



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 23, 2023

Ms. Jamie M. Coleman
Regulatory Affairs Director
Southern Nuclear Operating Co., Inc.
3535 Colonnade Parkway
Birmingham, AL 35243

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2; AND VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2 - ISSUANCE OF AMENDMENT NOS. 248, 245, 222, AND 205 RE: REVISING TECHNICAL SPECIFICATION 3.2.1, "HEAT FLUX HOT CHANNEL FACTOR ($F_Q(Z)$)," TO IMPLEMENT METHODOLOGY FROM WCAP-17661, REVISION 1 (EPID L-2022-LLA-0148)

Dear Ms. Coleman:

The U. S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 248 to Renewed Facility Operating License No. NPF-2 and Amendment No. 245 to Renewed Facility Operating License No. NPF-8 for the Joseph M. Farley Nuclear Plant (Farley), Units 1 and 2, respectively, and Amendment No. 222 to Renewed Facility Operating License NPF-68 and Amendment No. 205 to Renewed Facility Operating License NPF-81 for the Vogtle Electric Generating Plant (Vogtle), Units 1 and 2, respectively. The amendments consist of changes to the License and Technical Specifications (TSs) in response to your application dated October 14, 2022, as supplemented by letters dated December 9, 2022, and July 5, 2023. The amendment requests for Vogtle, Units 3 and 4, regarding the same topic are being processed in separate correspondence.

For Farley, Units 1 and 2, and Vogtle, Units 1 and 2, the amendments revise TS 3.2.1, "Heat Flux Hot Channel Factor ($F_Q(Z)$)," and TS 5.6.5, "CORE OPERATING LIMITS REPORT (COLR)," to implement the methodology from licensing Topical Report WCAP-17661, Revision 1, "Improved RAOC [Relaxed Axial Offset Control] and CAOC [Constant Axial Offset Control] F_Q Surveillance Technical Specifications."

In addition, for Farley, Units 1 and 2, and Vogtle, Units 1 and 2, the amendments revise TS 3.2.1 to adopt several technical specification task force (TSTF) change travelers to align the Vogtle, Units 1 and 2, and Farley, Units 1 and 2, TSs with the F_Q formulations and required actions of TS 3.2.1B of NUREG-1431, "Standard Technical Specifications Westinghouse Plants." The TSTFs are (1) TSTF-99-A, Revision 0, "Extend the Completion Time for $F_Q(w)$ not within limits from 2 hours to 4 hours;" (2) TSTF-241-A, Revision 4, "Allow time for stabilization after reducing power due to QPTR [quadrant power tilt ratio] out of limit;" and (3) TSTF-290-A, Revision 0, "Revisions to hot channel factor specifications."

A copy of the related Safety Evaluation is enclosed. Notice of Issuance will be included in the Commission's monthly *Federal Register* notice.

Sincerely,

/RA/

John G. Lamb, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-348, 50-364, 50-424,
and 50-425

Enclosures:

1. Amendment No. 248 to NPF-2
2. Amendment No. 245 to NPF-8
3. Amendment No. 222 to NPF-68
4. Amendment No. 205 to NPF-81
5. Safety Evaluation for Farley and Vogtle,
Units 1 and 2

cc: Listserv



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

ALABAMA POWER COMPANY

DOCKET NO. 50-348

JOSEPH M. FARLEY NUCLEAR PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 248
Renewed License No. NPF-2

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Southern Nuclear Operating Company, Inc. (Southern Nuclear), dated October 14, 2022, as supplemented by letters dated December 9, 2022, and July 5, 2023, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications, as indicated in the attachment to this license amendment; and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-2 is hereby amended to read as follows:

- (2) Technical Specifications

- The Technical Specifications contained in Appendix A, as revised through Amendment No. 248, are hereby incorporated in the renewed license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented prior to startup from the spring 2024 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: October 23, 2023



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

ALABAMA POWER COMPANY

DOCKET NO. 50-364

JOSEPH M. FARLEY NUCLEAR PLANT, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 245
Renewed License No. NPF-8

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Southern Nuclear Operating Company, Inc. (Southern Nuclear), dated October 14, 2022, as supplemented by letters dated December 9, 2022, and July 5, 2023, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications, as indicated in the attachment to this license amendment; and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-8 is hereby amended to read as follows:

- (2) Technical Specifications

- The Technical Specifications contained in Appendix A, as revised through Amendment No. 245, are hereby incorporated in the renewed license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented prior to startup from the spring 2025 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: October 23, 2023

ATTACHMENT

JOSEPH M. FARLEY NUCLEAR PLANT, UNIT 1

TO LICENSE AMENDMENT NO. 248

TO RENEWED FACILITY OPERATING LICENSE NO. NPF-2

DOCKET NO. 50-348

TO LICENSE AMENDMENT NO. 245

JOSEPH M. FARLEY NUCLEAR PLANT, UNIT 2

TO RENEWED FACILITY OPERATING LICENSE NO. NPF-8

DOCKET NO. 50-364

Replace the following pages of the Licenses and Appendix A Technical Specifications (TSs) with the enclosed pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

Remove Pages

License

License No. NPF-2, page 4
License No. NPF-8, page 3

TSs

3.2.1-1
3.2.1-2
3.2.1-3
3.2.1-4
3.2.1-5
5.6-3
5.6-5
5.6-6
5.6-7

Insert Pages

License

License No. NPF-2, page 4
License No. NPF-8, page 3

TSs

3.2.1-1
3.2.1-2
3.2.1-3
3.2.1-4
3.2.1-5
5.6-3
5.6-5
5.6-6
5.6-7

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 248, are hereby incorporated in the renewed license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications.

(3) Additional Conditions

The matters specified in the following conditions shall be completed to the satisfaction of the Commission within the stated time periods following the Issuance of the renewed license or within the operational restrictions indicated. The removal of these conditions shall be made by an amendment to the renewed license supported by a favorable evaluation by the Commission.

- a. Southern Nuclear shall not operate the reactor in Operational Modes 1 and 2 with less than three reactor coolant pumps in operation.
- b. Deleted per Amendment 13
- c. Deleted per Amendment 2
- d. Deleted per Amendment 2
- e. Deleted per Amendment 152
Deleted per Amendment 2
- f. Deleted per Amendment 158
- g. Southern Nuclear shall maintain a secondary water chemistry monitoring program to inhibit steam generator tube degradation. This program shall include:
 - 1) Identification of a sampling schedule for the critical parameters and control points for these parameters;
 - 2) Identification of the procedures used to quantify parameters that are critical to control points;
 - 3) Identification of process sampling points;
 - 4) A procedure for the recording and management of data;
 - 5) Procedures defining corrective actions for off control point chemistry conditions; and

- (2) Alabama Power Company, pursuant to Section 103 of the Act and 10 CFR Part 50, "Licensing of Production and Utilization Facilities," to possess but not operate the facility at the designated location in Houston County, Alabama in accordance with the procedures and limitations set forth in this renewed license.
- (3) Southern Nuclear, pursuant to the Act and 10 CFR Part 70, to receive, possess and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;
- (4) Southern Nuclear, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
- (5) Southern Nuclear, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required any byproducts, source or special nuclear material without restriction to chemical or physical form for sample analysis or instrument calibration or associated with radioactive apparatus or components; and
- (6) Southern Nuclear, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This renewed license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporate below:

(1) Maximum Power Level

Southern Nuclear is authorized to operate the facility at reactor core power levels not in excess of 2821 megawatts thermal.

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 245, are hereby incorporated in the renewed license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications.

(3) Delete per Amendment 144

(4) Delete Per Amendment 149

(5) Delete per Amend 144

3.2 POWER DISTRIBUTION LIMITS

3.2.1 Heat Flux Hot Channel Factor (F_Q(Z))

LCO 3.2.1 F_Q(Z), as approximated by F_Q^C(Z) and F_Q^W(Z), shall be within the limits specified in the COLR.

