September 7, 2004

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 2 - DOCKET 50-260 - FACILITY OPERATING LICENSE DPR - 52 - LICENSEE EVENT REPORT (LER) 50-260/2004-002-00

The enclosed report provides details concerning an automatic reactor scram during startup due to indicated upscale trip on the intermediate range monitors.

This report is being submitted in accordance with 10 CFR 50.73 (a) (2) (iv) (A) as an event that resulted in automatic actuation of the systems listed in paragraph (a)(2)(iv)(B) (i.e., Reactor Protection System including: reactor scram or reactor trip).

There are no commitments contained in this letter.

Sincerely,

Original signed by:

Mike D. Skaggs

cc: See page 2

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(Via NRC Electronic Distribution)

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S:lic/submit/lers/LER 260/2004-02

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.

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Browns Ferry Nuclear Plant Unit 2	050000260	1 of 5

TITLE (4)

Automatic Reactor Scram During Startup Due To Spurious Upscale Trip On The Intermediate Range Monitors

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
									BFN Unit 2	05000260
07	10	2004	2004	-- 002	-- 00	09	07	2004	NA	DOCKET NUMBER

OPERATING MODE (9)	2	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)	001		20.2201(b)		20.2203(a)(2)(v)		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)	X	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, Mechanical Engineer, Licensing and Industry Affairs	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).	X	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On July 10, 2004, at 2235 hours Central Daylight Time (CDT) Unit 2 received an automatic reactor scram from approximately one percent power due to an upscale trip on Intermediate Range Monitor (IRM) E (Reactor Protection System (RPS) channel A), IRMs F and H (RPS channel B). At the time of the reactor scram, the Reactor Mode Switch was in Startup and the IRMs were on ranges 6 and 7. IRM C was bypassed and was being withdrawn from the core in support of a maintenance activity to verify the correlation between ranges 6 and 7. After placing IRM C in the bypass mode the operator commenced withdrawing the detector with a series of bumps (starts and stops of the drive mechanism). The goal was to obtain a 60 percent scale reading on IRM C. The full reactor scram occurred on the third bump of the drive mechanism. All systems responded as designed and all control rods fully inserted. No Emergency Core Cooling System or Primary Containment Isolation System set-points were reached; therefore, no other system actuations took place. Immediately following the reactor scram the Mode Switch was placed in, Shutdown.

The root cause of the upscale IRM trip was electrical noise generated by the movement of IRM C. This electrical noise caused voltage spikes on IRM E (RPS Channel A) and IRM F and H (RPS Channel B) that led to the subsequent reactor scram. Corrective actions include evaluation of the IRMs for possible upgrades to enhance noise isolation.

I. PLANT CONDITION(S)

At the time of the event, Unit 2 was in Mode 2 (Startup) at approximately 1 percent power, restarting following a July 8, 2004, reactor scram from 100 percent power (see LER 260/2004-001). Unit 3 was at 100 percent reactor power (approximately 3458 megawatts thermal), and it was not affected by this event. Unit 1 was shutdown and defueled, and it was also not affected by the event.

II. DESCRIPTION OF EVENT

A. Event:

On July 10, 2004, at 2235 hours Central Daylight Time (CDT) Unit 2 received an automatic reactor scram from approximately one percent power due to an upscale trip on Intermediate Range Monitor (IRM) E (Reactor Protection System (RPS) [JC] channel A), IRM F and IRM H (RPS channel B). At the time of the reactor scram, the Reactor Mode Switch was in Startup (Mode 2) and the IRMs were on ranges 6 and 7. IRM C was bypassed and was being withdrawn from the core in support of a maintenance activity to verify the correlation between ranges 6 and 7. After placing IRM C in the bypass mode, the operator commenced withdrawing the detector with a series of bumps (starts and stops of the drive mechanism). The goal was to obtain a 60 percent scale reading on IRM C. The full reactor scram occurred on the third bump of the drive mechanism.

All systems responded as designed, all control rods fully inserted. No Emergency Core Cooling System [BJ/BM/BN/BO] or Primary Containment Isolation System [JM] set-points were reached; therefore, no other system actuations took place. Immediately following the reactor scram the Mode Switch was placed in Shutdown (Mode 3).

This event is reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A), as an event that resulted in an automatic actuation of the systems listed in paragraph (a)(2)(iv)(B) (i.e., Reactor Protection System including: reactor scram or reactor trip).

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

None.

