

September 27, 2006

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 No. 50-259
Tennessee Valley Authority)

**BROWNS FERRY NUCLEAR PLANT (BFN) - UNIT 1 - RESPONSE TO
NRC LETTER, DATED AUGUST 25, 2006 - REQUEST FOR
ADDITIONAL INFORMATION ASSOCIATED WITH THE RESTART OF
UNIT 1 (TAC NO. MC4660)**

The Enclosure to this letter provides the additional information requested by NRC's letter dated August 25, 2006, (Reference 1) that questioned if TVA had considered that the status change of BFN Unit 1 could result in a need to update the licensing basis for Unit 2 and 3. NRC stated that: "TVA should ensure that the licensing basis for Units 2 and 3 are continuing to be met and if there are any other outstanding licensing actions for BFN Units 2 and 3 needed prior to the restart of Unit 1, TVA should seek approvals." Additionally, NRC requested that TVA provide a list and a schedule for submittal of any required licensing actions for Units 2 and 3, which are necessary due to previous assumptions that are no longer valid due to the restart of Unit 1.

Based on the review documented in Enclosure 1, only the two additional licensing actions for Unit 2 and 3 identified by NRC in letter dated August 25, 2006, are required to support restart of Unit 1. Both of these

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issues were identified in TVA's regulatory framework letter dated December 13, 2002, (Reference 2) as issues requiring resolution prior to Unit 1 restart.

Enclosure 2 contains the new commitment contained in this letter. If you have any questions, please contact me at (256) 729-2636.

Sincerely,

Original signed by:

William D. Crouch
Manager of Licensing
and Industry Affairs

Reference:

1. NRC's letter dated August 25, 2006, "Request for Additional Information Associated with Restart of Unit 1 (TAC No. MC4660)"
2. TVA letter dated December 13, 2002, BFN Unit 1, "Regulatory Framework for the Restart of Unit 1"

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Enclosure

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Enclosure

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ENCLOSURE 1

BROWNS FERRY NUCLEAR PLANT (BFN) - UNIT 1 RESPONSE TO NRC LETTER, DATED AUGUST 25, 2006 REQUEST FOR ADDITIONAL INFORMATION ASSOCIATED WITH RESTART OF UNIT 1 (TAC NO. MC4660)

TVA letter dated December 13, 2002¹, as supplemented by a February 28, 2003,² letter, proposed the regulatory framework for the restart of Unit 1. As noted by NRC in letter dated August 25, 2006³, these framework letters established a plan for addressing the generic communications, special programs, Technical Specification (TS) changes, and other licensing and regulatory issues needed prior to the restart of Unit 1.

Included with the framework was a list of license amendments, relief requests, generic communications, and special programs that would be resolved prior to Unit 1 restart. NRC stated that as they work to resolve these items, the Staff noted the potential effect of the Unit 1 restart on Units 2 and 3 was not sufficiently discussed in previous TVA correspondence. NRC identified two TVA issues that exemplify their concern.

The first example identified was TVA's proposed TS amendment request (TVA letters dated December 6, 2004⁴ and October 28, 2005⁵) to extend the allowed outage time for the Unit 1/2 emergency diesel generators (EDGs) from 7 days to 14 days. Specifically, NRC stated that TVA did not provide adequate justification regarding the risk impact of Unit 1 restart on the previously granted EDG AOT extension for Units 2 and 3. NRC stated in their August 17, 2006⁶, letter that the effect of Unit 1 restart on the approval of an extension of the EDGs allowed out of service time for Units 2 and 3 from 7 days to 14 days was based on treating BFN as a two unit plant, each with four EDGs available for service. However, with the proposed restarting of Unit 1, the same eight EDGs will be shared between units.

The second example is BFN Units 1, 2 and 3 Fire Protection License Conditions 2(C)13, 2(C)14, and 2(C)7 citing two safety evaluations that were approved for all three units assuming Units 2 and 3 operating with Unit 1 shutdown and defueled (NRC SER dated November 2, 1995⁷), and the second evaluation (NRC SER

¹ TVA letter dated December 13, 2002, BFN Unit 1 - "Regulatory Framework for the Restart of Unit 1."

