



Progress Energy

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Progress Energy Carolinas, Inc.

MAY 14 2003

SERIAL: BSEP 03-0088
TSC-2002-09

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

Subject: Brunswick Steam Electric Plant, Unit Nos. 1 and 2
Docket Nos. 50-325 and 50-324/License Nos. DPR-71 and DPR-62
Response to Request for Additional Information
Core Flow Operating Range Expansion
(NRC TAC No. MB6692 and MB6693)

Reference: Letter from Mr. John S. Keenan to the U. S. Nuclear Regulatory
Commission (Serial: BSEP 02-0169), "Request for License
Amendments - Core Flow Operating Range Expansion," dated
November 12, 2002.

Ladies and Gentlemen:

On November 12, 2002, Progress Energy Carolinas, Inc. requested a revision to the Technical Specifications (TSs) for the Brunswick Steam Electric Plant (BSEP), Units 1 and 2. The proposed license amendments revise TSs, as necessary, to support an expansion of the core flow operating range (i.e., Maximum Extended Load Line Limit Analysis Plus (MELLLA+)).

On May 1, 2003, the NRC provided a verbal request for additional information (RAI) concerning the impact of moisture carryover on flow accelerated corrosion. The response to this RAI is enclosed.

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A001

Please refer any questions regarding this submittal to Mr. Edward T. O'Neil,
Manager - Support Services; at (910) 457-3512.

Sincerely,


John S. Keenan

MAT/mat

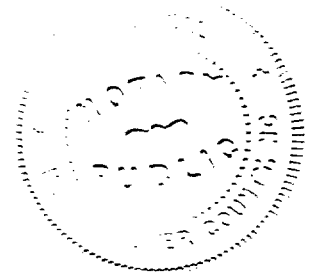
Enclosure:

Response to Request for Additional Information (RAI) 1

John S. Keenan, 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: 05/18/2008



cc:

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Response to Request for Additional Information (RAI) 1

Background

On November 12, 2002 (i.e., Serial: BSEP 02-0169), Progress Energy Carolinas, Inc. requested a revision to the Technical Specifications (TSs) for the Brunswick Steam Electric Plant (BSEP), Units 1 and 2. The proposed license amendments revise TSs, as necessary, to support an expansion of the core flow operating range (i.e., Maximum Extended Load Line Limit Analysis Plus (MELLLA+)).

On May 1, 2003, the NRC provided a verbal request for additional information (RAI) concerning the impact of moisture carryover on flow accelerated corrosion (FAC). The response to this RAI follows.

NRC Question 1-1

In the Topical Report NEDC-33063P supporting MELLLA+ in the Brunswick Plant, it is stated that the moisture content in the main steam piping may increase to as high as 0.14 weight percent and that this will not significantly impact piping wear rates by FAC. Please provide the analysis justifying this statement.

Response to NRC Question 1-1

The original design moisture content for steam leaving the reactor vessel was 0.10 weight percent, which is the value used in the CHECKWORKS FAC model for BSEP. As discussed in Section 3.3.3 of GE Nuclear Energy Report NEDC-33063, "Safety Analysis Report for Brunswick Steam Electric Plant Units 1 and 2 Maximum Extended Load Line Limit Analysis Plus," dated November 2002 (i.e., M+SAR), the moisture content leaving the vessel is predicted to be as high as 0.14 weight percent when a certain combination of conditions (i.e., limiting equilibrium cycle conditions of high radial power peaking, operation at approximately 85% core flow, and operation with a downcomer water level at the high level alarm point) are present. This combination of conditions would not be expected to exist over a significant portion of the operating cycle.

In order to assess the potential wear rate impact on the main steam piping itself, sensitivity runs using CHECKWORKS were completed with moisture contents up to 0.20 weight percent leaving the reactor vessel. These sensitivity runs showed an insignificant impact (i.e., less than 1 mil/year) on steam line wear rates, even if the higher moisture contents are assumed to exist continuously. Additionally, plant heat balances were run to determine the resulting changes in flow rates and steam qualities in other balance-of-plant (BOP) piping. These heat balances showed that for a predicted moisture value of 0.14 weight percent leaving the reactor vessel, other plant BOP piping (e.g., extraction steam, heater drains, etc.) would experience a negligible change (i.e., < 0.5%) in flow rate, temperature, and steam quality. Consequently, the potentially

higher moisture content leaving the vessel is considered to have a negligible impact on the FAC wear rates.

The worst case moisture content of 0.14 weight percent is a predicted value based on steam separator-dryer performance models. As discussed in Section 10.4 of NEDC-33063P, testing will be conducted under MELLLA+ conditions to confirm the expected steam separator-dryer performance. Should actual performance deviate from predicted performance, the plant FAC program would be updated as appropriate to reflect these changes.