C. Dates and Approximate Times of Major Occurrences:

July 10, 2004, 2235 hours CDT	Operations received a full reactor scram. The Mode Switch was moved to Mode 3 immediately following the scram.
July 11, 2004, 0031 hours CDT	TVA made a four hour non-emergency report per 10 CFR 50.72(b)(iv)(B) and an eight hour non-emergency report per 10 CFR 50(b)(3)(iv)(A).

D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

Operations received alarms indicating a full reactor scram had occurred.

F. Operator Actions

Operations personnel responded to the event in accordance with applicable plant procedures.

G. Safety System Responses

No safety system actuations were required. As such, the safety systems responded as designed.

III. CAUSE OF THE EVENT

A. Immediate Cause

The immediate cause of the event was an upscale trip of IRMs E (RPS Channel A), F and H (RPS Channel B) during the withdrawal of IRM C. This satisfied the RPS logic for a full scram signal.

B. Root Cause

The root cause of the upscale IRM trip was electrical noise generated by the movement of IRM C. This electrical noise caused voltage spikes on IRM E (RPS Channel A) and IRM F and H (RPS Channel B) that lead to the subsequent reactor scram.

C. Contributing Factors

None.

IV. ANALYSIS OF THE EVENT

The IRMs monitor neutron flux to prevent fuel damage due to operational transients that may occur during this intermediate power range due to excessive power generation and to provide signals to the reactor protection system, so the release of radioactive material from the fuel barrier is minimized. The IRMs monitor and record core neutron flux levels between the startup range and the power range during startup and shutdown. The IRM functions are bypassed during Mode 1 (RUN).

The IRMS are arranged so each RPS channel contains four IRMs. RPS channel A contains IRM channels A, C, E, and G. RPS channel B contains IRM channels B, D, F, and H. System design and

plant Technical Specifications allow one channel IRM in each RPS channel to be bypassed without compromising the intermediate range monitoring neutron function. An upscale trip on one IRM channel on one RPS channel will cause a half scram signal. An upscale trip on one IRM channel in each RPS channel will result in a full scram signal. During startup activities, all of the IRMs were operable.

During the July 8, 2004, forced outage the pre-amplifier for IRM C was replaced due to previously identified problems. The work order that replaced the pre-amplifier required that the range correlation verification be performed during reactor Mode 2 (Startup). The test demonstrates the scale response for the pre-amplifier when the range switch was taken from high gain (range 6) to the low gain (range 7) and ensures the IRM indication will remain on scale when it is ranged up.

In accordance with the post maintenance test instruction, IRM C was placed in the bypass mode and then range 6. The IRM detector was to be withdrawn to a point where a 60 percent of scale reading was present. After placing IRM C in the bypass on range 6 the operator began to withdraw the detector with a series of bumps (starts and stops). On the third bump the full reactor scram was received.

Post scram data indicated the detectors that were on range 7, received an upscale trip. These were E (RPS Channel A), and F and H (RPS Channel B). The system responded correctly to the upscale trip through the initiation of the reactor scram.

V. ASSESSMENT OF SAFETY CONSEQUENCES

The safety consequences of this event were not significant. Reactor scram is an analyzed transient for which the plant is designed. Control rod insertion occurred as designed. No emergency makeup or system isolation was required during or following the event.

VI. CORRECTIVE ACTIONS

A. Immediate Corrective Actions

Operations personnel responded to the event in accordance with plant procedures following the reactor scram. The mode switch was taken to Shutdown, Mode 3.

B. Corrective Actions to Prevent Recurrence[1]

1. Evaluate IRMs for possible upgrades to enhance noise isolation.

1 TVA does not consider these corrective actions regulatory commitments. The completion of these actions will be tracked in TVA's Corrective Action Program.

2. Surveillance requirement (SR) Intermediate Range Monitor Calibration will be revised to include the following:

   - Range correlation for the IRMs performed when in the Startup (Mode 2) will be limited to monitor only with no IRM drive mechanism movement.
   - While performing range correlation portion of the IRM calibration procedure, if the range correlation criteria are not met, repairs shall be made to the preamplifier prior to continuing with the SR.

VII. ADDITIONAL INFORMATION

A. Failed Components

None.

B. Previous LERs on Similar Events

None.

C. Additional Information

None.

D. Safety System Functional Failure Consideration:

No safety functions were compromised as a result of this event. Therefore, this event is not considered a safety system functional failure in accordance with NEI 99-02 in that the functional capability of the overall system was not jeopardized.

E. Loss of Normal Heat Removal Consideration:

The condenser remained available providing a normal heat removal path following the reactor scram. Accordingly, this event did not result in a scram with a Loss of Normal Heat Removal as defined in NEI 99-02.

VII. COMMITMENTS

None.