APPLICABILITY: MODE 1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. -----NOTES-----</p> <p>1. Required Action A.4 shall be completed whenever this Condition is entered prior to increasing THERMAL POWER above the limit of Required Action A.1.</p> <p>2. SR 3.2.1.2 is not required to be performed if this Condition is entered prior to THERMAL POWER exceeding 75% RTP after refueling.</p> <p>----- F_Q^C(Z) not within limit.</p>	<p>A.1 Reduce THERMAL POWER ≥ 1% RTP for each 1% F_Q^C(Z) exceeds limit.</p> <p><u>AND</u></p> <p>A.2 Reduce Power Range Neutron Flux — High trip setpoints ≥ 1% for each 1% that THERMAL POWER is limited below RTP by Required Action A.1.</p> <p><u>AND</u></p> <p>A.3 Reduce Overpower ΔT trip setpoints ≥ 1% for each 1% that THERMAL POWER is limited below RTP by Required Action A.1.</p> <p><u>AND</u></p>	<p>15 minutes after each F_Q^C(Z) determination</p> <p>72 hours after each F_Q^C(Z) determination</p> <p>72 hours after each F_Q^C(Z) determination</p> <p>(continued)</p>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.4 Perform SR 3.2.1.1 and SR 3.2.1.2.	Prior to increasing THERMAL POWER above the limit of Required Action A.1
B. F _Q ^W (Z) not within limits.	<p>B.1.1 -----NOTE----- Required Action B.1.2 shall be completed if control rod motion is required to comply with the new operating space implemented by Required Action B.1.1. ----- Restore F_Q^W(Z) to within limits specified in the COLR.</p> <p style="text-align: center;"><u>AND</u></p> <p>B.1.2 Perform SR 3.2.1.1 and SR 3.2.1.2.</p> <p style="text-align: center;"><u>OR</u></p> <p>B.2.1 -----NOTE----- Required Action B.2.5 shall be completed whenever Required Action B.2.1 is performed prior to increasing THERMAL POWER above the limit of Required Action B.2.1. ----- Limit THERMAL POWER to less than RTP by amount specified in the COLR.</p> <p style="text-align: center;"><u>AND</u></p>	<p>4 hours</p> <p>72 hours</p> <p>4 hours after each F_Q^W(Z) determination</p> <p style="text-align: right;">(continued)</p>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	<p>B.2.2 Reduce AFD limits by amount specified in the COLR.</p> <p style="text-align: center;"><u>AND</u></p> <p>B.2.3 Reduce Power Range Neutron Flux – High trip setpoints ≥ 1% for each 1% that THERMAL POWER is limited below RTP by Required Action B.2.1.</p> <p style="text-align: center;"><u>AND</u></p> <p>B.2.4 Reduce Overpower ΔT trip setpoints ≥ 1% for each 1% that THERMAL POWER is limited below RTP by Required Action B.2.1.</p> <p style="text-align: center;"><u>AND</u></p> <p>B.2.5 Perform SR 3.2.1.1 and SR 3.2.1.2</p>	<p>4 hours after each F_Q^W(Z) determination</p> <p>72 hours after each F_Q^W(Z) determination</p> <p>72 hours after each F_Q^W(Z) determination</p> <p>Prior to increasing THERMAL POWER above the limit of Required Action B.2.1</p>
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify F _Q ^C (Z) is within limit.	<p>Once after each refueling prior to THERMAL POWER exceeding 75% RTP</p> <p><u>AND</u></p> <p>Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which F_Q^C(Z) was last verified</p> <p><u>AND</u></p> <p>In accordance with the Surveillance Frequency Control Program</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.2.1.2	Verify F _Q ^W (Z) is within limit.	<p>Once after each refueling within 24 hours after achieving equilibrium conditions after THERMAL POWER exceeds 75% RTP</p> <p><u>AND</u></p> <p>Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which F_Q^W(Z) was last verified</p> <p><u>AND</u></p> <p>In accordance with the Surveillance Frequency Control Program</p>

5.6 Reporting Requirements

5.6.5 CORE OPERATING LIMITS REPORT (COLR) (continued)

4. Shutdown Bank Insertion Limits for LCO 3.1.5,
 5. Control Bank Insertion Limit and RAOC Operating Spaces for LCO 3.1.6,
 6. Heat Flux Hot Channel Factor F_Q^{RTP} limits, $K(Z)$ figure, $T(Z)$ values, and RAOC Operating Spaces for LCO 3.2.1,
 7. Nuclear Enthalpy Rise Hot Channel Factor limits, $F_{\Delta H}^{RTP}$, and Power Factor Multiplier, $PF_{\Delta H}$, for LCO 3.2.2.
 8. Axial Flux Limits and RAOC Operating Spaces for LCO 3.2.3,
 9. Reactor Trip System Instrumentation Overtemperature ΔT (OT ΔT) and Overpower ΔT (OP ΔT) setpoint parameter values for Table 3.3.1-1,
 10. Reactor Coolant System pressure, temperature, and flow in LCO 3.4.1,
 11. Refueling Operations Boron Concentration for LCO 3.9.1.
- b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:
1. WCAP-9272-P-A, "Westinghouse Reload Safety Evaluation Methodology," July 1985 (W Proprietary).

(Methodology for LCOs 3.1.1 - SHUTDOWN MARGIN, 3.1.3 - Moderator Temperature Coefficient, 3.1.5 - Shutdown Bank Insertion Limit, 3.1.6 - Control Bank Insertion Limits, 3.2.3 - Axial Flux Difference, 3.2.1 - Heat Flux Hot Channel Factor, 3.2.2 - Nuclear Enthalpy Rise Hot Channel Factor and 3.9.1 - Boron Concentration)
 2. WCAP-10216-P-A, Rev.1A, "Relaxation of Constant Axial Offset Control / F_Q Surveillance Technical Specification," February 1994 (W Proprietary).

(Methodology for LCOs 3.2.3 - Axial Flux Difference and 3.2.1 - Heat Flux Hot Channel Factor.)

(continued)

5.6 Reporting Requirements

5.6.5 CORE OPERATING LIMITS REPORT (COLR) (continued)

7. WCAP-11397-P-A "Revised Thermal Design Procedure," April 1989

(Methodology for LCO 2.1.1-Reactor Core Safety Limits, LCO 3.4.1-RCS Pressure, Temperature and Flow Departure from Nucleate Boiling Limits.)
 8. WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement," March 1997.

(Methodology for LCO 3.1.3 - Moderator Temperature Coefficient.)
 9. WCAP-17661-P-A, Revision 1, "Improved RAOC and CAOC FQ Surveillance Technical Specifications," February 2019. (W Proprietary)

(Methodology for LCOs 3.1.6 – Control Bank Insertion Limits, 3.2.1 – Heat Flux Hot Channel Factor, and 3.2.3 – Axial Flux Difference)
- c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.
 - d. The COLR, including any midcycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

5.6.6 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)

- a. The reactor coolant system pressure and temperature limits, including heatup and cooldown rates and the LTOP System applicability temperature, shall be established and documented in the PTLR for the following:

LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits," and
LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System."

(continued)

5.6 Reporting Requirements

5.6.6 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR) (continued)

- b. The analytical methods used to determine the RCS pressure and temperature limits shall be those previously reviewed and approved by the NRC, specifically those described in WCAP-14040-A, Revision 4, "Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves," May 2004. WCAP-18124-NP-A, Revision 0, "Fluence Determination with RAPTOR-M3G and FERRET," July 2018, may be used as an alternative to Section 2.2 of WCAP-14040-A.
- c. The PTLR shall be provided to the NRC upon issuance for each reactor fluence period and for any revision or supplement thereto.

5.6.7 EDG Failure Report

If an individual emergency diesel generator (EDG) experiences four or more valid failures in the last 25 demands, these failures shall be reported within 30 days. Reports on EDG failures shall include a description of the failures, underlying causes, and corrective actions taken per the Emergency Diesel Generator Reliability Monitoring Program.

5.6.8 PAM Report

When a report is required by Condition B or F of LCO 3.3.3, "Post Accident Monitoring (PAM) Instrumentation," a report shall be submitted within the following 14 days. The report shall outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to OPERABLE status.

5.6.9 Deleted

5.6.10 Steam Generator (SG) Tube Inspection Report

A report shall be submitted within 180 days after the initial entry into MODE 4 following completion of an inspection performed in accordance with the Specification 5.5.9, "Steam Generator (SG) Program". The report shall include:

- a. The scope of inspections performed on each SG;
- b. The nondestructive examination techniques utilized for tubes with increased degradation susceptibility;

(continued)

5.6 Reporting Requirements

5.6.10 Steam Generator (SG) Tube Inspection Report (continued)

- c. For each degradation mechanism found:
 - 1. The nondestructive examination techniques utilized;
 - 2. The location, orientation (if linear), measured size (if available), and voltage response for each indication. For tube wear at support structures less than 20 percent through-wall, only the total number of indications needs to be reported;
 - 3. A description of the condition monitoring assessment and results, including the margin to the tube integrity performance criteria and comparison with the margin predicted to exist at the inspection by the previous forward-looking tube integrity assessment; and
 - 4. The number of tubes plugged during the inspection outage;
- d. An analysis summary of the tube integrity conditions predicted to exist at the next scheduled inspection (the forward-looking tube integrity assessment) relative to the applicable performance criteria, including the analysis methodology, inputs, and results;
- e. The number and percentage of tubes plugged to date, and the effective plugging percentage in each SG; and
- f. The results of any SG secondary side inspections.

5.6.11 Alternate AC (AAC) Source Out of Service Report

The NRC shall be notified if the AAC source is out of service for greater than 10 days.



