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DUKE POWER

December 6, 1994

U. S Nuclear Regulatory Commission
Washington D. C. 20555

Attention: Document Control Desk

Subject: McGuire Nuclear Station
Docket Numbers 50-369 and -370
Catawba Nuclear Station
Docket Numbers 50-413 and 414
Report Pursuant to 10 CFR 50.46, Changes to or
Errors in an ECCS Evaluation Model

Westinghouse Electric Corporation recently issued Nuclear Safety Advisory Letter 94-022, "SBLOCTA Axial Nodalization", which identified a deficiency in the amount of detail used in the axial nodalization of fuel rods in the SBLOCTA code, which is used in the NOTRUMP and WFLASH Small Break LOCA ECCS Evaluation Models (EMs). Further investigation identified several additional related issues associated with the nodalization and the overall solution of the fluid conservation equations, which have been corrected.

The changes identified in the NSAL were evaluated with respect to the analyses documented in the FSARs for the McGuire and Catawba Nuclear Stations. The results of this evaluation are presented in the Attachment. The results show that the peak clad temperatures for each station are well below the 2200 °F limit imposed in 10 CFR 50.46.

If there are any questions about this report, please call H. J. Lee at (704) 382-7565 or S. A. Gewehr at (704) 382-7581.

Very truly yours,

M. S. Tuckman

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McGuire Nuclear Station

Mr. R. J. Freudenberger
Senior Resident Inspector
Catawba Nuclear Station

Attachment

SBLOCA EM Changes

References:

- 1) DFC-94-226, August 18, 1994, letter from Westinghouse (K. B. Hanahan) to Duke (T. E. Ryan) "10 CFR 50.46 Notification and Reporting Information"
- 2) DPC-94-229, October 27, 1994, letter from Westinghouse (K. B. Hanahan) to Duke (T. E. Ryan), "SBLOCTA Axial Nodalization"
- 3) Letter, July 28, 1994, from Duke Power (D. L. Rehn) to NRC Document Control Desk
- 4) Letter, October 4, 1994, from Duke Power (T. C. McMeekin) to NRC Document Control Desk

Summary of the effects of the changes:

The 1985 Westinghouse ECCS evaluation model (EM) analyses apply to all fuel types in the McGuire and Catawba Nuclear Station reactor cores. The analyses which will be shown in the next updates of the McGuire and Catawba FSARs include a case in which a 1264°F peak clad temperature (PCT) is calculated. As shown in References 3 (report pursuant to ¶ 50.46 for McGuire) and 4 (for Catawba) EM changes could result in an increase of this value by as much as 121°F, to 1385°F. Per Reference 1, there are two additional changes to report; a benefit due to error corrections in the boiling heat transfer correlations in the NOTRUMP code, and a penalty due to the correction of logic which nonconservatively postponed the isolation of the steam lines. The benefit is 6°F, while the penalty is 18°F. These changes were not required to be reported earlier, due to the lack of significance (as defined in ¶50.46) of the magnitudes of the changes. Per Reference 2, which was received by Duke on November 10, 1994, the combined effects of a set of closely related changes to the SBLOCTA code could cause a penalty of as much as 149 °F. These changes are: 1) using a finer axial nodalization than the historic choice of 19 nodes, 2) implementing a revised model for calculating transient fuel rod internal pressure, and 3) correcting several related issues associated with nodalization and with the overall solution of the fluid conservation equations. Therefore, the summation of the effects identified in References 1 and 2, when added to the possible PCT previously reported in References 3 and 4, yields a PCT of $1385 - 6 + 18 + 149 = 1546^{\circ}\text{F}$. This PCT is applicable to both McGuire and Catawba.