



50-4100

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 11, 1996

Mr. W. R. Robinson, Vice President
Shearon Harris Nuclear Power Plant
Carolina Power & Light Company
Post Office Box 165, Mail Code: Zone 1
New Hill, NC 27562-0165

SUBJECT: 10 CFR 50.46 LARGE BREAK LOSS-OF-COOLANT ACCIDENT EVALUATION MODEL
FOR SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1 (TAC NO. M96355)

Dear Mr. Robinson:

During August 1995, the Nuclear Regulatory Commission (NRC) met with Siemens Power Corporation (SPC) with regard to the large break loss-of-coolant accident (LBLOCA) evaluation model. As a result of that meeting, we sent a letter to SPC, dated November 13, 1995, which identified problems concerning changes in the model used by SPC for pressurized water reactors. This model was approved by the NRC staff to meet the requirements of 10 CFR 50.46 in the letter of July 8, 1986, from D.M. Crutchfield (NRC) to G. Ward (Exxon).

In the staff's letter of November 13, 1995, we stated that SPC had made changes to the NRC-approved Fuel Cooling Test Facility (FCTF) reflood heat transfer coefficient correlation used in the TOODEE2 computer code and did not properly assess the significance of the code changes. It appears that the following two major changes were made to the FCTF correlation in the TOODEE2 code: (1) some nonphysical non-monotonic behavior of the FCTF heat transfer coefficient correlation with respect to the reflood rate were eliminated and (2) the quench time calculation used in the model, using data from Cylindrical Core Test Facility (CCTF) experiments, was modified. By letter dated March 13, 1996, the staff requested SPC to address the changes to the TOODEE2 model and the code errors identified since July 1986.

On June 2, 1996, SPC submitted topical report XN-NF-82-20, "EXEM/PWR Large Break LOCA ECCS TOODEE2 Updates," Revision 1, Supplement 5, which described the updates made to the TOODEE2 computer code since 1986. The staff has completed its review of this report and has concluded that the proposed LBLOCA-ECCS model (i.e., 1991 model) is not acceptable and the previous approved model (i.e., the 1986 model) has an unacceptable error in the model. The staff's letter to SPC dated October 11, 1996, which includes the summary of conference calls with SPC on October 10 and 11, 1996, on this matter, will be telecopied separately.

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Because of the staff's conclusions regarding the unacceptability of the reflood heat transfer coefficient correlation used in the T00DEE2 computer code, we conducted a conference call on Thursday, October 10, 1996, with several licensees, including a representative of your plant. Other participants were representatives from Comanche Peak Station Units 1/2, Kewaunee Plant, Millstone Station Unit 2, Palisades Plant, Robinson Plant Unit 2, St. Lucie Plant Unit 1, and SPC. The purpose of the conference call was to inform each licensee that the staff had found changes in the unapproved 1991 LBLOCA evaluation model, which were intended to address problems with the approved 1986 model used by SPC for the LBLOCA and emergency core cooling system analyses, unacceptable. In addition, the staff indicated that it will not accept LBLOCA analyses using the previously approved 1986 model unless that model adequately corrects the non-physical behavior observed in the reflood heat transfer correlation.

Therefore, in accordance with 10 CFR 50.46(a)(3)(ii), you should assess the impact of these model errors and changes and take whatever actions are required to assure compliance with 10 CFR 50.46. Further, as you were informed in the conference call, the staff has scheduled a public meeting on October 16, 1996, at 1:00 pm, in O-12B11, at its Headquarters Offices. The affected plants and SPC were requested to attend this meeting to present the results of their assessment of the peak cladding temperature for the LBLOCA and the corrective actions and compensatory measures that have been undertaken, both short-term and long-term, to assure plant compliance with 10 CFR 50.46.

If you have any questions about this matter, please contact Ngoc(Tommy) Le at 301-415-1458, or Jack Donohew at 301-415-1307.

Sincerely,



Brian W. Sheron, Acting Associate Director
for Technical Review
Office of Nuclear Reactor Regulation

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cc: See next page

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