² TVA letter dated February 28, 2003, BFN Unit 1 - "Regulatory Framework for the Restart of Unit 1."

³ NRC letter dated August 25, 2006, "Request for Additional Information Associated with Restart of Unit 1 (TAC No. MC4660)"

⁴ TVA letter dated December 6, 2004, BFN Unit 1 - "TS Change TS-426 - Revision to Diesel Generators Allowed Outage Time"

⁵ TVA letter dated October 28, 2005, BFN Unit 1 - "TS-426 - Response to RAI Regarding Revision to Diesel Generators Allowed Outage (TAC No. MC5254)"

⁶ NRC letter dated August 17, 2006, BFN Unit 1 - "Withdrawal of License Amendment Request to Revise DGs AOT (TAC No. MC5254)"

⁷ NRC letter dated November 2, 1995, "Safety Evaluation of Post-Fire Shutdown Capability and Issuance of TS Amendments for BFN Units 1, 2, and 3 (TAC Nos. M85254, M87900, M87901 and M87902) (TS-337)"

ENCLOSURE 1

**BROWNS FERRY NUCLEAR PLANT (BFN) - UNIT 1
RESPONSE TO NRC LETTER, DATED AUGUST 25, 2006
REQUEST FOR ADDITIONAL INFORMATION ASSOCIATED WITH RESTART OF
UNIT 1 (TAC NO. MC4660)**

dated November 3, 1989⁸) assumed Units 1 and 3 shut down. The NRC request and TVA's response are provided below.

NRC Request:

TVA should ensure that the licensing basis for Units 2 and 3 are continuing to be met and if there are any other outstanding licensing actions for BFN Units 2 and 3 needed prior to the restart of Unit 1, TVA should seek approvals. Based on the concern mentioned above, to ensure that all required reviews have been completed, the NRC Staff request TVA to provide a list and a schedule for submittal of any required licensing actions for Units 2 and 3, which are necessary due to previous assumptions that are no longer valid due to the restart of Unit 1.

TVA Response:

The following provides the results of the review of those items/programs that may be affected by three unit operation to determine if there are any Units 2 or 3 items/programs that may require additional regulatory action(s) due to the restart of Unit 1. TVA conducted a review of Nuclear Performance Plan (NPP) Programs, Generic Letters (GLs), Bulletins, etc., as described in TVA's regulatory framework letters. The review identified areas where TVA potentially assumed Unit 1 was not operating in order to justify operation of Units 2 and/or 3. The attachment to this enclosure provides the results of this review. The status of NPP Programs, GLs, Bulletins and TMI items are provided quarterly to NRC.

Similarly, a review was performed of the TSs changes made since the conversion to the Improved TS, as documented in TVA's letter dated September 7, 2006⁹. As a result of this review, TVA concluded that the supporting analysis for the affected TS changes have been completed, except for the seismic analysis associated with License Condition 2.C(15).

⁸ NRC letter dated November 3, 1989, "Supplemental Safety Evaluation on Post-Fire Shutdown Systems and Final Review of the National Fire Protection Association Code Deviations - BFN Unit 2, (TAC Nos. 72908 and 00459)"

⁹ TVA letter dated September 7, 2006, BFN Unit 1, "Response to NRC letter dated July 7, 2006 - Review of Pending License Amendment Request (TAC No. MC 4797)(TS-432)"

ENCLOSURE 1

**BROWNS FERRY NUCLEAR PLANT (BFN) - UNIT 1
RESPONSE TO NRC LETTER, DATED AUGUST 25, 2006
REQUEST FOR ADDITIONAL INFORMATION ASSOCIATED WITH RESTART OF
UNIT 1 (TAC NO. MC4660)**

The Attachment to this enclosure lists: 1) the areas identified; 2) discusses the assumed status of Unit 1 and the reason for the assumed status; 3) discusses the actions taken or to be taken to allow operation of Unit 1; and 4) any additional required licensing actions for Unit 2 and 3. The list includes the two examples cited by the NRC letter.