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WASHINGTON, D.C. 20555-0001

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

GEORGIA POWER COMPANY

OGLETHORPE POWER CORPORATION

MUNICIPAL ELECTRIC AUTHORITY OF GEORGIA

CITY OF DALTON, GEORGIA

DOCKET NO. 50-424

VOGTLE ELECTRIC GENERATING PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 222
Renewed License No. NPF-68

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment to the Vogtle Electric Generating Plant, Unit 1 (the facility) Renewed Facility Operating License No. NPF-68 filed by the Southern Nuclear Operating Company, Inc. (the licensee), acting for itself, Georgia Power Company, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and City of Dalton, Georgia (the owners), dated October 14, 2022, as supplemented by a letters dated December 9, 2022, and July 5, 2023, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-68 is hereby amended to read as follows:

Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 222, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented prior to startup from the fall 2024 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to License No. NPF-68
and the Technical Specifications

Date of Issuance: October 23, 2023



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

GEORGIA POWER COMPANY

OGLETHORPE POWER CORPORATION

MUNICIPAL ELECTRIC AUTHORITY OF GEORGIA

CITY OF DALTON, GEORGIA

DOCKET NO. 50-425

VOGTLE ELECTRIC GENERATING PLANT, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 205
Renewed License No. NPF-81

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment to the Vogtle Electric Generating Plant, Unit 2 (the facility) Renewed Facility Operating License No. NPF-81 filed by the Southern Nuclear Operating Company, Inc. (the licensee), acting for itself, Georgia Power Company Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and City of Dalton, Georgia (the owners), dated October 14, 2022, as supplemented by a letters dated December 9, 2022, and July 5, 2023, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

- E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
- 2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-81 is hereby amended to read as follows:

Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 205, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

- 3. This license amendment is effective as of its date of issuance and shall be implemented prior to startup from the spring 2025 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to License No. NPF-81
and the Technical Specifications

Date of Issuance: October 23, 2023

ATTACHMENT

VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2

TO LICENSE AMENDMENT NO. 222

RENEWED FACILITY OPERATING LICENSE NO. NPF-68

DOCKET NO. 50-424

AND

TO LICENSE AMENDMENT NO. 205

RENEWED FACILITY OPERATING LICENSE NO. NPF-81

DOCKET NO. 50-425

Replace the following pages of the Licenses and the Appendix A Technical Specifications (TSs) with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages

License

License No. NPF-68, page 4
License No. NPF-81, page 3

TSs

3.2.1-1
3.2.1-2
3.2.1-3
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3.2.1-5
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5.6-4
5.6-5

Insert Pages

License

License No. NPF-68, page 4
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TSs

3.2.1-1
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(1) Maximum Power Level

Southern Nuclear is authorized to operate the facility at reactor core power levels not in excess of 3625.6 megawatts thermal (100 percent power) in accordance with the conditions specified herein.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 222, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) Southern Nuclear Operating Company shall be capable of establishing containment hydrogen monitoring within 90 minutes of initiating safety injection following a loss of coolant accident.

(4) Deleted

(5) Deleted

(6) Deleted

(7) Deleted

(8) Deleted

(9) Deleted

(10) Mitigation Strategy License Condition

The licensee shall develop and maintain strategies for addressing large fires and explosions and that include the following key areas:

(a) Fire fighting response strategy with the following elements:

1. Pre-defined coordinated fire response strategy and guidance
2. Assessment of mutual aid fire fighting assets
3. Designated staging areas for equipment and materials
4. Command and control
5. Training and response personnel

(b) Operations to mitigate fuel damage considering the following:

1. Protection and use of personnel assets
2. Communications
3. Minimizing fire spread
4. Procedures for Implementing integrated fire response strategy
5. Identification of readily-available pre-staged equipment
6. Training on integrated fire response strategy

- (2) Georgia Power Company, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and City of Dalton, Georgia, pursuant to the Act and 10 CFR Part 50, to possess but not operate the facility at the designated location in Burke County, Georgia, in accordance with the procedures and limitations set forth in this license;
- (3) Southern Nuclear, pursuant to the Act and 10 CFR Part 70, to receive, possess, and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;
- (4) Southern Nuclear, pursuant to the Act and 10 CFR Parts 30, 40, and 70 to receive, possess, and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
- (5) Southern Nuclear, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components;
- (6) Southern Nuclear, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility authorized herein.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter 1 and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect, and is subject to the additional conditions specified or incorporated below.

(1) Maximum Power Level

Southern Nuclear is authorized to operate the facility at reactor core power levels not in excess of 3625.6 megawatts thermal (100 percent power) in accordance with the conditions specified herein.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 205 and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

The Surveillance requirements (SRs) contained in the Appendix A Technical Specifications and listed below are not required to be performed immediately upon implementation of Amendment No. 74. The SRs listed below shall be

3.2 POWER DISTRIBUTION LIMITS

3.2.1 Heat Flux Hot Channel Factor (F_Q(Z))

LCO 3.2.1 F_Q(Z), as approximated by F_Q^C(Z) and F_Q^W(Z), shall be within the limits specified in the COLR.

APPLICABILITY: MODE 1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. -----NOTES-----</p> <p>1. Required Action A.4 shall be completed whenever this Condition is entered prior to increasing THERMAL POWER above the limit of Required Action A.1.</p> <p>2. SR 3.2.1.2 is not required to be performed if this Condition is entered prior to THERMAL POWER exceeding 75% RTP after refueling.</p> <p>----- F_Q^C(Z) not within limit.</p>	<p>A.1 Reduce THERMAL POWER ≥ 1% RTP for each 1% F_Q^C(Z) exceeds limit.</p> <p><u>AND</u></p> <p>A.2 Reduce Power Range Neutron Flux — High trip setpoints ≥ 1% for each 1% that THERMAL POWER is limited below RTP by Required Action A.1.</p> <p><u>AND</u></p> <p>A.3 Reduce Overpower ΔT trip setpoints ≥ 1% for each 1% that THERMAL POWER is limited below RTP by Required Action A.1.</p> <p><u>AND</u></p> <p>A.4 Perform SR 3.2.1.1 and SR 3.2.1.2.</p>	<p>15 minutes after each F_Q^C(Z) determination</p> <p>72 hours after each F_Q^C(Z) determination</p> <p>72 hours after each F_Q^C(Z) determination</p> <p>Prior to increasing THERMAL POWER above the limit of Required Action A.1</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>B. F_Q^W(Z) not within limits.</p>	<p>B.1.1 -----NOTE----- Required Action B.1.2 shall be completed if control rod motion is required to comply with the new operating space implemented by Required Action B.1.1. ----- Restore F_Q^W(Z) to within limits specified in the COLR.</p>	<p>4 hours</p>
	<p><u>AND</u></p>	
	<p>B.1.2 Perform SR 3.2.1.1 and SR 3.2.1.2.</p> <p>OR</p>	<p>72 hours</p>
	<p>B.2.1 -----NOTE----- Required Action B.2.5 shall be completed whenever Required Action B.2.1 is performed prior to increasing THERMAL POWER above the limit of Required Action B.2.1. ----- Limit THERMAL POWER to less than RTP by amount specified in the COLR.</p> <p><u>AND</u></p> <p>B.2.2 Reduce AFD limits by amount specified in the COLR.</p>	<p>4 hours after each F_Q^W(Z) determination</p> <p>4 hours after each F_Q^W(Z) determination</p>

(continued)

ACTIONS (continued)		
CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	<p style="text-align: center;"><u>AND</u></p> <p>B.2.3 Reduce Power Range Neutron Flux - High trip setpoints $\geq 1\%$ for each 1% that THERMAL POWER is limited below RTP by Required Action B.2.1.</p> <p style="text-align: center;"><u>AND</u></p> <p>B.2.4 Reduce Overpower ΔT trip setpoints $\geq 1\%$ for each 1% that THERMAL POWER is limited below RTP by Required Action B.2.1.</p> <p style="text-align: center;"><u>AND</u></p> <p>B.2.5 Perform SR 3.2.1.1 and SR 3.2.1.2.</p>	<p>72 hours after each F_Q^W(Z) determination</p> <p>72 hours after each F_Q^W(Z) determination</p> <p>Prior to increasing THERMAL POWER above the limit of Required Action B.2.1</p>
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.1.1 Verify F _Q ^C (Z) is within limit.	<p>Once after each refueling prior to THERMAL POWER exceeding 75% RTP</p> <p><u>AND</u></p> <p>Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which F_Q^C(Z) was last verified</p> <p><u>AND</u></p> <p>In accordance with the Surveillance Frequency Control Program</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.2.1.2 Verify F_Q^W(Z) is within limit.</p>	<p>Once after each refueling within 24 hours after achieving equilibrium conditions after THERMAL POWER exceeds 75% RTP</p> <p><u>AND</u></p> <p>Once within 24 hours after achieving equilibrium conditions after exceeding, by $\geq 10\%$ RTP, the THERMAL POWER at which F_Q^W(Z) was last verified</p> <p><u>AND</u></p> <p>In accordance with the Surveillance Frequency Control Program</p>

5.6 Reporting Requirements (continued)

5.6.5 Core Operating Limits Report (COLR)

- a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and shall be documented in the COLR for the following:

LCO 3.1.1 "SHUTDOWN MARGIN"
LCO 3.1.3 "Moderator Temperature Coefficient"
LCO 3.1.5 "Shutdown Bank Insertion Limits"
LCO 3.1.6 "Control Bank Insertion Limits"
LCO 3.2.1 "Heat Flux Hot Channel Factor"
LCO 3.2.2 "Nuclear Enthalpy Rise Hot Channel Factor"
LCO 3.2.3 "Axial Flux Difference"
LCO 3.9.1 "Boron Concentration"

- b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:

WCAP-9272-P-A, "WESTINGHOUSE RELOAD SAFETY EVALUATION METHODOLOGY," July 1985 (W Proprietary). (Methodology for Moderator Temperature Coefficient, Shutdown Bank Insertion Limit, Control Bank Insertion Limits, and Nuclear Enthalpy Rise Hot Channel Factor.)

