of RWST to Charging Pump Check Valve & CVCS Emerg. Borate Filter to Chg. Pmp. Suction Check Valve	Rev. 22.0
71111.21N.02	Procedures	FNP-1-STP-40.0B	Safety Injection with Loss of Off-Site Power Test - B Train	Rev. 12.0
71111.21N.02	Procedures	FNP-1-STP-45.4	ECCS Refueling Outage Valves Inservice Test	04/09/21
71111.21N.02	Procedures	FNP-1-UOP-1.1	Startup of Unit from Cold Shutdown to Hot Standby	Rev. 110.2
71111.21N.02	Procedures	FNP-1-UOP-1.2	Startup of Unit from Hot Standby to Minimum Load	Rev. 120.0
71111.21N.02	Procedures	FNP-2-SOP-7.0	Residual Heat Removal System	Rev. 102.0
71111.21N.02	Procedures	FNP-2-STP-11.17	RHR RWST Suction Check Valve Reverse Closure Test	10/23/20
71111.21N.02	Procedures	FNP-2-STP-11.6	Residual Heat Removal Valves Inservice Test	11/02/20
71111.21N.02	Procedures	FNP-2-STP-11.6	Residual Heat Removal Valves Inservice Test	07/26/21
71111.21N.02	Procedures	FNP-2-STP-158.0	Reactor Coolant System Pressure Isolation Valve Leak Test	11/10/20
71111.21N.02	Procedures	FPN-0-SOP-103.0	Return to Service Checklist and Return to Service Systems Lineup	Rev. 49.0
71111.21N.02	Procedures	NMP-ES-017	Motor-Operated Valve Program	Version 10.1
71111.21N.02	Procedures	NMP-ES-017-001	Motor Operated Valve (MOV) Regulatory Scoping Process	Version 6.2
71111.21N.02	Procedures	NMP-ES-017-001-F-V3	FNP GL89-10/96-05 MOV Program Scope	Version 1.0
71111.21N.02	Procedures	NMP-ES-017-002	Motor Operated Valve Design Basis Setpoint Deamination	Version 6.2
71111.21N.02	Procedures	NMP-ES-017-003	Motor Operated Valve Performance Trending and Margin	Version 5.2

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Management	
71111.21N.02	Work Orders	SNC75202, SNC390935, SNC679107, SNC681216, SNC681217, SNC831498, SNC835825, SNC835825, SNC975098		