

March 22, 2002

Mr. J. S. Keenan  
Vice President  
Brunswick Steam Electric Plant  
Carolina Power & Light Company  
Post Office Box 10429  
Southport, North Carolina 28461

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1 - ISSUANCE OF  
AMENDMENT REGARDING REVISION OF SAFETY LIMIT MINIMUM  
CRITICAL POWER RATIO (TAC NO. MB2952)

Dear Mr. Keenan:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 220 to Facility Operating License No. DPR-71 for Brunswick Steam Electric Plant, Unit 1. The amendment changes the Technical Specifications (TS) in response to your submittal dated September 18, 2001, as supplemented December 10, 2001, and March 5, 2002.

The amendment revises the Safety Limit Minimum Critical Power Ratio (SLMCPR) values contained in TS 2.1.1.2, and revises the SLMCPR values from 1.10 to 1.12 for two recirculation loop operation, and from 1.11 to 1.14 for single recirculation loop operation.

A copy of the related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's bi-weekly Federal Register Notice.

Sincerely,

***/RA by J.Goshen Acting for/***

Allen G. Hansen, Project Manager, Section 2  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-325

Enclosures:

1. Amendment No. 220 to License No. DPR-71
2. Safety Evaluation

cc w/enclosures: See next page

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CAROLINA POWER & LIGHT COMPANY

DOCKET NO. 50-325

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 220  
License No. DPR-71

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment filed by Carolina Power & Light Company (the licensee), dated September 18, 2001, as supplemented December 10, 2001, and March 5, 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 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 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 Facility Operating License No. DPR-71 is hereby amended to read as follows

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 220, are hereby incorporated in the license. Carolina Power & Light Company shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented prior to startup for Unit 1 Cycle 14 operation.

FOR THE NUCLEAR REGULATORY COMMISSION

***/RA/***

Richard P. Correia, Chief, Section 2  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: March 22, 2002

ATTACHMENT TO LICENSE AMENDMENT NO. 220

FACILITY OPERATING LICENSE NO. DPR-71

DOCKET NO. 50-325

Replace the following page of the Appendix "A" Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

Remove Page

2.0-1

Insert Page

2.0-1

EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 220 TO FACILITY OPERATING LICENSE NO. DPR-71  
CAROLINA POWER & LIGHT COMPANY  
BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1  
DOCKET NO. 50-325

## 1.0 INTRODUCTION

By letter dated September 18, 2001, as supplemented December 10, 2001, and March 5, 2002, the Carolina Power & Light Company (CP&L, the licensee) submitted a request for changes to the Brunswick Steam Electric Plant (BSEP), Unit 1, Technical Specifications (TS). The requested change revises the Safety Limit Minimum Critical Power Ratio (SLMCPR) values contained in TS 2.1.1.2, and revises the SLMCPR Safety Limit values from 1.10 to 1.12 for two recirculation loop operation and from 1.11 to 1.14 for single recirculation loop operation. The December 10, 2001, and March 5, 2002, letters provided clarifying information only and did not change the initial proposed no significant hazards consideration determination, or expand the scope of the initial *Federal Register* notice.

## 2.0 BACKGROUND

The proposed changes include revising the SLMCPR values in TS 2.1.1.2 for BSEP Unit 1 Cycle 14 operation based on a maximum power level of 2923 megawatts thermal ( $MW_t$ ), which is 120 percent of the original licensed power level. The BSEP Unit 1 Cycle 14 core has 560 fuel assemblies, of which there are 248 fresh General Electric (GE) 14 bundles, 220 once-burned GE13 fuel bundles, and 92 twice-burned GE13 fuel bundles. The revision of these values requires analysis to ensure Generic Design Criterion (GDC) 10 of Appendix A to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 regarding acceptable fuel design limits is maintained.

## 3.0 EVALUATION

The licensee requested a change to the BSEP Unit 1 TS in accordance with 10 CFR 50.90. The proposed revision of the TS is described below.

### 3.1 TS 2.1.1 Reactor Core Safety Limits (SLs)

The licensee proposed to change the SLMCPR values in TS 2.1.1.2 for BSEP Unit 1 Cycle 14 operation from 1.10 to 1.12 for two recirculation loop operation and from 1.11 to 1.14 for single recirculation loop operation with the reactor vessel steam dome pressure greater than or equal to 785 psig and core flow greater than or equal to 10 percent of rated core flow.

