

June 9, 2005

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) 50-260/2005-003-00**

The enclosed report provides details of an event which involved a valid initiation of the reactor protection system while shutdown. TVA is reporting this event pursuant to the requirements of 10 CFR 50.73(a)(2)(iv)(A).

There are no commitments contained in this letter.

Sincerely,

Original Signed by:

Mike D. Skaggs

cc: See page 2

U.S. Nuclear Regulatory Commission
Page 2
June 9, 2005

Enclosure

cc (Enclosure):

Ms. Eva Brown, Project Manager
U.S. Nuclear Regulatory Commission
(MS 08G9)
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852-2739

Mr. Stephen J. Cahill, Branch Chief
U.S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, Georgia 30303-8931

NRC Resident Inspector
Browns Ferry Nuclear Plant
10833 Shaw Road
Athens, Alabama 35611-6970

U.S. Nuclear Regulatory Commission
Page 3
June 9, 2005

WDC:DTL:PSH:BAB

Enclosure

cc (Enclosure):

- A. S. Bhatnagar, LP 6A-C
- J. C. Fornicola, LP 6A-C
- N. M. Moon, BR 4T-C
- R. F. Marks, PAB 1C-BFN
- R. G. Jones, NAB 1A-BFN
- K. L. Krueger, POB 2C-BFN
- J. R. Rupert, NAB 1A-BFN
- K. W. Singer, LP 6A-C
- M. D. Skaggs, POB 2C-BFN
- E. J. Vigluicci, ET 11A-K
- NSRB Support, LP 5M-C
- LEREvents@inpo.org
- EDMS WT CA - K

S:\lic\submit\lers\260-2005-03.doc

NRC FORM 366 (6-2004)		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED BY OMB NO. 3150-0104		EXPIRES 06/30/2007							
<h2 style="margin: 0;">LICENSEE EVENT REPORT (LER)</h2> <p style="margin: 10px 0 0 40px;">(See reverse for required number of digits/characters for each block)</p>				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 Browns Ferry Unit 2				2. DOCKET NUMBER 05000260		3. PAGE 1 OF 5							
4. TITLE Reactor Protection System Actuation from Scram Discharge Volume High Level while Shutdown													
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			
04	13	2005	2005-003-00			06	09	2005	none	N/A			
9. OPERATING MODE 4			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §:(Check all that apply)										
10. POWER LEVEL 0			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 Paul S. Heck, Nuclear Engineer, Licensing and Industry Affairs								TELEPHONE NUMBER (Include Area Code) 256-729-3624					
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						
<input type="checkbox"/> YES (if yes, complete 15. EXPECTED SUBMISSION DATE)							<input checked="" type="checkbox"/> NO						
							MONTH	DAY	YEAR				
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)													
<p>On April 13, 2005, Unit 2 was in cold shutdown with surveillance testing being performed in support of returning the unit to power operations. At approximately 0954 hours, an unplanned actuation of one channel of the anticipated transient without scram/alternate rod insertion logic occurred. The actuation was caused by an interaction between a surveillance test being actively performed and another test which had been in conduct, but which was halted for troubleshooting an equipment issue. The plant equipment response to this logic actuation isolated and vented the control rod drive (CRD) scram air header, causing the scram inlet and outlet valves on each CRD hydraulic control unit (HCU) to open and the scram discharge volume (SDV) vent and drain valves to close. With the scram outlet valves open, per plant design a flow path exists from the reactor vessel, through the 185 individual control rod drives and the open scram outlet valve on each drive's HCU, to the associated SDV (east or west), and each SDV began filling. Level switches on the associated scram discharge instrument volumes (SDIV) sensed the increasing water level, and at approximately 0955 hours, Unit 2 received a reactor scram from high water level in both the east and west SDIV's. All control rods were already fully inserted prior to the scram. There was no impact to plant operations as a result of the scram.</p> <p>The root cause of the event was inadequate communication between different plant testing groups. Corrective actions include re-emphasis to site personnel involved in testing of the necessity for clear, unambiguous communication.</p>													

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Browns Ferry Nuclear Plant Unit 2	05000260	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 5
		2005	-- 003	-- 00	

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

I. PLANT CONDITION(S)

At the time of this event, Unit 2 was in Mode 4 during its Cycle 13 refueling outage. Unit 1 was shutdown and defueled and was unaffected by the event. Unit 3 was in Mode 1 at approximately 3458 megawatts thermal (100 percent power) and was also unaffected by this event.

