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

February 8, 2022

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

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT – INTEGRATED INSPECTION REPORT 05000348/2021004 AND 05000364/2021004

Dear Ms. Gayheart:

On December 31, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Joseph M. Farley Nuclear Plant. On January 25, 2022, the NRC inspectors discussed the results of this inspection with Mr. Delson Erb, Plant Manager 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,

/RA/

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 05000348/2021004 AND 05000364/2021004 – dated February 8, 2022

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OFFICE	RII/DRP	RII/DRP	RII/DRP		
NAME	P. Meier	D. Mas-Peñaranda	A. Blamey		
DATE	01/25/2022	01/25/2022	02/08/2022		

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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:	05000348/2021004 and 05000364/2021004
Enterprise Identifier:	I-2021-004-0007
Licensee:	Southern Nuclear Company
Facility:	Joseph M. Farley Nuclear Plant
Location:	Columbia, AL
Inspection Dates:	October 01, 2021 to December 31, 2021
Inspectors:	B. Caballero, Senior Operations Engineer D. Mas-Penaranda, Project Engineer P. Meier, Senior Resident Inspector N. Staples, Senior Project Engineer 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 report period at approximately 100 percent rated thermal power (RTP). On October 21, 2021, power was reduced to approximately 85 percent RTP for turbine valve testing. Subsequently power was increased back to approximately 100 percent RTP on the next day, October 22, 2021 and held there 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," conducted routine reviews using IP 71152, "Problem Identification and Resolution," 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) (2 Samples)

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

(1) Unit 2 'B' emergency diesel generator during the unit 1 'C' emergency diesel generator planned maintenance outage on October 13, 2021 (FNP-0-SOP-38.0, A181005, D200013)
(2) Unit 2 'C' service water pump alignment to the 'A' train when the 'A' service water pump was unavailable due to check valve replacement on October 19, 2021 (FNP-2-SOP-24.0, D200013)

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) Fire area 2-TB, unit 2 turbine building on October 28, 2021 (FNP-0-FPP-2.0)
(2) Fire zone 2116, unit 2 auxiliary building cable chase on October 28, 2021 (FNP-0-

FPP-1.0)
(3) Fire area 2-021, unit 2 'B' train 4160 volt switchgear room on November 21, 2021 (FNP-2-FPP-1.0)
(4) Fire zone 2163, unit 2 waste processing system control panel room on November 30, 2021 (FNP-2-FPP-1.0)
(5) Fire zone 2208, unit 2 auxiliary building 121 foot elevation corridor on November 30, 2021 (FNP-0-FPP-1.0)

71111.11A - Licensed Operator Requalification Program and Licensed Operator Performance

Requalification Examination Results (IP Section 03.03) (1 Sample)

(1) On September 2, 2021, the licensee completed the annual requalification operating tests required to be administered to all licensed operators in accordance with Title 10 of the *Code of Federal Regulations* 55.59(a)(2), "Requalification Requirements," of the NRC's "Operator's Licenses." During the week of November 29, 2021, the inspector performed an in-office review of the overall pass/fail results of the individual and crew operating tests in accordance with Inspection Procedure (IP) 71111.11, "Licensed Operator Requalification Program." These results were compared to the thresholds established in Section 3.02, "Requalification Examination Results of IP 71111.11.

The inspectors reviewed and evaluated the licensed operator operating test failure rates for the requalification annual operating tests, which the licensee completed administering on September 2, 2021.

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 during unit 1 turbine valve testing and the required power changes associated with the testing on October 21, 2021 (FNP-1-STP-62.0).

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

(1) The inspectors observed and evaluated an operator training simulator exam (Scenario 21-6 As-found) on November 8, 2021 that involved a manual reactor trip and steam generator feedwater break.

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) '1C' emergency diesel generator failure to meet voltage criteria within 12 seconds following a maintenance outage and control relay replacements identified on October

16, 2021 (CR 10835014)

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (3 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) Planned unit 1 'B' residual heat removal pump maintenance outage resulting in yellow risk on October 5, 2021 (NMP-DP-001)
(2) Unit 1 'C' emergency diesel generator maintenance outage on October 10, 2021 through October 15, 2021 (SNC1010397)
(3) '1-2A' emergency diesel generator unit 2 output breaker failure identified on December 13, 2021 (NMP-DP-001)

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) Unit 1 spent fuel assembly K19 potentially stored in a location not in compliance with Technical Specifications identified on July 6, 2021 (CR10810952)
(2) '2C' emergency diesel generator with the ventilation louvers issues identified on November 1, 2021 (CRs 10838390 and 10838481)
(3) Calculation error discovered in the unit 1 and unit 2 spent fuel pool criticality analysis identified on November 5, 2021 (CR 10839475)

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (2 Samples)

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

(1) Unit 1 turbine driven auxiliary feedwater pump steam supply valve test following valve replacement on September 30, 2021 (SNC1152614, FNP-1-STP-21.3)
(2) '1C' emergency diesel maintenance testing following the replacement of the diesel generator output breaker remote hand switch on October 12, 2021 (SNC1110169)

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

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

(1) Number 2 diesel driven fire pump surveillance on October 20, 2021 (FNP-0-FSP-201.2)

