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

John T. Herron
Vice President, Browns Ferry Nuclear Plant

May 16, 2000

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

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) 50-296/2000-002-00

The enclosed report provides details of a failure to meet the requirements of Technical Specifications (TS) Limiting Condition of Operation 3.3.1.2 due to reactor mode switch testing.

This condition is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as an operation prohibited by plant TS. There are no commitments contained in this letter.

Sincerely,

RJS for

John T. Herron
Site Vice President

cc: See page 2

IE22

RGN-001

Enclosure
cc (Enclosure):
Mr. William O Long, Senior Project Manager
U.S. Nuclear Regulatory Commission
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852

Mr. Paul E. Fredrickson, Branch Chief
U.S. Nuclear Regulatory Commission
Region II
61 Forsyth Street, S. W.
Suite 23T85
Atlanta, Georgia 30303

NRC Resident Inspector
Browns Ferry Nuclear Plant
10833 Shaw Road
Athens, Alabama 35611

NRC FORM 366 (6-1998) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an 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.

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TITLE (4)

Failure To Meet The Requirements Of Technical Specifications During Reactor Mode Switch Testing

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									NA	NA
04	16	2000	2000	002	00	05	16	2000	NA	DOCKET NUMBER NA

OPERATING MODE (9)	3	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)	000		20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)
			20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
			20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Steve Austin, Senior Licensing Project Manager	(256) 729-2070

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	NO X				

On April 15, 2000, at 1226 hours Central Daylight time (CDT), Unit 3 received an automatic reactor scram from 70 percent power. Following the scram, the reactor mode switch was placed in the shutdown position. On April 16, 2000, at 0835 hours CDT, plant operators commenced performance of surveillance Reactor Protection System Mode Switch in Shutdown Scram and Logic System Functional Test. This test requires that the mode switch be moved out of the shutdown position. On April 17, 2000, at approximately 1735 hours CDT, following satisfactory completion of mode switch testing, it was determined that 3-SR-3.3.1.2.4, Source Range Monitor (SRM) System Count Rate and Signal to Noise Ratio Check, was not performed as required. The SR was subsequently completed at approximately 2235 hours CDT. SRMs A, B, and D were found to be operable. Following completion of the SRM system test, it was determined that the mode switch testing had been conducted in violation of an action statement for inoperable SRMs which required the mode switch to be in the shutdown position. Therefore, TVA is reporting this event in accordance with 10 CFR 50.73 (a)(2)(i)(B), as any operation or condition prohibited by the plants Technical Specifications. The root cause of this event was inadequate procedures, which resulted in misapplication of the requirements for operability of the SRMs. Corrective actions included revisions to appropriate procedures and personnel training.

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION	
Browns Ferry Nuclear Plant - Unit 3	05000296	2000	-- 002	-- 00	2 of 8

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

I. PLANT CONDITION(S)

At the time of the event, Unit 3 was in Mode 3 (Hot Shutdown) in a scheduled refueling outage. Previously, on April 15, 2000, at 1226 hours Central Daylight Time (CDT), Unit 3 received an automatic reactor scram from 70 percent power. For details surrounding the reactor scram see BFN LER 296/2000-001. Unit 2 was at 100 percent power, approximately 3458 Megawatts thermal, and Unit 1 was shutdown and defueled.

II. DESCRIPTION OF EVENT

A. Event:

On April 15, 2000, with the Unit 3 Reactor in Mode 3 (hot shutdown), in accordance with Abnormal Operating Instruction (AOI) 3-AOI-100-1, Reactor Scram, Operations checked to ensure surveillances 3-SR-3.3.1.2.5&6, Source Range Monitor Functional Test With Reactor Mode Switch Not in Run Position, and 3-SR-3.3.1.2.7 (A, B, C, and D), Source Range Monitor (SRM) [IG] Calibration and Functional test, were in their periodicity. From the check, it was determined that 3-SR-3.3.1.2.5&6 was out of the periodicity, and on April 15, 2000, at 1426 hours CDT, Operations commenced performance of the surveillance. The surveillance was successfully completed by 1761 hours CDT, and SRMs A, B, and D were declared operable. Source Range Monitor C was inoperable prior to the scram. TSs require only two channels to be operable when in Mode 3. Thus, the operators considered the minimum required channels to be operable with C channel inoperable.

