



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

October 3, 2008

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

Gentlemen:

In the Matter of )  
Tennessee Valley Authority )

Docket No. 50-259

**BROWNS FERRY NUCLEAR PLANT (BFN) UNIT 1 – TECHNICAL SPECIFICATIONS (TS) CHANGE TS-431 – EXTENDED POWER UPRATE (EPU) – UNIT 1 LARGE TRANSIENT TESTING (LTT) (TAC NO. MD5262)**

By letters dated June 28, 2004, and June 25, 2004 (ADAMS Accession Nos. ML041840109 and ML041840301), TVA submitted license amendment applications 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 from 3458 megawatts to 3952 megawatts, which is an increase of approximately 14 percent.

In a submittal dated October 22, 2007 (ML072960311), TVA provided supplemental justification for not performing main steam isolation valve closure LTT and for not performing main turbine trip/generator load reject LTT on Units 2 and 3 at EPU conditions. However, due to the limited operating experience on Unit 1 following its restart from the extended outage, a regulatory commitment was provided to perform turbine trip/generator load reject LTT from EPU rated power conditions within 60 days of operation at EPU power on Unit 1. This testing commitment was provided in Enclosure 2 of the referenced October 22, 2007, submittal.

BFN Unit 1 has presently operated 16 months since its restart and will complete the current operating cycle at the end of this October. As detailed in the enclosure, a sufficient operating experience basis has been established such that the previous

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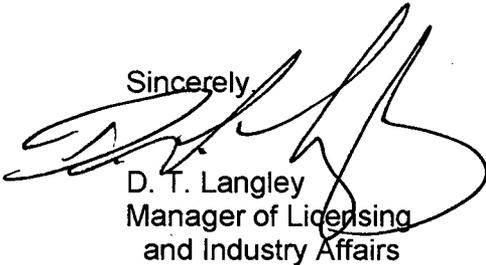
commitment to perform turbine trip/generator load reject LTT on Unit 1 is no longer considered necessary. Therefore, TVA is requesting that NRC concur that with this additional Unit 1 operating experience, the performance of main turbine trip/generator load reject LTT is not required as a condition for EPU approval on Unit 1.

TVA has determined that the additional information provided by this letter does not affect the no significant hazards considerations associated with the proposed amendment and that the proposed TS change still qualifies for the categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and enclosure to the Alabama State Department of Public Health.

If you have any questions regarding this letter, please contact me at (256) 729-2636.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 3rd day of October, 2008.

Sincerely,

A handwritten signature in black ink, appearing to read 'D. T. Langley', is written over the typed name and title.

D. T. Langley  
Manager of Licensing  
and Industry Affairs

Enclosure:  
Unit 1 Large Transient Testing (LTT)

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Enclosure

cc (Enclosure):

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## ENCLOSURE

### TENNESSEE VALLEY AUTHORITY BROWNS FERRY NUCLEAR PLANT (BFN) UNIT 1

#### TECHNICAL SPECIFICATIONS (TS) CHANGE TS-431 EXTENDED POWER UPRATE (EPU)

#### UNIT 1 LARGE TRANSIENT TESTING (LTT)

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##### **Background**

The overall EPU testing program for the BFN units is based on the guidance in Standard Review Plan (SRP) 14.2.1, Generic Guidelines for Extended Power Uprate Testing Programs, of NUREG-0800. The BFN EPU test program was described in detail in previous EPU submittals, particularly in those dated April 25, 2005, and March 7, 2006, for TS-418 and TS-431 (ADAMS Accession Nos. ML051170244, ML051170242, ML060720248, and ML060680583).

In the April 25, 2005, submittals, TVA documented a basis for not performing generator load reject LTT and main steam isolation valve (MSIV) closure LTT at EPU conditions. This justification was based on SRP 14.2.1 guidelines and included elements such as an evaluation of the initial startup testing program, conduct of other required testing such as TS surveillance testing and EPU post-modification tests, similarity of the EPU design among the three BFN units, conformance with limitations associated with analytic methods, non-introduction of new thermal-hydraulic phenomena, and previous operating experience on Units 2 and 3. In a subsequent submittal dated October 22, 2007 (ML072960311), TVA provided supplemental justification for not performing MSIV closure LTT and for not performing main turbine trip/generator load reject LTT on Units 2 and 3 at EPU conditions. Due to the limited operating experience on Unit 1 following its restart from the extended refurbishment/modifications outage, a regulatory commitment was provided to perform main turbine trip/generator load reject LTT from full power within 60 days of Unit 1 operation at EPU power. This testing commitment was provided in Enclosure 2 of the October 22, 2007, submittal. BFN Unit 1 has operated 16 months and will complete its first operating cycle since the extended outage at the end of this October. As detailed below, a sufficient operating experience basis has now been such that the previous commitment to perform turbine trip/generator load reject LTT on Unit 1 is no longer considered necessary.

