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

February 11, 1998

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

Gentlemen:

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 - REQUEST FOR INFORMATION REGARDING TORUS WALL THICKNESS - TORUS INSPECTIONS SUMMARY REPORT

This letter provides the results of TVA's voluntary inspections on BFN's torus wall thickness. On December 23, 1997, in our response to the NRC staff's request for information regarding torus wall thickness, dated October 27, 1997, TVA agreed to voluntarily perform additional torus inspections on Units 1 and 2 to address the staff's concern on torus wall thinning from corrosion.

TVA performed the additional inspections from December 10, 1997 to December 31, 1997. The scope of the inspections included ultrasonic (UT) examinations of torus bays to determine the Units 1 and 2 torus wall thickness. The UT examinations were conducted on the shell plates of each torus using qualified Level I and II nondestructive examiners in the vicinity of the torus-to-ring-girder support welds, at the air-water interface, and in submerged areas.

For each unit, plates in eight of the 16 torus bays were examined at the bottom of the torus, 10 and 15 feet from the bottom centerline weld on the bottom of the torus, and at the air-water interface. Altogether, TVA conducted a 100 percent UT scan on a total of 215, 12" x 12" inspection sites for each unit.

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The BFN Units 1 and 2 torus bays were fabricated from carbon steel plate material with a nominal plate thickness of .750". The inside and outside surfaces of the steel plates are coated. As the UT examinations are conducted from outside the torus, the initial UT readings for each inspection site included only the plate and outside coating thickness of the torus. Inside coatings have no effect on the UT thickness measurements because the high acoustic impedance at the steel to coating interface on the inside surface of the torus causes most of the sound from the UT examinations to be reflected back from the interface.

Since sound travels in coatings (i.e., paint) about three times slower than in steel, a dry film thickness correction factor for the outside surface coatings was calculated for each inspection site. This coating correction factor was then subtracted from the initial UT readings to obtain a net UT thickness reading of the torus steel plate.

The UT examinations from the BFN Units 1 and 2 torus inspections indicated that torus wall thickness measurements in Units 1 and 2 meet the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. Additionally, the UT examinations revealed that the protective coatings on the inside surfaces of the Units 1 and 2 torus walls are in good condition. Except for one location in the Unit 1 torus, the UT readings obtained from Units 1 and 2 exceeded the ASME Section XI, Subsection IWE criteria.

The average minimum reading for all 430, 12" x 12" inspection locations that were UT scanned in Units 1 and 2, less their coatings, was .714" and .708", respectively. In comparison, the average minimum UT reading for Unit 3 performed by the NRC inspector on April 24 and 25, 1997, was .739". The NRC findings on the Unit 3 torus wall thickness are documented in NRC Inspection Report 50-259/97-05, 50-260/97-05, and 50-296/97-05.

TVA expected the average minimum UT readings for the three units at BFN to be fairly close to each other. This is based not only on the similarities in operating history between the units but

also on the torus inspection and protective coating program that TVA has established and maintained to prevent corrosion wall thinning.

The lowest UT reading obtained on the Units 1 and 2 torus steel plate thickness was .670" and .686", respectively. The .670" reading, which was taken in the submerged area of Unit 1 torus-to-ring girder welds, is slightly below the 10 percent of nominal plate thickness allowance (.675") of Section XI, Subsection IWE of the ASME Code. This was the only UT reading that did not meet the ASME Code allowable wall thickness.

Unit 1 has been shutdown and defueled since March 1985. It is currently on administrative hold with no plans for restart. However, TVA conducted a supplemental UT examination on January 26, 1998, and in addition, an engineering evaluation for the Unit 1 torus area that contained the .670" reading. UT examination revealed a gradual and very uniform change in wall thickness relative to the inside surface of the torus which was not indicative of pitting corrosion or an embedded flaw. This gradual uniform change in wall thickness appeared to be some type of anomaly associated with original fabrication (e.g., grinding) of the torus steel shell rather than corrosion.

TVA's engineering evaluation of the .670" wall thickness determined it would not adversely affect the long term structural integrity of the torus.

If you have any questions concerning this information, please contact me at (205) 729-2636.

Sincerely,

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Manager of Licensing
and Industry Affairs

cc: See page 4

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