

August 9, 2002

Mr. J. B. Beasley, Jr.  
Vice President  
Southern Nuclear Operating  
Company, Inc.  
Post Office Box 1295  
Birmingham, Alabama 35201-1295

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2 RE: ISSUANCE  
OF AMENDMENTS (TAC NOS. MB3568 AND MB3569)

Dear Mr. Beasley:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 127 to Facility Operating License NPF-68 and Amendment No. 105 to Facility Operating License NPF-81 for the Vogtle Electric Generating Plant, Units 1 and 2. The amendments consist of changes to the Technical Specifications (TS) in response to your application dated October 30, 2001, as supplemented by letters dated February 11 and May 27, 2002.

The amendments revise the current TSs for Vogtle to place a cooldown clamp on the Overtemperature Delta Temperature (OTDT) reactor trip function.

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

Sincerely,

/RA/

Frank Rinaldi, Project Manager, Section 1  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-424 and 50-425

Enclosures:

1. Amendment No. to NPF-68
2. Amendment No. to NPF-81
3. Safety Evaluation

cc w/encls: See next page

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DATE	7/15/02	7/10/02	7/22/02	7/22/02	8/9/02

OFFICIAL RECORD COPY

Vogtle Electric Generating Plant

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SOUTHERN NUCLEAR OPERATING COMPANY, INC.

GEORGIA POWER COMPANY

OGLETHORPE POWER CORPORATION

MUNICIPAL ELECTRIC AUTHORITY OF GEORGIA

CITY OF DALTON, GEORGIA

VOGTLE ELECTRIC GENERATING PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 127

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) 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 30, 2001, as supplemented by letters dated February 11 and May 27, 2002, 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 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. 127, 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 within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

John A. Nakoski, Chief, Section 1  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment:  
Technical Specification  
Changes

Date of Issuance: August 9, 2002

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

GEORGIA POWER COMPANY

OGLETHORPE POWER CORPORATION

MUNICIPAL ELECTRIC AUTHORITY OF GEORGIA

CITY OF DALTON, GEORGIA

VOGTLE ELECTRIC GENERATING PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 105  
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) 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 30, 2001, as supplemented by letters dated February 11 and May 27, 2002, 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 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. 105, 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 within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

John A. Nakoski, Chief, Section 1  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment:  
Technical Specification  
Changes

Date of Issuance: August 9, 2002

ATTACHMENT TO LICENSE AMENDMENT NO. 127

FACILITY OPERATING LICENSE NO. NPF-68

DOCKET NO. 50-424

AND

TO LICENSE AMENDMENT NO. 105

FACILITY OPERATING LICENSE NO. NPF-81

DOCKET NO. 50-425

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

Remove

3.3.1-20  
3.3.1-21  
B 3.3.1-17  
B 3.3.1-19  
B 3.3.1-63  
B 3.3.1-65

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Insert

3.3.1-20  
3.3.1-21  
B 3.3.1-17  
B 3.3.1-19  
B 3.3.1-63  
B 3.3.1-65  
B 3.3.1-66



SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 127 TO FACILITY OPERATING LICENSE NPF-68  
AND AMENDMENT NO. 105 TO FACILITY OPERATING LICENSE NPF-81  
SOUTHERN NUCLEAR OPERATING COMPANY, INC., ET AL.  
VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2  
DOCKET NOS. 50-424 AND 50-425

## 1.0 INTRODUCTION

By letter dated October 30, 2001 (Ref. 1), as supplemented by letters dated February 11 (Ref. 2) and May 27, 2002 (Ref. 3), Southern Nuclear Operating Company, Inc., et al. (SNC, the licensee) proposed license amendments to change the Technical Specifications (TS) for the Vogtle Electric Generating Plant (Vogtle), Units 1 and 2. The proposed changes would revise the current technical specifications for Vogtle to place a cooldown clamp on the Overtemperature Delta Temperature (OTDT) reactor trip function. The supplemental information was in response to the staff's request for additional information (RAI) dated January 17, 2002 (Ref. 4), and additional questions during conference calls with the licensee that took place on March 14 and May 9, 2002.

The supplemental letters dated February 11 and May 27, 2002, provided clarifying information that did not change the scope of the October 30, 2001, application nor the initial proposed no significant hazards consideration determination.

## 2.0 BACKGROUND

In the submittal dated October 30, 2001, SNC requested to amend the TS Limiting Condition for Operation 3.1.1 for Vogtle, Units 1 and 2. The proposed changes affect Table 3.3.1-1 that contains the OTDT reactor trip function and its associated constants.

