October 10, 2007

U.S. Nuclear Regulatory Commission 10 CFR 50.73
ATTN: Document Control Desk
Mail Stop: OWFN, P1-35
Washington, D. C. 20555-0001

Dear Sir:

TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT (BFN) - UNIT 1 - DOCKET 50-259 - FACILITY OPERATING LICENSE DPR - 33 - LICENSEE EVENT REPORT (LER) 50-259/2007-007-00

The enclosed report provides details of an automatic reactor scram from a Neutron Monitoring Trip Signal.

TVA is reporting this in accordance with 10 CFR 50.73(a)(2)(iv)(A), as an event that resulted in a manual or automatic actuation of the systems listed in paragraph 10 CFR 50.73(a)(2)(iv)(B) (i.e., Reactor Protection System including reactor scram or trip, and general containment isolation signals affecting containment isolation valves in more than one system). There are no commitments contained in this letter.

Sincerely,

Original signed by:

R. G. Jones for:

Brian O'Grady

cc: See page 2

Enclosure
cc (Enclosure):

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NRC FORM 366 (6-2004)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2007
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)		Estimated burden per response to comply with this mandatory 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 and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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 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.

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
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4. TITLE: Automatic Reactor Scram From A Neutron Monitoring Trip Signal

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									None	N/A
08	11	2007	2007	-007	-00	10	10	2007	FACILITY NAME None	DOCKET NUMBER N/A

9. OPERATING MODE: 1

10. POWER LEVEL: 100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*

	20.2201(b)		20.2203(a)(3)(i)		50.73(a)(2)(i)(C)		50.73(a)(2)(vii)
	20.2201(d)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(A)
	20.2203(a)(1)		20.2203(a)(4)		50.73(a)(2)(ii)(B)		50.73(a)(2)(viii)(B)
	20.2203(a)(2)(i)		50.36(c)(1)(i)(A)		50.73(a)(2)(iii)		50.73(a)(2)(ix)(A)
	20.2203(a)(2)(ii)		50.36(c)(1)(ii)(A)	X	50.73(a)(2)(iv)(A)		50.73(a)(2)(x)
	20.2203(a)(2)(iii)		50.36(c)(2)		50.73(a)(2)(v)(A)		73.71(a)(4)
	20.2203(a)(2)(iv)		50.46(a)(3)(ii)		50.73(a)(2)(v)(B)		73.71(a)(5)
	20.2203(a)(2)(v)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(C)		OTHER
	20.2203(a)(2)(vi)		50.73(a)(2)(i)(B)		50.73(a)(2)(v)(D)		specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER *(Include Area Code)*
Steve Austin, Licensing Engineer, Licensing and Industry Affairs	256-729-2070

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED		15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES (*if yes, complete 15. EXPECTED SUBMISSION DATE*)	☒ NO		N/A	N/A	N/A

ABSTRACT (*Limit to 1400 spaces, i.e., approximately 15 single-spaced type written lines*)

On August 11, 2007, at 1751 hours central daylight time (CDT) Unit 1 automatically scrammed from a Neutron Monitoring Average Power Range Monitor [IG] (APRM) signal. Just prior to the scram, a Reactor Recirculation system flow sensing line separated from the Recirculation Pump 1B Flow Transmitter (1-FT-068-081). This resulted in a false indicated recirculation system low flow with a high reactor core thermal power (100 percent) to the Neutron Monitoring system. Based on these conditions, the neutron monitoring system initiated an APRM Simulated Thermal Power Flow Biased Reactor Scram. The root cause of this event is the TVA instruction for Instrument Line Installation does not provide descriptive instructions for confirmation of compression fitting assembly and final tightening. The procedure contains requirements for verification of fitting engagement and final tighting; however, these requirements are not descriptive in how the verifications are made. There are no steps to remove the fitting nut and visually verify proper engagement of the ferrule.

TVA is submitting this report in accordance with 10 CFR 50.73(a)(2)(iv)(A), as an event that resulted in a manual or automatic actuation of the systems listed in paragraph 10 CFR 50.73(a)(2)(iv)(B) (i.e., reactor protection system including reactor scram or trip, and general containment isolation signals affecting containment isolation valves in more than one system).

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

I. PLANT CONDITION(S)

Prior to the event, Unit 1 was operating at approximately 100 percent of rated thermal power (RTP) (3458 megawatts thermal). Units 2 and 3 were operating in Mode 1 at 100 percent RTP (3458 megawatts thermal). Units 2 and 3 were unaffected by the event.

II. DESCRIPTION OF EVENT

A. Event:

On August 11, 2007, at 1751 hours central daylight time (CDT) Unit 1 automatically scrammed from a Neutron Monitoring Average Power Range Monitor [IG] (APRM) signal. Just prior to the scram, a Reactor Recirculation [AD] system flow sensing line separated from the transmitter (1-FT-068-081). This resulted in a false indicated recirculation system low flow with a high reactor core thermal power (100 percent) to the Neutron Monitoring system. Based on these circumstances, the neutron monitoring system initiated an APRM Simulated Thermal Power Flow Biased Reactor Scram.

During the event, all automatic functions resulting from the scram occurred as expected. All of the control rods [AA] inserted. The reactor water level lowered to below level 3, 528 inches, hence; primary containment isolation system (PCIS) [JE] isolations Group 2 (residual heat removal (RHR) system [BO] shutdown cooling), Group 3 (reactor water cleanup (RWCU) system) [CE], Group 6 (ventilation), and Group 8 (traversing incore probe (TIP) [IG] system were received along with the autostart of the control room emergency ventilation (CREV) [VI] system and the three standby gas treatment (SGT) [BH] system trains. The reactor water level remained above level 2, 470 inches; accordingly, no emergency core cooling systems actuated. Reactor water level was recovered and maintained by the feedwater [SJ] and condensate [SG] systems. Reactor pressure was controlled by the main steam bypass valves [JI].