WCAP-10216-P-A, Revision 1A, "RELAXATION OF CONSTANT AXIAL OFFSET CONTROL FQ SURVEILLANCE TECHNICAL SPECIFICATION," February, 1994 (W Proprietary). (Methodology for Axial Flux Difference (Relaxed Axial Offset Control) and Heat Flux Hot Channel Factor.)

WCAP-10266-P-A, Revision 2, "The 1981 Version of the Westinghouse ECCS Evaluation Model Using the BASH Code," March 1987. (W Proprietary) (Methodology for Axial Flux Difference (Relaxed Axial Offset Control) and Heat Flux Hot Channel Factor.)

WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement," March 1997.

WCAP-16045-P-A, "Qualification of the Two-Dimensional Transport Code PARAGON," August 2004 (Methodology for Moderator Temperature Coefficient.)

WCAP-16045-P-A, Addendum 1-A, "Qualification of the NEXUS Nuclear Data Methodology," August 2007 (Methodology for Moderator Temperature Coefficient.)

(continued)

5.6 Reporting Requirements

5.6.5 Core Operating Limits Report (COLR) (continued)

WCAP-12610-P-A, "VANTAGE+ Fuel Assembly Reference Core Report," April 1995 (Westinghouse Proprietary). (Methodology for Axial Flux Difference (Relaxed Axial Offset Control) and Heat Flux Hot Channel Factor.)

WCAP-12610-P-A & CENPD-404-P-A, Addendum 1-A, "Optimized ZIRLO™," July 2006 (Westinghouse Proprietary). (Methodology for Axial Flux Difference (Relaxed Axial Offset Control) and Heat Flux Hot Channel Factor.)

WCAP-17661-P-A, Revision 1, "Improved RAOC and CAOC F_Q Surveillance Technical Specifications," February 2019 (W Proprietary). (Methodology for Control Bank Insertion Limits, Heat Flux Hot Channel Factor (W(Z) surveillance requirements for F_Q Methodology), and Axial Flux Difference (Relaxed Axial Offset Control).)

- c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.
- d. The COLR, including any midcycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

5.6.6 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)

- a. RCS pressure and temperature limits for heatup, cooldown, operation, criticality, and hydrostatic testing as well as heatup and cooldown rates shall be established and documented in the PTLR for the following:

LCO 3.4.3 "RCS Pressure and Temperature (P/T) Limits"

- b. The power operated relief valve lift settings required to support the Cold Overpressure Protection Systems (COPS) and the COPS arming temperature shall be established and documented in the PTLR for the following:

LCO 3.4.12 "Cold Overpressure Protection Systems"

(continued)

5.6 Reporting Requirements

5.6.6 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR) (continued)

- c. The analytical methods used to determine the RCS pressure and temperature limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:
 - 1. WCAP-14040-A, Rev. 4, "Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves."
 - 2. WCAP-16142-P, Rev. 1, "Reactor Vessel Closure Head/Vessel Flange Requirements Evaluation for Vogtle Units 1 and 2."
 - 3. The PTLR will contain the complete identification for each of the TS reference Topical Reports used to prepare the PTLR (i.e., report number, title, revision, date, and any supplements).
- d. The PTLR shall be provided to the NRC upon issuance for each reactor vessel fluence period and for any revision or supplement thereto.

5.6.7 EDG Failure Report

If an individual emergency diesel generator (EDG) experiences four or more valid failures in the last 25 demands, these failures and any nonvalid failures experienced by that EDG in that time period shall be reported within 30 days. Reports on EDG failures shall include the information recommended in Regulatory Guide 1.9, Revision 3, Regulatory Position C.4, or existing Regulatory Guide 1.108 reporting requirement.

5.6.8 PAM Report

When a Report is required by Condition G or J of LCO 3.3.3, "Post Accident Monitoring (PAM) Instrumentation," a report shall be submitted within the following 14 days. The report shall outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to OPERABLE status.

(continued)



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2

AMENDMENT NO. 248 TO RENEWED FACILITY OPERATING LICENSE NPF-2

AMENDMENT NO. 245 TO RENEWED FACILITY OPERATING LICENSE NPF-8

VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2

AMENDMENT NO. 222 TO RENEWED FACILITY OPERATING LICENSE NPF-68

AMENDMENT NO. 205 TO RENEWED FACILITY OPERATING LICENSE NPF-81

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

DOCKET NOS. 50-348, 50-364, 50-424, AND 50-425

1.0 INTRODUCTION

By letter dated October 14, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22287A174), as supplemented by letters dated December 9, 2022 (ML22343A255), and July 5, 2023 (ML23186A134), Southern Nuclear Operating Company (SNC, the licensee) requested changes to the Technical Specifications (TSs) for the Joseph M. Farley Nuclear Plant (Farley), Units 1 and 2, and Vogtle Electric Generating Plant (Vogtle), Units 1, 2, 3, and 4. The amendment requests for Vogtle, Units 3 and 4, are being processed in separate correspondence (ML23138A085).

The proposed amendments would revise TS 3.2.1, "Heat Flux Hot Channel Factor ($F_Q(Z)$)," to adopt the TS changes for the RAOC methodology described in Appendix A of Westinghouse topical report WCAP-17661-P-A, Revision 1, "Improved RAOC and CAOC F_Q Surveillance Technical Specifications" (ML19225C081), to address the issues identified in Westinghouse Nuclear Safety Advisory Letter (NSAL)-09-5, Revision 1, "Relaxed Axial Offset Control F_Q Technical Specification Actions," dated September 23, 2009, and NSAL-15-1, "Heat Flux Hot Channel Factor Technical Specification Surveillance,"¹ dated February 3, 2015.

¹ Westinghouse Electric Company LLC issues NSALs to its customers to communicate a potential safety issue so that the customers can conduct a review of the issue and determine whether any action is necessary. The NRC does not have official record copies of NSALs 09-5 and 15-1.

The proposed amendments would include adoption of several technical specification task force (TSTF) change travelers to align the Vogtle, Units 1 and 2, and Farley, Units 1 and 2, TSs with the F_Q formulations and required actions of TS 3.2.1B, "Heat Flux Hot Channel Factor ($F_Q(Z)$) (RAOC-W(Z) Methodology)," of NUREG-1431, "Standard Technical Specifications Westinghouse Plants," Volume 1, Revision 5 (ML21259A155). The TSTFs are (1) TSTF-99-A, Revision 0, "Extend the Completion Time for $F_Q(w)$ not within limits from 2 hours to 4 hours;" (ML040480063); (2) TSTF-241-A, Revision 4, "Allow time for stabilization after reducing power due to QPTR [quadrant power tilt ratio] out of limit;" (ML040611034 and ML20199E634); and (3) TSTF-290-A, Revision 0, "Revisions to hot channel factor specifications," (ML040630063 and ML20209B346).

Additionally, the proposed amendments would revise the Vogtle, Units 1 and 2, and Farley, Units 1 and 2, TS 5.6.5, "Core Operating Limits Report (COLR)," to include WCAP-17661-P-A, Revision 1, in the list of the NRC approved methodologies used to develop the cycle specific COLR.

NSAL-09-5, Revision 1, and NSAL-15-1 noted there are non-conservatisms in the methodology in Westinghouse Standard TS 3.2.1B for plants that have implemented the relaxed axial offset control methodology. NSALs 09-05 and 15-01 contain recommended administrative actions that ensured a very conservative set of compensatory measures to address the non-conservatisms. The licensee stated they are currently following the applicable compensatory measures described in NSALs 09-05 and 15-01. This proposed license amendment request (LAR) is required to correct a non-conservative TS in accordance with the guidance in the NRC Administrative Letter 98-10, "Dispositioning of Technical Specifications that are Insufficient to Assure Plant Safety," dated December 29, 1998 (ML031110108).

The supplement dated July 5, 2023, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published the *Federal Register* on March 21, 2023 (88 FR 17036).

2.0 REGULATORY EVALUATION²

The specification of and adherence to limits on F_Q ensure that the value of the initial total peaking factor assumed in the accident and transient analyses remains valid. NUREG-1431, Revision 5.0, Volume 1, "Specifications" dated September 2021 (ML21259A155), contains the Standard Technical Specifications (STS) for Westinghouse nuclear power plants, except for Westinghouse AP1000 plants.

NUREG-1431, Revision 5.0, Volume 2, "Bases" dated September 2021 (ML21259A159) states on page B3.2.1B-2:

Limits on $F_Q(Z)$ ensure that the value of the initial total peaking factor assumed in the accident analyses remains valid. Other criteria must also be met (e.g., maximum cladding oxidation, maximum hydrogen generation, coolable geometry, and long term cooling). However, the peak cladding temperature is typically most limiting.