The licensee described the approved methodologies used to calculate the SLMCPR value for the proposed TS change in the submittal. The Cycle 14 SLMCPR analysis was performed by Global Nuclear Fuel - Americas, LLC (GNF-A) using plant- and cycle-specific fuel and core parameters, and Nuclear Regulatory Commission (NRC)-approved methodologies. These include NEDC-32505P, Revision 1 (R-Factor Calculation Method for GE11, GE12 and GE13 Fuel), NEEDO-10958-A (GETAB), NEDC-32601P (Methodology and Uncertainties for Safety Limit MCPR Evaluations), NEDC-32694P (Power Distribution Uncertainties for Safety Limit MCPR Evaluation), and Amendment 25 to NEDE-24011-P-A (GESTAR II).

The staff has reviewed:

- (1) the justification for the changes on the SLMCPR from 1.10 to 1.12 for two recirculation loop operation and from 1.11 to 1.14 for single recirculation loop operation using the approach stated in Amendment 25 to GESTAR II;
- (2) the issue relating to the NRC staff's March 2001 audit on GNF databases for GEXL14 correlation, and
- (3) the applicability of the previously approved methodologies to GE14 fuel.

The NRC staff identified discrepancies in databases while conducting an audit on GNF-A's GEXL correlation development for the Duane Arnold plant-specific power uprate application in March 2001. The details of the deficiencies are described in a letter to the Duane Arnold licensee dated June 4, 2001. Based on the findings of that audit, the NRC staff requested that the licensee provide a justification why the overall GEXL14 correlation uncertainty remains valid. In their response to the NRC staff's request for additional information (RAI) dated March 5, 2002, the licensee provided the results of additional analyses that indicate there is sufficient conservatism for BSEP Unit 1 Cycle 14 SLMCPR values. This is because no credit associated with the reduced power distribution uncertainty is taken, and no top-peaked power shape is expected during BSEP Unit 1 Cycle 14 operation. The NRC staff has reviewed the licensee's evaluation and finds it acceptable.

To address the audit issue about the applicability of the previously approved methodologies to GE14 fuel, GNF-A submitted two letters for the staff's review:

- (1) FLN-2001-016, from Glen A. Watford to USNRC, "Confirmation of 10x10 Fuel Design Applicability to Improved SLMCPR, Power Distribution and R-Factor Methodologies," dated September 24, 2001; and
- (2) FLN-2001-017, from Glen A. Watford to USNRC, "Confirmation of the applicability of GEXL14 Correlation and Associated R-Factor Methodology for Calculating SLMCPR Values in Core Containing GE14 Fuel," dated October 1, 2001.

The staff reviewed the GNF-A's evaluation contained in the two letters and finds the approach, supplemented by the approach dealing with a proposed higher interim GEXL14 correlation uncertainty discussed in the licensee's RAI response, dated March 5, 2002, acceptable for this application. This is because the NRC approved methodologies of calculating the SLMCPR (GESTAR II) were used by GNF-A.

The staff reviewed the licensee's application dated September 18, 2001, and the response to the NRC staff's RAI dated March 5, 2002, including the detailed summary results of the analysis for BSEP Unit 1 Cycle 14 operation in Table 1 of Enclosure 2 of the application, and Table 1 of Enclosure 1 in the response to the RAI, to determine whether the proposed changes to the BSEP Unit 1 SLMCPR values were justified. The analysis provided in the RAI response, dated March 5, 2002, indicates that a top-peaked power shape relating to the issue of the databases for GEXL 14 correlation is not applicable to and does not have any impact on BSEP Unit 1 Cycle 14 operation.

The proposed BSEP Unit 1 in Cycle 14 SLMCPR values will ensure that 99.9 percent of the fuel rods in the core will not experience boiling transition, which satisfies the requirements of GDC 10 of Appendix A to 10 CFR Part 50 regarding acceptable fuel design limits. The staff concludes that the SLMCPR analysis for BSEP Unit 1 Cycle 14 operation, which uses the plant- and cycle-specific parameters in conjunction with the approved method, is acceptable.

#### 4.0 STATE CONSULTATION

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

#### 5.0 ENVIRONMENTAL CONSIDERATIONS

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes the surveillance requirements. The NRC staff has determined that the amendment involves 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 amendment involves no significant hazards consideration, and there has been no public comment on such finding (66 FR 52797). Accordingly, the amendment meets 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 amendment.

#### 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: T. Huang

Date: March 22, 2002



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Carolina Power & Light Company

Brunswick Steam Electric Plant  
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