On April 16, 2000, at 0820 hours CDT, the Unit 3 Operators commenced Surveillance 3-SR-3.10.2, Verification of Surveillance Requirements For Reactor Mode Switch Interlock Testing. This was in anticipation of performing Surveillance 3-SR-3.3.1.1.12, Reactor Protection System Mode Switch in Shutdown Scram and Logic System Functional Test. Surveillance 3-SR-3.10.2 requires that the operators verify that all control rods located in core cells containing one or more fuel assemblies are fully inserted and, there are no core alterations in progress. The requirements of 3-SR-3.10.2 were subsequently verified to be complete.

On April 16, 2000, at approximately 0835 hours CDT, the plant operators commenced performance of Surveillance 3-SR-3.3.1.1.12. This test required moving the reactor mode switch [XIS][JE] out of shutdown. The test on the reactor mode switch was completed satisfactorily at approximately 1225 hours CDT.

On April 17, 2000, at approximately 1735 hours CDT, operators determined that 3-SR-3.3.1.2.4, Source Range Monitor System Count Rate and Signal to Noise Ratio Check, had not been performed as required. The SR was commenced and successfully completed at approximately 2235 hours for SRMs A, B, and D. Following the successful completion of 3-SR-3.3.1.2.4 on April 17, 2000, the NRC Resident Inspector questioned TVA's implementation of the TS requirements for TS LCO 3.3.1.2, Condition D, and TS LCO 3.10.2.

This condition was not considered reportable as a missed surveillance since the actions for inoperable SRMs (Mode switch in Shutdown and all insertable control rods inserted) had been met since the reactor scram. TVA's response to the resident inspector was that TS LCO 3.10.2

authorizes mode switch movement, and that all of the requirements of TS 3.10.2 were implemented. This was based on the following:

The SRMs have no safety function and are not assumed to function during a Final Safety Analysis Report design basis accident or transient analysis. The SRMs are utilized during refueling, shutdown, and low power operations to provide the primary indication of neutron flux levels. The SRMs provide monitoring of reactivity changes during fuel or control rod movement and give the control room operator early indication of subcritical multiplication that could be indicative of an approach to criticality.

Technical Specification (TS) Section 3.3.1.2 Source Range Monitor Instrumentation, TS LCO 3.3.1.2, Condition D, requires with one or more SRMs inoperable in Mode 3, fully insert all insertable control rods and, place the reactor mode switch in the shutdown position.

The TS Basis for TS LCO 3.3.1.2, Condition D, concludes that with one or more required SRMs inoperable in Mode 3 the neutron flux monitoring capability is degraded or nonexistent. Further, the requirement to fully insert all insertable control rods ensures that the reactor will be at its minimum reactivity level while no neutron monitoring capability is available. Placing the reactor mode switch in the shutdown position prevents subsequent control rod withdrawal by maintaining a control rod block.

TS Section 3.10, Special Operations, Reactor Mode Switch Testing, LCO 3.10.2 provides specific allowances for changing the mode switch position for interlock testing. The LCO states in part, that the reactor mode switch position for Mode 3 may be changed to include the run position, startup/hot standby position, and refuel position, and operation considered not to be in power operation or startup, to allow testing of the instrumentation associated with the reactor mode switch interlock functions, provided a) all control rods remain fully inserted in core cells containing one or more fuel assemblies, and b) no core alterations are in progress.

The TS Basis for TS LCO 3.10.2 indicates the interlock functions of the shutdown and refuel reactor mode switch positions normally maintained for the reactor mode switch in Mode 3 are provided to preclude reactivity excursions that could potentially result in fuel failure. Interlock testing that requires moving the reactor mode switch to either positions (run, startup/hot standby, or refuel) while in Mode 3 requires administratively maintaining all control rods inserted and no other core alterations in progress.

The requirements for utilizing TS LCO 3.10.2 are stipulated in TS Section 3.0 Limiting Condition for Operation Applicability , TS LCO 3.0.7. This LCO states: Special Operations LCOs in Section 3.10 allow specified TS requirements to be changed to permit performance of special test and operations. Unless otherwise specified, all other TS requirements remain unchanged. The Basis of TS 3.0.7 clearly addresses the other TS requirements by defining all other TS requirements as those "not directly associated with or required to be changed to perform the special test or operation will remain in effect".

