



# Progress Energy

**Cornelius J. Gannon**  
Vice President  
Brunswick Nuclear Plant  
Progress Energy Carolinas, Inc.

**AUG 16 2004**

SERIAL: BSEP 04-0091  
TSC-2004-02

10 CFR 50.90

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Subject: Brunswick Steam Electric Plant, Unit No. 2  
Docket No. 50-324/License No DPR-62  
Request for License Amendment - Addition of TRACG Methodology for  
Determining Core Operating Limits

Ladies and Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Part 50.90, Carolina Power & Light (CP&L) Company, now doing business as Progress Energy Carolinas, Inc., (PEC) is requesting a revision to the Technical Specifications for the Brunswick Steam Electric Plant (BSEP), Unit No. 2. The proposed change adds topical report NEDE-32906P-A, "TRACG Application for Anticipated Operational Occurrences (AOO) Transient Analyses," to the documents listed in TS 5.6.5 describing the approved methodologies used to determine the core operating limits. An evaluation of the proposed license amendment is provided in Enclosure 1.

PEC has evaluated the proposed change in accordance with 10 CFR 50.91(a)(1), using the criteria in 10 CFR 50.92(c), and determined that this change involves no significant hazards considerations.

Unit 2 will be unable to resume power operation following Refueling Outage 16 without NRC approval for inclusion of the TRACG methodology in Technical Specification 5.6.5.b. Therefore, the NRC is requested to issue the requested license amendment no later than January 31, 2005. PEC requests that the amendment, once approved, be issued effective immediately, to be implemented prior to resuming operation from Unit 2 Refueling Outage 16 for Cycle 17.

CP&L is providing, in accordance with 10 CFR 50.91(b), the State of North Carolina a copy of the proposed license amendments.

P.O. Box 10429  
Southport, NC 28461

T > 910.457.3698  
F > 910.457.2803

A001

No regulatory commitments are contained in this letter. Please refer any questions regarding this submittal to Mr. Edward T. O'Neil, Manager - Support Services, at (910) 457-3512.

Sincerely,

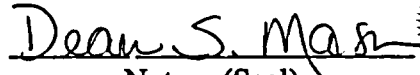
  
Cornelius J. Gannon

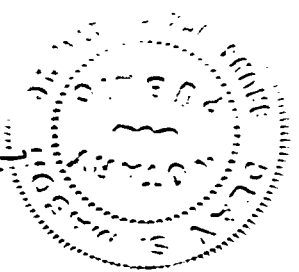
WRM/wrm

Enclosures:

1. Evaluation of License Amendment Request
2. Marked-up Technical Specification Pages - Unit 2
3. Typed Technical Specification Pages - Unit 2
4. List of Regulatory Commitments

Cornelius J. Gannon, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief; and the sources of his information are officers, employees, and agents of Carolina Power & Light Company.

  
Notary (Seal)



My commission expires: 5-23-09

cc (with enclosures):

U. S. Nuclear Regulatory Commission, Region II  
ATTN: Dr. William D. Travers, Regional Administrator  
Sam Nunn Atlanta Federal Center  
61 Forsyth Street, SW, Suite 23T85  
Atlanta, GA 30303-8931

U. S. Nuclear Regulatory Commission  
ATTN: Mr. Eugene M. DiPaolo, NRC Senior Resident Inspector  
8470 River Road  
Southport, NC 28461-8869

U. S. Nuclear Regulatory Commission  
ATTN: Ms. Brenda L. Mozafari (Mail Stop OWFN 8G9)  
11555 Rockville Pike  
Rockville, MD 20852-2738

Ms. Jo A. Sanford  
Chair - North Carolina Utilities Commission  
P.O. Box 29510  
Raleigh, NC 27626-9510

Ms. Beverly O. Hall, Section Chief  
Radiation Protection Section, Division of Environmental Health  
North Carolina Department of Environment and Natural Resources  
3825 Barrett Drive  
Raleigh, NC 27609-7221

## Evaluation of License Amendment Request

Subject: Request for License Amendment - Addition of TRACG Methodology for Determining Core Operating Limits

### 1.0 Description of Proposed Change

The proposed change will revise the Appendix A Technical Specifications for Operating License DPR-62 to add General Electric Nuclear Energy (GENE) licensing topical report NEDE-32906P-A as an approved analytical method for determining core operating limits. Currently, TS 5.6.5.b requires that the listed analytical methods, which have been previously reviewed and approved by the NRC, be used to determine the core operating limits. At present, only the latest approved version of GENE licensing topical report NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel," otherwise referred to as GESTAR-II, is listed.

