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U S Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Prairie Island Nuclear Generating Plant Units 1 and 2
Dockets 50-282 and 50-306
License Nos. DPR-42 and DPR-60

Additional Clarifications of Actions for Corrections to Emergency Core Cooling System (ECCS) Evaluation Models

References 1) Letter L-PI-04-097 from Nuclear Management Company to Document Control Desk, "Corrections to ECCS Evaluation Models," dated August 5, 2004.

2) Letter L-PI-04-111 from Nuclear Management Company to Document Control Desk, "Corrections to ECCS Evaluation Models," dated September 24, 2004.

In Reference 1, the Nuclear Management Company (NMC) reported corrections to the ECCS evaluation models in accordance with 10 CFR 50.46. In Reference 2, NMC provided certain clarifications regarding Reference 1 and committed to complete a Large Break Loss of Coolant Analysis (LB LOCA) reanalysis by March 31, 2006. During a telephone conference between the Nuclear Regulatory Commission (NRC), NMC and Westinghouse on October 22, 2004, additional clarifications were provided to the NRC. This letter documents the additional clarifications.

The Prairie Island Analysis of Record (AOR) was performed in 1995 using the Westinghouse SECY 83-472 Methodology approved by the NRC for Large Break LOCA Analyses for Upper Plenum Injection (UPI) Plants (Addendum 4 to WCAP-10924-P-A). The calculated peak clad temperature (PCT) from the AOR is 2180 °F. Subsequently Westinghouse has performed estimates of effect of errors and plant changes to the results from the AOR in accordance with 10 CFR 50.46. (These estimates of effect were most recently reported by NMC to the NRC by Reference 1).

The sum of the absolute value of these estimates (as reported in Reference 1) totals 810 °F, while the net effect of these estimates is -186 °F, and the reported cumulative PCT for the Prairie Island units is therefore 1994 °F. The line items can be placed in three categories: Low Head Safety Injection (LHSI) Evaluation +30 °F and -30 °F Line

Items, Plant Specific Limiting Case WCOBRA-TRAC Calculations, and Engineering Evaluation Based Items.

Category 1: LHSI Evaluation +30 °F and -30 °F line items

The +30°F (Line Item A.9 of PCT Sheet) corresponds to an engineering judgment evaluation for a LHSI error. Subsequent to this evaluation, a limiting case WCOBRA-TRAC study was made which included the LHSI correction. This study is reported as line Item A.10 "Sensitivity Study for FQ=2.5, LHSI Correction, etc." As such, a compensating -30 °F effect was added to the Prairie Island PCT Sheet to delete the original +30 °F penalty from the previous year report. Therefore, although the Prairie Island 10 CFR 50.46 report includes 810 °F of items, 60 °F should be eliminated from consideration when reporting the absolute value of the total estimates of effect reported against the Prairie Island AOR. Therefore the effective absolute value of the estimates of effect against the Prairie Island AOR should be considered as 750 °F.

Category 2: Plant Specific Limiting Case WCOBRA-TRAC Calculations

Westinghouse performed explicit WCOBRA-TRAC computer calculations of the limiting transient from the Prairie Island AOR for each of 9 of the remaining 13 non-zero PCT line items from the Prairie Island 10 CFR 50.46 report (specifically, Items A.1, A.2, A.3, A.4, A.6, A.7, A.10, A.11, B.1). Each of the nine line items was estimated using a WCOBRA-TRAC run that incorporated the previously identified line items to-date. Therefore, the most recent of these calculations includes the estimates of effect of these 9 Items. These nine estimates account for 692 °F of the 750 °F. This calculation was performed with the approved version of the WCOBRA-TRAC computer code used to perform the SECY-83-472 large break LOCA AOR as supplemented by the code corrections reported in the PCT Sheet Line Items (specifically, the code corrections in Items A.1, A.2, A.3, A.7). The PCT in this most recent run is 1936 °F, which corresponds to the net PCT difference of these 9 items relative to the AOR PCT of 2180 °F. (Net Sum = -244 °F; 2180 °F -1936 °F = 244 °F).

Category 3: Engineering Evaluation Based Items

The remaining 58 °F of estimates are attributed to four individual positive estimates of effect contained in the recent 10 CFR 50.46 report (Items B.2, B.3, B.5, A.8). Two of these line item evaluations (A.8 and B.3) are related to a change in the accumulator pressure range initial condition, while a third (B.2) is related to a change in the initial condition for the accumulator water volume range input assumption. These estimates were determined based on WCOBRA-TRAC calculations performed for a similar plant using the WCOBRA-TRAC code approved for best-estimate LOCA analyses. These estimates have been judged to be reasonable estimates of effect for the Prairie Island AOR. The fourth estimate of effect not explicitly determined using a plant-specific Prairie Island WCOBRA-TRAC calculation is a conservative estimate of effect of 17 °F due to a steady state fuel temperature adjustment of 17 °F in the core balance rods.

Summary

All of the individual line item estimates of effect greater than 50 °F were determined based on a WCOBRA-TRAC calculation of the limiting AOR case. Based on the results and high quality of the estimates of effect performed by Westinghouse against the Prairie Island AOR, it can be concluded with high confidence that the Prairie Island units continue to meet the 2200 °F requirement of 10 CFR 50.46.

Moreover it should be noted that the methodology used to perform the Prairie Island AOR itself is highly conservative. As stated earlier, the Prairie Island Analysis of Record was performed in 1995 using the Westinghouse SECY-83-472 Methodology approved by the NRC for Large Break LOCA analyses for UPI Plants (Addendum 4 to WCAP-10924-P-A) that was approved in 1988. This methodology employs highly-conservative techniques and thus yields calculated PCT results that are higher than would be calculated using the Westinghouse best-estimate LOCA methodology subsequently approved for 2-loop UPI plants (WCAP-14449).

Westinghouse recently performed a LB LOCA analysis of another 2-loop UPI plant using the NRC-approved best-estimate methodology (WCAP-14449) as part of a plant uprate analysis. The other UPI plant analysis was performed at 5.9% higher core power relative to Prairie Island with acceptable results with respect to the regulatory limits. This provides additional assurance that the Prairie Island units continue to meet the requirements of 10 CFR 50.46.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments.

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cc: Administrator, Region III, USNRC
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