Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609-2000

May 07, 2009

TVA-BFN-TS-418
TVA-BFN-TS-431

10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop OWFN, P1-35
Washington, D. C. 20555-0001

In the Matter of	)	Docket Nos. 50-259
Tennessee Valley Authority	)	50-260
		50-296

BROWNS FERRY NUCLEAR PLANT (BFN) – UNITS 1, 2, AND 3 – TECHNICAL SPECIFICATIONS (TS) CHANGES TS-431 AND TS-418 – EXTENDED POWER UPRATE (EPU) – RESULTS OF REVISED CONTAINMENT OVERPRESSURE (COP) ANALYSES FOR APPENDIX R – DRYWELL COOLERS OPERATING (TAC NOS. MD5262, MD5263, AND MD5264)

By letters dated June 28, 2004 and June 25, 2004 (ADAMS Accession Nos. ML041840109 and ML041840301), TVA submitted license amendment requests to the NRC for the EPU operation of BFN Unit 1 and BFN Units 2 and 3, respectively. The proposed amendments would change the operating licenses to increase the maximum authorized core thermal power level of each reactor by approximately 14 percent to 3952 megawatts. In the EPU license applications, additional COP credit was requested for the Appendix R special event.

In a submittal dated March 12, 2009, TVA provided the results of a revision to the net positive suction head (NPSH)/COP calculations for the licensing basis Appendix R event. In that revised Appendix R calculation, the required NPSH (NPSHr) for the Residual Heat Removal (RHR) pump used in the Appendix R analysis was changed to a fixed 3% head loss value, which resulted in a substantial reduction in the magnitude and duration of required COP credit. That Appendix R licensing basis analysis also takes credit for operator action to terminate drywell cooling within two hours of the event initiation. Terminating drywell air space cooling increases drywell and wetwell pressure, which provides additional COP margin.

This submittal presents the results of an additional Appendix R licensing basis calculation during which drywell cooling remains in service throughout the event. The revised analysis shows that with drywell cooling in service, the minimum containment pressure exceeds that

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required to support NPSHr for RHR pump operation. But since termination of drywell cooling provides additional COP margin, TVA plans to continue to secure drywell cooling in the BFN Appendix R safe shutdown procedures.

Enclosure 1 provides a discussion of the revised calculation and a summary of the results. A copy of the full TVA calculation is in Enclosure 2. TVA has determined that the additional information provided by this letter does not affect the no significant hazards considerations associated with the proposed TS changes. The proposed TS changes still qualify for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9).

No new regulatory commitments are made in this submittal. If you have any questions regarding this letter, please contact J. D. Wolcott at (256)729-2495.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 7th day of May, 2009.

Sincerely,

James J. Randich FOR

R. G. West
Site Vice President

Enclosures:

1. Results of Revised Containment Overpressure (COP) Analyses for Appendix R - Drywell Coolers Operating
2. Calculation MDQ099920060011, Rev. 5, "Transient NPSH/Containment Pressure Evaluation of RHR and Core Spray Pumps"

Enclosures:
cc: State Health Officer
Alabama Dept. of Public Health
RSA Tower - Administration
Suite 1552
P.O. Box 303017
Montgomery, AL 36130-3017

Ms. Eva Brown, Project Manager
U.S. Nuclear Regulatory Commission
(MS 08G9)
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852-2739

Ms. Heather J. Gepford, Acting Branch Chief
U.S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, Georgia 30303-8931

NRC Resident Inspector
Browns Ferry Nuclear Plant
10833 Shaw Road
Athens, Alabama 35611-6970

ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNITS 1, 2, AND 3

TECHNICAL SPECIFICATIONS (TS) CHANGES TS-431 AND TS-418
EXTENDED POWER UPRATE (EPU)

RESULTS OF REVISED CONTAINMENT OVERPRESSURE (COP) ANALYSES FOR APPENDIX R – DRYWELL COOLERS OPERATING

EPU net positive suction head (NPSH) calculations for the licensing basis Appendix R event have utilized the same required NPSH (NPSHr) criteria as used for the design basis Loss-of-Coolant Accident. The Appendix R analysis also credits operator action to secure drywell cooling within two hours of the fire event beginning to preserve adequate NPSH. This approach is reflected in the NPSH/COP calculations submitted to NRC on August 31, 2006 (ADAMS Accession No. ML062510371). In a submittal dated March 12, 2009, TVA provided the results of a revised analysis for the licensing basis Appendix R event in which the NPSHr for the Residual Heat Removal (RHR) pump was changed from a time dependent value based on 8000 hours of operation to a fixed value corresponding to a 3% head loss. This change resulted in a reduction in the magnitude and duration of required COP credit, and an increase in the margin between minimum containment pressure available and the maximum COP required.

With the increased COP margin, an additional Appendix R analysis has been performed with drywell cooling remaining in service throughout the event. A summary of the revised analysis results is provided below. The revised analysis shows that with drywell cooling operating during the entire event, the minimum containment pressure exceeds that required to support NPSHr for RHR pump operation.

Effects of Drywell Cooling on COP

Initial conditions for the licensing basis Appendix R analysis assume that all drywell coolers are operating and removing heat at rated capacity with a heat removal rate equal to the heat load in the drywell from the primary system piping and equipment. In the Appendix R event, the reactor is depressurized using safety relief valves at 25 minutes, which reduces the heat load in the drywell and causes drywell air temperature and pressure to begin decreasing. Termination of drywell cooling reverses this trend and increases available NPSH (NPSHa). Accordingly, a regulatory commitment was established in a TVA submittal dated August 4, 2006 (ML062220647) to terminate drywell cooling in the Appendix R safe shutdown procedures.

Revisions in the analysis submitted March 12, 2009, yielded an increase in NPSH margin and as a result, an additional licensing basis Appendix R case has been analyzed with the drywell coolers operating throughout the event to determine if termination of drywell cooling was still required. All other analysis inputs and assumptions remained the same.

Table 1 shows the summary results from the new analysis and from the previous Appendix R calculations for comparison. Figure 1 provides a graphical comparison of the two cases with drywell cooling secured at two hours and with drywell cooling continuing to operate after two hours. The magnitude and duration of COP credit is not significantly affected by drywell cooling.

Available wetwell pressure and NPSH are decreased with drywell cooling always operating, but the NPSHa still exceeds NPSHr. Since termination of drywell cooling provides additional COP margin and no credit is taken for drywell cooling in an Appendix R event, TVA plans to continue to secure drywell cooling in the BFN Appendix R safe shutdown procedures.

A copy of the TVA calculation, MDQ099920060011, Rev. 5, is provided in Enclosure 2. This calculation replaces in entirety the calculation submitted on August 31, 2006.

Table 1
Appendix R Calculation Results Comparison

RHR Pump NPSHr	Maximum Required COP (psi*)	Minimum Containment Margin (psi)	Duration COP Needed (hours)
8000 hour curve - drywell cooling off at 2 hours	9.6	1.6	69
3% head loss - drywell cooling off at 2 hours	6.1	4.1	27.8
3% head loss - drywell cooling always in operation	5.9	1.5	27.7

* pounds per square inch

Figure 1: Appendix R
Coolers On vs. Coolers Off After 2 Hours