The proposed change revises Technical Specification 5.6.5.b to add GENE licensing topical report NEDE-32906P-A, "TRACG Application for Anticipated Operational Occurrences (AOO) Transient Analyses." This document describes the application of the TRACG computer code for determining core operating limits for AOO transient analyses.

The specific wording of the proposed change follows; the change made is bolded.

#### 5.6.5 CORE OPERATING LIMITS REPORT (COLR)

- 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. NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel," (latest approved version).
  2. **NEDE-32906P-A, "TRACG Application for Anticipated Operational Occurrences (AOO) Transient Analyses," approved version as specified in the COLR.**

### 2.0 Discussion of Licensing Methodology

The BSEP, Unit 2 Cycle 17 core thermal/hydraulic analysis will be performed by Global Nuclear Fuel - Americas, LLC (GNF)-A using plant-specific and cycle-specific fuel and core parameters and the NRC-approved methodologies included in GESTAR-II. In addition to the methods currently approved in GESTAR-II, GNF-A also plans to use the TRACG code, described in GENE licensing topical report NEDE-32906P-A, for the BSEP Unit 2 Cycle 17 core analysis.

The TRACG code is a thermal/hydraulic analysis code intended to be used in realistic analyses of abnormal operational occurrences. The TRAC family of codes began as a pressurized water reactor analysis code developed for the NRC at Los Alamos National Laboratory. A boiling water reactor (BWR) version of the code was developed jointly by the NRC and GENE at the Idaho National Engineering Laboratory (INEL) as TRAC-BD1/MOD1. GENE has developed a proprietary version of the code designated as TRACG. TRACG is a multi-dimensional, two-fluid reactor thermal-hydraulics analysis code with three-dimensional neutron kinetics capability. The code is designed to perform in a realistic manner with conservatism added, where appropriate, via the input specifications.

By letter dated January 25, 2000 (i.e., ADAMS Accession Number ML003680922), GENE and its subsidiary GNF-A submitted licensing topical report NEDE-32906P for NRC review and approval. NRC approval of NEDE-32906P was subsequently issued by letter dated October 22, 2001 (i.e., ADAMS Accession Number ML012770430).

By letter dated August 6, 2003, GENE submitted an update to GESTAR-II which incorporates additional NRC-approved codes, including TRACG, into the GNF-A licensing methodology. A portion of these GESTAR-II changes were approved by the NRC in a letter dated July 16, 2004 (i.e., ADAMS Accession Number ML042010353); however, Progress Energy Carolinas, Inc. (PEC) understands that GENE does not plan to issue the amendment to GESTAR-II until the NRC completes review of the remaining changes. Thus, until GENE can issue the approved amendment to GESTAR-II, and thus incorporate NEDE-32906P-A for use, PEC must request the change to BSEP TS 5.6.5.b in order to the use NEDE-32906P. If the NRC completes review and approval of the GENE updates to GESTAR-II prior to issuance of the PEC license amendment, the proposed change to BSEP TS 5.6.5.b will no longer be needed.

### **3.0 Regulatory Safety Analysis**

#### **3.1 No Significant Hazards Consideration Determination**

PEC has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The proposed change to TS 5.6.5.b will add General Electric Nuclear Energy topical report NEDE-32906P-A, "TRACG Application for Anticipated Operational Occurrences (AOO) Transient Analyses," to the list of documents describing approved methodologies for determining core operating limits. NRC review and acceptance of the TRACG

methodology is documented in an October 22, 2001, letter and associated safety evaluation issued to General Electric Nuclear Energy (i.e., refer to ADAMS Accession Numbers ML012740390 and ML012740161). Analyzed events are assumed to be initiated by the failure of plant structures, systems, or components. The core operating limits, which are developed using the topical report being added, ensure that the integrity of the fuel will be maintained during normal operations and that design requirements will continue to be met. The proposed change does not involve physical changes to any plant structure, system, or component. Therefore, the probability of occurrence for a previously analyzed accident is not significantly increased.

