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 FACIL: 50-261 H. B. Robinson Plant, Unit 2, Carolina Power and Light 05000261
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 VARGA, S.A. Operating Reactors Branch 1

SUBJECT: Requests that low leakage core be factored into Calculations
 re fast neutron fluence for reactor vessel. Differences
 between BNL & Westinghouse calculations resolved at 820825
 meeting.

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Carolina Power & Light Company

SEP 24 1982

Office of Nuclear Reactor Regulation
ATTN: Mr. Steven A. Varga, Chief
Operating Reactors Branch No. 1
United States Nuclear Regulatory Commission
Washington, D.C. 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
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FAST NEUTRON FLUENCE CALCULATIONS FOR REACTOR VESSEL

Dear Mr. Varga:

In the course of NRC review of pressurized thermal shock (PTS) to the H. B. Robinson Unit No. 2 (HBR) reactor vessel, calculations of fast neutron flux by Brookhaven National Laboratory (BNL) differed significantly from those furnished to Carolina Power & Light Company (CP&L) by Westinghouse (W).

In a meeting held on August 25, 1982, BNL and W exchanged cross sections and other data. Subsequently, the differences have been resolved as follows:

1. The BNL transport calculations, using P3 Legendre polynomials, resulted in a fast neutron fluence (>1 Mev) of 7.4×10^{19} nvt. This is 14 percent higher than the W transport calculation results, using P1, which was 6.5×10^{19} nvt.
2. Carolina Power & Light Company agrees to the use of 7.4×10^{19} nvt as a conservative representative value for the fast neutron fluence (>1 Mev) at its peak location on the inner surface of the HBR vessel wall for 32 EFPY of reactor operation in calculations for the NRC screening criteria.

In order to calculate a more realistic fluence at the vessel wall, we request that you factor in the low leakage core which was installed in the reactor during the past summer. This core has twice burned fuel located on the periphery (flats) of the core with the result that the neutron flux projected from the core flats onto the vessel I.D. is calculated to be reduced by approximately 50 percent. As an example, the total fluence for prior irradiation and a projected 3 EFPY into the future will then be 1.73×10^{19} nvt > 1 Mev.

In its continuing program to address the PTS issue, Carolina Power & Light Company has installed dosimetry in the cavity between the vessel and the surrounding concrete shielding. This dosimetry should confirm the calculated reduction in flux. An additional capsule has been installed on the thermal shield to check the cavity results. Hanford Engineering Development Laboratory and the National Bureau of Standards have participated in the

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design, fabrication and/or installation of the dosimetry on behalf of NRC. They will perform the measurements with Westinghouse at the end of the current operating cycle.

Carolina Power & Light Company also requests your consideration of data to be presented by Westinghouse to demonstrate their contention that the P3 Legendre polynomial result is offset by including cladding and correcting peripheral power to HBR conditions.

Yours very truly,

A handwritten signature in cursive script, appearing to read "S. R. Zimmerman".

S. R. Zimmerman
Manager
Licensing & Permits

DCW/cr (4301C4T5)

cc: Mr. J. P. O'Reilly (NRC-R11)
Mr. G. Requa (NRC)
Mr. Steve Weise (NRC-HBR)