Results of Review:

As a result of TVA's review, no additional Units 2 or 3 items/programs beyond that identified in the NRC letter were identified as being affected by the Unit 1 status change (i.e., restart). The following provides a list of the items identified and a submittal schedule for each item:

1. EDG Allowed Outage Time Example:

With respect to the EDG example, submit a proposed TS amendment requesting a 7 day AOT for EDGs for Units 2 and 3. TVA will submit this proposed TS amendment request by October 27, 2006.

2. Fire Protection Example:

With respect to the Fire Protection example, TVA's April 24, 2006¹⁰ letter summarizes the results of the meeting held between TVA and NRC on April 5, 2006. One of the actions that TVA stated it would take during this meeting, as documented in this April 24, 2006 letter, was as follows:

TVA will use existing Unit 1 License Condition 2.C(13) to approve the Unit 1, 2 and 3 Fire Protection Report (i.e., supersede the current Unit 2 and 3 Fire Protection Report) prior to restart (enter into Mode 2 or 3). At restart, Unit 1 will utilize the same type of manual operator actions as are currently used in Units 2 and 3. The manual operator actions will be demonstrated to be feasible via timed walkdowns.

Since this action will be performed under TS License condition 2.C (13), no additional submittals are required.

¹⁰ TVA letter dated April 24, 2006, BFN Units 1, 2 & 3 - "Fire Protection Program - Post-Fire Operator Manual Actions"

**ATTACHMENT
LIST OF PROGRAMS REVIEWED
FOR**

NRC AUGUST 25, 2006 RAI ASSOCIATED WITH RESTART OF UNIT 1

No.	Title	Assumed Status of Unit 1 and Reason for Assumption	Action(s) Taken to Allow Operation of Unit 1	Licensing Action(s) Required for Units 2 & 3
1.	10 CFR 50, Appendix R Fire Protection	Shutdown and defueled. Reactor building assumed as one fire area with low potential for fires. Modifications and manual operator actions related to Appendix R not required.	Unit 1 is implementing the same Fire Protection Program (modifications, operator actions, fire detection, fire suppression, etc.) as installed in Units 2 & 3.	TVA will use existing Unit 1 TS Licensing Condition 2.C.(13) to approve the Unit 1, 2 and 3 Fire Protection Report (i.e. supersede the current Unit 2 and 3 Fire Protection Report) prior to restart (enter into Mode 2 or 3). No submittal required since this action is performed as allowed by TS License condition 2.C (13).
2.	10 CFR 50.49 Environment Qualification of Electrical Equipment	Shutdown and defueled. No high energy sources in Unit 1 spaces to create a harsh environment. All areas assumed mild.	10 CFR 50.49 Program to be completed for Unit 1.	No additional actions required.
3.	Diesel Generator Allowed Outage Time	Indefinite non-operational status. Facility treated as a two unit plant each with four EDGs available. Unit 1 loads were not included in the diesel loading calculations and were not in the PSA supporting the allowed outage time in LCO 3.8.1 (Operating) & 3.8.2 (Shutdown)	AOT to be returned to 7 days. TVA to submit a proposed TS change to return Units 2 and 3 to a 7 day AOT.	TS proposed change will be submitted by October 27, 2006.
4.	10 CFR 50.63 Station Blackout Rule	NRC's 9/16/92 SSE concluded that TVA's proposed methodology for coping with an SBO event at BFN Units 1, 2, and 3 conforms with the SBO rule. SBO is a single unit special event. The diversity of BFN off-site power system, diesel generators, and batteries makes a multi-unit SBO unlikely and therefore is not considered.	TVA to complete Unit 1 equipment and associated procedural modifications required for SBO compliance prior to restart.	No additional actions required.
5.	Baseline Calculations. (Electrical, Mechanical, Nuclear, & Civil)	The baseline calculation program assumed in some isolated calculations that Unit 1 was shutdown and defueled.	The Unit 1 baseline calculation program revised all baseline calculations to ensure Unit 1 was considered in operation in the	No additional actions required.

