



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION II
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ATLANTA, GEORGIA 30303-1200

May 4, 2023

R. Keith Brown
Regulatory Affairs Director
Southern Nuclear Operating Company, Inc.
3535 Colonnade Parkway
Birmingham, AL 35243

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT—INTEGRATED INSPECTION REPORT
05000348/2023001 AND 05000364/2023001

Dear R. Keith Brown:

On March 31, 2023, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Joseph M. Farley Nuclear Plant. On April 25, 2023, the NRC inspectors discussed the results of this inspection with Mr. Delson Erb 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 black ink, appearing to read "A. Blamey".

Signed by Blamey, Alan
on 05/04/23

Alan J. Blamey, Chief
Reactor Projects Branch 2
Division of Reactor Projects

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

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT–INTEGRATED INSPECTION REPORT
05000348/2023001 AND 05000364/2023001 Dated May 04, 2023

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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: 05000348/2023001 and 05000364/2023001

Enterprise Identifier: I-2023-001-0021

Licensee: Southern Nuclear Operating Company, Inc.

Facility: Joseph M. Farley Nuclear Plant

Location: Columbia, AL

Inspection Dates: January 01, 2023 to March 31, 2023

Inspectors: P. Meier, Senior Resident Inspector
S. Temple, Resident Inspector

Approved By: Alan J. Blamey, Chief
Reactor Projects Branch 2
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 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

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

Additional Tracking Items

None.

PLANT STATUS

Unit 1 began the inspection period at approximately 100 percent rated thermal power (RTP). On February 1, 2023, the unit experienced an unplanned uncomplicated reactor trip associated with troubleshooting a vital DC ground (Licensee Event Report 05000348/2023-001-00). On February 4, 2023, the unit 1 reactor was restarted and reached approximately 100 percent RTP on February 6, 2023. Unit 1 remained at approximately 100 percent RTP through the end of the report period.

Unit 2 began the report period at approximately 100 percent RTP and remained at or near 100 percent RTP through the end of the report 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

71111.04 - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (4 Samples)

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

- (1) Number 1 diesel-driven fire pump while the number 2 diesel-driven fire pump was out of service for planned maintenance during the week of January 9, 2023 (FNP-0-SOP-61.0 A; D170366)
- (2) Unit 2 'A' train high head safety injection system while the 'C' charging pump was inoperable for quarterly testing on January 24, 2023 (D205039)
- (3) Unit 2 'B' train auxiliary building 125 vital DC volt distribution system while aligned to the 'C' battery charger during 'B' battery charger load testing on January 24, 2023 (D207082, D207083)
- (4) Unit 2 'B' motor-driven auxiliary feedwater system following planned system maintenance and testing on March 21, 2022 (FNP-2-SOP-22.0, D205007)

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 auxiliary building cable chase (FZ-2117) on March 15, 2023 (FNP-2-FPP-1.0)
- (2) Unit 2 auxiliary building cable chase (FZ-2246) on March 15, 2023 (FNP-2-FPP-1.0)
- (3) Unit 2 control rod drive mechanism control system cabinet room (FA 2-023) on March 15, 2023 (FNP-2-FPP-1.0)
- (4) Unit 2 electrical penetration room (FA 2-035) on March 15, 2023 (FNP-2-FPP-1.0)
- (5) Unit 2 'A' and 'B' motor-driven auxiliary feedwater pump rooms (FA 2-006) on March 15, 2023 (FNP-2-FPP-1.0)

Fire Brigade Drill Performance Sample (IP Section 03.02) (2 Samples)

- (1) Announced fire drill inside the unit 1 radiation-controlled area (1 V motor control center small electrical fire) on January 9, 2023
- (2) Announced fire drill at the service water pump house on March 8, 2023

71111.06 - Flood Protection Measures

Flooding Sample (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated internal flooding mitigation protections in the unit 1 cable spreading room on January 17, 2023 (calculation BM-99-1932-001; F-RIE–IF-U00-006).

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 control room for the following activities:
 - Unit 1 manipulation of plant equipment, boration, and operator response to various control room alarms on January 26, 2022
 - operator response following an unplanned Unit 1 reactor trip on February 1, 2023
 - Unit 1 startup on February 4, 2023 following an unplanned reactor trip

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

- (1) The inspectors observed licensed operator continuing training as-left exam (LOCT Segment 23-1) on January 19, 2023.

