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

November 2, 1995

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

Gentlemen:

In the Matter of) Docket No. 50-296
Tennessee Valley Authority)

BROWNS FERRY NUCLEAR PLANT (BFN) - UNIT 3 - SUPPLEMENTAL INFORMATION FOR REACTOR PRESSURE VESSEL (RPV) SHELL WELDS AUGMENTED EXAMINATION AND INSERVICE INSPECTION (ISI) RELIEF REQUEST 3-ISI-17 (TAC M93759)

The purpose of this letter is to submit information provided to the NRC project manager during a telephone call on October 30, 1995. This letter provides supplemental information regarding the BFN Unit 3 RPV shell welds augmented examination and ISI relief request 3-ISI-17.

TVA's March 6, 1995 letter provided the results of the BFN Unit 3 RPV shell welds augmented examination required by 10 CFR 50.55a(g)(6)(ii)(A) and submitted relief request 3-ISI-17. The structural flaw evaluation of the RPV weld flaws identified during the augmented inspection were determined to meet IWB-3600, Analytical Evaluation of Flaws acceptance criteria. TVA submitted the supporting calculation (MD-Q3001-940005, Vessel Weld Flaw Evaluation for Browns Ferry Nuclear Plant Unit 3), by letter dated October 4, 1995. Subsequent to the October 4, 1995 letter NRC requested TVA to provide Calculation MD-Q3001-920053, Vessel Flaw Evaluation for Browns Ferry Nuclear Plant Unit 3; and Drawing 729E762, Reactor Thermal Cycles. This information was furnished by TVA in a letter dated October 9, 1995.

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The enclosure provides TVA's response to the staff's questions. There are no new commitments contained in this letter. If you have any questions, please contact me at (205) 729-2636.

Sincerely,

Pedro Salas
Manager of Site Licensing

Enclosure
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ENCLOSURE

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNIT 3

SUPPLEMENTAL INFORMATION FOR
REACTOR PRESSURE VESSEL (RPV)
SHELL WELDS AUGMENTED EXAMINATION AND
INSERVICE INSPECTION (ISI) RELIEF REQUEST 3-ISI-17

PURPOSE

The purpose of this enclosure is to document the information provided to the NRC during a telephone call on October 30, 1995, regarding TVA's request for relief from certain sections of American Society of Mechanical Engineers (ASME) Section XI Code.

RESPONSE TO THE NRC QUESTIONS

NRC Question 1

In the March 6, 1995, letter Page E1-2, TVA stated, "In accordance with 10 CFR 50.55a(g)(6)(ii)(A)(2), the extent of the examination for the RPV welds was determined from the 1989 edition of ASME Section XI for examination category B-A, Item number B1.10. The examination techniques and evaluation criteria complied with the 1986 edition of ASME Section XI the Unit 3 code of record (1974 Edition, Summer 1975 Addenda) and Regulatory Guide 1.150."

Why did TVA use the 1986 edition?

TVA Reply

As stated in paragraph 4.2.4.1 of the BFN Updated Final Safety Analysis Report, code of record for BFN Unit 3 at the time of the Augmented Reactor Pressure Vessel (RPV) examination was the 1974 edition, summer 1975 addenda of ASME Section XI code with the ultrasonic examination technique and evaluation updated in the 1986 edition (no addenda) of the ASME Section XI code. 10 CFR 50.55a(g)(6)(ii)(A)(2) requires the licensee to perform the RPV examination in accordance with related procedures specified in ASME Section XI edition and addenda applicable to the inservice inspection interval in effect on September 8, 1992.

NRC Question 2

In the March 6, 1995, letter on page E1-7 Paragraph 2 TVA states, "In addition to the four welds mentioned above, one weld (C-5-FLG, ASME Code Category B-A, Item No. B1.30) contained five indications which exceeded IWB-3500 acceptance criteria."

Has TVA evaluated these indications based on the IWB-3600, Analytical Evaluation Flaws acceptance criteria?

TVA Reply

TVA has evaluated the above welds in accordance with the IWB-3600 acceptance criteria. This evaluation is documented in TVA's calculation MD-Q3001-940005, "Vessel Weld Flaw Evaluation For Browns Ferry Nuclear Plant (BFN) Unit 3." The evaluation was performed in accordance with ASME Section XI, IWB-3600 (1986 edition). The enclosure to the letter dated October 4, 1995, contains the Examination Summary for these indications (calculation MD-Q3001-940005). The summary for the indications can be found on page 10 of 34 of the calculation. The flaw curves for these indications can be found on pages 30 through 34 of the calculation.

NRC Question 3

In the letter dated October 9, 1995, TVA submitted Calculation MD-Q3001-920553, Vessel Flaw Evaluation for Browns Ferry Nuclear Plant Unit 3, and Drawing 729E762, Reactor Thermal Cycles. In reviewing the calculation, NRC noted that the analysis considered Service Limits A and B of the ASME code Section III, 1992 edition. However, NRC noted the calculation did not address Service Limits C or D of the code.

Did TVA evaluate Service Limit codes C or D? If not, justify why not.

TVA Reply

The vessel thermal cycle diagram specifies the applicable Level A, B, C, and D transients that should be considered during any structural integrity evaluation of a reactor vessel. The BFN Units 1, 2, and 3 Reactor Thermal Cycle drawing (729E762) is of such vintage that the operating transients were not broken down into the different operating levels. However, in preparing the General Electric Flaw Evaluation Handbook, a review of the transients was conducted and it were determined that the Hydrostatic Test and Boltup conditions provide the most limiting condition (i.e., the allowable flaw sizes are the lowest for these conditions). The reason for this is that the reactor vessel temperature during these events are low compared to other transients thus, resulting in a lower toughness. Additionally, the required factors of safety are lower for C or D service limits as compared to normal or Level A service limits. The

required safety factors for the level C and D conditions are approximately half of those for the A and B service limits.

Therefore, based on the above reasons, TVA has concluded that the consideration of hydrostatic test and boltup conditions provides the bounding results and the most conservative approach for evaluating Levels A, B, C, and D Service Limits.