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10CFR50.46(a)(3)(ii)

June 10, 1999

OCAN069903

U. S. Nuclear Regulatory Commission
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Subject: Arkansas Nuclear One - Units 1 and 2
Docket Nos. 50-313 and 50-368
License Nos. DPR-51 and NPF-6
Errors or Changes in the Emergency Core Cooling
System Evaluation; Annual Report for 1998

Gentlemen:

10CFR50.46(a)(3)(ii) requires licensees to report each change to or error discovered in an acceptable evaluation model or in the application of such model for the emergency core cooling system (ECCS) that affects the peak cladding temperature (PCT) at least annually. Included in the submittal is the estimated effect these changes or errors have on the limiting ECCS analysis. The purpose of this submittal is to provide the required information for Arkansas Nuclear One (ANO).

For ANO-1, there were no significant errors (PCT increase of greater than 50 degrees F) in the evaluation model reported in 1998 that resulted in a change in the calculated PCT, and no changes have been made to the Babcock and Wilcox (B&W) CRAFT2 based evaluation model or the RELAP5/MOD2-B&W evaluation model. However, an ANO-1 input application error in the currently approved evaluation model was discovered which resulted in a change in the calculated PCT for the limiting Small Break Loss of Coolant Accident (SBLOCA) analysis. The details of this error are discussed in Appendix A and were provided to the NRC on June 2, 1999 (1CAN069901). The NRC has accepted both the CRAFT2 and the RELAP5 based evaluation models for the Loss of Coolant Accident (LOCA) analysis application. The CRAFT2 evaluation based model is the current ANO-1 SBLOCA licensing basis analysis. The RELAP5 based model was approved for BWNT generic use as documented in BAW-10192P-A, June 1998.

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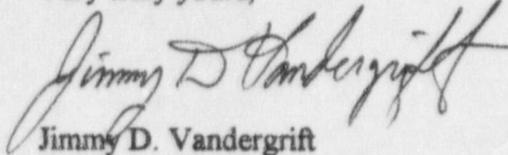
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Appendix B discusses minor changes or additions to the RELAP5 based model documentation which have occurred over the 1998 calendar year.

For ANO-2, there were no significant errors to the ABB-CE ECCS evaluation models or the application of these models that resulted in a significant increase in the PCT or non-conformance to additional criteria set forth in 10CFR50.46.

Very truly yours,



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APPENDIX A: ENTERGY (ANO-1) SPECIFIC

1. CRAFT2 SBLOCA Condition Report

On October 29, 1998, Entergy initiated a condition report which identified that the boundary conditions for Emergency Feedwater (EFW) flow in the generic CRAFT2 SBLOCA analyses of record did not bound the ANO-1 plant configuration. Consistent with an assumed failure of one ECCS loop of flow (possibly due to a failure of the "red" Emergency Diesel Generator), only one EFW pump would be available. The current licensing basis application of CRAFT2 assumed that two pumps were available. Analysis has shown that a decrease in the assumed EFW flow rate using CRAFT2 could predict core uncovering and increase the calculated PCT for the spectrum of small breaks in which EFW flow is effective in removing core heat. Reanalysis of the SBLOCA break spectrum using the RELAP5 based model was recently completed and is summarized in Reference A-1 and A-2.

The current ANO-1 licensing basis SBLOCA analysis documented in BAW-1976 (CRAFT2) predicted no core uncovering (PCT of less than 1100°F) when two loops of EFW flow were available. The CRAFT2 limiting PCT for ANO-1 assuming a conservative EFW flow rate for one loop availability was bounded by the 1859°F PCT calculated at 2568 MWt for Crystal River-3 (CR-3) cold leg pump discharge (CLPD) break size of 0.125 ft². The RELAP5 2568 MWt power level case from Reference A-2 calculated a limiting PCT of 1311°F for the 0.15 ft² CLPD break assuming a conservative EFW flow rate having only one loop available. The input parameter changes increased the overall PCT by more than 50°F when comparing the current licensing basis analysis to the bounding CR-3 analysis.

When comparing the CRAFT2 model (CR-3 case) predictions to the RELAP5 model, predictions, a decrease of greater than 50°F PCT was experienced by the RELAP5 model due to the differences in the two modeling approaches and in small plant specific changes in EFW and High Pressure Injection (HPI) flow rates. The RELAP5 based model provides a significant improvement in the determining the most limiting PCTs for the worst SBLOCA break sizes and locations.

The most-limiting SBLOCA PCT remains bounded by the limiting Large Break LOCA (LBLOCA) PCT value of 2079°F using the CRAFT2 based model.

References

- A-1. FTI Document 86-5002073-01, "Summary Report for BWOG 20% SGTP LOCA)".
- A-2. FTI Document 86-5003912-00, "SBLOCA Mini-Spectrum".

APPENDIX B - B&W 177-FA PLANT GENERIC ITEMS

1. Typographical Error in BWNT LOCA for OTSG Plants, BAW-10192.

The NRC was notified in Reference B-1 that FTI had discovered a typographical error in the NRC-approved version of the BWNT LOCA model, BAW-10192P (Reference B-2). The error was discovered in the LBLOCA text discussion of the three-operating reactor coolant pump (RCP) study. The most severe three-pump case was calculated when the break was located in the cold leg with the inoperable pump. This orientation is inconsistent with the text included in the topical report which stated that the most severe case occurred when the inoperable pump was in the intact leg of the broken loop. Replacement pages for the original release of Reference B-2 were provided in Reference B-1.

2. BWNT LOCA MODEL Limits and Restrictions, BAW-10192

FTI developed a document that contains discussions of how FTI LOCA analyses comply with the limitations and restrictions contained in the Once Through Steam Generator (OTSG) LOCA model and the individual codes that comprise its calculational framework (Reference B-3). Each model or code restriction, for both SBLOCA and LBLOCA analyses, was listed and cross-referenced to a code-specific input requirement that demonstrates compliance with the limitation. The code and model input restriction compliance was merged with the input requirements that originate from information in Tables 9-1 and 9-2 of BAW-10192PA (Reference B-2) to define the final detailed check tables. These tables are guides that assist with the verification of key parameters input in the model analyses and ensure that no input restriction has been violated, without some additional justification or explanation for any input deviation.

References

- B-1. Letter to USNRC, from Mr. J.J. Kelly, FTI, "Response to a Typographical Error in BWNT LOCA - BWNT Loss-of-Coolant Accident Evaluation Model for Once-Through Steam Generator Plants", BAW-10192P-A, June 10, 1998.
- B-2. FTI Topical Report "BWNT LOCA - BWNT Loss-of-Coolant Accident Evaluation Model for Once-Through Steam Generator Plants", BAW-10192P-A, Rev. 0, June, 1998.
- B-3. FTI Document 51-5001731-00, "BWNT LOCA EM Limitations and Restrictions".