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SUBJECT: Discusses changes to emergency core cooling sys evaluation  
 for HB Robinson Electric Plant Unit 2 forwards EMP-91-237,  
 "Siemens Nuclear Power Corp HB Robinson Unit 2 Large Break  
 LOCA/ECCS Analysis W/Increased Peaking Factors."

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# Carolina Power & Light Company

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April 3, 1992

SERIAL: NLS-92-080

United States Nuclear Regulatory Commission  
ATTENTION: Document Control Desk  
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H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2  
DOCKET NO. 50-261/LICENSE NO. DPR-23  
LARGE-BREAK LOSS-OF-COOLANT ACCIDENT ANALYSIS

Gentlemen:

The purpose of this letter is to describe changes to the Emergency Core Cooling System (ECCS) Evaluation for the H. B. Robinson Steam Electric Plant, Unit No. 2 (HBR2) and to report a potentially significant change in the calculated peak fuel cladding temperature (PCT) as required by 10CFR50.46. As part of ongoing fuel design enhancements, the fuel vendor, Siemens Nuclear Power Corporation (SNP), has completed a reanalysis of the postulated Large-Break Loss-of-Coolant Accident (LOCA) that will conservatively bound Cycle 15 and Cycle 16 operating conditions. The Siemens report, EMF-91-237, is enclosed for your information.

Several changes were incorporated into this analysis relative to the Cycle 14 analysis of record:

- (a) a different fuel pellet design which includes a reduction in the fuel-to-cladding gap width and an increase in fuel density;
- (b) use of one-half of the containment spray flow rate and containment fan cooler capacity for the loss-of-emergency diesel, single-failure case, as opposed to full spray flow rate and fan cooler capacity used in previous analyses;
- (c) incorporation of plant modification M-1043 to Emergency Load Sequencer timer settings, including:
  - a low-pressure safety injection delay time of 32.5 seconds, as opposed to 33.5 seconds;
  - a containment spray delay of 14.4 seconds, as opposed to 8 seconds;
  - a containment fan cooler delay time of 34.45 seconds, as opposed to 40 seconds;

(1568RNP)

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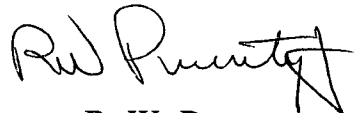
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- (d) incorporation of plant modification M-1087, "RHR Pumps Minimum Flow Recirculation Lines";
- (e) a maximum rod average exposure of 56,000 MWd/MTU, as opposed to 49,000 MWd/MTU as preliminary preparation for a future increase in maximum allowable fuel burnup; and
- (f) a total peaking factor,  $F_{TQ}^T$ , of 2.5 (as opposed to 2.32) and a nuclear enthalpy rise hot channel factor,  $F_{\Delta H}$ , of 1.75 (as opposed to 1.65) as preliminary preparation for a future change.

The combination of these changes resulted in a net decrease of 32°F in the calculated PCT from 2178°F (in the Cycle 14 analysis) to 2146°F. Although the overall effect was a net decrease in the calculated PCT, individual changes would tend to both increase and decrease PCT. Since the effect of each parameter was not calculated separately, there is a possibility that the cumulative sum of the absolute values of each respective change could be greater than 50°F. As such, the sum of these changes is being conservatively reported under 10CFR50.46(a)(3) as a significant change in the application of an acceptable model; however, the resulting PCT is lower and thus remains within the acceptance criteria of 10CFR50.46(b). These changes are limited to input data and represent neither discovery nor correction of any errors and therefore are reportable to the NRC thirty (30) days from start-up from Refueling Outage 14.

Questions regarding this matter may be referred to Mr. R. E. Stirling at (919) 546-2502.

Yours very truly,



R. W. Prunty  
Manager HNP / RNP Licensing Unit

RES/jbw

cc: Mr. S. D. Ebnetter  
Mr. L. W. Garner  
Mr. R. Lo

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