



Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

August 20, 2012

10 CFR 50.4
10 CFR 50.46

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Browns Ferry Nuclear Plant, Unit 2
Facility Operating License No DPR-52
NRC Docket No 50-260

Subject: 10 CFR 50.46 30-Day Report for Browns Ferry Nuclear Plant, Unit 2

- Reference:
1. TVA Letter to NRC, "10 CFR 50.46 30-Day and Annual Report for Browns Ferry Nuclear Plant, Units 2 and 3," dated April 18, 2012
 2. TVA Letter to NRC, "10 CFR 50.46 30-Day Report for Browns Ferry Nuclear Plant, Unit 3," dated May 30, 2012
 3. ANP-2910(P) Revision 1, "Browns Ferry Units 1, 2, and 3 105% OLTP LOCA-ECCS Analysis MAPLHGR Limit for ATRIUMTM-10 Fuel," AREVA NP Inc., November 2010.

The purpose of this letter is to provide a report, as required by 10 CFR 50.46, of significant changes discovered in the Emergency Core Cooling System (ECCS) evaluation model for Browns Ferry Nuclear Plant (BFN), Unit 2. In accordance with 10 CFR 50.46, "Acceptance Criteria for ECCS for Light-Water Nuclear Power Reactors," paragraph (a)(3)(ii), the enclosure to this letter describes the nature and the estimated effect on the limiting ECCS analysis of changes or errors discovered since submittal of the Reference 1 letter for BFN, Unit 2.

As described in the Reference 1 letter, the Tennessee Valley Authority (TVA) reported a significant increase in Peak Cladding Temperature (PCT) due to ECCS analysis changes created to address issues with the applicability of the EXEM BWR-2000 Loss of Coolant Accident (LOCA) methodology identified during the NRC acceptance review of the BFN, Unit 1, ATRIUMTM-10 fuel transition License Amendment Request.

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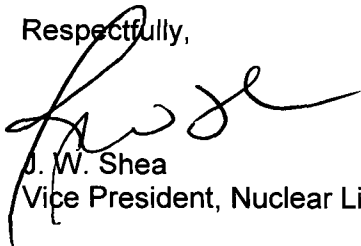
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In a letter dated May 30, 2012 (Reference 2), TVA provided a 30-day report, as required by 10 CFR 50.46, of significant changes discovered in the ECCS evaluation model for BFN, Unit 3. This report included the application of a modified EXEM BWR-2000 LOCA methodology, due to the completion of a modification to the Automatic Depressurization System. Additionally, this report included a change to the evaluation of thermal conductivity degradation over the approved fuel burnup range.

For BFN, Unit 2, the current LOCA analysis (Reference 3) does not apply the modified EXEM BWR-2000 LOCA Methodology. On July 20, 2012, TVA was notified that the previously reported change related to thermal conductivity degradation is applicable to the current LOCA Methodology for BFN, Unit 2. The current LOCA analysis (Reference 3) had shown that the limiting PCT occurs at beginning of life (BOL). The effects of thermal conductivity degradation at higher burnups results in a zero (0) degree change in the limiting PCT, which occurs at BOL. Therefore, there is no change in the reported PCT due to thermal conductivity degradation for Browns Ferry.

There are no new regulatory commitments in this letter. Please direct questions concerning this issue to Tom Hess at (423) 751-3487.

Respectfully,



J. W. Shea
Vice President, Nuclear Licensing

Enclosure:

10 CFR 50.46 30-Day Report for Browns Ferry Nuclear Plant, Unit 2

cc (w/Enclosure):

NRC Regional Administrator – Region II
NRC Senior Resident Inspector – Browns Ferry Nuclear Plant

ENCLOSURE

10 CFR 50.46 30-DAY REPORT FOR BROWNS FERRY NUCLEAR PLANT, UNIT 2

The Browns Ferry Nuclear Plant (BFN), Unit 2, reactor core currently contains only the ATRIUM™10 fuel design.

