UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001
July 15, 2009

Mr. Preston D. Swafford
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNIT 1, REQUEST FOR ADDITIONAL INFORMATION FOR EXTENDED POWER UPRATE - ROUND 25 (TAC NO. MD5262) (TS-431)

Dear Mr. Swafford:

By letter dated June 28, 2004, the Tennessee Valley Authority (TVA, the licensee) submitted an amendment request for Browns Ferry Nuclear Plant (BFN), Unit 1, as supplemented by letters dated August 23, 2004, February 23, April 25, June 6, December 19, 2005, February 1 and 28, March 7, 9, 23, and 31, April 13, May 5, 15, and 16, June 15, 23, and 27, July 6, 21, 26, and 31, August 4, 16, 18, and 31, September 1, 15, and 22, October 3, 5, and 13, November 7, December 1, 5, 11, and 21, 2006, January 31, February 16 and 26, April 6, 18, and 24, July 27, September 24, November 15 and 21, December 14, 2007, January 25 and 31, February 11 and 21, March 6, April 4 and 9, May 1, June 3, 12, and 16, August 15, September 2 and 19, October 3 ,17, and 31, November 11 and 14, December 15, 2008, January 9, 16, and 23, February 18 and 24, March 11, 12, and 27, April 3, 10, 21, and 29, and May 7 and 29, 2009. The proposed amendment would change the BFN operating license for Unit 1 to increase the maximum authorized power level by approximately 15 percent.

A response to the enclosed Request for Additional Information (RAI) is needed before the Nuclear Regulatory Commission staff can complete the review. This request was discussed with Mr. Denzel Housely of your staff on July 1, 2009, and it was agreed that TVA would respond within 30 days of issuance of this letter.

If you have any questions, please contact me at (301) 415-2315.

Sincerely

/RA/

Eva A. Brown, Senior Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-259

Enclosure:
RAI

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REQUEST FOR ADDITIONAL INFORMATION

EXTENDED POWER UPRATE

ROUND 25

TENNESSEE VALLEY AUTHORITY (TVA)

BROWNS FERRY NUCLEAR PLANT (BFN), UNITS 1 AND 2

DOCKET NOS. 50- 259, AND 50-260

SCVB (formerly ACVB)

Requests 75/73 (Unit 1/Unit 2), through 81/79, were provided to TVA by e-mail on April 6, 2009, and responded TVA's letter dated April 29, 2009. These requests were made for Browns Ferry Units 1 and 2 as TVA requested in a letter dated November 14, 2008, that the Unit 3 review be placed on hold. The requests are included here for completeness.

75/73. Provide the following information:

a. Liquid vapor interface area in reactor vessel;
b. Data for heat sinks (material, mass, and surface area) in drywell (DW), wetwell (WW) airspace, and suppression pool);
c. Size of each vacuum breaker pipe and its length between WW and DW;
d. Reactor pressure vessel (RPV) metal thickness (average if it varies);
e. Elevations of suppression pool low and high water level;
f. Elevations of vacuum breaker line inlet (in WW) and outlet (in DW) area center;
g. Elevations of core spray (CS) suction line, and residual heat removal (RHR) suction line at the suppression pool;
h. For Appendix R event analysis, provide the heat removal rate by each drywell fan cooler.

76/74. FW flow rate at 102 percent extended power uprate (EPU), page 17 of Draft OPL-4a gives 28 million pounds per hour (Mlbs/hr), Figure 1-2 of the Unit 1 PUSAR (Enclosure 4 to the letter dated June 28, 2004) gives 16,781,000 lbs/hr for feedwater (FW) flow. Explain the difference.

77/75. On page 5 of the Draft OPL 4a, the loss of coolant accident (LOCA) break area for long term response for the design basis accident (DBA) is 4.2 ft^2 and for net positive suction head (NPSH) is 1.94 ft^2. Specify the type of breaks, and explain why different types of breaks were considered for these cases.

78/76. Provide Reference 2 given in Draft OPL-4a page 23.

79/77. The vacuum breaker loss coefficient per draft OPL-4a page 18 is 0.45, address whether this includes entrance and exit loss coefficients.

80/78. On the last line of page 7, discuss what is meant by drywell holdup volume and why it is not modeled. On page 8, discuss why the drywell pool surface area not modeled.

81/79. The safe shutdown analysis document for Units 2 and 3, page 277 of 559, states

> When reactor pressure drops below the shutoff head of the RHR system, the RHR system operating in the LPCI [low pressure coolant injection] mode, would inject subcooled water into the reactor.

According to draft OPL-4a Page 14, the low pressure coolant injection (LPCI) pump shutoff head is 319.5 psig. In the Appendix R analysis, address whether LPCI is assumed to be initiated automatically based on its shutoff head setpoint after the operator depressurizes the reactor using three safety relief valves (SRVs). In case LPCI is assumed to be operator initiated in the analysis, provide the initiation time.

82. In Tables 7.1 through 7.39 of Enclosure 1 to a letter dated August 31, 2006, a pressure is indicated in support of calculation of the NPSHa. Identify which pressure is represented in the table and provide information on where the pressure was measured as referenced from the pump [residual heat removal (RHR) and core spray (CS)] suction centerline. Also provide bounding values of the pump suction pressures for the DBA-LOCA, station blackout (SBO), anticipated transient with scram (ATWS), Appendix R, Steam Line Breaks that were used to calculate the actual NPSHa.

83. Provide the friction pressure loss (includes strainer loss, header and inlet piping loss) up to the suction flange of the RHR and CS pumps for flows under all events analyzed in Enclosure 1 to a letter dated August 31, 2006.

84. Item q on page E1-12 in Enclosure 1 to a letter dated April 10, 2009, describes the mode of RHR suppression pool cooling as modeled in the SHEX containment analysis after the drywell pressure drops below 2.6 psig. Provide the time that this mode is initiated during the transient. Describe how a negative pressure in the containment is prevented, in the SHEX containment analyses, while the suppression pool cooling continues, given that the reactor building-to-wetwell vacuum breakers are not modeled.

85. Enclosure 1 to the letter dated April 10, 2009, page E1-12, item y addresses shutoff of LPCI above a certain water level. Provide the water level at which LPCI will be automatically shutoff, and discuss how the LPCI shutoff water level is addressed in the SHEX containment analysis. Also address the resultant water level should the RHR system be aligned to continue to support LPCI, with the RHR heat exchangers in use, and aligned in the alternate cooling mode.

86. Provide the flow areas for each of the main steam relief valves.

If you have any questions, please contact me at (301) 415-2315.

Sincerely,

/RA/

Eva A. Brown, Senior Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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Enclosure:
RAI

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