II. DESCRIPTION OF EVENT**A. Event:**

On April 13, 2005, Unit 2 was in cold shutdown (Mode 4) during the latter stages of refueling outage U2C13, with surveillance testing being performed in support of returning the unit to power operations. At approximately 0954 hours central daylight time (CDT), an unplanned actuation of one channel of the anticipated transient without scram/alternate rod insertion (ATWS/ARI) logic occurred. The actuation was caused by an interaction between a surveillance test being actively performed and another surveillance test which had been in conduct, but which was halted for troubleshooting an equipment issue. The plant equipment response to this logic actuation isolated and vented the control rod drive (CRD) [AA] scram air header, causing the scram inlet and outlet valves on each CRD hydraulic control unit (HCU) to open and the scram discharge volume (SDV) vent and drain valves to close. With the scram outlet valves open, per plant design a flow path exists from the reactor vessel, through the 185 individual control rod drives and the open scram outlet valve on each drive's HCU, to the associated SDV (east or west), and each SDV began filling. Each SDV (east/west) has an associated scram discharge instrument volume (SDIV) physically located beneath it, and each SDIV is instrumented to initiate a reactor scram upon high level, thereby ensuring all control rods are fully inserted prior to the filling of the associated SDV itself. This action occurred in accordance with the plant design, and at approximately 0955 hours CDT, Unit 2 received a reactor scram from high water level in both the east and west SDIV's. All control rods were already fully inserted prior to the scram. There was no impact to plant operations as a result of the scram.

This event resulted in filling of the SDIV's and thereby the initiation of a valid, automatic actuation of the reactor protection system (RPS) [JC] on SDIV high level. The scram was not part of a pre-planned sequence, therefore this event is reportable in accordance with 10 CFR 50.73 (a) (2) (iv) (A).

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

None

C. Dates and Approximate Times of Major Occurrences:

April 12, 2005	1555 hours CDT	Instrument Maintenance (IM) technicians commenced performance of calibration testing on reactor water level instrument loop 2-L-3-58B
	1835 hours CDT	Instrument loop calibration activities halted for troubleshooting an equipment issue
April 13, 2005	0815 hours CDT	Operations commenced performance of surveillance testing on reactor core isolation cooling (RCIC) initiation logic
	0954 hours CDT	ATWS/ARI logic initiation occurred with resulting reactor scram on high SDIV level closely following. With Unit 2 in cold shutdown, there was no significant plant impact from the scram logic actuation.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Browns Ferry Nuclear Plant Unit 2	05000260	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 5
		2005	-- 003	-- 00	

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

D. Other Systems or Secondary Functions Affected

None

E. Method of Discovery

Operations personnel received control room annunciation of the automatic reactor scram.

F. Operator Actions

Operator action in response to this event was appropriate. Since Unit 2 was shutdown and in Mode 4 at the time of the event, the occurrence of the scram did not result in a plant transient. The control room crew suspended surveillance testing activities and took the necessary actions to verify the source of the scram.

G. Safety System Responses

The only safety systems and/or components required to respond to the event were the RPS and portions of the CRD system. The switches monitoring the east and west SDIV levels properly sensed the fill event, and the RPS logic properly responded to the level switch operation by initiating a reactor scram. The CRD HCU's and SDV vent and drain valves operated in accordance with the plant design during this event.

