



Nebraska Public Power District
Nebraska's Energy Leader

50.46

NLS2002142
December 20, 2002

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Subject: Reporting of Changes and Errors in ECCS Evaluation Models
Cooper Nuclear Station
NRC Docket 50-298, DPR-46

Reference: Letter from M. T. Coyle (Nebraska Public Power District) to
U. S. Nuclear Regulatory Commission, dated July 12, 2002, Reporting of
Changes and Errors in ECCS Evaluation Models.

In accordance with 10 CFR 50.46(a)(3)(ii), the Nebraska Public Power District (NPPD) is submitting this report enumerating the impact of changes and errors in the evaluation model used by General Electric/Global Nuclear Fuel (GE/GNF) to demonstrate compliance with the Emergency Core Cooling System (ECCS) requirements of 10 CFR 50.46. In the Reference letter, the District provided revisions to the Licensing Basis (LB) Peak Clad Temperatures (PCT) for Cooper Nuclear Station (CNS), in accordance with 10 CFR 50.46(a)(3)(i) and (ii). As a result of three reports of errors and/or changes affecting the SAFER analyses, NPPD is updating the LB PCT values for CNS. Attachment 1 summarizes, by fuel type, the baseline PCTs, the PCT error accumulations, and the resultant estimated LB PCTs for the limiting and non-limiting fuel types.

An error was found involving gap conductance interpolation. The GESTR input files provide the steady state gap conductance initialization information for the SAFER code. The GESTR input files consist of tables of gap conductance and related fuel input parameters as functions of Linear Heat Generation Rate (LHGR) and exposure (EXP). To determine the initial gap conductance, SAFER must perform a double interpolation in the tables for the specified LHGR and exposure inputs. An error in the interpolation coding resulted in an error in the initial gap conductance for cases at or beyond the knee in the LHGR curve. Due to this error, the initial gap conductance used in the SAFER calculations was slightly lower than it should have been.

An evaluation was performed in order to determine the impact of the GESTR file interpolation error on the PCT results. This evaluation concluded that the PCT results were conservative when compared to the corrected cases. However, the PCT impact is small enough that it was determined to be negligible with respect to the LB PCT and the Upper Bound (UB) PCT. This error applies to the SAFER analysis of Boiling Water Reactor (BWR)/2-6 plants.

The SAFER analysis for GE14 fuel at CNS does not have the GESTR input file interpolation error. The SAFER analysis for GE9 fuel at CNS does have the GESTR input file interpolation error but the LB PCT impact is negligible. Thus the accumulation of changes and errors since the last analysis of record is unchanged. Also, this reported error does not change the estimated LB PCT.

The LOCA evaluation code SAFER04 has been migrated from the VAX computer platform (SAFER04V) to the Alpha computer platform (SAFER04A). The change in computer platform may result in a change in the calculated PCT due to changes in the processor word size and FORTRAN compiler characteristics.

To determine the impact of changing from the VAX computer platform to the Alpha computer platform, SAFER and SAFER/CORECOOL calculations were performed over the range of plant types, fuel types, break sizes, locations, and initial analysis assumptions using SAFER04V and SAFER04A. The results of these calculations showed that the change in the SAFER computer platform did not introduce any bias in the calculated PCTs for any plant. The change applies to BWR/2-6 plants.

This accumulation of changes and errors is unchanged and the LB PCT is unchanged.

An error was found involving the free volume in the shroud head region. The WEVOL code is used to calculate the weight and volume inputs for jet pump plant SAFER analyses. An error was found in the WEVOL code, which affects the calculated vessel volume in the downcomer region. The free volume in the region of the shroud head is calculated incorrectly. The code did not properly account for the volume of the standpipes inside the shroud head thickness. This resulted in the value for the free volume in the downcomer being too small by 4 – 10 cubic feet.

A study was performed to assess the impact of the downcomer volume correction on the PCT. A set of representative jet pump plants covering the BWR/2-6 product lines was selected and SAFER runs were performed to obtain the change in PCT for both Nominal and Appendix K conditions. Based on these analyses, it was determined that the impact of the volume error on the PCT was negligible.

This error has zero impact on both the accumulation of changes and errors and the estimated LB PCT.

As shown in Attachment 1, the LB PCT values have more than 300°F margin to the 2200°F limit specified in 10 CFR 50.46. Due to the large margin to the 2200°F limit, no reanalysis is planned at this time.

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If you have any questions, please do not hesitate to contact Jerry Lewis at (402) 825-5770.

Sincerely,



Michael T. Coyle
Site Vice President

Attachment

cc: Regional Administrator w/attachment
USNRC – Region IV

Senior Project Manager w/attachment
USNRC – NRR Project Directorate IV-1

Senior Resident Inspector w/attachment
USNRC

Records w/attachment

**Current Baseline LB PCT (°F) Values and Error Accumulation
Cooper Nuclear Station**

	GE9	GE14
Baseline PCT	1570	1760
Existing Error (Reported in prior years)	105	95
Existing Errors (Reported 7/12/2002)	+15	N/A
GE 10 CFR 50.46 Notification Letter 2002-03	Negligible	N/A
GE 10 CFR 50.46 Notification Letter 2002-04	0	N/A
GE 10 CFR 50.46 Notification Letter 2002-05	0	0
PCT Error Accumulation	120	95
New Estimated Licensing Basis PCT Values	1680	1855

