

UNITED STATES NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATING TO AMENDMENT NO. 182 TO LICENSE NO. DPR-71

CAROLINA POWER & LIGHT COMPANY

BRUNSWICK STEAM ELECTRIC PLANT, Unit 1

DOCKET NO. 50-325

1.0 INTRODUCTION

By letter dated April 8, 1996 (BSEP 96-0061), as supplemented by letters dated July 30, 1996 (BSEP 96-0271), October 4, 1996 (BSEP 96-0366), October 8, 1996 (BSEP 96-0376), and October 16, 1996 (BSEP 96-0390) Carolina Power & Light Company (CP&L, the licensee) proposed changes to the Technical Specifications (TS) for the Brunswick Steam Electric Plant (BSEP), Unit 1. The requested changes would revise the safety limit minimum critical power ratio (SLMCPR) from 1.07 to 1.10 for two recirculation loop operation, include the use of a new type of fuel (GE-13), and revise the acceptable range of sodium pentaborate concentration for the standby liquid control system (SLCS) to support use of GE-13 fuel for BSEP, Unit 1, Cycle 11 operation.

2.0 EVALUATION

The licensee requested TS changes in accordance with 10 CFR 50.90 and 2.101. The revised TS were proposed as follows:

(1) Specification 2.1.2

Due to the use of GE13 fuel, the licensee proposed to change the SLMCPR from 1.07 to 1.10 for operation with the reactor steam dome pressure greater than 800 psia and core flow greater than 10% of rated flow. which is based on a cycle-specific analysis performed by the General Electric Company (GE) for BSEP, Unit 1 Cycle 11. BSEP, Unit 1 cyclespecific fuel and core parameters were used in the analysis including the actual core loading, the most limiting permissible control blade patterns, the actual bundle parameters, and the cycle exposure range.

The NRC staff has reviewed the proposed TS change which is based on the analysis performed using BSEP, Unit 1 cycle-specific inputs and approved methodologies including GESTAR II (NEDE-24011-P-A-11, Sections 1.1.5 and 1.2.5) and has found it acceptable. Because the R-factor methodology referenced in NEDE-24011-P-A-11 is not applicable to the part-length GE13 fuel, an improved R-factor methodology described in NEDC-32505P, "R-Factor Calculation Method for GE11, GE12 and GE13 Fuel," November 1995, was used. The improved R-factor calculation method uses the same NRC-approved equation stated in GESTAR (NEDE-24011-P-A) with correction factors to account for the peaking factor effects due to the part-

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length-rod design. The staff has reviewed the R-factor calculation method for GE13 and finds it acceptable because it provides appropriate correction for peaking factor effects for the GE 13 fuel in BSEP Unit 1 in the calculation of the safety limit MCPR. A telephone conference was held on October 3, 1996 with CP&L and GE to request additional information on the cycle-specific analysis with respect to the cause of a 0.01 increase above the generic SLMCPR of 1.09 reported in a letter report "Safety Limit MCPR for GE13 Fuel," transmitted to NRC by GE letter (JFK94-014) dated September 28, 1994, and the search procedure for variations of projected control blade patterns. The responses to the information requests discussed in the conference call were documented in a letter dated October 4, 1996, from CP&L to the NRC.

(2) Specification 5.3.1

The GE13 fuel type is added to the list of fuel assembly types contained in the reactor core. This addition is acceptable since the licensee indicated that the GE13 fuel type design fully complies with the acceptance criteria contained in the approved Amendment 22 of NEDE-24011-P-A.

(3) Figure 3.1.5-1

A portion of the SLCS sodium pentaborate volume-concentration range shown in TS Figure 3.1.5-1 (applicable to the lower range of tank volume) is being revised to increase the required concentration of sodium pentaborate solution to account for the additional shutdown reactivity needed based on the planned used of GE13 fuel assemblies as reload for the Unit 1, Cycle 11 reactor core. For the currently approved fuel types, a minimum shutdown margin of 2.6% K is required in the SLCS analysis; and for the GE13 fuel type, GE methodology requires a shuldown margin of greater than 3.2% AK. GE calculations show that an in-vessel concentration of 660 ppm boron results in an estimated SLCS shutdown margin of 3.6% K (at 20°C, Xenon free), which exceeds the minimum required shutdown margin of 3.2% AK, based on the current minimum SLCS tank concentration of 13% by weight. The proposed increase of the required concentration of sodium pentaborate solution co raise the in-vessel concentration from 600 to 660 ppm boron is acceptable for this plant-specific application, since the proposed concentration results in a higher shutdown margin than the required minimum of 3.2% K. In addition, the previously approved methodologies used in support of this application were documented in a GE submittal (RJR-96-020) dated February 29, 1996.

Based on NRC staff review, the NRC staff concludes that the proposed changes to the BSEP, Unit 1, TS are acceptable; however, the SLMCPR TS change is acceptable <u>only</u> for the Brunswick, Unit 1 Cycle 11 operation since the change was analyzed based on the NRC-approved method using BSEP Unit 1 cycle-specific inputs.

3.0 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.

4.0 ENVIRONMENTAL CONSIDERATION

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. 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 (61 FR 42276). 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.

5.0 CONCLUSIONS

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.

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Date: October 17, 1996