Description of Changes or Errors Relative to the Previous Report

In a letter dated May 30, 2012, TVA provided a 30-day report, as required by 10 CFR 50.46, of significant changes discovered in the ECCS evaluation model for BFN, Unit 3. This report included the application of a modified EXEM BWR-2000 LOCA methodology, due to the completion of a modification to the Automatic Depressurization System. Additionally, this report included a change to the evaluation of thermal conductivity degradation over the approved fuel burnup range.

For BFN, Unit 2, the current LOCA analysis (Reference 2 of this enclosure) does not apply the modified EXEM BWR-2000 LOCA Methodology. The previous 10 CFR 50.46 report for BFN, Unit 2, (Reference 1) was submitted on April 18, 2012. This report referenced ANP-2910, "Browns Ferry Units 1, 2, and 3 105% OLTP LOCA-ECCS Analysis MAPLHGR Limit for ATRIUM™-10 Fuel," Revision 1, (Reference 2 of this enclosure) as the analysis of record, with a baseline Peak Cladding Temperature (PCT) of 1992 °F.

On July 20, 2012, AREVA notified the Tennessee Valley Authority of a change to their evaluation of thermal conductivity degradation over the approved fuel burnup range. As discussed in the May 30, 2012 letter, when older generation codes, like AREVA's RODEX2, were approved, experimental data was not available to support explicit modeling of thermal conductivity degradation with fuel burnup. However, in recent evaluations of this phenomenon, it appears that the use of the RODEX2 code (which provides inputs to RELAX and HUXY in the Loss of Coolant Accident (LOCA) analysis methodology) results in conservatively high temperatures at low burnup (<15 Giga-Watt day / Metric Ton Uranium), but underpredicts pellet temperatures at higher exposures.

For BFN, Unit 2, the current analysis (Reference 2) had shown that the limiting PCT occurs at beginning of life (BOL). The effects of thermal conductivity degradation at higher burnups results in a zero (0) degree change in the limiting PCT, which occurs at BOL. Therefore, there is no change in the reported PCT due to thermal conductivity degradation for Browns Ferry.

Table 1 details the accumulated PCT impact due to errors and changes in the LOCA analyses since the analysis of record in Reference 2 of this enclosure.

In accordance with 10 CFR 50.46 (a)(3)(ii), TVA provided details of a proposed schedule for reanalysis or other action needed to show compliance with 10 CFR 50.46 requirements in Reference 1 (of this enclosure) letter.

ENCLOSURE

10 CFR 50.46 30-DAY REPORT FOR BROWNS FERRY NUCLEAR PLANT, UNIT 2

Table 1: Cumulative Effect of PCT Changes - Unit 2

Baseline PCT (Reference 2 of this enclosure)	1992°F
Revised HUXY numerical view factor treatment analysis (reported in Reference 3 of this enclosure)	+1°F
Modification to methodology to address NRC concerns regarding Appendix K event progression (reported in Reference 1 of this enclosure)	+322°F
Change in initial conditions for analysis (MAPLHGR reduction) (reported in Reference 1 of this enclosure)	-221°F
Thermal Conductivity Degradation (Reference 4 of this enclosure)	+ 0°F
Accumulated changes since baseline analysis	+102°F
Absolute value of accumulated changes	544°F
New licensing PCT	2094°F

References

1. TVA Letter to NRC, "10 CFR 50.46 30-Day and Annual Report for Browns Ferry Nuclear Plant, Units 2 and 3," April 18, 2012.
2. ANP-2910(P) Revision 1, "Browns Ferry Units 1, 2, and 3 105% OLTP LOCA-ECCS Analysis MAPLHGR Limit for ATRIUM™-10 Fuel," AREVA NP Inc., November 2010.
3. TVA Letter to NRC, "10 CFR 50.46 Annual Report," June 3, 2011.
4. FAB12-2255, "10 CFR 50.46 PCT Error Reporting Clarification for Browns Ferry Unit 2," AREVA NP Inc., July 2012.