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SERIAL: BSEP 97-0060

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United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 & 50-324/LICENSE NOS. DPR-71 & DPR-62
SUPPLEMENTAL INFORMATION FOR GENERIC LETTER 92-01,
REACTOR VESSEL STRUCTURAL INTEGRITY

Gentlemen:

The purpose of this letter is to provide the results of the Brunswick Steam Electric Plant Unit Nos. 1 and 2, specific upper shelf energy equivalent margins analysis for reactor vessel N16 forged nozzles. Carolina Power & Light (CP&L) Company committed to provide these results in CP&L's response to Generic Letter 92-01, Revision 1, Supplement 1, dated November 16, 1995 (Serial No. BSEP 95-0572).

The analysis of the nozzles for both reactor vessels, included as Attachment 2, demonstrates that the lower value of end-of-life upper shelf energy is anticipated to remain higher than the minimum value required by the American Society of Mechanical Engineers (ASME) Code Section XI, Appendix G.

Please refer any questions regarding this letter to Mr. Keith Jury, Manager Regulatory Affairs, at (910) 457-2783.

Sincerely,

William R. Campbell

GMT/

Enclosures:

170060

1. Discussion
2. N-16 Nozzles Upper Shelf Energy Evaluation
3. List of Regulatory Commitments



cc: Mr. L. A. Reyes, NRC Regional Administrator, Region II
Mr. C. A. Patterson, NRC Senior Resident Inspector - Brunswick Steam Electric Plant
Mr. D. C. Trimble, Jr., NRR Project Manager - Brunswick Steam Electric Plant
The Honorable J. A. Sanford, Chairman - North Carolina Utilities Commission

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ENCLOSURE 1

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
NRC DOCKET NOS. 50-325 & 50-324
OPERATING LICENSE NOS. DPR-71 & DPR-62

SUPPLEMENTAL INFORMATION FOR GENERIC LETTER 92-01
REACTOR VESSEL STRUCTURAL INTEGRITY

Discussion

Carolina Power & Light (CP&L) Company's response to Generic Letter 92-01, Revision 1, Supplement 1, dated November 16, 1995 (Serial No. BSEP 95-0572), committed to provide a plant-specific upper shelf energy (USE) equivalent margins analysis for each of the Brunswick Steam Electric Plant reactor pressure vessels' N16 forged nozzles.

10CFR50, Appendix G, requires that the upper shelf Charpy V Notch (CVN) Energy of the reactor vessel beltline region be greater than 75 ft-lbs initially, and remain above 50 ft-lbs throughout the operating license of the plant. If this minimum requirement is not maintained, the licensee is required to demonstrate that lower values of USE will provide margins of safety against fracture equivalent to those required by the American Society of Mechanical Engineers (ASME) Code Section XI, Appendix G.

Each reactor vessel contains two 2-inch nominal pipe size forged instrument nozzles, N16A and N16B, within the upper beltline region. Although all of the nozzle forgings are from the same heat of material, the Unit 1 nozzle forgings have significantly lower reported Charpy impact energy at 40 degrees F than those contained within the Unit 2 vessel. Although most of the reactor vessel beltline materials had been previously bounded by the Boiling Water Reactor (BWR) Owners Group USE equivalent margins analysis report, NEDO-32205-A, "10CFR50, Appendix G Equivalent Margin Analysis for Low Upper Shelf Energy in BWR/2 Through BWR/6 Vessels", forged materials were not addressed by the report. As a result, CP&L decided to perform a plant-specific equivalent margin analysis as required by 10CFR50, Appendix G.

The report (96124-TR-01) provided in Attachment 2 shows that, based on an extensive database search, the N16 nozzles for both reactor vessels should have had an initial USE of at least 70 ft-lbs. In addition, a conservative projection of the end-of-life fluence shows that the initial USE is not anticipated to drop more than 18% for either reactor vessel. Therefore, the end-of-life USE of the nozzles for both vessels is anticipated to remain higher than the minimum screening criteria of 50 ft-lbs. However, for added conservatism, an equivalent margins analysis was also performed per the guidelines provided in USNRC Regulatory Guide 1.161. This analysis demonstrates that the N16 nozzles would meet the ASME Code, Section XI, Appendix K, and Regulatory Guide 1.161 J-R fracture toughness requirements, with an end-of-life USE as low as 29 ft-lbs. It is further shown in Section 3.0 of the attached report that a 29 ft-lb end-of life USE value would be equivalent to an initial USE of 35 ft-lbs, conservatively assuming the 18% drop in USE over the life of the vessels. As noted above, based on the material database search conducted as a part of this project, it has been shown that the subject nozzle material should have an initial USE of at least 70 ft-lbs.

ENCLOSURE 2

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
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SUPPLEMENTAL INFORMATION FOR GENERIC LETTER 92-01
REACTOR VESSEL STRUCTURAL INTEGRITY

N-16 NOZZLES UPPER SHELF ENERGY EVALUATION

Technical Report No. 96124-TR-01

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