##### **Unit 1 Operations Summary Since Restart**

After a lengthy refurbishment/modifications outage, Unit 1 began start-up activities in May 2007, was made critical on May 22, 2007, and first achieved full licensed power at 3458 megawatts thermal (MWt) on June 8, 2007. The restart testing program, which included several large transient tests, was completed in August 2007 and the unit has now been in routine commercial service for nearly a full operating cycle. The first scheduled refueling outage will begin in October 2008. The Unit 1 reactor core is an EPU core and all major modifications needed for full uprated power generation capability (3952 MWt) are installed on Unit 1.

## **Summary of Restart Testing Phase - Large Transient Tests**

### **Condensate and Feedpump Testing**

The Unit 1 restart test program included the performance of a condensate pump trip, a condensate booster pump trip, and a main feedwater pump trip test from rated thermal power.

### **Main Turbine Trip**

On June 9, 2007, Unit 1 was operating at approximately 80% rated power when an unplanned main turbine trip and scram occurred. The post-trip analysis of the event showed the integrated plant response of the reactor shutdown systems and reactor level/pressure control systems was as expected and the scram recovery actions following the trip were uncomplicated. In addition, General Electric (GE), performed a simulation of the event using their transient code, ODYN. This simulation showed that actual plant performance during the turbine trip was bound by the ODYN analysis and was milder than predicted by the ODYN simulation. TVA provided the results of the ODYN simulation and a summary of the actual plant performance during the event to NRC in a submittal dated July 3, 2007 (ML071870024).

### **MSIV Closure LTT**

A planned MSIV closure large transient test from nominal full power was performed on June 23, 2007. The MSIV closure test from rated power creates a large transient since all four main steam lines are simultaneously isolated from the main condenser during the test. The observed integrated plant response during the MSIV closure test was as expected and scram recovery was uncomplicated. All established test criteria for the test were met. In addition, GE performed an ODYN simulation of the MSIV closure transient using similar initial reactor conditions and parameters as those that existed on BFN Unit 1 when the June 23, 2007, transient test was performed. This simulation showed that actual plant performance during the MSIV closure transient test was bound by the ODYN analysis. TVA provided the results of the ODYN simulation and a summary of the actual plant performance during the MSIV LTT to NRC in a submittal dated July 26, 2007 (ML072070667).

### **Supplemental Operating Experience Basis for Elimination of Unit 1 EPU Main Turbine Trip/Generator Load Reject LTT**

The previous justification provided in April 25, 2005, submittals for excepting the conduct of EPU main turbine trip/generator load reject LTT on Units 2 and 3 was, in part, based on previous plant operating experience. A listing of the related BFN operating experience was provided in the April 25, 2005, submittals and was further augmented in October 22, 2007, submittal with more recent BFN operating experience.

As discussed above, a comprehensive restart testing program, which included performance of feedwater/condensate pump trip tests from high power and a full power MSIV closure large transient test, was completed in August 2007. Completion of the restart test program provided a high degree of assurance of the proper integrated performance of Unit 1 power generating and safety systems. Additionally, two large unplanned transients were experienced on Unit 1 in the Fall of 2007, which provided

additional verification of integrated system performance. Note that one of the events was a main turbine trip from rated power. These two transients are described below.

1. Reactor Scram from 72 Percent of Rated Power

LER 50-259/2007-008-00 dated November 2, 2007 (ML073090091) describes a September 3, 2007, manual scram from approximately 72 percent of rated power. The reactor scram was not complicated and all automatic functions resulting from the scram occurred as expected. Reactor water level was recovered and maintained by the feedwater and condensate system, and reactor pressure was controlled by the main steam bypass system. No emergency core cooling systems actuated.

2. Main Turbine Trip from Full Rated Power

LER 50-259/2007-009-00 dated December 11, 2007 (ML073450844) describes an October 12, 2007, automatic scram from rated power resulting from a main turbine trip. The reactor scram was not complicated and all safety systems operated as required. Reactor water level was recovered and maintained by the feedwater and condensate system. Reactor pressure was controlled by the main steam bypass system and no main steam safety relief valves or emergency core cooling systems actuated.

Summary

The satisfactory completion of the restart test program in combination with nearly a full cycle of normal operation provides a high degree of assurance of the proper integrated performance of power generating and safety systems following the extended Unit 1 outage. As noted, the restart test program included several planned large transients tests such as condensate/feedwater pump trips and a MSIV closure test from full power. In the current operating cycle, Unit 1 has experienced two main turbine trips from high power levels including one from full rated power. For both turbine trip transient events, proper performance of Unit 1's control and safety systems was observed. Hence, the performance of additional main turbine trips/load reject LTT at EPU conditions on Unit 1 would provide no significant benefits. Accordingly, TVA is requesting that NRC concur that the performance of this LTT is not required for EPU approval on Unit 1.