**ATTACHMENT
LIST OF PROGRAMS REVIEWED
FOR
NRC AUGUST 25, 2006 RAI ASSOCIATED WITH RESTART OF UNIT 1**

No.	Title	Assumed Status of Unit 1 and Reason for Assumption	Action(s) Taken to Allow Operation of Unit 1	Licensing Action(s) Required for Units 2 & 3
6.	Emergency Equipment Cooling Water (EECW) System	EECW is a common plant system which has been in service to support Units 2 and 3 operations. Selected Unit 1 loads not required for Units 2 & 3 operation were valved out while Unit 1 was shutdown.	expected Extended Power Uprate (EPU) status/condition. A three unit flow balance has been performed confirming the EECW system is capable of providing the cooling needs of all equipment required to safely shutdown all three units, with one unit mitigating a design basis LOCA. Three unit flow modeling has been performed to ensure the system is capable of supporting 3 unit operations in all modes.	No additional actions required.
7.	Residual Heat Removal Service Water (RHRSW) System	RHRSW is a common plant system which has been in service to support Units 2 & 3 operations. The Unit 1 A & C supply lines were cut and capped to support Unit 2 operation so that the downstream piping did not have to be seismically qualified for Unit 2 operation. The B & D supply lines were in service and seismically qualified to support Unit 2 operation.	The Unit 1 A & C supply lines have been restored and seismically qualified. Tests were performed to ensure the system can supply design flow to two heat exchangers simultaneously on the most hydraulically limiting header (i.e., C header).	No additional actions required.
8.	Containment Atmospheric Dilution (CAD) System	The Unit 1 supply line was cut and capped to support Unit 2 operation so that the downstream piping did not have to be seismically qualified for Unit 2 operation.	The Unit 1 supply lines will be restored and seismically qualified.	No additional actions required.
9.	GL 87-02, Verification of Seismic Adequacy of Mechanical and Electrical Equipment in Operating Reactors, Unresolved Safety Issue (USI) - A-46	The unit 1 A-46 program is a stand alone program fashioned in the same manner as the unit 2 and unit 3 programs.	Unit 1 will apply the same procedures in the implementation of the program.	No additional actions required.
10.	Nuclear Performance Plan (NPP) Volume III,	The BFN electrical system was evaluated for Unit 2 and 3 recoveries	The Unit 1 Recovery Program is addressing the NPP Volume III	No additional actions required.

**ATTACHMENT
LIST OF PROGRAMS REVIEWED
FOR
NRC AUGUST 25, 2006 RAI ASSOCIATED WITH RESTART OF UNIT 1**

No.	Title	Assumed Status of Unit 1 and Reason for Assumption	Action(s) Taken to Allow Operation of Unit 1	Licensing Action(s) Required for Units 2 & 3
	Electrical Programs	assuming Unit 1 was shutdown and defueled. The recovery effort did not address program attributes for Unit 1 specific loads, cables, etc.	attributes. These programs are the subject of several TVA commitments and are in process and being verified by the NRC Region II staff. The Unit 1 recovery is utilizing the same acceptance criteria as previously used for Units 2 & 3.	
11.	Seismic	The unit 1 program did not change any of the requirements.	The criteria and licensing basis requirements for BFN were developed for all three units during the unit 2 restart effort. Unit 1 modifications are in progress.	No additional actions required.
12.	Probabilistic Safety Assessment (PSA) GL 88-20	The Units 2 and 3 PSAs assumed Unit 1 was shutdown and defueled. The PSAs did not account for Unit 1 initiated events nor address the actions required to maintain Unit 1 in a safe condition.	The Unit 1 PSA has been issued for three unit operation at EPU conditions. Additionally, the Units 2 and 3 PSAs have been revised/enhanced to account for Unit 1 operation and EPU conditions. The following program examples being revised to include U1: MSPI, Online Maint, ORAM, Sentinel, and Risk Significant evaluations.	No additional actions required.
13.	Individual Plant Examination of External Events (IPEEE) GL 88-20, Individual Plant Examination, Supplement 4	Unit 1 shutdown, no IPEEE fire and seismic analysis was submitted. Unit 1 IPEEE fire and seismic analysis to be submitted prior to restart. TVA letter dated July 24, 1995, BFN - GL 88-20, sup 4, IPEEE for Severe Accident Vulnerabilities - Partial Submittal of Report," transmitted TVA's evaluation addressing High Winds and Tomadoes, External Floods, Transportation and Nearby Facility Accidents for all three units,	TVA's January 14, 2005 letter provided BFN Unit 1's: Seismic IPEEE Report and IPEEE Fire Induced Vulnerability Evaluation. This completed TVA's response to GL 88-20. Unit 1 will complete the corrective actions with the emergency lighting battery racks.	No additional actions required.

