

August 26, 2003

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Mail Stop OWFN, P1-35  
Washington, D. C. 20555-0001

10 CFR 50.73

Dear Sir:

**TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT (BFN) -  
UNIT 3 - DOCKET 50-296 - FACILITY OPERATING LICENSE DPR-68 -  
LICENSEE EVENT REPORT (LER) 50-296/2003-001-00**

The enclosed report provides details concerning an event during which the reactor mode change requirements of Technical Specifications (TS) Limiting Condition for Operation 3.0.4 were not met. TVA is reporting this event as a condition prohibited by TS in accordance with 10 CFR 50.73(a)(2)(i)(B). There are no commitments contained in this letter.

Sincerely,

Original signed by:

Ashok S. Bhatnagar

Enclosure

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TEA:DTL:BCM:BAB

Enclosure

cc (Enclosure):

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<b>NRC FORM 366</b> (7-2001)			<b>U.S. NUCLEAR REGULATORY COMMISSION</b>			<b>APPROVED BY OMB NO. 3150-0104</b>			<b>EXPIRES 7-31-2004</b>			
<b>LICENSEE EVENT REPORT (LER)</b>  (See reverse for required number of digits/characters for each block)						Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.						
<b>1. FACILITY NAME</b> Browns Ferry Nuclear Plant Unit 3						<b>2. DOCKET NUMBER</b> 05000296			<b>3. PAGE</b> 1 OF 5			
Mode Change Not Allowed by Technical Specifications During Vessel Reassembly												
<b>5. EVENT DATE</b>			<b>6. LER NUMBER</b>			<b>7. REPORT DATE</b>			<b>8. OTHER FACILITIES INVOLVED</b>			
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER		
06	30	2003	2003 - 001 - 00			08	26	2003	None	N/A		
<b>9. OPERATING MODE</b>			5			<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §</b>			(Check all that apply)			
<b>10. POWER LEVEL</b>			0			20.2201(b)			20.2203(a)(3)(ii)			
			20.2201(d)			20.2203(a)(4)			50.73(a)(2)(iii)			
			20.2203(a)(1)			50.36(c)(1)(i)(A)			50.73(a)(2)(iv)(A)			
			20.2203(a)(2)(i)			50.36(c)(1)(ii)(A)			50.73(a)(2)(v)(A)			
			20.2203(a)(2)(ii)			50.36(c)(2)			50.73(a)(2)(v)(B)			
			20.2203(a)(2)(iii)			50.46(a)(3)(ii)			50.73(a)(2)(v)(C)			
			20.2203(a)(2)(iv)			50.73(a)(2)(i)(A)			50.73(a)(2)(v)(D)			
			20.2203(a)(2)(v) x			50.73(a)(2)(i)(B)			50.73(a)(2)(vii)			
			20.2203(a)(2)(vi)			50.73(a)(2)(i)(C)			50.73(a)(2)(viii)(A)			
			20.2203(a)(3)(i)			50.73(a)(2)(ii)(A)			50.73(a)(2)(viii)(B)			
<b>12. LICENSEE CONTACT FOR THIS LER</b>												
NAME Bertram C. Morris, Senior Licensing Engineer								TELEPHONE NUMBER (Include Area Code) 256-729-7909				
<b>13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT</b>												
CAUSE	SYSTEM	COMPONENT	MANU- FACTURER	REPORTABLE TO EPIX	CAUSE		SYSTEM	COMPONENT	MANU- FACTURER	REPORTABLE TO EPIX		
<b>14. SUPPLEMENTAL REPORT EXPECTED</b>								<b>15. EXPECTED SUBMISSION DATE</b>		MONTH	DAY	YEAR
YES (if yes, complete EXPECTED SUBMISSION DATE)						X	NO					
<b>16. ABSTRACT</b> (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)  On June 30, 2003, Unit 3 was in the latter stages of recovering from a scheduled mid-cycle outage during which the reactor vessel had been disassembled to allow fuel bundle testing. The Reactor Mode Switch had been previously placed in Refuel (Mode 5) to support testing of control rods. Vessel reassembly activities were in progress and the last reactor vessel head closure bolt was tensioned at 0220 hours.  With the Reactor Mode Switch in Refuel and all vessel head bolts tensioned, Technical Specifications (TS) Table 1.1-1, Modes, defines the reactor mode as Startup (Mode 2). So, the final tensioning of the head bolts resulted in an unintended reactor mode change from 5 (Refueling) to 2 (Startup). TS Limiting Condition For Operation (LCO) 3.0.4 prohibits ascending mode changes unless all TS equipment required for the mode is Operable. Due to the outage status of the plant, several TS systems required for Mode 2 were not in fully operable status, which resulted in not meeting the requirements of LCO 3.0.4. An oncoming dayshift operator noted that the Reactor Mode Switch was not in the proper position and placed the switch in Shutdown at 0726, which restored compliance with TS.  The root cause of this event was the plant procedure for vessel assembly did not have a notification step to verify mode switch position when the vessel head was tensioned. The procedure has been revised.  This event is being reported as a condition prohibited by TS in accordance with 10 CFR 50.73(a) (2) (i) (B). There was no safety significance associated with the event.												
NRC FORM 366 (7-2001)												

# LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Browns Ferry Nuclear Plant Unit 3	05000296	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 5
		2003	-- 001	-- 00	

**NARRATIVE** (If more space is required, use additional copies of NRC Form 366A) (17)

## I. PLANT CONDITION(S)

During this event, Unit 3 was shutdown and in the process of recovering from a scheduled mid-cycle outage. Unit 2 was in Mode 1 at approximately 100% power (3458 megawatts thermal) and was unaffected by this event. Unit 1 was shutdown and defueled, and also was unaffected by the event.

## II. DESCRIPTION OF EVENT

### A. Event:

On June 30, 2003, Unit 3 was in the latter stages of recovering from a scheduled mid-cycle outage during which the reactor vessel had been disassembled to allow fuel bundle testing. The Reactor Mode Switch had been previously placed in Refuel (Mode 5) to support testing of control rods. Vessel reassembly activities were in progress and the last reactor vessel head closure bolt was tensioned at 0220 hours.

With the Reactor Mode Switch in Refuel and all vessel head bolts tensioned, Technical Specifications (TS) Table 1.1-1, Modes, defines the reactor mode as Startup (Mode 2). So, the final tensioning of the head bolts resulted in an unintended reactor mode change from 5 (Refueling) to 2 (Startup). TS Limiting Condition For Operation (LCO) 3.0.4 prohibits ascending mode changes unless all TS equipment required for the mode is operable. Due to the outage status of the plant, several TS systems required for Mode 2 operations were not yet in fully Operable status, which resulted in not meeting the requirements of LCO 3.0.4 regarding mode change restrictions. An oncoming dayshift operator noted that the Reactor Mode Switch was not in the proper position and placed the switch in Shutdown at 0726 hours, which restored compliance with TS.

### B. Inoperable Structures, Components, or Systems that Contributed to the Event:

None

### C. Dates and Approximate Times of Major Occurrences:

June 27, 2003	1330 hours CST	Reactor Mode Switch placed in Refuel to support control rod testing.
June 29, 2003	2025 hours CST	Reactor head bolt tensioning activities commenced.
June 30, 2003	0220 hours CST	Last reactor head bolt tensioned.
June 30, 2003	0726 hours CST	Reactor Mode Switch placed in Shutdown.

### D. Other Systems or Secondary Functions Affected

None

## LICENSEE EVENT REPORT (LER)

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**NARRATIVE** (If more space is required, use additional copies of NRC Form 366A) (17)

**E. Method of Discovery**

An oncoming dayshift operator noted that the Reactor Mode Switch was not in the proper position during a control panel check.

**F. Operator Actions**

An oncoming dayshift operator placed the Reactor Mode Switch in Shutdown at 0726, which restored compliance with TS.

**G. Safety System Responses**

None.

### III. Cause of Event

**A. Immediate Cause**

The immediate cause of the event was the positioning of the Reactor Mode Switch in the Refuel position rather than Shutdown when the reactor head was tensioned.

**B. Root Cause**

The plant maintenance procedure for vessel disassembly/reassembly had a notification step to Operations that detensioning the reactor head results in a mode change per the definitions in TS Table 1.1-1, Modes. The procedure section for head tensioning, however, did not provide an analogous notification, even though vessel head tensioning also results in a mode change per TS Table 1.1-1.

**C. Contributing Factors**

The pre-job briefing did not adequately address the requirements for the Reactor Mode Switch position. Also, the outage schedule did not detail the mode switch change associated with tensioning of the reactor head.

### IV. ANALYSIS OF THE EVENT

During refueling operations, the Reactor Mode Switch is maintained in Shutdown or alternatively Refuel, if control rods are being tested. If the mode switch is in Refuel, interlocks will allow the withdrawal of one control rod, which provides a means to test control rods during the outage. With the switch in either position, the reactor mode is defined as Mode 5 (Refueling) in TS Table 1.1-1.

