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TVA-BFN-431

February 1, 2006

10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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Washington, D.C. 20555-0001

Gentlemen:

In the Matter of)
Tennessee Valley Authority)

Docket No. 50-259

**BROWNS FERRY NUCLEAR PLANT (BFN) - UNIT 1 - RESPONSE TO NRC
REQUEST EMEB-B.6 FROM NRC ROUND 2 REQUESTS FOR ADDITIONAL
INFORMATION RELATED TO TECHNICAL SPECIFICATIONS (TS) CHANGE
NO. TS-431 - REQUEST FOR EXTENDED POWER UPRATE
(TAC NO. MC3812)**

TVA's letter of December 19, 2005 (Reference 1), provided TVA's response to the NRC Staff's request for additional information, which was submitted to TVA by letter dated October 3, 2005 (Reference 2), in order to support review of the BFN Unit 1 Extended Power Uprate (EPU) license amendment application. TVA's letter noted that the response to NRC Request EMEB-B.6 would be deferred, and that TVA would provide the complete response by February 1, 2006. This letter provides the response to NRC Request EMEB-B.6.

TVA submitted the BFN Unit 1 EPU application to the NRC by letter dated June 28, 2004 (Reference 3). TVA supplemented that application by letters dated February 23, 2005 (Reference 4), April 25, 2005 (Reference 5), and June 6, 2005 (Reference 6).

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There are no new regulatory commitments associated with this submittal. If you have any questions concerning this letter, please contact William D. Crouch, Browns Ferry Manager of Licensing and Industry Affairs at (256) 729-2636.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 1st day of February, 2006.

Sincerely,

Original Signed by:

William D. Crouch
Manager of Licensing
and Industry Affairs

References:

1. TVA letter, Brian O'Grady to NRC, "Browns Ferry Nuclear Plant (BFN) - Unit 1 - Response to NRC Round 2 Requests for Additional Information Related to Technical Specifications (TS) Change No. TS-431 - Request For Extended Power Uprate Operation (TAC No. MC3812)," dated December 19, 2005
2. NRC letter, Margaret H. Chernoff to TVA, "Browns Ferry Nuclear Plant, Unit 1 - Request for Additional Information for Extended power Uprate (TS-431) (TAC No. MC3812)," dated October 3, 2005
3. TVA letter, T. E. Abney to NRC, "Browns Ferry Nuclear Plant (BFN) - Unit 1 - Proposed Technical Specifications (TS) Change TS-431 - Request for License Amendment Extended Power Uprate (EPU) Operation," dated June 28, 2004

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4. TVA letter, T. E. Abney to NRC, "Browns Ferry Nuclear Plant (BFN) - Unit 1 - Response to NRC's Acceptance Review Letter and Request for Additional Information Related to Technical Specifications (TS) Change No. TS-431 - Request for Extended Power Uprate Operation, (TAC No. MC3812)," dated February 23, 2005
5. TVA letter, T. E. Abney to NRC, "Browns Ferry Nuclear Plant (BFN) - Unit 1 - Response to NRC's Request for Additional Information Related to Technical Specifications (TS) Change No. TS-431 - Request for Extended Power Uprate Operation (TAC No. MC3812)," dated April 25, 2005
6. TVA letter, William D. Crouch to NRC, "Browns Ferry Nuclear Plant (BFN) - Unit 1 - Response to NRC's Request for Additional Information Related to Technical Specifications (TS) Change No. TS-431 - Request For License Amendment - Extended Power Uprate (EPU) Operation (TAC No. MC3812)," dated June 6, 2005

Enclosures:

cc: See page 4

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Enclosures

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(Via NRC Electronic Distribution)

Enclosures

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cc: continued page 5

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Enclosure

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NSRB Support, LP 5M-C
EDMS, WT CA-K

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ENCLOSURE

**TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT UNIT 1
DOCKET NO. 50-259**

**RESPONSE TO NRC REQUEST EMEB-B.6 FROM NRC ROUND 2 REQUESTS FOR
ADDITIONAL INFORMATION RELATED TO TECHNICAL SPECIFICATIONS
(TS) CHANGE NO. TS-431 - REQUEST FOR EXTENDED POWER UPRATE**

By letter dated June 28, 2004 (Reference 1), TVA submitted to the NRC a license amendment application requesting authorization for Extended Power Uprate (EPU) operation for Browns Ferry Nuclear Plant (BFN) Unit 1. TVA supplemented that application by letters dated February 23, 2005 (Reference 2), April 25, 2005 (Reference 3), and June 6, 2005 (Reference 4). By letter dated October 3, 2005 (Reference 5), the NRC Staff transmitted a request for additional information to support its review of the BFN Unit 1 EPU application.

TVA's letter of December 19, 2005 (Reference 6), provided TVA's response to the NRC Staff's request for additional information. TVA's letter noted that the response to NRC Request EMEB-B.6 would be deferred, and that TVA would provide the complete request by February 1, 2006. This enclosure provides the response to NRC Request EMEB-B.6.

NRC Request EMEB-B.6

Section 10.4.3, Main Steam Line, Feedwater and Reactor Recirculation Piping Flow Induced Vibration Testing, of Enclosure 4 of the June 28, 2004, submittal discusses the plans for vibration monitoring during initial plant operation for the new EPU operating conditions. Discuss in more detail, the procedures for avoiding adverse flow effects during power escalation and after achieving EPU conditions, including specific hold points and duration, inspections, plant walkdowns, vibration data collection methods and locations, planned data evaluation, and decision criteria for reducing plant power level or initiating plant shutdown.