**ATTACHMENT
LIST OF PROGRAMS REVIEWED
FOR
NRC AUGUST 25, 2006 RAI ASSOCIATED WITH RESTART OF UNIT 1**

No.	Title	Assumed Status of Unit 1 and Reason for Assumption	Action(s) Taken to Allow Operation of Unit 1	Licensing Action(s) Required for Units 2 & 3
14.	Common Accident Signal (CAS)	<p>including Unit 1.</p> <p>The Common Accident Signal (CAS) detects the presence of an accident signal on multiple units and then directs the partitioning of the diesels to support accident mitigation. The signal between Units 1 and 2 was disconnected since it was not possible to have an accident on Unit 1 with the unit shutdown and defueled. Disconnecting the signal prevented spurious signals from Unit 1 affecting Unit 2 accident response. Diesel loading based on Unit 2/3 accidents only.</p>	<p>To support the restart of Unit 1, TVA performed an analysis of the ECCS and common accident signal initiation logic. DCNs 51016 (U1) and 51018 (U2) implement the Unit 1/2 ECCS Preferred Pump Logic changes. These modifications ensure that the consequences of a spurious accident signal during combined operation of Units 1, 2, and 3 will be mitigated and that the accident signal logic will satisfy the minimum ECCS requirements in the UFSAR Table 6-5.3. These changes were submitted to the NRC under TS Change Request TS-424, dated April 11, 2003. TS-424 was approved by the NRC by Amendments 250, 289 and 248 (Units 1, 2 and 3 respectively) on 4/1/04.</p>	<p>No additional actions required.</p>
15.	Control Room Design Review (CRDR)	<p>The objective of the CRDR was to improve the ability of the nuclear power plant control room operators to reduce errors and improve their ability to cope with accidents if they occur, by improving the information provide to them. A team of qualified plant operators and design engineer have reviewed the layout of the controls and instruments in the BFN control room. There are a total of 313 CRDR concerns, 111 were safety significant (Category 1 and 2). The nine concerns</p>	<p>CRDR modifications are being installed on Unit 1.</p>	<p>No additional actions required.</p>

**ATTACHMENT
LIST OF PROGRAMS REVIEWED
FOR
NRC AUGUST 25, 2006 RAI ASSOCIATED WITH RESTART OF UNIT 1**

No.	Title	Assumed Status of Unit 1 and Reason for Assumption	Action(s) Taken to Allow Operation of Unit 1	Licensing Action(s) Required for Units 2 & 3
		<p>that met the restart criteria were resolved on Unit 2 prior to restart. Safety significant changes were completed on Unit 2 prior to restart from the next refueling outage (Cycle 6 outage). Non-safety concerns were implemented, if they were determined to have a positive cost/benefit ratio, prior to restart from the Unit 2 Cycle 7 outage. Similar changes were performed prior to Unit 3 restart and will be performed prior to the restart of Unit 1.</p>		
16.	Emergency Operating Instructions (EOI)	<p>Unit 1 assumed defueled and in layup. No EOIs created for Unit 1 operation.</p>	<p>Symptom based EOI's for Unit 1 similar to those on Units 2 & 3 being developed, verified and validated for restart.</p>	<p>No additional actions required.</p>
17.	Abnormal Operating Instructions (AOI)	<p>Unit 1 assumed defueled and in layup. No AOIs created for Unit 1 operation.</p>	<p>AOI's similar to those on Units 2 & 3 being developed, for Unit 1 restart.</p>	<p>No additional actions required.</p>

ENCLOSURE 2

COMMITMENT

BROWNS FERRY NUCLEAR PLANT (BFN) - UNIT 1
RESPONSE TO NRC LETTER, DATED AUGUST 25, 2006
REQUEST FOR ADDITIONAL INFORMATION ASSOCIATED WITH RESTART OF
UNIT 1 (TAC NO. MC4660)

TVA will submit a proposed TS amendment requesting a 7 day AOT for EDGs for Units 2 and 3 by October 27, 2006.