The consequences of a previously analyzed accident are dependent on the initial conditions assumed for the analysis, the behavior of the fuel during the analyzed accident, the availability and successful functioning of the equipment assumed to operate in response to the analyzed event, and the setpoints at which these actions are initiated. Use of the analytical methodologies described in the topical report being added to TS 5.6.5.b will ensure that applicable design and safety analyses acceptance criteria are met. Use of these NRC-approved methodologies does not affect the performance of any equipment used to mitigate the consequences of an analyzed accident. As a result, no analysis assumptions are violated and there are no adverse effects on the factors that contribute to offsite or onsite dose as the result of an accident. Use of the approved methodologies described in the topical report being added to TS 5.6.5.b ensures that plant structures, systems, or components are maintained consistent with the safety analysis and licensing bases. Based on this evaluation, there is no significant increase in the consequences of a previously analyzed event.

Therefore, the proposed change adding General Electric Nuclear Energy licensing topical report NEDE-32906P-A to the TS 5.6.5.b list of documents describing approved methodologies for determining core operating limits does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed change adding licensing topical report NEDE-32906P-A to TS 5.6.5.b, and the use of the analytical methods described therein, does not involve any physical alteration of plant systems, structures, or components, other than allowing for fuel and core designs in accordance with NRC approved methodologies. The proposed methodology continues to meet applicable criteria for core operating limit analysis. No new or different equipment is being installed. No installed equipment is being operated in a different manner. There is no alteration to the parameters within which the plant is normally operated or in the setpoints that initiate protective or mitigative actions. As a result no new failure modes are being introduced.

Therefore, the proposed change adding General Electric Nuclear Energy licensing topical report NEDE-32906P-A to the TS 5.6.5.b list of documents describing approved methodologies for determining core operating limits does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No

The margin of safety is established through the design of the plant structures, systems, and components, through the parameters within which the plant is operated, through the establishment of the setpoints for the actuation of equipment relied upon to respond to an event, and through margins contained within the safety analyses. The proposed change adding General Electric Nuclear Energy licensing topical report NEDE-32906P-A to the TS 5.6.5.b list of documents describing approved methodologies for determining core operating limits does not impact the condition or performance of structures, systems, setpoints, and components relied upon for accident mitigation. The proposed change does not significantly impact any safety analysis assumptions or results. Therefore, the proposed change adding topical report NEDE-32906P-A to the TS 5.6.5.b list of documents describing approved methodologies for determining core operating limits does not result in a significant reduction in the margin of safety.

Based on the above, PEC concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

### 3.2 Applicable Regulatory Requirements/Criteria

The BSEP design was reviewed for construction under the "General Design Criteria for Nuclear Power Plant Construction" issued for comment by the Atomic Energy Commission in July 1967 and is committed to meet the intent of the General Design Criteria (GDC), published in the Federal Register on May 21, 1971 as Appendix A to 10 CFR Part 50. Title 10 of the Code of Federal Regulations (10 CFR) establishes the fundamental regulatory requirements with respect to reactivity control systems. Specifically, GDC-10, "Reactor design," states, in part, that 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.

NRC Generic Letter 88-16, "Removal of Cycle-Specific Parameter Limits from Technical Specifications," provides guidance on modifying cycle-specific parameter limits in TS. The proposed change to TS 5.6.5.b adding GENE topical report NEDE-32906P-A to the list of documents describing approved methodologies for determining core operating limits is in compliance with the guidance specified in Generic Letter 88-16. Use of the approved TRACG methods helps ensure that appropriate fuel margins are maintained and fuel design limits are not exceeded.

In conclusion, based on the considerations discussed above, (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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

#### **4.0 Environmental Evaluation**

10 CFR 51.22(c)(9) identifies certain licensing and regulatory actions, which are eligible for categorical exclusion from the requirement to perform an environmental assessment. A proposed amendment to an operating license for a facility does not require an environmental assessment if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant hazards consideration; (2) result in a significant change in the types or significant increase in the amounts of any effluents that may be released offsite; or (3) result in a significant increase in individual or cumulative occupational radiation exposure.

Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

#### **5.0 Precedents**

By letter dated March 23, 2004 (ADAMS Accession Numbers ML040890673 and ML040900042), the NRC has previously approved an identical change for BSEP, Unit 1 incorporating GENE topical report NEDE-32906P-A into the list of documents describing approved methodologies for determining core operating limits.