III. CAUSE OF THE EVENT

A. Immediate Cause

The immediate cause of this event was the inadvertent actuation of the ATWS/ARI logic which led to the filling of the east and west SDIV's beyond the high level reactor scram setpoint.

B. Root Cause

The root cause of this event was inadequate communication between the Operations and IM testing groups. It was not clearly understood by the Operations test director that, even though surveillance testing had been halted, test equipment was still connected in the field while the related troubleshooting was being conducted.

C. Contributing Factors

None

IV. ANALYSIS OF THE EVENT

IM personnel commenced testing of a reactor vessel water level instrument loop on April 12, 2005. This testing included the connection of a volt-ohm meter (VOM) across a set of logic relay contacts for the purpose of verifying contact operation. During the test conduct, an incorrect equipment response was identified, and testing was halted to perform troubleshooting. The VOM connection, which was properly documented by sign-offs in the procedure, was left in place while this troubleshooting was performed.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Browns Ferry Nuclear Plant Unit 2	05000260	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 5
		2005	-- 003	-- 00	

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

Operations personnel were responsible for performing a separate surveillance test on reactor core isolation cooling (RCIC) initiation logic, and it was understood by both Operations and IM personnel that the water level instrument loop testing and the RCIC logic testing could not be conducted simultaneously. However, with the water level instrument loop surveillance testing temporarily halted for the previously mentioned troubleshooting, the decision was made to proceed with the RCIC logic testing. The status of the water level surveillance troubleshooting and what test equipment was still installed in the field (i.e., VOM connected) was not clearly communicated between the two testing groups.

The VOM installed by the water level instrument loop test procedure was configured to monitor relay contact resistance, and in such a configuration, the meter itself acted as a closed logic contact to the associated logic circuitry. During performance of the RCIC logic testing, a separate, series relay was actuated. The actuation of this relay, together with the VOM placed across the series contacts in the other logic channel, resulted in completion of Channel A of the ATWS/ARI initiation logic. The ATWS/ARI logic isolated and vented the CRD scram air header, and this action resulted in opening the HCU scram inlet and outlet valves and filling the SDIV's. The reportable RPS logic actuation then occurred.

V. ASSESSMENT OF SAFETY CONSEQUENCES

The ATWS/ARI logic, the actuated equipment, and the RPS all operated in accordance with the plant design. At the time of this event, Unit 2 was shutdown in Mode 4, and all control rods were already fully inserted into the core. The reactor scram from high SDIV level is part of the BFN design, and the occurrence of this event from at-power conditions has been analyzed. It should be noted that the testing environment during cold shutdown conditions is quite different from that with the reactor at power, and the conduct of testing similar to that which led to this event would undergo greater scrutiny prior to authorization for at-power performance, particularly if there were any possibility of conflict with other plant activities.

Based on the above discussion, it is apparent there was no adverse safety impact of this event, either as it occurred or if it had hypothetically occurred with the reactor at power. There was no effect on the health and safety of the public.

VI. CORRECTIVE ACTIONS**A. Immediate Corrective Actions**

Surveillance testing was halted and the interaction between the two tests identified. The VOM was removed from the circuit and the RCIC logic testing satisfactorily completed.

B. Corrective Actions to Prevent Recurrence⁽¹⁾

- The essential nature of clear, unambiguous communication will be reinforced to site personnel involved in testing activities

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

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Browns Ferry Nuclear Plant Unit 2	05000260	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 OF 5
		2005	-- 003	-- 00	

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

VII. ADDITIONAL INFORMATION

A. Failed Components

None

B. Previous LERs on Similar Events

None

C. Additional Information

Browns Ferry corrective action document PER 80721

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. The RPS responded properly to the SDIV high level condition.

E. Loss of Normal Heat Removal Consideration:

This event occurred with the reactor in Mode 4 (cold shutdown), and the main condenser was not in service, nor was it needed, at the time of this event.

VIII. COMMITMENTS

None