This report is submitted in accordance with 10 CFR 50.73(a)(2)(iv)(A), as an event that resulted in a manual or automatic actuation of the systems listed in paragraph 10 CFR 50.73(a)(2)(iv)(B) (i.e., reactor protection system including reactor scram or trip, and general containment isolation signals affecting containment isolation valves in more than one system).

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

None.

C. Dates and Approximate Times of Major Occurrences:

August 11, 2007 at 1751 hours CDT	Unit 1 received an automatic reactor scram.
August 11, 2007 at 2025 hours CDT	TVA made a four hour non-emergency report per 10 CFR 50.72(b)(2)(iv)(B) and an eight hour non-emergency report per 10 CFR 50.72(b)(3)(iv)(A).

D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

The reactor scram was immediately apparent to the control room staff through alarms and indications.

F. Operator Actions

Operations personnel responded to the event according to applicable plant procedures. Operations momentarily entered Emergency Operating Instruction, 1-EOI-1, Reactor Pressure Control, and Abnormal Operating Instruction, 1-AOI-100-1, Reactor Scram. The operator actions taken in response to the reactor scram were appropriate. These included the verification that the reactor was shutdown, the expected system isolations had occurred, and restoration of the affected systems to port scram alignment.

G. Safety System Responses

All control rods inserted. The PCIS Group 2 (RHR system shutdown cooling), Group 3 (RWCU system), Group 6 (ventilation), and Group 8 (TIP) isolations were received as expected, due to the lowering of the reactor water level, along with the auto start of the CREV system and the three SGT system trains. Reactor level was automatically restored with reactor feed water; therefore, emergency core cooling system actuation was not required.

III. CAUSE OF THE EVENT

A. Immediate Cause

The immediate cause of the reactor scram was improper engagement of the ferrule to the sense line to on the low pressure port on 1-FT-068-081B which allowed the sense line to disengage from the transmitter.

B. Root Cause

TVA instruction, Instrument Line Installation (MAI-4.4A) does not provide descriptive instructions for confirmation of compression fitting assembly and final tightening. The procedure contains requirements for verification of fitting engagement and final tighting; however, these requirements are not descriptive in how the verifications are made. There are no steps to remove the fitting nut and visually verify proper engagement of the ferrule.

C. Contributing Factors

None.

IV. ANALYSIS OF THE EVENT

The compression fitting that failed leading to this event was installed as part of Unit 1 recovery activities. The manufactures instructions for compression fitting installation include insert tubing into the fitting until the tube bottoms out. Tighten the nut finger tight; then, wrench-tighten the nut one and a quarter turns to seat the ferrule on the sense line. TVA postulates that those involved in the refurbishment of 1-FT-068-081B, the craft personnel, the second party verifier, and the Quality Control Inspectors failed to perform proper self-checking activities to ensure all of the attributes for the assembly of the compression fitting on the flow transmitter were addressed.

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

The instrument sense line was pressure tested on several occasions including hydrostatic pressure testing activities performed on March 19, 2007, and the reactor pressure vessel hydro performed on March 28, 2007. Neither of these activities detected the error. TVA postulates that the physical arrangement of the sense line held the tubing in place until it failed on August 11, 2007.

V. ASSESSMENT OF SAFETY CONSEQUENCES

The safety consequences of this event were not significant. The reactor scram was not complicated. All safety systems operated as required. PCIS groups 2, 3, 4, 6, and 8 isolations were as expected. The reactor water level lowered to level 3, but remained above level 2; therefore, ECCS systems did not actuate. Reactor water level was recovered and maintained by the reactor feed pumps.

Reactor scram from a turbine trip from 100% power is a transient for which BFN is analyzed. Therefore, TVA concludes that the health and safety of the public was not affected by this event.

VI. CORRECTIVE ACTIONS

A. Immediate Corrective Actions

Operations personnel placed the reactor in a stable condition according to plant procedures.

The instrument panels in the Unit 1 Reactor Building were inspected to identify leakage or visual fitting deficiencies. Blotter paper was placed under the instrument panels in the Unit 1 Reactor Building and monitored for leakage. Any leaks identified were corrected.

B. Corrective Actions to Prevent Recurrence [1]

TVA will revise MAI-4.4A to require that second party verifiers and QC inspectors physically remove the compression fitting nut following installation to verify proper engagement of the ferrule. TVA will review and if necessary, revise the initial tube fitting training to ensure the changes to MAI-4.4 are enforced during personnel indoctrination.

VII. ADDITIONAL INFORMATION

A. Failed Components

None.

B. Previous LERs on Similar Events

LER 259/2007-005 discusses a reactor scram that was the result of a false moisture separator tank high level signal. Although the root cause of this event was the sizing of the Moisture Separator Level Control Dump Valve, a leak in a compression fitting initiated the sequence of events that lead to the reactor scram. TVA's corrective actions for the event initiator were aimed at the balance of plant moisture separator level controllers. At the time of the scram, there was no indication that similar issues existed in the reactor recirculation system instrumentation discussed in this LER. Therefore, the corrective actions taken in LER 259/2007-005 would not prevent this event.

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

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

C. Additional Information

Corrective action document for the reactor scram is PER 128756.

D. Safety System Functional Failure Consideration:

This event is not considered a safety system functional failure in accordance with NEI 99-02.

E. Scram With Complications Consideration:

This event did not result in a complicated scram in accordance with NEI 99-02.

VIII. COMMITMENTS

None.