**BSEP 04-0091**  
**Enclosure 2**

**Marked-up Technical Specification Pages - Unit 2**

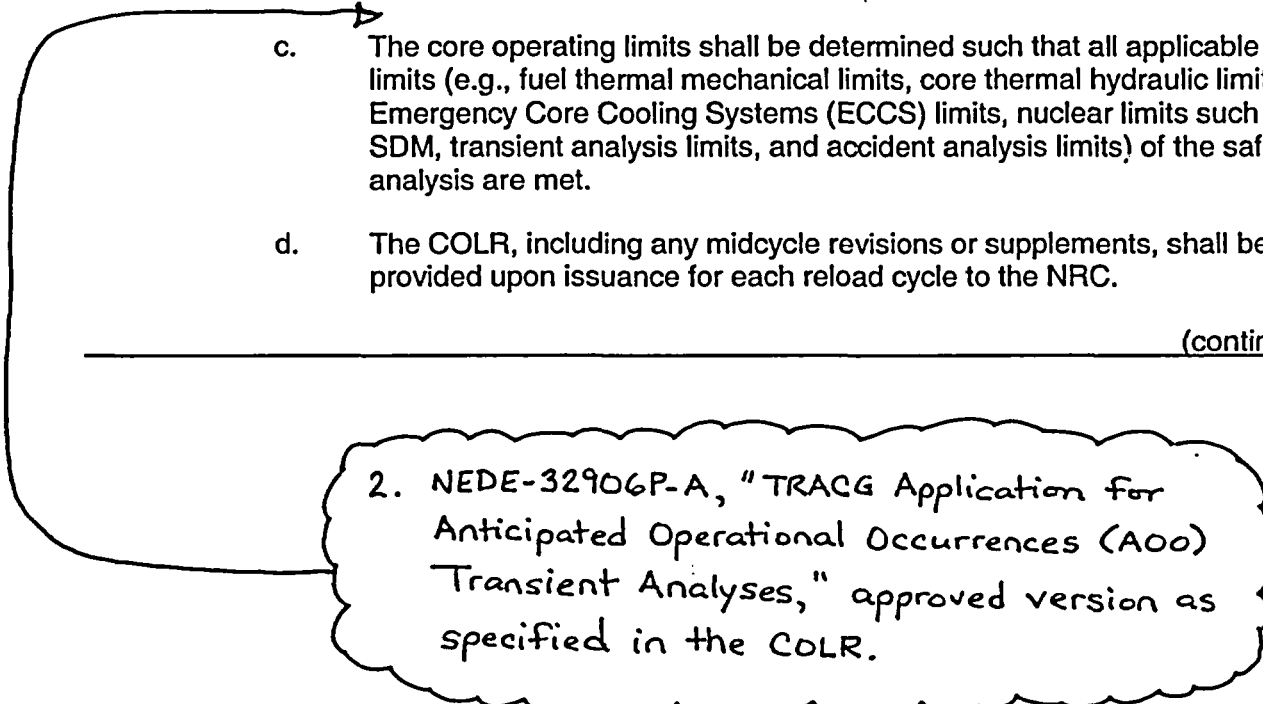
5.6 Reporting Requirements (continued)

---

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:
  - 1. The AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR) for Specification 3.2.1;
  - 2. The MINIMUM CRITICAL POWER RATIO (MCPR) for Specification 3.2.2;
  - 3. The period based detection algorithm (PBDA) setpoint for Function 2.f, Oscillation Power Range Monitor (OPRM) Upscale, for Specification 3.3.1.1; and
  - 4. The Allowable Values and power range setpoints for Rod Block Monitor Upscale Functions for Specification 3.3.2.1.
- 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. NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel" (latest approved version).
- 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.

(continued)



2. NEDE-32906P-A, "TRACG Application for Anticipated Operational Occurrences (AOO) Transient Analyses," approved version as specified in the COLR.

BSEP 04-0091  
Enclosure 3

Typed Technical Specification Pages - Unit 2

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:
  - 1. The AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR) for Specification 3.2.1;
  - 2. The MINIMUM CRITICAL POWER RATIO (MCPR) for Specification 3.2.2;
  - 3. The Allowable Value for Function 2.b, APRM Flow Biased Simulated Thermal Power—High, for Specification 3.3.1.1; and
  - 4. The Allowable Values and power range setpoints for Rod Block Monitor Upscale Functions for Specification 3.3.2.1.
- 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. NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel" (latest approved version).
  - 2. NEDE-32906P, "TRACG Application for Anticipated Operational Occurrences (AOO) Transient Analyses," approved version as specified in the COLR.
- 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.

(continued)

**List of Regulatory Commitments**

The following table identifies those actions committed to by Carolina Power & Light Company, now doing business as Progress Energy Carolinas, Inc. (PEC), in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments. Please direct questions regarding these commitments to the Manager - Support Services at the Brunswick Steam Electric Plant.

Commitment	Schedule
1. None.	N/A