² This regulatory evaluation is adapted from the NRC staff SE approving WCAP-17661-P-A, Revision 1 (ML19225C081), for use.

$F_Q(Z)$ limits assumed in the LOCA analysis are typically limiting relative to (i.e., lower than) the $F_Q(Z)$ limit assumed in safety analyses for other postulated accidents. Therefore, this LCO provides conservative limits for other postulated accidents.

2.1 System Design and Operation

In its letter dated October 14, 2022, the licensee stated, in part, that:

$F_Q(Z)$ is a measure of the peak fuel pellet power within the reactor core and is defined as the maximum local fuel rod linear power density divided by the average fuel rod linear power density, assuming nominal fuel pellet and fuel rod dimensions. Limiting condition for operation (LCO) 3.2.1 provides limits on the values of $F_Q(Z)$ to limit the local (i.e., pellet) peak power density. $F_Q(Z)$ varies with fuel loading patterns, control bank insertion, fuel burnup, and axial power distribution. Limits on $F_Q(Z)$ maintain the value of the initial total peaking factor assumed within that assumed in the accident analyses.

$F_Q(Z)$ is measured periodically using the incore detector system to derive a measured value for $F_Q(Z)$ which is compared to the limit to maintain peak power density within the value assumed in the operational analysis.

The peak fuel power and the power distribution are input to the safety analyses to establish that a facility will comply with the requirements of 10 CFR 50.46 and GDC 10. Since the peak fuel power and the power distribution are initial conditions of design-basis accident and transient analyses that either assume the failure of or present a challenge to the integrity of a fission product barrier, Criterion 2 of 10 CFR 50.36(c)(2) requires that facility operation must be controlled by LCOs that are established based on these parameters.

Westinghouse pressurized water reactors (PWRs) have LCOs relative to F_Q . In accordance with 10 CFR 50.36(c)(3), SRs, in part, ensure that the LCO is satisfied. At plants that have implemented GL 88-16, specific parameter values may be administratively controlled, and in such cases, a TS requires that these parameters be determined in accordance with NRC-approved methodology and contained in the facility COLR.

If, during performance of an SR, F_Q is determined not to be within the limit, then the LCO is not met, and the TS remedial actions must be followed to ensure that facility operation remains safe. These remedial actions are based on (1) restoring compliance with the LCO, and (2) adjusting the reactor protection system settings so that the functionality required by GDC 10 is maintained. The NRC staff previously reviewed WCAP-17661 and determined that the RAOC surveillance formulations and required actions proposed in WCAP-17661 are acceptable, and as such, found the submitted -A version of the topical to be acceptable for referencing in licensing applications for nuclear power plants to the extent specified, and under the limitations delineated in the topical report. As part of this review, the NRC staff generically reviewed TS changes needed to ensure that the TS is appropriately revised to be consistent with the NRC finding on WCAP-17661. In the NRC staff safety evaluation (SE) approving WCAP-17661-P-A, Revision 1, the NRC staff determined that the methodology for determining fuel operating limits and the corresponding TS changes would ensure that the F_Q LCO and RAOC surveillance requirements are acceptable to maintain the fuel operating conditions within the bounds of the safety analyses. In doing so, the licensee would continue to demonstrate that its operating conditions comply with the aforementioned regulatory requirements.

2.2 Regulations

The performance requirements and design criteria applicable to the power distribution assumed in the safety analysis are those that pertain to accident and transient analyses. Primarily, these include the requirements contained in 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," and Appendix A to 10 CFR Part 50, "General Design Criteria for Nuclear Power Plants," General Design Criterion (GDC) 10.

The regulations in 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," require, in part, that the ECCS "be designed so that its calculated cooling performance following postulated loss-of-coolant accidents [LOCAs] conforms to the criteria set forth in paragraph (b) of this section." Also, "ECCS cooling performance must be calculated in accordance with an acceptable evaluation model and must be calculated for a number of postulated [LOCAs] of different sizes, locations, and other properties sufficient to provide assurance that the most severe postulated loss-of-coolant accidents are calculated." The criteria in 10 CFR 50.46(b), include peak cladding temperature, maximum cladding oxidation, maximum hydrogen generation, coolable geometry, and long-term core cooling.

Appendix A to 10 CFR Part 50, "General Design Criteria for Nuclear Power Plants," *Criterion 10* (GDC 10), "Reactor Design," states as follows:

The reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences.

The requirements for TSs are set forth in 10 CFR 50.36, "Technical Specifications." The regulations in 10 CFR 50.36(c), require that TSs include, among other items, limiting conditions for operation (LCOs), surveillance requirements (SRs) and Administrative Controls.

The regulations in 10 CFR 50.36(c)(2), contains requirements for LCOs and state, in part, that such TSs "are the lowest functional capability or performance levels of equipment required for safe operation of the facility." If an LCO is not met, the facility must be shut down, or other acceptable remedial action must be taken. LCOs must be established for each item that meets one or more of four criteria in 10 CFR 50.36(c)(2)(ii). One of the specified criteria is (Criterion 2) which states:

A process variable, design feature, or operating restriction that is an initial condition of a design-basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

The regulation, 10 CFR 50.36(c)(3), "Surveillance requirements," states:

Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."

The regulation, 10 CFR 50.36(c)(5), “Administrative Controls,” states, in pertinent part:

Administrative controls are the provisions relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure operation of the facility in a safe manner.

2.3 Guidance

NRC Generic Letter (GL) 88-16, “Removal of Cycle-Specific Parameter Limits from Technical Specifications,” dated October 4, 1988 (ML031200485), provides guidance for licensees to remove the cycle-specific values of certain operating limits from the TSs and maintain them in a COLR. The guidance in GL 88-16 provides a means by which the values of certain parameters can be determined and modified on a cycle-specific basis without prior NRC review and approval. To implement this guidance, licensees must, in part, do the following: (1) use an NRC-approved methodology to determine the operating limits; (2) list, in the TS Administrative Controls section the references used to determine the operating limits; and (3) maintain the limits in a COLR which must be submitted to the NRC for information. The licensee’s TS 5.6.5, “CORE OPERATING LIMITS REPORT (COLR),” contains the plant-specific implementation of the GL 88-16 guidance.

Regulatory Guide (RG) 1.239, “Licensee Actions to Address Nonconservative Technical Specifications,” dated November 2020 (ML20294A510), describes a method acceptable to the NRC staff for licensee actions to address nonconservative TSs. RG 1.239 endorses the Nuclear Energy Institute (NEI) guidance in NEI 15-03, Revision 3, “Licensee Actions to Address Nonconservative Technical Specifications,” issued March 2020 (ML20100G899).

2.4 Summary of Proposed Changes

LCO 3.2.1, under TS 3.2, “Power Distribution Limits,” requires that $F_Q(Z)$, as approximated by $F_Q^C(Z)$ and $F_Q^W(Z)$, be within the limits specified in the COLR when the reactor is in MODE 1.

The SNC letter dated October 14, 2022, contains the changes that SNC proposed for Farley, Units 1 and 2; and Vogtle, Units 1 and 2. The proposed changes are in the following:

- Attachment 1 - Vogtle Electric Generating Plant 1 and 2 Marked-up TS Pages
- Attachment 2 - Vogtle Electric Generating Plant 1 and 2 Revised TS Pages
- Attachment 3 - Farley Nuclear Plant 1&2 Marked-up TS Pages
- Attachment 4 - Farley Nuclear Plant 1&2 Revised TS Pages

The SNC letter dated October 14, 2023, states:

The proposed change would modify the following for VEGP [Vogtle Electric Generating Plant] 1&2 and FNP [Farley Nuclear Plant] 1&2:

TS 3.2.1 Changes

- Global Changes

Where the TS actions and surveillance requirements refer to “steady state” in conjunction with $F_Q(Z)$, the proposed change deletes both “ $F_Q(Z)$ ” and “steady state” and replaces them with a common term $F_Q^C(Z)$.

Where the TS actions and surveillance requirements refer to “transient” in conjunction with $F_Q(Z)$, the proposed change deletes both “ $F_Q(Z)$ ” and “transient” and replaces them with a common term $F_Q^W(Z)$.

- VEGP only - TS 3.2.1 title is revised to delete “(F_Q Methodology).”
- LCO 3.2.1 is revised to state (addition in italics and deletion in strikeout text):

“ $F_Q(Z)$, *as approximated by $F_Q^C(Z)$ and $F_Q^W(Z)$* shall be within the ~~steady state and transient~~ limits specified in the COLR.”

- Action A

Two notes are added. Note 1 states: “Required Action A.4 shall be completed whenever this Condition is entered.” Note 2 states: “SR 3.2.1.2 is not required to be performed if this Condition is entered prior to THERMAL POWER exceeding 75% RTP after refueling.”

Required Actions A.2 and A.3 are revised replacing, “1% for each 1% $F_Q(Z)$ exceeds steady state limit” with “1% for each 1% that THERMAL POWER is limited below RTP by Required Action A.1.”

