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50.46

NLS2003121  
December 16, 2003

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

The purpose of this letter is to submit the annual report in accordance with 10 CFR 50.46(a)(3)(ii). Therefore, 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. As a result of two reports of errors and/or changes affecting the SAFER analyses, NPPD is updating the Licensing Basis (LB) Peak Clad Temperature (PCT) values for Cooper Nuclear Station (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.

In the process for constructing the initial level/volume table for SAFER, it was assumed that the value of initial water level was the same as the volume break point in the original reactor pressure vessel (RPV) level/volume calculation. However, the level/volume tables were generated with revised initial water levels, which did not consider this assumption. This resulted in an incorrect volume split in the nodes above and below the water surface, and incorrect initial liquid mass. The total volume in the vessel was correct.

The level/volume nodalization table used in the evaluation of the LB PCT was reviewed by GE/GNF to determine the impact of this error. The corrected liquid volume is lower if the water level was raised relative to the original RPV volume calculation and higher if the water level has been lowered relative to the original RPV volume calculation. Higher initial liquid volume results in lower PCT.

This error results in a plus 5 degree Fahrenheit (°F) change in LB PCT for GE14 fuel and a minus 5 °F change in LB PCT for GE9 fuel.

The initial steam separator pressure drop is an input to the SAFER model. The calculation of this value uses a loss coefficient derived from steam separator tests. This

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loss coefficient is product line dependent. Calculations for some plant/fuel types applied the wrong loss coefficient or erroneously included a term to account for the hydrostatic pressure (which is calculated separately by the SAFER model). These errors resulted in a higher initial steam separator pressure drop and overly restricted the flow through the separator during the Loss of Coolant Accident (LOCA) event.

These errors were caused by inadequate documentation of the steam separator loss coefficient and an incorrect formulation of the steam separator pressure drop input value. No plant calculations were affected by both causes.

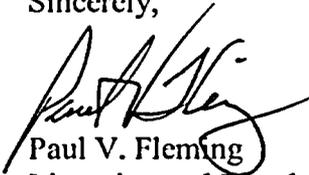
The calculation of the initial steam separator pressure drop used in the ECCS LOCA evaluation of the LB PCT was reviewed by GE/GNF for each plant. For each initial steam separator pressure drop calculation it was determined if the incorrect steam separator loss coefficient or the elevation term was present. For each calculation affected, the initial steam separator pressure drop was correctly recalculated. A series of Appendix K runs were performed for a number of representative plants to predict the changes in PCT over the range of the change in the initial steam separator pressure drop due to the correction of the errors. The corrected initial steam separator value for all cases was slightly lower during the LOCA event. This in turn resulted in higher core water levels and a small decrease in the calculated PCTs for jet pump plants.

There was no error in the calculation for GE14 fuel and the impact on GE9 fuel was conservatively determined to be zero °F.

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.

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

Sincerely,



Paul V. Fleming  
Licensing and Regulatory Affairs Manager

/cb

Attachment

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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)	120	95
GE 10 CFR 50.46 Notification Letter 2003-01	-5	+5
GE 10 CFR 50.46 Notification Letter 2003-03	0	No Error
PCT Error Accumulation	125	100
New Estimated Licensing Basis PCT Values	1675	1860

