December 1, 2006

TVA-BFN-TS-431
TVA-BFN-TS-418

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	)	Docket Nos. 50-259
Tennessee Valley Authority	)	50-260
	)	50-296

BROWNS FERRY NUCLEAR PLANT (BFN) – UNITS 1, 2, AND 3 - TECHNICAL SPECIFICATIONS (TS) CHANGES TS-431 AND TS-418 – EXTENDED POWER UPRATE (EPU) MODIFICATIONS AND AGING MANAGEMENT REVIEW STATUS (TAC NOS. MC3812, MC3743, AND MC3744)

By letters dated June 28, 2004 and June 25, 2004 (ADAMS Accession Nos. ML041840109 and ML041840301, respectively), TVA submitted license applications to the NRC for the EPU of BFN Unit 1 and BFN Units 2 and 3, respectively. At the request of the NRC staff, this letter provides a completion status of planned EPU modifications for BFN Unit 1 and the results of preliminary, aging management reviews of EPU modifications for all three BFN units.

TVA has completed a substantial portion of the planned Unit 1 modifications and activities needed to support restart and EPU operation. These actions include significantly replacing or upgrading of piping, electrical and instrumentation cabling, and components throughout the plant. Approximately half of the Unit 1 systems have been returned to operating service. In addition, TVA has transferred “ownership” of those systems from the

construction organization to the operating organization and is planning to complete those EPU modifications necessary to support restart of Unit 1 by early calendar year 2007.

The EPU modifications described in the enclosure to this letter are designed to support operation at power levels representing 120% of original licensed thermal power (i.e., 3952 MWt). While the modifications for Unit 1 are substantially complete, completion of the EPU modifications for Units 2 and 3 is planned to occur during subsequent refueling outages when the majority of the modifications will be implemented.

Subsequent to the aging management reviews performed and reported by TVA in support of the license renewal application (LRA), TVA has performed preliminary reviews of the EPU modifications for all three BFN units. The preliminary reviews indicate that the aging management conclusions in the LRA remain valid for EPU. The final reviews will be performed after modification implementation.

TVA has determined that the additional information provided by this letter does not affect the no significant hazards considerations associated with the proposed TS changes. The proposed TS changes still qualify for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9).

No new regulatory commitments are made in this submittal. 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 1st day of December, 2006.

Sincerely,

Original signed by:

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ENCLOSURE
TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNITS 1, 2, AND 3

TECHNICAL SPECIFICATIONS (TS) CHANGES TS-431 AND TS-418 – EXTENDED POWER UPRATE (EPU) MODIFICATIONS AND AGING MANAGEMENT REVIEW STATUS (TAC NOS. MC3812, MC3743, AND MC3744)

BFN UNIT 1 EPU MODIFICATION STATUS AND PRELIMINARY AGING MANAGEMENT REVIEW

BFN Unit 1 EPU Modification Status

Table 1 provides a current status of the planned extended power uprate (EPU) modifications for Unit 1. The modifications described in this table correspond to those listed in Table 3 of Enclosure 1 to TVA's April 25, 2005, EPU submittal (ADAMS Accession No. ML051170244). In addition to the EPU modifications Table 2 designates those Unit 1 EPU setpoint adjustments that are being implemented for operation at 105% of original licensed thermal power (OLTP), and/or 120% OLTP. Because the actual setpoint adjustments can readily be achieved and may occur just before system return to service, a completion estimate is not provided.

EPU Modification Aging Management Review

In TVA's EPU submittal of June 15, 2006 (ML061780308) and the reply to NRC Request CPTB.1, it was concluded that no impact to the aging management in the license renewal application (LRA) is anticipated due to the EPU modifications. The LRA for BFN Units 1, 2, and 3 was developed in parallel with the EPU license amendment requests for BFN Units 1, 2, and 3. The review of EPU conditions was performed as part of the LRA. The conclusions on operational characteristics reached in TVA's LRA letters dated February 19, 2004 (ML040510241) (January 28, 2004, Meeting Follow-up), May 28, 2004 (ML041550393 and ML041550399) (as updated by letter dated August 5, 2004 (ML042220285)), and August 3, 2004 (ML042180449), concerning the effects remain valid for EPU.

The February 19, 2004, letter provided additional information discussing the effects of EPU on the LRA. That letter concluded that all evaluations in support of the LRA were valid at the EPU power level, except those associated with LRA Section 4.3, "Metal Fatigue." LRA Sections 4.2 and 4.3 were later updated by the letters dated May 28, 2004, and August 5, 2004, to reflect EPU

conditions. Attachment 1 of the August 3, 2004, letter identified the changing operational characteristics that potentially affected the identified aging mechanisms following EPU. These operational characteristics were reviewed for the systems affected, as delineated in Attachment 2 of that letter, to verify the license renewal application remains valid.