Revising the completion times of Required Actions A.1, A.2, and A.3 to include; “...after each $F_Q^C(Z)$ determination.”

Required Action A.4 is being revised to state (addition in *italics* text): “Perform SR 3.2.1.1 *and* SR 3.2.1.2.”

- Action B

Required Action B.1 and associated completion time is deleted and replaced with the following actions:

Required Action B.1.1 states “Restore $F_Q^W(Z)$ to within limits specified in the COLR,” with a completion time of 4 hours and Required Action B.1.2 states “Perform SR 3.2.1.1 and SR 3.2.1.2,” with a completion time of 72 hours.

A Note modifies Required Action B.1.1 stating “Required Action B.1.2 shall be completed if control rod motion is required to comply [with] the new operating space implemented by Required Action B.1.1.”

An alternative to Required Actions B.1.1 and B.1.2 is provided as:

Required Action B.2.1 states “Limit THERMAL POWER to less than RTP by amount specified in the COLR,” with a completion time of 4 hours after each $F_Q^W(Z)$ determination, Required Action B.2.2 states “Reduce AFD limits by amount

specified in the COLR,” with a completion time of 4 hours after each $F_Q^W(Z)$ determination, Required Action B.2.3 states “Reduce Power Range Neutron Flux — High trip setpoints $\geq 1\%$ for each 1% THERMAL POWER is limited below RTP by Required Action B.2.1,” with a completion time of 72 hours after each $F_Q^W(Z)$ determination, Required Action B.2.4 states “Reduce Overpower ΔT trip setpoints $\geq 1\%$ for each 1% that THERMAL POWER is limited below RTP by Required Action B.2.1,” with a completion time of 72 hours after each $F_Q^W(Z)$ determination, and Required Action B.2.5 states “Perform SR 3.2.1.1 and SR 3.2.1.2,” with a completion time of “Prior to increasing THERMAL POWER above the limit of Required Action B.2.1.”

A note modifies Required Action B.2.1 stating “Required Action B.2.5 shall be completed whenever Required Action B.2.1 is performed.”

- Surveillance Requirements

FNP Only - The note to the SRs; allowing, during power escalation at the beginning of each cycle, thermal power to be increased until an equilibrium power level has been achieved at which a power distribution map is obtained; is deleted.

VEGP Only – Revising the first frequency of SR 3.2.1.1 from “Once after each refueling after achieving equilibrium conditions at any power level exceeding 50% RTP,” to “Once after each refueling prior to THERMAL POWER exceeding 75% RTP.”

Revising the second frequency of SR 3.2.1.1 to include a 24 hour delay after achieving equilibrium conditions, from “Once after achieving equilibrium conditions after exceeding, by $\geq 20\%$ RTP, the THERMAL POWER at which $F_Q(Z)$ was last verified,” to “Once within 24 hours after achieving equilibrium conditions after exceeding, by $\geq 10\%$ RTP, the THERMAL POWER at which $F_Q^W(Z)$ was last verified.”

Note to SR 3.2.1.2, describing additional requirements if $F_Q(Z)$ measurements indicate an increase in the maximum over Z expression, is deleted.

Revising the first frequency of SR 3.2.1.2 from “Once after each refueling after achieving equilibrium conditions at any power level exceeding 50% RTP,” for VEGP and “Once after each refueling prior to THERMAL POWER exceeding 75% RTP,” for FNP to “Once after each refueling within 24 hours after achieving equilibrium conditions after THERMAL POWER exceeds 75% RTP.”

Revising the second frequency of SR 3.2.1.2 from “Once after achieving equilibrium conditions after exceeding, by $\geq 20\%$ RTP, the THERMAL POWER at which $F_Q(Z)$ was last verified,” to “Once within 24 hours after achieving equilibrium conditions after exceeding, by $\geq 10\%$ RTP, the THERMAL POWER at which $F_Q^W(Z)$ was last verified.”

TS 5.6.5 Change

Westinghouse topical report WCAP-17661-P-A, Revision 1, “Improved RAOC and CAOC F_Q Surveillance Technical Specifications,” February 2019 is added to the

list of documents describing the analytical methods used to determine the core operating limits specified in Specification 5.6.5.b of the VEGP Units 1 and 2 TS and FNP Units 1 and 2 TS with applicability to TS 3.1.6, TS 3.2.1, and TS 3.2.3.

VEGP only – Changes are made in the list of documents describing the analytical methods for WCAP-10216-P-A, Revision 1A, WCAP-10266-P-A, Revision 2, WCAP-12610-P-A, and WCAP-12610-P-A & CENPD-404-P-A, Addendum 1-A, to remove the parenthetical phrase “(W(Z) surveillance requirements for F_Q Methodology)” from each.

FNP only – Specification 5.6.5.a listing of Specifications for which core operating limits must be established is revised for items 5, 6 and 8 from:

5. Control Bank Insertion Limit for LCO 3.1.6,
6. Heat Flux Hot Channel Factor F_{RTP_Q} limits, K(Z) figure, W(Z) values,
and $F_Q(Z)$ Penalty Factors for LCO 3.2.1,

...

8. Axial Flux Limits for LCO 3.2.3,

to:

5. Control Bank Insertion Limit and RAOC Operating Spaces for LCO 3.1.6,
6. Heat Flux Hot Channel Factor F_{RTP_Q} limit, K(Z) figure, T(Z)^{COLR} values,
and RAOC Operating Spaces for LCO 3.2.1,

...

8. Axial Flux Limits and RAOC Operating Spaces for LCO 3.2.3.

By letters dated December 9, 2022, and July 5, 2023, SNC provided updated TS pages for the letter dated October 14, 2022.

The licensee provided TS Bases for information. The NRC does not approve changes to TS Bases.

3.0 TECHNICAL EVALUATION

The NRC staff evaluated the proposed TSs changes for Farley, Units 1 and 2, and Vogtle, Units 1 and 2, proposed by SNC, and considered whether the modified TSs are consistent with the regulatory requirements and regulatory guidance identified in Section 2 above. Various F_Q limits, surveillance methods, and remedial actions have been found to satisfy these requirements as documented in the NRC staff SE approving WCAP-17661-P-A, Revision 1, for use. These include the requirements contained in 10 CFR 50.46 and GDC 10. Therefore, in the technical evaluation below, the NRC staff evaluates whether Farley, Units 1 and 2, and Vogtle, Units 1 and 2, has proposed to implement revised RAOC F_Q TSs that are consistent with WCAP-17661-P-A, Revision 1, and whether SNC has sufficiently addressed two limitations that are identified in the NRC staff SE for WCAP-17661-P-A, Revision 1.

3.1 Consistency with WCAP-17661-P-A, Revision 1, and Changes to TS 3.2.1

The NRC staff reviewed the TS changes proposed for Farley, Units 1 and 2, and Vogtle, Units 1 and 2, in comparison to the TSs approved in WCAP-17661-P-A, Revision 1. The NRC staff determined that the changes proposed by SNC are consistent with the TSs approved by the staff in WCAP-17661-P-A, Revision 1, except for the licensee-proposed deviations from

WCAP-17661-P-A, Revision 1, in the TSs as discussed in Section 3.A.3.5 of its letter dated October 14, 2022 as supplemented by letters dated December 9, 2022 and July 5, 2022.

Under the proposed change, when the limit for $F_Q^C(Z)$ is exceeded, thermal power will be limited to less than the Surveillance power level required by Required Action A.1. The corresponding setpoints will, therefore, reflect this new thermal power limit. The current Required Action only requires a setpoint reduction of ≥ 1 percent and did not account for Surveillances being conducted at reduced power. The Required Actions for Condition B, which are for RAOC plants, would also be revised in the improved F_Q TSs to ensure that compliance with the LCO is restored and to adjust reactor protection settings to provide sufficient margin for non-equilibrium operation. In addition, the licensee proposes to eliminate the Farley, Units 1 and 2, TS SR 3.2.1 NOTE, which states, "During power escalation following shutdown, THERMAL POWER may be increased until an equilibrium power level has been achieved, at which a power distribution map is obtained," and modifies the Farley, Units 1 and 2, TSs TS 3.2.1 SRs. The SR NOTE is proposed to be eliminated, because it was considered to have been a source of confusion and can be interpreted differently by different utilities implementing the requirement. The first frequency of SR 3.2.1.1 would be modified to be conducted once following each refueling prior to thermal power exceeding 75 percent rated thermal power (RTP). The second frequency of SR 3.2.1.1 would be modified to be conducted once within 24 hours after achieving equilibrium conditions after exceeding, by $\geq 10\%$ RTP, the THERMAL POWER at which $F_Q^C(Z)$ was last verified. The first Frequency of SR 3.2.1.2 would be modified to be conducted following each refueling within 24 hours after achieving equilibrium conditions after thermal power exceeds 75 percent RTP. The second Frequency of SR 3.2.1.2 is modified in the same way as the second frequency of SR 3.2.1.1.

