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SUBJECT: Forwards results of RTD delta-temp comparisons, per NRC  
 880910 request.

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H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2  
DOCKET NO. 50-261/LICENSE NO. DPR-23  
RTD DELTA-TEMPERATURE COMPARISONS

Gentlemen:

The NRC letter dated September 10, 1988, regarding elimination of the RTD Bypass System at H. B. Robinson Steam Electric Plant, Unit No. 2 (HBR2) requested (in question 10) that Carolina Power & Light Company (CP&L) inform the staff of results of a test to check and confirm the accuracy of the new hot leg average temperature measurement method against the former RTD bypass method. A discussion of this concern is attached.

Questions regarding this matter may be referred to Mr. R. W. Prunty at (919) 546-7318.

Yours very truly,

L. I. Loflin  
Manager  
Nuclear Licensing Section

JSK/ecc (771RNP)

Attachment

cc: Mr. S. D. Ebnetter  
Mr. L. Garner (NRC-HBR)  
Mr. R. Lo

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ATTACHMENT

The response to question 10 in WCAP 11889, Addendum 1, transmitted by our November 1, 1988 letter stated as follows:

"10. RESPONSE: The hot leg temperature measured with the thermowell RTDs can be compared with the hot let temperature previously measured with the RTDs in the bypass system by comparing delta Ts (normalized to full power) measured before and after the modification. Since there are uncertainties in both RTD system measurements, and differences in streaming patterns from cycle to cycle, it is not likely that the two measurements will be exactly the same. Any difference between the two delta T's considered to be an indication of the error in both measurements rather than an indication of an error in just the new thermowell RTD measurement. The staff will be informed of the results of this analysis."

Six sets of delta T data for Reactor Coolant Loop B were used in the analysis. These data sets were defined as follows:

OLD 1: Pre-modification from 6/12/87 to 6/26/87  
OLD 2: Pre-modification from 8/19/87 to 9/8/87  
OLD 3: Pre-modification from 10/7/87 to 10/26/87  
  
NEW 1: Post-modification . . . Diskette Data Corrupted  
NEW 2: Post-modification from 3/30/89 to 4/17/89  
NEW 3: Post-modification from 7/16/89 to 8/7/89

To minimize scaling errors, data cuts were made such that for OLD 1 only data points at power levels above 90% were accepted. For the other data sets only data points at power levels above 99% were accepted. In addition, to keep the data sets manageable, randomly selected subsets of the OLD 2, OLD 3, NEW 2, and NEW 3 data were used in the analysis.

A summary of the results is provided below:

	No. of data points used	Duration (hours)	Loop B Delta T (degrees)
OLD 1	66	28	55.3
OLD 2	100	127	55.7
OLD 3	100	318	55.7
NEW 1	.....DISKETTE CORRUPTED.....		
NEW 2	104	31	55.1
NEW 3	96	24	57.0

Thus, it is concluded there are uncertainties in both RTD system measurements and differences in streaming patterns from cycle to cycle. Therefore, it is not expected that the pre- and post- modification delta Ts would be identical. In addition, uncertainties inherent in the determination of the power levels means that variations in normalized delta T within a cycle are to be expected. The magnitude of the variations given above is consistent with measurements obtained from other plants. These results indicate an expected distribution in the variations of normalized delta T and show that the modified reactor coolant temperature measurement system is functioning as expected.