Per TS Table 1.1-1, detensioning/tensioning the reactor head results in a change in defined mode. If the mode switch is in Shutdown, tensioning the head results in a mode change from Mode 5 (Refueling) to Mode 4 (Cold Shutdown). If the mode switch is in Refuel when the head is tensioned, the defined mode changes from Mode 5 (Refueling) to Mode 2 (Startup). Hence, bolting of the head results in a change from Mode 5 to Mode 4 or 2, depending on the mode switch position.

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**NARRATIVE** (If more space is required, use additional copies of NRC Form 366A) (17)

Not all TS systems required for Mode 2 operation (Startup) are maintained operable during outages. In view of this and in consideration of the routine need to test control rods during outages (which requires the Reactor Mode Switch be in Refuel to enable single rod withdrawal logic), a Special Operations TS (3.10.4 - Single Control Rod Withdrawal - Cold Shutdown) establishes an exception to the Mode 2 definition in TS Table 1.1-1. Specifically, Special Operations TS 3.10.4 provides that the Reactor Mode Switch position specified in Table 1.1-1 for Mode 4 may include Refuel and not consider plant operation to be in Mode 2. This provision allows the mode switch to be in Refuel in Mode 4 (Cold Shutdown - head bolted) for testing control rods without invoking Table 1.1-1 Mode 2 (Startup) system requirements. During this outage, however, control rod testing was not in progress during the actual timeframe of vessel reassembly and, therefore, the Mode 2 exception allowed by TS 3.10.4 was not in effect. Therefore, to avoid a conflict with LCO 3.0.4, the Reactor Mode Switch should have been placed in Shutdown prior to the final tensioning of the vessel head.

Most reactor mode changes occur as a result of the planned movement of the Reactor Mode Switch by the control room operator. Hence, plant operating procedures have standing provisions to verify that the TS requirements for the planned mode are met prior to the actual mode change. In this event, the reactor mode change as defined in TS Table 1.1-1 resulted from a plant maintenance activity (vessel head tensioning) not directly controlled by the control room operator. For this type of mode change, it is important that procedural guidance be in place to notify operators that a mode change is imminent, which, in turn, provides a positive communication to verify TS requirements are fulfilled prior to the mode change. In this case, such a notification would have prompted the operators to place the mode switch in Shutdown prior to completion of head tensioning activities. However, as noted above, while the head detensioning procedure had such a notification, the tensioning section of the procedure did not have a similar notification.

## V. ASSESSMENT OF SAFETY CONSEQUENCES

LCO 3.0.4 prohibits ascending reactor mode changes unless the TS systems required for the mode (or other specified condition) are operable. The objective of this TS provision is to ensure that the TS systems required for plant startup are in service prior to commencing power operation. Although this event resulted in an unintended transition to Mode 2 (Startup) as defined in TS Table 1.1-1, since startup activities were not underway, the inoperability of some TS systems required for Mode 2 (Startup) is of no safety consequence. The time duration of the improper mode switch positioning was short (5 hours) and no significant plant evolutions were in progress during the time period. To actually startup the plant, the Reactor Mode Switch must be placed in Startup and subsequently moved to Run. These two mode switch positions enable various system logics required for the physical startup of the plant. In addition, plant startup is governed by a detailed set of operating instructions, which verify TS required systems are tested and made operable prior to changing reactor mode for power operations.

Although the event had no safety significance, the proper application of TS LCO 3.0.4 restrictions is an important concern and corrective actions to prevent recurrence are appropriate.

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NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

## VI. CORRECTIVE ACTIONS

### A. Immediate Corrective Actions

An oncoming dayshift operator noted that the Reactor Mode Switch was not in the proper position and placed the switch in Shutdown at 0726 hours, which restored compliance with TS LCO 3.0.4.

### B. Corrective Actions to Prevent Recurrence<sup>(1)</sup>

1. The plant operating procedure for assembling the reactor vessel was revised to verify the position of the Reactor Mode Switch prior to tensioning the last vessel head bolt.
2. Future outage schedules will be revised to reflect mode change resulting from tensioning of reactor head bolts.

## VII. ADDITIONAL INFORMATION

### A. Failed Components

None.

### B. Previous LERs on Similar Events

There have been no previous LERs associated with mode changes during vessel assembly/disassembly activities.

### C. Additional Information

None

### D. Safety System Functional Failure Consideration:

This event does not involve a safety system functional failure which would be reported in accordance with NEI 99-02.

## VIII. COMMITMENTS

None

<sup>(1)</sup> TVA does not consider these corrective actions as regulatory commitments. The completion of these actions will be tracked in TVA's Corrective Action Program.

**LICENSEE EVENT REPORT (LER)**

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**NARRATIVE** *(If more space is required, use additional copies of NRC Form 366A) (17)*