TS LCO 3.10.2 specifies that no other requirements than the definition of reactor modes applies. By changing the definition of Reactor Modes, the TSs authorize moving the mode switch out of the shutdown position when the additional requirements specified by TS LCO 3.10.2 are implemented. Because the TS definitions apply throughout the TSs, it can be

concluded that TS requirements are also changed. Since the required mode switch position is changed by TS LCO 3.10.2, the required action statement in TS LCO 3.3.2.1 for inoperable SRMs which requires the mode switch to be placed in the shutdown position was "directly associated with or required to be changed to perform the special test."

As can be realized from above the discussion, the TS Bases for TS 3.10.2 take no credit for the SRMs during reactor mode switch testing. However, the specifications rely on activities that preclude an unexpected reactivity excursion. That is, all control rods are fully inserted and no core alterations are taking place. Thus, it can be concluded that the actions specified by TS 3.10.2 compensate for the conditions requiring the mode switch to be in the shutdown position. Moving the mode switch from shutdown bypasses the control rod block, which was the Basis for the TS LCO 3.3.1.2 action. The basis for TS LCO 3.10.2 clearly state that with the controls in place (i.e., all control rods fully inserted and no core alterations), there is "no credible mechanism for unacceptable reactivity excursions during the planned interlock testing."

Based on the above discussion, there is no clear guidance in the TSs that state the steps taken to test the mode switch was a condition prohibited by the TSs. TS 3.10.2. do not take credit for SRM monitoring during mode switch testing. The requirements of TS LCO fully compensate for the lack of a control rod block the which is the bases for LCO 3.3.1.2, Condition D.

Following this discussion with the TVA staff, the NRC Senior Resident Inspector contacted the NRC Office Of Nuclear Reactor Regulation (NRR) for an interpretation. NRR concluded that TS LCO 3.10.2 does not apply to the requirement for mode switch position with inoperable SRMs.

Therefore, because of the failure to properly comply with the TS requirements for the source range monitor operability, during mode switch testing, this event is reportable in accordance with 10 CFR 50.73 (a)(2)(i)(B) as any operation or condition prohibited by the plants Technical Specifications.

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

None.

C. Dates and Approximate Times of Major Occurrences:

April 15, 2000, 1226 hours CDT	Unit 3 Reactor automatically scrams from 70 percent power.
April 16, 2000, 0820 hours CDT	Unit 3 entered TS LCO 3.10.2. in support of reactor mode switch testing , and performed mode switch testing in accordance with 3-SR-3.3.1.1.12.
April 17, 2000, 1735 hours CDT	Operations discovered that the 3-SR-3.3.1.2.4 had not been performed and initiated procedure.
April 17, 2000, 2235 hours CDT	SRMs A, B, and D are declared operable following successful completion of SRM testing.

D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

This condition was discovered by the BFN Operations review of routine activities and subsequent questioning by the NRC Resident Inspectors.

F. Operator Actions

None.

G. Safety System Responses

None.

III. CAUSE OF THE EVENT

A. Immediate Cause

Operations performed surveillance 3-SR-3.3.1.1.12 which moved the mode switch out of the Shutdown position under the allowances of TS LCO 3.10.2 without the completion of all the required surveillances for SRMs.

B. Root Cause

The root cause of this event was inadequate procedures which resulted in misapplication of the requirements for operability of the SRMs.

Abnormal Operating Instruction, 3-AOI-100-1, Reactor Scram, included steps to verify two of the four required SRs were in periodicity however, did not direct the operator to initiate 3-SR-3.3.1.2.4 to perform Source Range Monitor System Count Signal to Noise Ratio Check. Also, surveillance 3-SR-2 contained confusing detail. It implied that the signal to noise ratio surveillance was only required during fuel movement

Additionally, General Operating Instruction, 3-GOI-100-12A, Unit Shutdown From Power Operation To Cold Shutdown and Reductions In Power During Power Operations did not specify performance of the SRM signal to noise ratio test.

C. Contributing Factors

None.

IV. ANALYSIS OF THE EVENT

3-AOI-100-1 did not include the requirement for performing 3-SR-3.3.1.2.4. Surveillance 3-SR-2 specified that 3-SR-3.3.1.2.4 was applicable when the reactor was in hot shutdown but contained confusing notes that implied that 3-SR- 3.3.1.2.4 was only required during core alterations. This oversight was discovered on April 17, 2000, at approximately 1735 hours. On April 17, at 2235 hours, following completion of 3-SR-3.3.1.2.4, SRMs A, B, and D were declared operable. SRM C was inoperable prior to the scram. TS require only two channels to be operable when in Mode 3. Thus, the operators considered the minimum required channels to be operable with C channel inoperable.

