



Nebraska Public Power District
Nebraska's Energy Leader

NLS2001055
 June 06, 2001

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

Gentlemen:

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

Reference: Letter from J.H. Swailes (Nebraska Public Power District) to
 U. S. Nuclear Regulatory Commission, dated December 28, 2000.

In accordance with 10 CFR 50.46(a)(3)(ii), the Nebraska Public Power District (District) is submitting this special report enumerating the impact of changes and errors in the evaluation model used by General Electric (GE) to demonstrate compliance with the Emergency Core Cooling System (ECCS) requirements of 10 CFR 50.46. In the Referenced letter, the District provided revisions to the licensing basis Peak Clad Temperatures (PCTs) for Cooper Nuclear Station (CNS), in accordance with 10 CFR 50.46 (a)(3)(i) and (ii). As a result of two errors identified in the SAFER/GESTR-LOCA analysis, the District is updating the licensing basis PCT values for CNS. Attachment 1 summarizes, by fuel type, the baseline PCTs, the PCT error accumulations, and the resultant estimated licensing basis PCTs for the limiting and non-limiting fuel types for CNS.

An error was identified in SAFER. The amount of condensation that occurs when subcooled ECCS flow enters the vessel is dependent on the location of the injection sparger relative to the fluid level in the injected region and an input maximum condensation efficiency. When the fluid level covers the sparger, no condensation is calculated. When the fluid level is below the injection elevation plus an input mixing length, steam is assumed to condense with the maximum allowable efficiency. When the fluid level is within the mixing length, a linear variation in condensation between the two limits is assumed. The mixture of injection flow and condensate is added to the injected region. For ECCS flow injected into region 1 (lower plenum/jet pump) a coding error was discovered that results in twice the calculated amount of condensate being added to the region. For typical BWR/4 applications, the amount of condensate will be in the range of 10 to 15 percent of the injection flow depending on the vessel pressure. The increased condensate will impact the mass and energy of the lower plenum as well as the calculated liquid and/or vapor flow to the core. Any change in core inventory will impact the calculated second Peak Clad Temperature (PCT) that occurs after ECCS initiation. The impact of this error was an increase in the PCT of +85 °F for both the GE9B and GE14 fuel designs.

Another error was identified in SAFER. The steam condensation on the subcooled ECCS injection flow is calculated as long as sufficient steam mass is available in the

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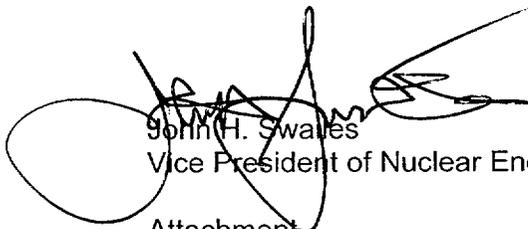
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vessel. The pressure rate equation maintains sufficient steam mass to fill the vessel by adjusting the flashing rates as the vessel depressurizes. Only when the vessel pressure is predicted to fall below the drywell pressure will the pressure rate be forced to zero, which allows steam mass to be reduced by condensation and not be replenished by flashing due to a decrease in pressure. When there is a change in the two-phase level position in the core, an inconsistent core exit steam flow was used in the SAFER pressure equation. This caused an error in the calculated pressure, which, resulted in reduced flashing and the premature termination of ECCS condensation due to insufficient steam mass. Any change in core inventory will impact the calculated second PCT that occurs after ECCS initiation. The impact of this error was an increase in the PCT of +10 °F for both the GE9B and GE14 fuel designs.

As shown in Attachment 1, the licensing basis PCT values have more than a 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 us.

Sincerely,



John H. Swales
Vice President of Nuclear Energy
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

NPG Distribution w/attachment

Records w/attachment

**CURRENT BASELINE PCT (°F) VALUES AND ERROR ACCUMULATION
COOPER NUCLEAR STATION**

	GE9	GE14
BASELINE PCT	1570	1760
Existing Error (Reported December 28,2000)	+ 10	0
This report (GE 2001-01)	+85	+85
This report (GE 2001-02)	+10	+10
PCT Error Accumulation	105	95
NEW ESTIMATED LICENSING BASIS PCT VALUES	1675	1855