The design of the OTDT reactor trip function provides protection against violating the TS safety limit for Departure from Nucleate Boiling Ratio (DNBR). Westinghouse-designed plants use this trip to ensure that transients that are slow with respect to delays from the core to the instrumentation system do not result in damage to the core. The OTDT reactor trip function inputs include coolant temperature, pressure, axial flux, and reactor power via the coolant delta temperature. The licensee credits the OTDT trip in some plant safety analyses and is therefore necessary for the safe operation of the facility.

The licensee's amendment request proposed to place a clamp on the OTDT function during cooldown events that would limit the maximum difference between the measured reactor coolant system (RCS) average coolant temperature ( $T_{avg}$ ) and the indicated RCS  $T_{avg}$  at rated thermal power (RTP). The proposed clamp would limit this difference to a maximum of three

degrees Fahrenheit. The licensee proposed to use this clamp to provide improved fuel cladding stress margin within the core during anticipated cooldown events. Additionally, to achieve the desired clad stress margin improvements, the licensee requested to revise the axial flux difference (AFD) modifier to reduce the deadband and increase the gain for negative values of the AFD while reducing the gain for positive AFD values. The improved cladding stress margin would allow the licensee to relax the current relaxed axial offset control (RAOC) band thereby improving flexibility in plant operation.

The RAOC band provides the TS limits for the axial flux distribution permitted within the core. The licensee proposes to expand this band from -12 percent to -15 percent at RTP and -25 percent to -30 percent at 50 percent power. The AFD is defined as the difference between the neutron flux in the top of the core minus the neutron flux in the bottom of the core. A negative value indicates that the neutron density is greater in the bottom of the core.

Approval of this request requires confirmation that the licensee has used the most limiting burnup in calculating the cladding stress; has used staff-approved methods in the necessary analyses; and has evaluated the spectrum of plant events for which the clamp may affect plant performance. Also, it requires confirmation that the licensee is using equipment approved for this application and that SNC is familiar with its design and operation.

### 3.0 EVALUATION

The licensee performed the necessary evaluations to provide a solid foundation for the staff's review of the proposed license amendment. The licensee provided substantial detailed quantitative and qualitative technical information to allow the staff to develop an informed conclusion regarding the acceptability of the proposal. The staff completed its review of the license amendment in several stages. First, the staff reviewed the licensee's selection of the most limiting cycle burnup for clad stress margin. The staff used the identified point as the basis for the second part of the review, the effects of placing a clamp on the OTDT reactor trip function on clad stress margins. Additionally, the staff reviewed the effects of the OTDT clamp on the operational, transient, and accident analyses used by Vogtle to demonstrate its ability to operate safely with the proposed modification. Finally, the staff reviewed the Westinghouse 7300 processor and summation card that will provide the clamp signal for the OTDT trip function.

In the RAI responses dated February 11 and May 27, 2002, the licensee provided the framework for justifying the selection of a most limiting time-in-life for the cladding stress analysis. The licensee used the PAD 3.4 code as described in the approved WCAP-10851-P-A, "Improved Fuel Performance Models for Westinghouse Fuel Rod Design and Safety Evaluations," (Ref. 5) to determine the appropriate burnup. SNC performed the analysis over the entire burnup range that each fuel region in the core could experience during the cycle. The licensee identified the most limiting burnup as 21,500 MWd/MTu that corresponds to the initial pellet-cladding contact. The licensee demonstrated that lower burnups were less limiting due to the effects of closing the pellet-cladding gap. Additionally, higher burnups yielded more cladding stress margin, because they resulted in lower peak powers due to less fissile material. After review of the licensee's data and verification that the licensee employed approved NRC methodologies using the PAD 3.4 code, the staff agrees that the 21,500 MWd/MTu is the most limiting burnup for the cladding stress analysis.

Upon identifying the limiting burnup, the licensee provided data to demonstrate the improved cladding stress margin that results from the incorporation of the OTDT clamp. The licensee performed analyses of a Condition II event (Anticipated Operational Occurrences per Appendix A of 10 CFR Part 50 or Incidents of Moderate Frequency per Farley's Updated Final Safety Analysis Report) with the proposed relaxation of the RAOC band and the OTDT clamp to demonstrate that significant cladding stress margin was gained. The licensee presented this data in the February 11, 2002, RAI response. The staff's review of the licensee's data showed that the cladding stress margin was improved by reducing the amount of energy deposited in the fuel. This lower peak power does not cause the pellet to expand as greatly as seen for a case with no OTDT clamp and the current RAOC band. This reduction in pellet expansion results in lower peak temperatures, higher yield stresses, and greater cladding stress margin. The staff reviewed the licensee's results and agrees that the implementation of an OTDT clamp and relaxation of the RAOC band will result in improved cladding stress margin for Condition II events.