In November 2006, TVA performed a preliminary review of the EPU modifications on Units 1, 2, and 3. This review was based upon the current status of the associated design change packages. (In general, Unit 1 modifications are in the installation stage, Unit 2 modifications are in the design/issue stage, and Unit 3 modifications are in the design stage) No additional components, materials, or environments were introduced that would affect the Aging Management Review that was contained in the LRA. This result is reflected in Table 3.

Final reviews of the EPU modifications for aging management will be completed post-implementation in accordance with the requirements of 10 CFR 54.37(b). Based on reviews to-date of EPU physical design changes, no impact to the aging management in the LRA is anticipated.

Table 1

BFN Unit 1 Status Update for Planned EPU Modifications

Activity	Description	Modification Completion Status[1]
Main Turbine	• Replace HP Turbine diaphragms and rotor buckets • Replace HP Rotor/LP Rotors • Replace springs, bonnets, washers, bellows, & bolting on 6 cross around relief valves to permit increased set pressure • Replace miter bend elbows in the condenser spray piping with long radius elbows to reduce back pressure	25% complete
Turbine Sealing Steam	• Modify the size of the steam seal unloader valves and associated piping to allow the turbine sealing system to accommodate the larger steam flow requirements	25% complete
Condensate Pumps	• Replace 2 impellers in each of 3 pumps • Install 3 - 1250 hp motors • Recalibrate relay settings • Recalibrate/replace pump & motor instrumentation • Modify HVAC ductwork	100% complete

[1] Completion status is approximate—in some cases the full scope of the modification is included in multiple design modification packages, which may also include additional design or modification activities. Does not include post-modification testing.

Table 1

BFN Unit 1 Status Update for Planned EPU Modifications

Activity	Description	Modification Completion Status[1]
Condensate Booster Pumps	• Replace 3 pumps • Install 3 – 3000 hp motors • Recalibrate relay settings • Recalibrate/replace pump & motor instrumentation • Modify HVAC ductwork	100% complete
Feedwater Pumps and Turbines	• Replace 3 pumps • Recalibrate pump instrumentation and control system for increased flows at EPU conditions • Replace turbine/pump coupling • Replace turbine rotor, diaphragms and buckets • Recalibrate/replace turbine instrumentation	87% complete
Moisture Separators	• Change vanes and add perforated plate on moisture separators • Modify internal drains as needed	96% complete

Table 1

BFN Unit 1 Status Update for Planned EPU Modifications

Activity	Description	Modification Completion Status[1]
Feedwater Heaters (FWHs)	• Upgrade heater shell pressure certification • Rerate tube side pressure certification for FWH 3 • Replace level transmitters on FWHs 1, 2 & 3 • Repair / replace 18 nozzles on FWHs 1, 2 & 3 • Replace relief valves on FWHs 1, 2 & 3 • Relocate extraction steam nozzle & shorten extraction steam line on FWH 3 • Install new impingement plate & steam duct inside FWH 3 • Reinforce / re-weld pass partition plates in all FWHs • Install manway stiffeners on FWH 3	93% complete
Main Condenser Extraction Steam Bellows	• Replace #2, #3 and #4 bellows with upgraded bellows	90% complete
Condensate Demineralizers	• Install 1 new vessel with valves • Install digital control system • Replace valves for increased reliability	88% complete
Steam Packing Exhauster Bypass	• Install 24” piping & flow control valve to accommodate increased condensate flows at EPU conditions	82% complete

Table 1

BFN Unit 1 Status Update for Planned EPU Modifications

Activity	Description	Modification Completion Status[1]
Drywell Building Steel	• Modify building steel beams and connections as required for load changes at EPU conditions	100% complete
Torus Attached Piping	• Modify supports and snubbers as required due to EPU conditions	99% complete
Main Steam Supports	• Modify supports as required for load changes due to EPU conditions	100% complete
Steam Dryer	• Perform identified modifications required to maintain Dryer structural integrity at EPU Conditions	100% complete
Main Steam Relief Valves	• Increase mechanical setpoint 30 psi with 3% tolerance due to increased reactor pressure	97% complete
Motor Operated Valves	• Modification to GL 89-10 MOVs to accommodate 30 psi pressure increase	80% complete
Reactor Recirculation Pump Motors	• Revise electrical protection system setpoints • Revise temperature monitoring setpoints • Assess additional heat load on plant HVAC & cooling water systems • Assess power cable voltage drop increase due to higher current • Revise pump/motor vibration monitoring setpoints • Re-rate pumps and motors for 120% Power/105% Core Flow operating conditions	99% complete