TVA Reply to EMEB-B.6

Piping and components in the Main Steam and Feedwater systems will experience flow increases due to EPU and, therefore, will be monitored for steady state vibration. Additionally, for Unit 1 only, the Reactor Recirculation (RR) system will be monitored since Unit 1 has had RR system piping

modifications implemented during the Restart program, and Unit 1 does not have operating experience above the originally licensed thermal power (OLTP) level, as do Units 2 and 3 at 105% of OLTP.

Steady state vibration monitoring for piping will follow the guidance of ASME Standards and Guides for Operation and Maintenance of Nuclear Power Plants OM-S/G Part 3 (OM-3).

Scope

The scope of BFN's flow induced vibration (FIV) monitoring for EPU is as follows:

- Main Steam, Feedwater, and RR piping inside the Drywell, including selected branch piping.
- Main Steam and Feedwater piping outside the Drywell, including selected branch piping:
 - the Main steam lines from the outboard containment anchors to the High Pressure Turbine;
 - the Feedwater lines from the three Feedwater Pumps to the High Pressure Heaters, then to the outboard containment anchors; and
 - small bore piping attached to the Main Steam and Feedwater piping.
- Selected Main Steam, High Pressure Coolant Injection (HPCI), and Reactor Core Isolation Cooling (RCIC) valves inside the Drywell.

TVA's procedures for vibration monitoring will require monitoring, evaluating, and taking prompt action in response to potential adverse flow effects that may result from power uprate operation. These procedures will include:

Hold Points and Duration

During a unit's initial power ascension to EPU, vibration data collection and analysis will be performed at power levels below the final, maximum extended power level. Vibration data is typically collected at 50%, 75%, 100%, 105%, 110%, 115% and 120% of originally licensed thermal power (OLTP). The duration of the hold points will be determined by the time required to obtain the specified data, complete the evaluation, and obtain approval to proceed.

Inspections and Walkdowns

Piping classified in OM-3 group 3 outside the drywell will be monitored visually by walkdown or cameras at each test plateau. If visual observation indicates significant vibration, the condition will be evaluated in more detail.

Data Collection Methods and Locations

a. PIPING INSIDE DRYWELL

Main Steam, Feedwater, and Recirculation piping inside the drywell will be monitored using accelerometers or linear voltage differential transformers (LVDTs) and recorded on a data acquisition system (DAS) located outside the drywell. Monitoring locations are based on hydraulic and structural analyses which identified where significant displacements are expected to occur relative to other locations. Branch line locations connected to main line piping which are expected to experience vibration effects were identified by walkdown.

b. COMPONENTS INSIDE DRYWELL

Components inside the drywell will be monitored using accelerometers and recorded on a DAS located outside the drywell. Locations are chosen based upon recent industry experience with component failures during EPU conditions and engineering judgment as to the susceptibility of the components. Currently, 1 Main Steam Isolation Valve (MSIV), 1 Main Steam drain valve, 2 main steam safety relief valves (SRVs), 1 HPCI steam valve, and 1 RCIC steam valve have been selected for monitoring and will be baselined during the upcoming Unit 3 operating cycle at currently licensed thermal power (CLTP).

c. PIPING OUTSIDE THE DRYWELL

Main Steam piping from the outboard containment anchors to the high pressure turbine and Feedwater piping from the Feedwater Pumps to the High Pressure Heaters, and from the High Pressure Heaters to the outboard containment anchors will be monitored using remote sensors and DAS equipment or with hand held vibration monitors depending upon accessibility. Monitoring locations are based on hydraulic and structural analyses which identified where significant displacements are expected to occur relative to other locations. Branch line locations connected to main line piping which are expected to experience vibration effects were identified by walkdown.

Planned Data Evaluation

Piping within the scope is classified into one of 3 groups defined in OM-3 depending upon the degree of rigor required to assess the affects of vibration. The effects prediction analysis, vibration data gathering, data analysis, and acceptance criteria for BFN's program are based on OM-3 requirements for the appropriate group. Testing procedures will contain criteria consistent with the appropriate OM-3 group. Data taken at each test plateau will be evaluated and compared to the acceptance criteria in the procedure prior to proceeding to the next power plateau.

Decision Criteria For Reducing Plant Power Level Or Initiating Plant Shutdown

In the event that measured vibrations at a given power level exceed the acceptance criteria, an evaluation will be performed to disposition the test deficiency. If appropriate, the power level would be reduced to a level where vibration amplitudes were previously shown to be acceptable until the deficiency is corrected.

References:

1. TVA letter, T. E. Abney to NRC, "Browns Ferry Nuclear Plant (BFN) - Unit 1 - Proposed Technical Specifications (TS) Change TS-431 - Request for License Amendment Extended Power Uprate (EPU) Operation," dated June 28, 2004
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4. TVA letter, William D. Crouch to NRC, "Browns Ferry Nuclear Plant (BFN) - Unit 1 - Response to NRC's Request for Additional Information Related to Technical Specifications (TS) Change No. TS-431 - Request For License Amendment - Extended Power Uprate (EPU) Operation (TAC No. MC3812)," dated June 6, 2005
5. NRC letter, Margaret H. Chernoff to TVA, "Browns Ferry Nuclear Plant, Unit 1 - Request for Additional Information for Extended power Uprate (TS-431) (TAC No. MC3812)," dated October 3, 2005
6. TVA letter, Brian O'Grady to NRC, "Browns Ferry Nuclear Plant (BFN) - Unit 1 - Response to NRC Round 2 Requests for Additional Information Related to Technical Specifications (TS) Change No. TS-431 - Request For Extended Power Uprate Operation (TAC No. MC3812)," dated December 19, 2005