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (2 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) Unit 1 vital DC ground troubleshooting that resulted in a unit 1 reactor trip (CR 10944529, CAR372223)
- (2) Repetitive unit 1 main control board annunciator issues associated with grounds (NMP-OS-006-002, SNC1364491)

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (5 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 2 service air compressors 'B' and 'C' emergent work on January 23, 2023 (NMP-DP-001, CR 10941453, CR 10941558)
- (2) Unit 1 main generator real and reactive capability testing January 30, 2023 (FNP-1-ETP-4223.0, SNC1207915)
- (3) New conduit and electrical cable installation in the unit 1 control room from main feedwater flow transmitters to steam generator 'A' on January 31 and February 1, 2023 (FNP-0-SOP-0.0, SNC1424382)
- (4) Splitting out unit 1 supply of auxiliary steam supply from unit 2 on February 10, 2023 (FNP-1-SOP-55.1)
- (5) Static oil pump issues and unit 2 motor auxiliary feedwater system planned motor operated valve maintenance on February 23, 2023 (CR10950736, WO SNC996415)

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) 1-2 A emergency diesel generator control circuit failure alarm received and identified on December 27, 2022 (CR10935005)
- (2) Unit 1 reactor coolant loops delta temperature deviation alarm identified on December 24, 2022 (CR10934242)
- (3) Security diesel generator apparent coolant leak identified on December 25, 2022 (CR10934418)
- (4) Unit 2 containment spray pump discharge valve (Q2E13MOV8820B) failed to close during a valve stroke surveillance (FNP-2-STP-16.7) identified on February 20, 2023 (CR10949573)
- (5) Unit 1 'B' train emergency diesel generator lube oil leak identified on February 26, 2023 (CR10951589)
- (6) Unit 2 residual heat removal pump seal coolers pressure ratings and associated pressure relief valve settings identified on February 17, 2015 (CR 10027796)

71111.18 - Plant Modifications

Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02)
(1 Sample)

The inspectors evaluated the following temporary or permanent modifications:

- (1) Unit 1 replacement and rerouting of cables for FT447, FT487, FT497, and PT446 (DECP SNC1426773) completed January 17 to February 3, 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) (5 Samples)

- (1) Unit 2 motor-driven auxiliary feedwater pump feed water isolation to the 'A' steam generator motor operated valve (MOV3764A) breaker and relay replacement on January 10, 2023 (SNC996413, SNC445522)
- (2) Number 2 diesel-driven fire pump maintenance outage during the week of January 9, 2023 (WO SNC1253916; SNC1337362)
- (3) Security uninterruptible power supply maintenance on February, 23, 2023 (WO SNC1373970)
- (4) Unit 1 'A' service water pump testing following a planned pump maintenance outage on March 7, 2023 (WO SNC1081989)
- (5) The number 1 diesel-driven fire pump functional test following pump relief valve scheduled maintenance on March 10, 2023 (SNC11362475)

Surveillance Testing (IP Section 03.01) (3 Samples)

- (1) Unit 1 'A' train service water pumps 'A', 'B', and 'C' surveillance test on January 19, 2023 (FNP-1-STP-24.1)
- (2) Unit 2 'C' component cooling water pump surveillance on March 6, 2023 (FNP-2-STP-23.3)
- (3) Unit 1 'B' train containment spray system valve stroke testing on March 28, 2023 (FNP-1-STP-16.7)

Inservice Testing (IST) (IP Section 03.01) (2 Samples)

- (1) Unit 1 'B' residual heat removal pump quarterly inservice test on January 4, 2023 (FNP-1-STP-11.2)
- (2) Unit 2 'A' motor-driven auxiliary feedwater pump inservice test on January 18, 2023 (FNP-2-STP-22.1)

71114.06 - Drill Evaluation

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

- (1) The inspectors observed an emergency response organization drill involving a mode 1 loss of coolant accident and safety injection actuation leading to a radiation release and a general emergency classification on February 21, 2023.