Table 1

BFN Unit 1 Status Update for Planned EPU Modifications

Activity	Description	Modification Completion Status[1]
Jet Pumps	• Install sensing line clamps as required to reduce vibration due to Recirculation Pump vane passing frequencies at EPU conditions	100% complete
Main Generator System	• Recalibrate/replace pressure regulators and pressure switches • Increase generator hydrogen to 75 psig to operate at increased loads • Rewind generator stator and generator field	98% complete
Isolation Phase Bus Duct Cooling	• Modify Isolation Phase Bus Duct Cooling System to remove Bus Duct heat under EPU conditions	100% complete
Main Bank Transformers	• Install 3-500 MVA transformers • Install 500 MVA spare • Upgrade oil and water deluge systems • Upgrade relaying as needed • Replace 5 breakers & disconnects	100% complete
ICS/SPDS	• Update as needed based on NSSS and BOP instrument changes	97% complete (based on 105% OLTP operation)
Vibration Monitoring	• Install temporary sensors • Conduct testing program during power ascension	30% complete

Table 1

BFN Unit 1 Status Update for Planned EPU Modifications

Activity	Description	Modification Completion Status[1]
Main Steam Isolation Valves	• Replace MSIV poppets and modify operators as required to reduce differential pressure across MSIVs at EPU conditions • Install 2-inch MSIV stems as required due to increased stem forces caused by EPU MS flow increase	98% complete
EHC Software	• New program inputs & logic for EPU conditions	89% complete

Table 2

BFN Unit 1 EPU Setpoint Adjustments

Activity	Description	Same Setpoints for 105% and 120% OLTP
High reactor vessel pressure scram setpoint	• Raise setpoint due to increased normal reactor vessel pressure Technical Specification value	Yes
High reactor vessel pressure trip for the reactor recirculation pump	• Raise setpoint due to increased normal reactor vessel pressure Technical Specification value	Yes
ATWS-RPT reactor vessel pressure recirculation pump trip setpoint	• Raise setpoint due to increased normal reactor vessel pressure Technical Specification value	Yes
Standby Liquid Control System pump discharge test pressure	• Raise discharge pressure requirement due to increased normal reactor vessel pressure	Yes
Turbine Stop Valve - Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure - Low bypass (pressure) setpoint	• Lower percent reactor thermal power to maintain trip at same absolute thermal power	Yes

Table 2

BFN Unit 1 EPU Setpoint Adjustments

Activity	Description	Same Setpoints for 105% and 120% OLTP
Neutron flux – High (set down)	• Lower percent reactor thermal power to maintain trip at same absolute thermal power	No
Flow Biased Simulated Thermal Power - High	• Adjust slope and intercept for equation to reflect change in maximum reactor thermal power	No
Main Steam Line high flow	• Adjust delta P to account for higher flow rate.	No
ATWS Alternate Rod Injection (ARI) high reactor pressure setpoint	• Raise setpoint due to increased normal reactor vessel pressure Technical Specification value	Yes

Table 3

BFN Units 1, 2, and 3 AMR for Planned EPU Modifications

Activity	Description	U1/2/3 Preliminary Review - AMR Affected?
Main Turbine	• Replace HP Turbine diaphragms and rotor buckets • Replace HP Rotor/LP Rotors (Unit 1 only) • Replace springs, bonnets, washers, bellows, & bolting on 6 cross around relief valves to permit increased set pressure • Replace miter bend elbows in the condenser spray piping with long radius elbows to reduce back pressure	No
Turbine Sealing Steam	• Modify the size of the steam seal unloader valves and associated piping to allow the turbine sealing system to accommodate the larger steam flow requirements	No
Condensate Pumps	• Replace 2 impellers in each of 3 pumps • Install 3 - 1250 hp motors • Recalibrate relay settings • Recalibrate/replace pump & motor instrumentation • Modify HVAC ductwork	No

Table 3

BFN Units 1, 2, and 3 AMR for Planned EPU Modifications

Activity	Description	U1/2/3 Preliminary Review - AMR Affected?
Condensate Booster Pumps	• Replace 3 pumps • Install 3 – 3000 hp motors • Recalibrate relay settings • Recalibrate/replace pump & motor instrumentation • Modify HVAC ductwork	No
Feedwater Pumps and Turbines	• Replace 3 pumps • Recalibrate pump instrumentation and control system for increased flows at EPU conditions • Replace turbine/pump coupling • Replace turbine rotor, diaphragms and buckets • Recalibrate/replace turbine instrumentation	No
Moisture Separators	• Change vanes and add perforated plate on moisture separators • Modify internal drains as needed	No