The staff reviewed the affects of the OTDT clamp on operational, transient, and accident analyses that form the basis for the safe operation of Vogtle. Since the clamp only acts during cooldown events, there will be no affect on heatup events that place the plant closer to DNBR limits. The licensee credits the OTDT trip function for plant protection during the following transients: 1) Rod bank withdrawal at power, 2) RCS depressurization, 3) Loss of load/turbine trip, and 4) Uncontrolled boron dilution. Since all of these events either result in a plant heatup or RCS pressure reduction, which causes a reduction in the OTDT trip setpoint, the licensee's current safety analyses remain valid.

During RCS cooldown events, the licensee's OTDT clamp will limit the increase in the trip setpoint. This lower trip setpoint for cooldown events will result in earlier reactor trips. Since no current safety analyses for Vogtle cooldown transients credit the OTDT reactor trip function, any cooldown transients that will now result in an OTDT reactor trip will be bounded by the current Vogtle safety analyses.

In addition to evaluating the effects of the OTDT clamp on the current Vogtle safety analyses, SNC performed a review of potential operational scenarios to determine if the clamp may cause undesired or unnecessary reactor trips. The licensee submitted the results of this study in the May 27, 2002, submittal. The licensee showed that for normal operating transients, such as a step load change, the variable OTDT trip setpoint under its worst case input conditions would not cause an unnecessary reactor trip.

The staff reviewed the Westinghouse 7300 processor and summation card that the licensee will use to provide the clamp signal that will limit the maximum temperature difference to three degrees Fahrenheit during cooldown events. This staff has previously approved this processor and summation card for use in Westinghouse plants. The staff confirmed by conference call that the licensee has experience with this equipment in its plant and therefore the staff finds its use for this application acceptable.

The staff has reviewed the proposed modifications to the technical specifications at Vogtle, Units 1 and 2, and has found that they do not result in a safety margin reduction and regulatory

requirements continue to be met. The staff approves the following changes to the technical specifications proposed by SNC:

- 1) Incorporation of an OTDT clamp for cooldown events that limits the maximum difference between the measured RCS  $T_{avg}$  and the indicated RCS  $T_{avg}$  at RTP to three degrees Fahrenheit,
- 2) Changes to the AFD modifier for the OTDT reactor trip function as described in Ref. 1, and
- 3) Expansion of the negative side of the RAOC band to -15 percent at RTP and -30 percent at 50 percent power.

#### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Georgia State official was notified of the proposed issuance of the amendments. The State official had no comments.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. 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, and there has been no public comment on such finding (67 FR 15608). 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) 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.

## 7.0 REFERENCES

1. Letter from J.B. Beasley, Jr. (SNC) to U.S. Nuclear Regulatory Commission, "Request to Revise Technical Specifications, Reactor Trip System Instrumentation Overtemperature Delta Temperature Reactor Trip Function (LCV-1563)," dated October 30, 2001, ADAMS Accession No. ML020160407.
2. Letter from J.B. Beasley, Jr. (SNC) to U.S. Nuclear Regulatory Commission, "Request to Revise Technical Specifications, Reactor Trip System Instrumentation Overtemperature Delta Temperature Reactor Trip Function, Request for Additional Information (LCV-1563-A)," dated February 11, 2002.
3. Letter from J.B. Beasley, Jr. (SNC) to U.S. Nuclear Regulatory Commission, "Request to Revise Technical Specifications, Reactor Trip System Instrumentation Overtemperature Delta Temperature Reactor Trip Function, Request for Additional Information (LCV-1563-B)," dated May 27, 2002, ADAMS Accession No. ML021540156.
4. Letter from R. Assa (USNRC) to J.B. Beasley, Jr. (SNC), "Request for Additional Information Re: Application for Amendments for Facility Operating Licenses, Vogtle Electric Generating Plant, Units 1 and 2 (TAC Nos. MB3568 and MB3569)," dated January 17, 2002, ADAMS Accession No. ML020170495.
5. WCAP-10851-P-A "Improved Fuel Performance Models for Westinghouse Fuel Rod Design and Safety Evaluations," August, 1988.

Principal Contributor: R. Taylor

Date: August 9, 2002