The NRC staff reviewed the remainder of the changes that SNC proposed to TS 3.2.1 for Farley, Units 1 and 2, and Vogtle, Units 1 and 2, and the NRC staff determined that the changes are consistent with those provided in Appendix A of WCAP-17661-P-A, Revision 1 (ML19225C081). The overall F_Q Surveillance formulation is provided in Section 4 of the WCAP-17661-P-A, Revision 1. The approval limitations and conclusions are described in Sections 5 and 6, respectively, of WCAP-17661-P-A, Revision 1. Section 4.0 of the NRC staff SE that approved WCAP-17661-P-A, Revision 1, provides a detailed technical basis explaining why the new Surveillance methodology and associated TS requirements, which are proposed for use at Farley, Units 1 and 2, and Vogtle, Units 1 and 2, are acceptable. The WCAP-17661-P-A, Revision 1 addresses potential non-conservatisms in TS 3.2.1, "Heat Flux Hot Channel Factor," that are applicable to RAOC plants and concludes that actions are taken to ensure compliance with the LCO and to maintain functionality required by GDC 10 and 10 CFR 50.46 by accounting for uncertainties in non-equilibrium operation.

In Section 3.5 of its submittal dated October 14, 2022, SNC provided a list of variations from the WCAP and associated justifications. Variation 1 applied to Vogtle, Units 1 and 2, TS only, SNC did not change the title of the TS to match the presentation of the title of the STS in the WCAP. The NRC staff determined the variation was acceptable because it did not alter the TS requirements and represents SNC's preference for the subject TS title. Variation 2 applied to Vogtle, Units 1 and 2, and Farley TS. SNC chose to retain the abbreviation "RTP" instead of spelling it out in some instances as it appeared in the WCAP. The staff determined the variation was acceptable because it did not alter the TS requirements and represents SNC's preference for the TS as well as maintains consistency with NUREG-1431. Variation 3 applied to Vogtle, Units 1 and 2, and Farley, Units 1 and 2, TS. SNC chose to clarify the text of Required Actions B.1.1 and B.1.2 by reducing the number of words for the required Action B.1.1 and breaking the text of Required Action B.1.2 up into a NOTE and Required Action. The NRC staff determined

the variation was acceptable because it did not alter the end result of the TS requirements and preserved the intent of the changes made to STS by the WCAP. Variation 4 applied to Vogtle, Units 1 and 2, TS only. Vogtle, Units 1 and 2, TS do not have a NOTE above the SRs in TS 3.2.1, so SNC did not propose deletion of the NOTE. The NRC staff determined the variation was acceptable. SNC proposed a variation 5 that SNC later decided not to use. Variation 6 applied to Vogtle, Units 1 and 2, and Farley TS. SNC proposed breaking the second sentence of the WCAP addition to the Condition A NOTE into a second NOTE and change the word "NOTE" to "NOTES." The staff determined the variation was acceptable because it did not alter the end result of the TS requirements and preserved the intent of the changes made to STS by the WCAP. Variation 7 applied to Vogtle, Units 1 and 2, and Farley, Units 1 and 2, TS. SNC proposed deleting articles "the" and "a" in several locations. The NRC staff determined the variation was acceptable because it did not alter the TS requirements and represents SNC's presentation preference for the TS. Variation 8 applied to Vogtle, Units 1 and 2, and Farley, Units 1 and 2, TS. SNC proposed breaking Required Action B.2.1 from the WCAP into two separate Required Actions. The NRC staff noted other licensees have been granted similar requests for the variation. The NRC staff determined the variation was acceptable because it did not alter the end result of the TS requirements and preserved the intent of the changes made to STS by the WCAP. Variation 9 applied to Vogtle, Units 1 and 2, and Farley, Units 1 and 2, TS. SNC proposed adding the phrase "after achieving equilibrium conditions" to the frequency for SR 3.2.1.2.

In its SNC letter dated October 14, 2022, the licensee states, in part, that:

SR 3.2.1.2 requires a Surveillance of $F_Q^W(Z)$ during the initial startup following each refueling within 24 hours after achieving equilibrium conditions after exceeding 75% RTP. THERMAL POWER levels below 75% are typically non-limiting with respect to the limit for $F_Q^W(Z)$. Furthermore, startup physics testing and flux symmetry measurements, also performed at low power, provide confirmation that the core is operating as expected. This Frequency ensures that verification of $F_Q^W(Z)$ is performed prior to extended operation at power levels where the maximum permitted peak linear heat rate could be challenged and that the first required performance of SR 3.2.1.2 after a refueling is performed at a power level high enough to provide a high level of confidence in the accuracy of the Surveillance result.

Equilibrium conditions are achieved when the core is sufficiently stable at the intended operating conditions required to perform the Surveillance.

If a previous Surveillance of $F_Q^W(Z)$ was performed at part power conditions, SR 3.2.1.2 also requires that $F_Q^W(Z)$ be verified at power levels $\geq 10\%$ RTP above the THERMAL POWER of its last verification within 24 hours after achieving equilibrium conditions. This ensures that $F_Q^W(Z)$ is within its limit using radial peaking factors measured at the higher power level.

Based on the above, the allowance of up to 24 hours after achieving equilibrium conditions will provide a more accurate measurement of $F_Q^W(Z)$ by allowing sufficient time to achieve equilibrium conditions and obtain the power distribution measurement. The first SR frequency of SR 3.2.1.1, as proposed by SNC to align with NUREG-1431, will require verification that $F_Q(Z)$ is within limit once after each refueling prior to exceeding 75% RTP. The NRC staff determined that the licensee's performance of the first SR frequency of SR 3.2.1.1 and the first SR

frequency of SR 3.2.1.2 will continue to ensure that both prior to and after exceeding 75% RTP, $F_Q(z)$ will be verified by the licensee to be within limits. Therefore, the NRC staff determined that the variation is acceptable.

Variation 10 applied to Vogtle, Units 1 and 2, and Farley, Units 1 and 2, TS. The WCAP's changes to STS did not show explicitly how TS 5.6.5 would be changed to include WCAP-17661.

- SNC proposed deleting existing instances of the parenthetical "(W(Z) surveillance requirements for FQ Methodology)" from TS 5.6.5 of Vogtle, Units 1 and 2, and adding "WCAP-17661-P-A, Revision 1, "Improved RAOC and CAOC FQ Surveillance Technical Specifications," February 2019 (W Proprietary) (Methodology for Control Bank Insertion limits, Heat Flux Hot Channel Factor, and Axial Flux Difference (Relaxed Axial Offset Control))" to the end of TS 5.6.5.b.
- For Farley TS, SNC proposed adding the phrase "and RAOC Operating Spaces" after "Control Bank Insertion Limit" in TS 5.6.5.a.5.
 - SNC proposed revising TS 5.6.5.a.6. to state "Heat Flux Hot Channel Factor FQ RTP limits, K(Z) figure, T(Z)^{COLR} values, and RAOC Operating Spaces for LCO 3.2.1,".
 - SNC proposed adding the phrase "and RAOC Operating Spaces" after "Axial Flux Limits" in TS 5.6.5.a.8.
 - SNC proposed adding "WCAP-17661-P-A, Revision 1, "Improved RAOC and CAOC FQ Surveillance Technical Specifications," February 2019 (W Proprietary) (Methodology for LCOs 3.1.6 – Control Bank Insertion Limits, 3.2.1 - Heat Flux Hot Channel Factor, and 3.2.3 – Axial Flux Difference)."

The NRC staff determined the changes identified as Variation 10 were acceptable and not necessarily a variation, rather the changes were necessary to fully complete adoption of the WCAP into TS 5.6.5 to remain in compliance with the requirements of TS 5.6.5.b as well as reflect adoption of the WCAP.

Because SNC proposed to implement the new RAOC Surveillance methodology in a manner that is consistent with the NRC-approved licensing topical report (including the two limitations in WCAP-17661-P-A, discussed in more detail below) and provided sufficient evaluation of the limitations to justify acceptance, the NRC staff finds that the proposed changes to TS 3.2.1 are acceptable and that there is reasonable assurance that 10 CFR 50.36(c)(2) requirements will continue to be met. The TS, as revised by the proposed changes, will continue to require SNC shut down the reactor or follow any remedial action permitted by the TS until the LCO can be met. The NRC staff's independent evaluation of the proposed changes also determined that 10 CFR 50.36(c)(3) requirements will continue to be met, because the SRs, as revised by the proposed changes, will continue to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met.

3.2 Evaluation of Limitations for WCAP-17661-P-A, Revision 1

Beginning on page E-17 of its letter dated October 14, 2022, SNC provided its evaluation of limitations for adoption of WCAP-17661-P-A. SNC stated, in part, that:

Chapter 5.0 of the WCAP-17661-P-A, Rev. 1 SE includes two limitations, “adherence to which are necessary to ensure acceptable implementation of the WCAP-17661.” SNC has reviewed the limitations and determined that the limitations apply to VEGP [Vogtle Electric Generating Plant] and FNP [Farley Nuclear Plant]. SNC complies with the SE limitations, as described herein, for VEGP Units 1 and 2 and FNP Units 1 and 2.