Table 3

BFN Units 1, 2, and 3 AMR for Planned EPU Modifications

Activity	Description	U1/2/3 Preliminary Review - AMR Affected?
Feedwater Heaters (FWHs)	• Upgrade heater shell pressure certification • Rerate tube side pressure certification for FWH 3 • Replace level transmitters on FWHs 1, 2 & 3 • Repair / replace 18 nozzles on FWHs 1, 2 & 3 • Replace relief valves on FWHs 1, 2 & 3 • Relocate extraction steam nozzle & shorten extraction steam line on FWH 3 • Install new impingement plate & steam duct inside FWH 3 • Reinforce / re-weld pass partition plates in all FWHs • Install manway stiffeners on FWH 3	No
Main Condenser Extraction Steam Bellows	• Replace #2, #3 and #4 bellows with upgraded bellows	No

Table 3

BFN Units 1, 2, and 3 AMR for Planned EPU Modifications

Activity	Description	U1/2/3 Preliminary Review - AMR Affected?
Condensate Demineralizers	• Install 1 new vessel with valves & digital controls • Upgrade controls on 9 existing vessels to digital (Unit 2 only) • Install digital control on 9 existing vessels (Unit 1 only) • Replace valves for increased reliability	No
Steam Packing Exhauster Bypass	• Install 24” piping & flow control valve to accommodate increased condensate flows at EPU conditions	No
Drywell Building Steel (Unit 1 only)	• Modify building steel beams and connections as required for load changes at EPU conditions	No
Torus Attached Piping	• Modify supports and snubbers as required due to EPU conditions	No
Main Steam Supports	• Modify supports as required for load changes due to EPU conditions	No
Steam Dryer	• Perform identified modifications required to maintain Dryer structural integrity at EPU Conditions	No
Main Steam Relief Valves (Unit 1 only)	• Increase mechanical setpoint 30 psi with 3% tolerance due to increased reactor pressure	No

Table 3

BFN Units 1, 2, and 3 AMR for Planned EPU Modifications

Activity	Description	U1/2/3 Preliminary Review - AMR Affected?
Motor Operated Valves (Unit 1 only)	• Modification to GL 89-10 MOVs to accommodate 30 psi pressure increase	No
Reactor Recirculation Pump Motors	• Revise electrical protection system setpoints • Revise temperature monitoring setpoints • Assess additional heat load on plant HVAC & cooling water systems • Assess power cable voltage drop increase due to higher current • Revise pump/motor vibration monitoring setpoints • Re-rate pumps and motors for 120% Power/105% Core Flow operating conditions	No
Jet Pumps	• Install sensing line clamps as required to reduce vibration due to Recirculation Pump vane passing frequencies at EPU conditions	No
Main Generator System	• Recalibrate/replace pressure regulators and pressure switches • Increase generator hydrogen to 75 psig to operate at increased loads • Rewind generator stator and generator field (Unit 1 only)	No

Table 3

BFN Units 1, 2, and 3 AMR for Planned EPU Modifications

Activity	Description	U1/2/3 Preliminary Review - AMR Affected?
Isolation Phase Bus Duct Cooling	• Modify Isolation Phase Bus Duct Cooling System to remove Bus Duct heat under EPU conditions	No
Main Bank Transformers	• Install 3-500 MVA transformers per unit • Install 2-500 MVA spares (U1/2 & 3) • Upgrade oil and water deluge systems • Upgrade relaying as needed • Replace 5 breakers & disconnects	No
ICS/SPDS	• Update as needed based on NSSS and BOP instrument changes	No
Reactor Recirculation Vibration Monitoring (Unit 2)	• Install ~ 35 temporary sensors on RR, RHR, & RWCU in Drywell. • Install data acquisition center in Rx Bldg. • Conduct testing program before EPU outage. (Installed on Unit 2 and vibration data obtained during startup from U2C12 Outage.)	No
Vibration Monitoring	• Install temporary sensors based on ongoing analyses • Conduct testing program during power ascension	No

Table 3

BFN Units 1, 2, and 3 AMR for Planned EPU Modifications

Activity	Description	U1/2/3 Preliminary Review - AMR Affected?
Main Steam Isolation Valves	• Replace MSIV poppets and modify operators (Unit 1 only) as required to reduce differential pressure across MSIVs at EPU conditions • Install 2-inch MSIV stems as required due to increased stem forces caused by EPU MS flow increase	No
EHC Software	• New program inputs & logic for EPU conditions	No