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 AUTH. NAME: SCAROLA, J.      AUTHOR AFFILIATION: Carolina Power & Light Co.  
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SUBJECT: Submits info required per 10CFR50.46(a)(3)(ii), re estimated effect of changes or errors in ECCS evaluation models or in application of models.

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Carolina Power & Light Company  
PO Box 165  
New Hill NC 27562

James Scarola  
Vice President  
Harris Nuclear Plant

SERIAL: HNP-98-133  
10 CFR 50.46

OCT - 1 1998

United States Nuclear Regulatory Commission  
ATTENTION: Document Control Desk  
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SHEARON HARRIS NUCLEAR POWER PLANT  
DOCKET NO. 50-400/LICENSE NO. NPF-63  
EMERGENCY CORE COOLING SYSTEM EVALUATION CHANGES

Dear Sir or Madam:

Carolina Power & Light Company (CP&L) hereby submits information required pursuant to 10 CFR 50.46(a)(3)(ii) for the Harris Nuclear Plant (HNP), regarding the estimated effect of changes or errors in Emergency Core Cooling System (ECCS) evaluation models or in the application of the models. This submittal satisfies CP&L's requirement for annual reporting of minor evaluation changes for HNP. CP&L's previous annual report for HNP to the NRC was provided by letter dated October 1, 1997. This annual report documented a Small Break Loss of Coolant Accident (SBLOCA) peak fuel cladding temperature (PCT) of 1953.3°F and a Large Break Loss of Coolant Accident (LBLOCA) PCT of 1993°F. These PCT values reflected changes that had been made in the evaluation models through May 1, 1997.

In addition, this letter fulfills the 10 CFR 50.46 requirement for a 30-day report required for changes greater than 50°F. By letter dated September 22, 1998, Siemens Power Corporation (SPC) provided information to CP&L regarding an error in the LBLOCA evaluation model. Specifically, it was discovered that an unrealistically high PCT in the region at the upper extremity of the core is calculated when 3-inch axial nodes are modeled in TOODEE2 in the upper extremity of the core. This error is conservatively estimated to result in an increase of 138.0°F in the PCT for the HNP LBLOCA analysis.

The ECCS performance following postulated accidents continues to be calculated for HNP by its fuel vendor, SPC, using the EXEM PWR Small Break LOCA Model for SBLOCAs and the EXEM PWR Large Break LOCA Model for LBLOCAs. SPC provided a 1997 annual report of changes and errors in ECCS evaluation models to the NRC by letter dated February 27, 1998. This report described minor changes and errors in the LOCA evaluation models made or discovered during the time period May 1, 1997 to December 31, 1997. In addition, SPC has provided several updates to CP&L regarding other changes and errors affecting the HNP LBLOCA and SBLOCA PCTs. The effects of the changes and errors in the LBLOCA evaluation model on the PCT for HNP are summarized in Table 1.

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Table 1: PCT Impact of Changes in Large Break LOCA Model

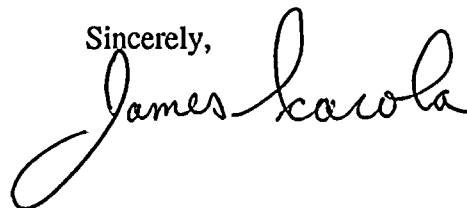
CHANGED CONDITION	PCT IMPACT (°F)
Modified Gadolinia Rod Input Preparation (reported in SPC annual report to NRC dated February 27, 1998)	no impact
RELAP4 Variability (reported in CP&L letter to NRC dated June 2, 1998)	- 135.0
DELFI Input Error in EM Used to Assess Variability	- 3.0
RODEX2 Gap Error	+ 1.0
RELAP4 Decay Heat Error	+ 13.0
Fuel Average Temperature Error	+ 2.0
RDX2LSE Gadolinia Conductivity Model Error	no impact
RDX2LSE Unrealistic SWMDEN value estimate	- 2.0
TOODEE2 Axial Nodalization Estimate	+ 138.0
RFPAC PREFILL Subcode Error Estimate	no impact
Corrected RELAP4 Code Incorrect Pressure Dependent Fill Rate Error Estimate	- 25.0

As reported to the NRC by CP&L letter dated June 2, 1998, the RELAP4 variability problem was estimated to result in a reduction of the HNP PCT by 135°F. HNP is crediting this reduction in the PCT at this time. SPC has revised the LBLOCA model to correct the RELAP4 variability and other errors. The revised model was submitted to the NRC on August 31, 1998. A re-analysis of the HNP LBLOCA PCT will be performed following NRC approval of the revised SPC ECCS model.

For the HNP SBLOCA model, SPC reported an error in the model loop seal elevation. The estimated impact of the error is + 32°F. The resultant SBLOCA PCT becomes 1986°F. The cumulative impact on the HNP PCT for the LBLOCA changes reported in Table 1 is - 11.0°F. For conservatism, the LBLOCA PCT of record will remain at 1993°F. Since the PCT values are less than 2200°F for both the SBLOCA and LBLOCA analyses, HNP remains in compliance with the requirements specified in 10 CFR 50.46(b).

Questions regarding this matter may be referred to Mr. J. H. Eads at (919) 362-2646.

Sincerely,



AEC/aec

- c: Mr. J. B. Brady (NRC Senior Resident Inspector, HNP)  
Mr. L. A. Reyes (NRC Regional Administrator, Region II)  
Mr. S. C. Flanders (NRR Project Manager, HNP)