Limitation 1: Use of A_{XY} and A_Q

As discussed in Section 4.1.1 of the WCAP-17661-P-A, Rev. 1 SE, the use of Methods 1 and 2 are acceptable for calculating A_{XY} and A_Q when performing RAOC and constant axial offset control (CAOC) W(Z) Surveillances, respectively, subject to the limitations provided herein. VEGP [Vogtle Electric Generating Plant] and FNP [Farley Nuclear Plant] utilize the RAOC methodology; therefore, the limitations associated with calculating A_{XY} will apply to the VEGP Units 1 and 2 and FNP Units 1 and 2 TS. The WCAP-17661-P-A, Rev. 1 SE limitations are listed as follows:

1. “The NRC-approved methods provided in the response to RAI 15.b must be used to perform the surveillance-specific A_{XY} and A_Q calculations. Newer methods with similar capabilities may be considered acceptable provided the NRC staff specifically approves them for calculating A_{XY} and A_Q factors.”

SNC uses NRC-approved methods to perform the surveillance-specific A_{XY} calculations for VEGP Units 1 and 2 and FNP Units 1 and 2.

2. “The depletion calculation used to determine the numerator and denominator of the A_{XY} and A_Q factor must be performed similarly to the original design calculation, as described in the response to RAI 15.c.”

SNC performs depletion calculations to determine the numerator and denominator of the A_{XY} factor similarly to the original design calculations, that is, either with the BEACON™ core monitoring system without using nodal calibration factors, or with Advanced Nodal Code using the same nuclear model and depletion basis used to generate the original T(Z) function.

3. “The use of Method 1 for calculating A_Q is only acceptable subject to the constraints discussed in the response to RAI 15.a. The Surveillance Axial Offset must be within 1.5-percent of the target AO, and there must be assurance that the limiting F_Q^W (Z) location does not lie within a rodged elevation at the time of surveillance. Note that the use of Method 1 remains acceptable when Surveillance-specific W(Z) functions are used.”

This limitation applies to plants that utilize the CAOC methodology and does not apply to the VEGP and FNP TS, which use the RAOC methodology.

The NRC staff reviewed the information provided by the licensee and determined that there is reasonable assurance that it sufficiently addresses Limitation 1 for adoption of WCAP-17661-P-A.

On page E-18 of its letter dated October 14, 2022, SNC provided its evaluation of Limitation 2 for adoption of WCAP-17661-P-A. SNC stated:

Limitation 2: Power Level Reduction to 50 Percent RTP

“As noted in Section 4.3.2 of this SE [WCAP-17661-P-A, Rev. 1 SE], the use of 50 percent as the final power level reduction in the event of failed F_Q surveillance is not included in the TS, but rather in the BASES and in the COLR. As such, this final power level, 50 percent, must be implemented on a plant-specific basis and included in COLR input generated using this methodology to use this TR.”

SNC is applying a final power level of 50% RTP in the event of a failed F_Q Surveillance. This is on a plant-specific basis for VEGP and FNP and included in COLR input generated using this methodology upon implementing the topical report at VEGP Units 1 and 2 and FNP Units 1 and 2.

The NRC staff reviewed the information provided by the licensee and determined that there is reasonable assurance that it sufficiently addresses Limitation 2 for adoption of WCAP-17661-P-A.

3.3 Proposed Changes to TS 5.6.5, Core Operating Limits Report

The NRC staff reviewed the proposed changes to the TS 5.6.5 COLR references for Vogtle, Units 1 and 2, and Farley, Units 1 and 2. If an LCO is not met, the facility must be shut down, or other acceptable remedial action must be taken. SRs are intended, in part, to ensure that facility operation remains within safety limits and that the LCOs are met. GL 88-16 established the NRC position that licensees could remove the cycle-specific values of certain operating limits from the TS and maintain them in a COLR, provided that certain requirements are met, including revision of TSs to list NRC-approved methodologies for cycle-specific parameters. The NRC staff finds that the proposed inclusion of WCAP-17661-P-A, Revision 1, in TS 5.6.5b, is acceptable, because this methodology is acceptable for use to determine cycle-specific parameters consistent with operating limits and to perform associated Surveillances for LCO 3.2.1. Finally, the methodology and TS changes provided in WCAP-17661-P-A, Revision 1, are applicable to and appropriate for Vogtle, Units 1 and 2, and Farley, Units 1 and 2, because each unit is a Westinghouse pressurized-water reactor (PWR) using the RAOC power distribution surveillance methodology, for which WCAP-17661-P-A, Revision 1, is approved for use by the NRC staff and the applicable limitations are met. Based on the above, the NRC staff's independent evaluation finds that there is reasonable assurance that the regulatory requirements of 10 CFR 50.36(c)(5) will continue to be met, because the TS, as revised by the proposed changes, will continue to contain provisions relating to organization and management, procedures, recordkeeping, review, and audit, and reporting necessary to assure operation of the facility in a safe manner.

3.4 Evaluation of TSTFs-99-A, 241-A and 290-A

The improved RAOC surveillance formulations, F_Q formulations, and changes to Required Actions of TS 3.2.1B approved in the NRC staff SE for WCAP-17661-P-A used Revision 4 of NUREG-1431 as the starting point for the STS changes. SNC proposed the adoption of the WCAP-17661-P-A as approved in the NRC staff SE. However, the current Farley, Units 1 and 2, and Vogtle, Units 1 and 2, TSs follow the guidance in revisions of NUREG-1431 prior to Revision 4. Therefore, SNC proposed adoption of TS changes related to TSTF-99, TSTF-241

and TSTF-290, to align the Vogtle, Units 1 and 2, TS and Farley, Units 1 and 2, TS more closely to Revision 4 of NUREG-1431.

The TSTF-99 changed the completion time of STS 3.2.1B, Required Action B.1 from 2 hours to 4 hours and was approved September 27, 1996. TSTF-241 revised LCO 3.2.1B Completion Times for Required Actions A.1, A.2 and A.3 to provide more appropriate Completion Times and was approved by the NRC on January 13, 1999. TSTF-290 revised STS 3.2.1B to reflect the RAOC-W(Z) methodology. TSTF-290 was approved by the NRC on June 29, 1999 (ML20209B346).

The NRC staff reviewed the proposed changes intended to align the Vogtle, Units 1 and 2, TS and Farley, Units 1 and 2, TS to the WCAP-17661-P-A as approved in the NRC staff SE, and the NRC staff determined the proposed changes based on TSTFs-99, 241 and 290 are acceptable, because the changes bring the plant specific TS into closer alignment to the STS revision on which the WCAP-17661 changes are based.

The licensee also proposed adding the phrase “after each $F_Q^W(Z)$ determination” to the end of the CTs for TS 3.2.1 Required Actions B.2.1 through B.2.4. The staff noted that while this CT content is not contained in the WCAP, it is an extension of the reasoning behind the approval of TSTF-241. Namely, the CT’s will require that the corrective actions be repeated after each subsequent $F_Q^W(Z)$ measurement that is not within limit. The staff concluded that extending the TSTF-241 changes to Required Actions B.2.1 through B.2.4 is acceptable because it clarifies when remedial measures are required and makes the presentation of Required Actions B.2.1 through B.2.4 consistent with Required Actions A.1 through A.3.

3.5 Technical Conclusion

Based on the above, the NRC staff concludes that:

1. SNC proposes to implement methods described in the licensing topical report that has been approved for use by the NRC staff for formulating and performing the F_Q Surveillance,
2. SNC’s proposed implementation is consistent with the TS approved by the NRC staff in WCAP-17661-P-A, Revision 1, and,
3. SNC acceptably addressed the limitations included in the NRC staff SE approving WCAP-17661-P-A, Revision 1.

The NRC staff finds the proposed TS changes for Farley, Units 1 and 2, and Vogtle, Units 1 and 2, acceptable, because WCAP-17661-P-A, Revision 1 (1) provides an acceptable method to determine operating limits and to perform core surveillance in a way that demonstrates compliance with the requirements identified in the 10 CFR 50.46 acceptance criteria for LOCAs and GDC 10, and (2) the proposed revised TSs meet the requirements of 10 CFR 50.36(c)(2) for LCOs, 10 CFR 50.36(c)(3) for SRs, and 10 CFR 50.36(c)(5) for Administrative Controls.

4.0 STATE CONSULTATION

In accordance with the Commission’s regulations, the Georgia and Alabama State officials were notified of the proposed issuance of the amendments on July 10, 2023. The Alabama State

official replied on July 11, 2023, and had no comments. The Georgia State official replied on August 2, 2023, and had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration published in the *Federal Register* on March 21, 2023 (88 FR 17036), and there has been no public comment on such finding. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: Fred Forsaty
Matt Hamm

Date: October 23, 2023

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2; AND VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2 - ISSUANCE OF AMENDMENT NOS. 248, 245, 222, AND 205 RE: REVISING TECHNICAL SPECIFICATION 3.2.1, "HEAT FLUX HOT CHANNEL FACTOR (F_q(Z))," TO IMPLEMENT METHODOLOGY FROM WCAP-17661, REVISION 1 (EPID L-2022-LLA-0148) DATED OCTOBER 23, 2023

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