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

The inspectors evaluated:

- (1) Licensed operator response during a simulator exam involving a loss of heat sink that contributed to the drill and exercise performance indicator on January 19, 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 (January 1, 2022, through December 31, 2022)
- (2) Unit 2 (January 1, 2022, through December 31, 2022)

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

- (1) Unit 1 (January 1, 2022, through December 31, 2022)
- (2) Unit 2 (January 1, 2022, through December 31, 2022)

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

- (1) Unit 1 (January 1, 2022, through December 31, 2022)
- (2) Unit 2 (January 1, 2022, through December 31, 2022)

71152 A - Annual Follow-up Problem Identification and Resolution

Annual Follow-up of Selected Issues (Section 03.03) (2 Samples)

- (1) Higher than expected startup rate during the unit 1 startup following the 1R31 refueling outage identified on December 21, 2022 (CR 10933508)
- (2) Identifying correct operation of the security backup power supply identified on February 24, 2023 (CR10951055)

INSPECTION RESULTS

Observation: Farley Unit 1 Excessive Startup Rate Issue	71152 A
The inspectors reviewed the licensee’s corrective action report (CAR 356458) associated with issues identified by the resident inspector during unit 1 startup in December 2022 following an extended refueling outage.	
On December 21, 2022, while conducting startup, the startup rate (SUR) exceeded the Farley plant procedure (FNP-1-UOP-1.2, Startup of Unit from Hot Standby to Minimum Load) limit	

due to excessive control rod withdrawal. This resulted in an imprecise recognition of the approach to criticality by the control room staff. Upon recognition, operators prevented a reactor startup trip by inserting control rods before the source range trip actuation setpoints. Control rods were inserted to lower power on the source range and intermediate range meters and to stabilize the SUR to a considerably lower level at criticality before proceeding on to the point of adding heat.

Immediately following the event, the resident inspector reviewed various startup trends to determine the significance of the issue and whether a startup trip should have occurred. Upon review of the trends, the inspector identified the SUR exceeded the procedurally required limit of one decade per minute (dpm). Specifically, the source range and intermediate range SURs exceeded two dpm before control rods were inserted to slow the startup. Although the highest source range SUR approached the trip setpoint, the inspector noted that it was not exceeded based on the computer data available.

Based on the event, the resident inspector identified a minor violation:

- a. Minor issue: The inspectors identified a minor violation of Farley's Technical Specifications (TS) 5.4.1.a for the licensee's failure to implement written procedures covering activities applicable in Regulatory Guide (RG) 1.33, Revision 2, Appendix A, February 1978. Specifically, while conducting a unit 1 reactor startup on December 21, 2022, the licensee exceeded the SUR limit specified in the procedure governing nuclear startup from hot standby to minimum load (RG 1.33, App. A, Section 2.b), FNP-1-UOP-1.2.
- b. Screening: The failure to implement the SUR limit of startup procedure FNP-1-UOP-1.2 was a performance deficiency. The performance deficiency was determined to be minor in accordance with IMC 0612 Appendix B because it did not adversely affect the Reactor Safety-Initiating Events cornerstone. The inspector referenced Inspection Manual Chapter 0612 Appendix E, 12/10/20, example 4.b and 9.a, to further inform the minor determination. A reactor trip was prevented (example 4.b) and the thermal power limits were not exceeded (example 9.a) thus preventing any actual safety consequences that challenged the reactor, fuel integrity, or any other safety systems.
- c. Enforcement: The failure to comply with TS 5.4.1.a constitutes a minor violation that is not subject to enforcement action in accordance with the NRC's Enforcement Policy.

The inspectors reviewed the licensee's casual report and associated corrective actions documented in CAR 356458. Farley determined the direct causes to be inadequate monitoring of diverse indication and the failure to establish critical parameters to minimize the significance. For the primary cause, the licensee determined that supervisory and management oversight failed to ensure adequate preventive actions were in place prior to the startup activity and failed to timely intervene during the actual startup.

The licensee corrective actions to address the issue were implemented and/or in progress. The inspectors summarized the corrective actions below:

- A change to FNP-1-UOP-1.2, "Startup of Unit From Hot Standby to Minimum Load," lowered the allowed SUR to 0.5 dpm and now requires more hold points during the approach to criticality. Additional enhancements were added to align with industry normal startup practices and improved monitoring point options or parameters via the plant computer. The inspectors observed these changes implemented during training on the simulator in January 2023 and during an actual startup observed in February 2023.
- The licensee is using their training process (Systematic Approach to Training) to address the use of diverse indications, critical parameters, and to improve oversight intervention. The inspectors reviewed the specific training process corrective actions with the operations training manager.
- Operations supervisors performed various actions to address supervisor intervention skills for all plant activities via oversight preparation and verification of impactful interventions. The inspectors observed several actions associated with this which included end-of-shift and weekly meetings between the shift supervisors and operations managers to discuss and trend daily learnings.

The inspectors did not identify any new findings or violations as a result of this inspection.

EXIT MEETINGS AND DEBRIEFS

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

- On April 25, 2023, the inspectors presented the integrated inspection results to Mr. Delson Erb and other members of the licensee staff.