



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

January 21, 2000

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

SUBJECT: NRC STAFF'S EVALUATION OF THE BRUNSWICK STEAM ELECTRIC
PLANT, UNITS 1 AND 2, INDIVIDUAL PLANT EXAMINATION (IPE) SUBMITTAL
(TAC NOS. M74387 AND M74388)

Dear Mr. Keenan:

By letter dated August 31, 1992, as supplemented on September 9 and September 30, 1994, and February 27 and May 18, 1995, you responded to Generic Letter 88-20, "Individual Plant Examinations for Severe Accident Vulnerabilities (IPE)," and Supplements 1, 2 and 3. With the assistance of contractors, the NRC staff has completed the review of the IPE submittal for internal events and internal flooding. The evaluation package consists of:

The Staff Evaluation Report (SER, Enclosure 1)

The contractors' Technical Evaluation Reports (TERs) for the front-end, back-end, and human reliability analysis reviews (Enclosures 2, 3, and 4)

Based on the review of the Brunswick IPE submittal and associated documentation, the staff has concluded that you have fully met the intent of Generic Letter 88-20.

You used the criteria in Nuclear Management and Resources Council document 91-04, "Severe Accident Issue Closure Guidelines," to screen for plant-specific vulnerabilities. The Brunswick IPE did not identify any severe accident vulnerabilities associated with either core damage or poor containment performance. Although the IPE did not identify any vulnerabilities, you advised us in the IPE revision of September 9, 1994, and your supplemental letters of September 30, 1994, and February 27, 1995, that you were implementing a number of procedural improvements and hardware modifications to enhance the capability of recovering from a station blackout event, recovering offsite power if dc power is depleted, extending battery life if the chargers are lost, and providing improved training with respect to loss of decay heat removal. The more significant hardware modifications included installation of a hardened wetwell vent in both Brunswick units in response to Generic Letter 89-16, "Installation of a Hardened Wetwell Vent," and installation of a remotely operated emergency bus cross-tie and logic switches to cross-tie the 4160-V buses between Units 1 and 2.

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In the submittal of August 31, 1992, you estimated that the overall core damage frequency (CDF) was 2.75E-5 per reactor-year from internally initiated events, including a contribution of 1.9E-6 per reactor-year from internal flooding sequences, most of which involved postulated failure of the low-pressure service water piping. The major classes of accidents contributing to the total CDF and their percentage of contribution were: (1) loss of offsite power and extended station blackout (66 percent); (2) a transient with loss of all three long-term decay heat removal options (30 percent); and (3) anticipated transient without scram (3 percent).

In your letters of September 30, 1994, and February 27, 1995, you advised us that as part of your program to maintain a "living model," you had updated the 1992 Brunswick IPE model with a new probabilistic safety assessment (PSA) to reflect various changes completed since the August 1992 IPE submittal, such as the plant modifications and procedural enhancements noted above. You further advised us that "the results of the PSA show that the overall CDF is reduced from the IPE value of 2.7E-5 per reactor-year to 1.1E-5 per reactor-year," and that the "updated PSA is also more leveled with respect to major CDF contributors." Although the staff acknowledges your program and commends you for updating the model, this evaluation is based on the submittal of August 31, 1992.

Generic Letter 88-20 suggested that licensees could use their IPE submittals to address, among other safety issues, Unresolved Safety Issue (USI) A-45, "Shutdown Decay Heat Removal Requirements" and USI A-17, "Systems Interactions in Nuclear Power Plants." As discussed in the SER and in the front-end TER, based on your IPE submittal, these two issues are adequately resolved for the Brunswick Steam Electric Plant, Units Nos. 1 and 2.

If you have any questions regarding this matter, please contact me.

Sincerely,
Original signed by:
Allen G. Hansen, Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-325 and 50-324

cc: See next page

- Enclosures: 1. Staff Evaluation
2. TER (Front-End)
3. TER (Back-End)
4. TER (Human Reliability Analysis)

cc w/encl 1: See next page

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| NAME | AHansen <i>[Signature]</i> | EDunnington | | <i>[Signature]</i> | | RCorreia <i>[Signature]</i> |
| DATE | <i>1/20/99</i> | <i>1/21/99</i> | | <i>2/11/99</i> | | <i>1/21/99</i> |

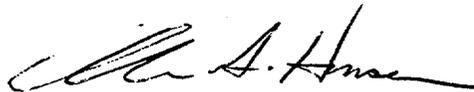
In the submittal of August 31, 1992, you estimated that the overall core damage frequency (CDF) was $2.75E-5$ per reactor-year from internally initiated events, including a contribution of $1.9E-6$ per reactor-year from internal flooding sequences, most of which involved postulated failure of the low-pressure service water piping. The major classes of accidents contributing to the total CDF and their percentage of contribution were: (1) loss of offsite power and extended station blackout (66 percent); (2) a transient with loss of all three long-term decay heat removal options (30 percent); and (3) anticipated transient without scram (3 percent).

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Allen G. Hansen, Project Manager, Section 2
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Docket Nos. 50-325 and 50-324

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2. TER (Front-End)
3. TER (Back-End)
4. TER (Human Reliability Analysis)

cc w/encl 1: See next page

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Brunswick Steam Electric Plant
Units 1 and 2

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