TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

July 2, 1981

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Denton:

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

Enclosed is additional information regarding the electrical system modifications for the Browns Ferry Nuclear Plant in support of the requested license amendment submitted to you by my letter dated April 9, 1981 and supplemented by letter dated June 8, 1981. The enclosed consists of information regarding capacitor controls and tests of the power system. Information regarding generator breaker testing performed by the vendor was submitted under separate cover. This information is submitted in response to verbal requests from your staff and the staff's consultants.

We trust that this information resolves all of the NRC staff's concerns regarding license amendment request TVA BFNP TS 156. As stated in my June 8 letter to you, NRC approval of TS 156 is needed by August 1, 1981. The technical specifications proposed in TS 156 are to be implemented on Browns Ferry units 1 and 2 when unit 1 is returned to operation following completion of the current refuel outage.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills

L. M. Mills, Manager
Nuclear Regulation and Safety

Subscribed and sworn to before me
this 2 day of July 1981.

Linn Bradbury
Notary Public

My Commission Expiresa 10-4-81

Enclosures

A001 s/1

ENCLOSURE

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
UNDERVOLTAGE CORRECTIVE MODIFICATIONS
BROWNS FERRY NUCLEAR PLANT

(In support of license amendment request TVA BFNP TS 156)

1. TVA commits to test the auxiliary power system supplies to safety buses for units 1 and 2 while connected to the 500-kV grid through the unit station-service transformer and while connected to the 161-kV grid through the common station-service transformers and the cooling tower transformers (unit 3) in order to verify the analysis calculations for steady-state conditions. Voltage levels, amperes, and watts will be monitored for each case at the grid, 4-kV bus and 480-V shutdown boards. This test will be completed before the next refueling outage on unit 1, which is presently scheduled for March 1983.

2. In a telephone conversation with NRC and their consultant (EG&G Idaho) the consultant raised the question of high voltage on the 480-volt system if the 161-kV system approached 170 kV. It was explained to the consultant that as long as the Browns Ferry unit 3 preferred power supply is through the cooling tower transformers, the voltage will have to be held rather high to protect against a loss of coolant accident of unit 3. However, when unit 3 is removed from service this fall for torus modification and refueling, the capacitor controls can be set to control the voltage on the start buses so the only time we will have high voltage on the 161-kV bus at Brows Ferry is when the capacitors are switched on to hold the start bus voltage up.

   Request

   The consultant asked that we provide the approximate settings that will be used.

   Response

   TVA is installing capacitor controls on the 4160-volt start buses. These controls will switch the 161-kV capacitor banks as needed for voltage control of the start buses. The controls have a narrow band for switching the capacitors during normal operation and a wide band for use when the Browns Ferry-Trinity 161-kV Line is out of service. The proposed settings for these controls, after unit 3 is taken out of service for refueling in the fall of 1981, will be as follows:

   narrow band - raise 4130 volts, lower 4305 volts

   wide band - raise 3990 volts, lower 4375 volts

3. The following is a description of Surveillance Instructions (SI's) which prove that residual heat removal (RHR), core spray, and residual heat removal service water (RHRSW) pumps are properly initiated and that the sequencing is correct on diesel power. These SI's are performed on both units 1 and 2.

<u>SI 4.2.B-45</u>

Places the RHR pump breakers for one loop at a time in the test position. Verifies that the start relays cause the breakers to close. Verifies that the start relays pick up on low reactor water level signals or low reactor pressure and high drywell pressure signals. Verifies the start logic that distinguishes between diesel and normal power availability. Verifies start relays pickup when diesel power is available in conjunction with an initiation signal. Calibrates the timers for both normal and diesel power sequencing of the RHR pumps.

<u>SI 4.5.B.1.a</u>

Tests both RHR loops simultaneously by simulating a major pipe break and demonstrating the response of the RHR (low-pressure-coolant injection mode). The logic circuits are placed in test mode to prevent the injection valves from actually opening. The RHR pumps are verified to start in the proper sequence on normal power. The same start relays are involved which were verified to pick up with either normal or diesel power available signals in SI 4.2.B-45 above. The pumps are then tripped to provide a pump auto-initiate lockout which prevents injection of water into the vessel during subsequent steps. These subsequent steps remove the logic from the test mode and verify operation of the injection valves and recirculation system discharge valves.

<u>SI 4.2.B-39</u>

Places the core spray pump breakers for one loop at a time in the TEST position. Verifies that the breakers close on high drywell pressure with low reactor pressure signals or on low reactor water level signals. Simulates loss of normal power and diesel power available and verifies pump breakers close when an initiation signal is generated. Verifies the interface between the core spray initiation signal and the common accident signal logic system. Verifies RHRSW pump starts because of core spray pump starts. Calibrates the timers for both normal and diesel power sequencing of the core spray pumps.

SI 4.5.A.1.a

Tests one core spray system at a time. Verifies that a simulated core spray actuation signal will automatically start up the core spray system and correctly position the proper valves for injecting water into the reactor vessel. Power is removed from the injection valve to prevent actual vessel injection. Although this test is performed with normal power, the same start circuits are involved which were verified to operate with either normal or diesel power available signals in SI 4.2.B-39 above.

SI 4.9.A.3.a

Tests one division of the common accident signal logic system at a time. Verifies the ability of the common accident signal logic system to bring the auxiliary electrical system and other associated equipment to running standby readiness. Verifies start signals actually fast start the diesels. Verifies the diesel generator running recognition circuits and the common accident signal circuits which start the RHRSW pumps.

SI 4.2.B-14

Calibrates the timers for both normal and diesel power sequencing of the RHRSW pumps.