(2) Unit 1 'B' charging pump quarterly surveillance on October 26, 2021 (FNP-1-STP-4.2)

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

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

(1) Unit 1 (October 1, 2020 – September 30, 2021)
(2) Unit 2 (October 1, 2020 – September 30, 2021)

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

(1) Unit 1 (October 1, 2020 – September 30, 2021)
(2) Unit 2 (October 1, 2020 – September 30, 2021)

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

(1) Unit 1 (October 1, 2020 – September 30, 2021)
(2) Unit 2 (October 1, 2020 – September 30, 2021)

INSPECTION RESULTS

Very Low Safety Significance Issue Resolution Process: Potential incorrect categorization of a spent fuel assembly resulting in a potential Technical Specifications non-compliance	71111.15
This issue is a current licensing basis question and inspection effort is being discontinued in accordance with the Very Low Safety Significance Issue Resolution (VLSSIR) process. No further evaluation is required.	
Description: The issue is associated with the potential incorrect categorization of a Unit 1 spent fuel assembly (K19). As a result of the potential incorrection categorization, the concern is whether the K19 storage configuration met Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.15 for spent fuel assembly storage in accordance with Specification 4.3.1.1 from January 4, 2021 to July 6, 2021. An additional concern is whether the event should have been reported to the NRC in accordance with 10 CFR 50.73(a)(2)(i)(B) for a condition prohibited by Technical Specifications. On July 6, 2021, the licensee identified that K19 was potentially not categorized correctly and potentially did not meet TS LCO 3.7.15 following the implementation of a licensee amendment regarding spent fuel pool criticality safety analysis. The amendment implementation date was January 4, 2021 and made various changes to TS 3.7.15 and 4.3.1.1 and the Updated Final Safety Analysis Report (UFSAR). Upon identification of the potential noncompliance, the licensee immediately initiated actions to relocate assembly K19 to an acceptable storage location in accordance with TS 3.7.15, Action A. The relocation was completed on July 7, 2021, and NRC inspectors determined this placed the storage configuration back into compliance. Additionally, the licensee initiated an incident response team to determine how this configuration was not identified prior to the amendment implementation.	

At the time of the discovery of the issue on July 6, 2021, fuel assembly K19 was adjacent to fuel assembly K21. These two fuel assemblies had been located adjacent to one another (and had not been moved) since 1998. Using the old spent fuel analysis, assembly K19 and K21 were both classified as category 3 and met criticality storage requirements. As a result of the amendment discussed above, K19 was re-classified as category 2 based on the recorded burn-up. K21 remained a category 3 assembly (less reactive than category 2). By the fuel assembly storage requirements, a category 2 assembly can only be stored next to either empty cells or Category 4 assemblies. K19 was potentially noncompliant with storage requirements starting on the amendment implementation date to the date of discovery since it was adjacent to a category 3 assembly.

As part of the evaluation of this issue, the licensee performed an alternative approach to determine the actual burn-up of K19 by using a methodology different than the original and not specifically described in the UFSAR or TS. By doing so, the licensee determined the actual burn-up of K19 met the category 3 requirements and therefore LCO 3.7.15 was always met. Despite this determination, K19 is still formally classified as a category 2 assembly and being treated as such.

Licensing Basis: The licensee concluded that LCO 3.7.15 was always met by using engineering judgement and an alternative analytical method to determine operability of the spent fuel assembly. The licensee considered this acceptable because TS does not specifically define how to determine the actual burn-up of a fuel assembly. However, TS does define the requirements on how to determine the fuel assembly category limits. The licensee did not use an alternative method from that required in the TS to determine the category limit.

Another consideration for why the licensee concluded their alternative method was acceptable in determining operability, is the fact it was not used to determine their final corrective action. Their final corrective action was to maintain K19 as a category 2 assembly and finally store it in accordance with TS.

The inspectors reviewed UFSAR section 4.3.2.7.2, which describes how the TS requirements were generated and the basis for the design features (TS 4.3.1.1). However, it does not appear to explicitly describe how individual fuel assembly actual burn-ups are determined.

The methodology to determine the fuel assembly burn-up category setpoints (i.e., setpoint limits) is dictated by TS. NRC inspectors concluded the licensee did not change the burn-up category setpoint. Instead, the licensee used an alternative method to determine the actual burn-up of one individual assembly. The licensing basis (including TS) does not have a specific requirement on how to accomplish this calculation. The licensee's final corrective action was to place the fuel assembly in a new location to demonstrate that there was clear compliance with technical specifications. NRC inspectors determined that engineering judgement was only used in determining past operability for reportability requirements.

Significance: If the issue of concern was assumed to be a performance deficiency, the inspectors determined the issue would have screened to minor in accordance with IMC 0612 Appendix B, "Issue Screening Directions" and IMC 0612 Appendix E, Examples of Minor Issues." Therefore, the issue of concern would not have proceeded to IMC 0609, Significance Determination Process," and therefore a detailed risk evaluation was not necessary due to the insufficient safety significance.

Technical Assistance Request: A technical assistance request was not initiated for this issue. Corrective Action Reference: Condition Report (CR) 10810952

EXIT MEETINGS AND DEBRIEFS

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

- On January 25, 2022, the inspectors presented the integrated inspection results to Mr. Delson Erb, Plant Manager and other members of the licensee staff.