V. ASSESSMENT OF SAFETY CONSEQUENCES

The SRMs have no safety function and are not assumed to function during a Final Safety Analysis Report design basis accident or transient analysis. The SRMs provide monitoring of neutron flux levels during startup and refueling operations. They provide monitoring of reactivity changes during fuel or control rod movement and give the control room operator early indication of subcritical multiplication that could be indicative of an approach to criticality. During the event, Unit 3 was in Mode 3 with all control rods inserted, and the vessel head closure bolts fully tensioned.

BFN TS 3.3.1.2 requires, with one or more required SRMs inoperable in Mode 3, within one hour, fully insert all insertable control rods and place the reactor mode switch in the shutdown position. BFN TSs provide specific allowances for changing the mode switch position for conducting interlock testing under specific circumstances. TS LCO 3.10.2 states that the reactor mode switch position for Modes 3 may be changed to include the run position, startup/hot standby position, and refuel position, and operation considered not to be in power operation or startup, to allow testing of the instrumentation associated with the reactor mode switch interlock functions, provided, a) all control rods remain fully inserted in core cells containing one or more fuel assemblies, and b) no core alterations are in progress. These conditions were maintained at all times during the mode switch testing.

The TS Basis for TS LCO 3.10.2 states, "with all control rods inserted in core cells containing one or more fuel assemblies, and no core alterations in progress, there are no credible mechanisms for unacceptable reactivity excursions during planned interlock testing."

During the Mode Switch testing, all control rods remained inserted and no core alterations were conducted. Additionally, subsequent successful performance of the signal to noise ratio surveillance proved that the SRMs were operable during mode switch testing. Accordingly, there were no actual or potential safety consequences as a result of this event.

VI. CORRECTIVE ACTIONS

A. Immediate Corrective Actions

The required SRs were performed and SRMs A, B, and D were verified to be operable.

Abnormal Operating Instruction (AOI), Reactor Scram, 3-AOI-100-1, was revised, directing the operator to initiate SRM count rate and signal to noise ratio check. Surveillance instruction, Instrument Checks and Observations, 3-SR-2, was revised clarifying when SRM signal to noise ratio testing is required

Additionally, General Operating Instruction (GOI), 3-GOI-100-12A, Unit Shutdown From Power Operation To Cold Shutdown and Reductions In Power During Power Operations, was revised providing guidance on operability of the SRMs and adding the requirement to perform source range monitor system count rate and signal to noise ratio check after unit shutdown.

B. Corrective Actions to Prevent Recurrence

TVA will perform additional procedure reviews to ensure requirements for other Special Operations TSs have been adequately implemented[1].

Training will be provided to licensed Operators on TS 3.10.2 requirements and other special operations TSs[1].

VII. ADDITIONAL INFORMATION

A. Failed Components

None.

B. Previous LERs on Similar Events

LER 260/1999-002, issued On May 6, 1999, discusses inadequate implementation of TS surveillance requirements during the performance of 2-SR-3.10.4, Verification of Surveillance Requirements for Single Control Rod Withdrawal - Cold Shutdown. During Control Rod Drive system testing, the SR for verification that all control rods other than the control rod being withdrawn, are fully inserted was not performed at the required frequency. The plant surveillance was written to apply to the withdrawal of single control rods during the testing evolution, the instruction was improperly used to document multiple withdrawals of single control rods during testing evolution. The root cause of the event was procedural inadequacy which lead to misinterpretation of the plant surveillance instruction. Recurrence control included revising applicable plant instructions to address multiple individual control rod withdrawals.

[1] TVA does not consider these corrective actions regulatory commitments. TVA's Corrective Action Program will track completion of these actions.

Although procedures played a role in this event, corrective actions taken as a result of the May, 1999 event, would not have lead to a correct implementation of the TS requirements for the SRMs.

C. Additional Information

None.

D. Safety System Functional Failure:

This event did not result in a safety system functional failure in accordance with NEI 99-02 Revision 0.

VIII. COMMITMENTS

None.

Energy Industry Identification System (EIIS) system and component codes are identified in the text by brackets (e,g., [XX]).