



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

September 10, 2010

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

10 CFR 50.73

Browns Ferry Nuclear Plant, Unit 2
Facility Operating License No. DPR-52
NRC Docket No. 50-260

Subject: Licensee Event Report 50-260/2010-005-00

The enclosed Licensee Event Report (LER) provides details of a High Pressure Coolant Injection (HPCI) system isolation experienced during performance of HPCI steam supply low pressure functional test. The Tennessee Valley Authority is submitting this report in accordance with 10 CFR 50.73 (a)(2)(v)(D) as, any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident.

There are no commitments contained in this letter. Should you have any questions concerning this submittal, please contact James Emens, Site Licensing and Industry Affairs Manager at (256) 729-2636.

Respectfully


James J. Polson
Vice President

Enclosure: Licensee Event Report - High Pressure Coolant Injection System Isolation Experienced During Performance Of High Pressure Coolant Isolation Steam Supply Low Pressure Functional Test

cc (w/ Enclosure):

NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Browns Ferry Nuclear Plant

JE22
NRR

Enclosure

**Browns Ferry Nuclear Plant
Unit 2**

**Licensee Event Report - High Pressure Coolant Injection System Isolation
Experienced During Performance Of High Pressure Coolant Isolation Steam Supply
Low Pressure Functional Test**

SEE ATTACHED:

LICENSEE EVENT REPORT (LER)

Estimated burden per response to comply with this mandatory collection request: 80 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: High Pressure Coolant Injection System Isolation Experienced During Performance Of High Pressure Coolant Isolation Steam Supply Low Pressure Functional Test

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
07	12	2010	2010	005	00	09	10	2010	None	N/A
									None	N/A

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)									
	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
10. POWER LEVEL 100	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER						
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A						

12. LICENSEE CONTACT FOR THIS LER

NAME
Steve Austin, Licensing Engineer

TELEPHONE NUMBER (Include Area Code)
256-729-2070

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED

YES (If yes, complete 15. EXPECTED SUBMISSION DATE) NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR
N/A	N/A	N/A

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

On July 12, 2010, at approximately 1230 Central Daylight Time (CDT), Browns Ferry Nuclear Plant (BFN) maintenance personnel commenced a scheduled performance of Surveillance Procedure, 2-SR-3.3.6.1.2(3B), High Pressure Coolant Injection (HPCI) Steam Line Supply Low Pressure Functional Test on the Unit 2 HPCI system. At 1310 CDT, the Unit 2 HPCI system unexpectedly received a Unit 2 Group 4 HPCI Primary Containment Isolation Signal (PCIS). Also, at 1310 hours CDT, Operations personnel declared the HPCI system inoperable and entered Technical Specification (TS) Limiting Condition for Operation 3.5.1 Action C, which requires verifying by administrative means that the Unit 2 Reactor Core Isolation Cooling (RCIC) system is operable, and restoring the Unit 2 HPCI system to operable status within 14 days. Operations verified that the RCIC system was operable. Operations entered Abnormal Operating Instruction, 2-AOI-64-2B, Group 4 High Pressure Coolant Isolation. By 1325 hours CDT, Operations personnel reset the HPCI system isolation using the applicable portions of 2-AOI-64-2B, and Operating Instruction, 2-OI-73, High Pressure Coolant Injection, and placed the Unit 2 HPCI system in standby readiness, exiting the TS Action. The immediate cause for the HPCI system isolation was the installation of multiple volt ohm meters (VOMs) on the associated circuits during performance of the surveillance. The apparent cause of the event is a lack of clear procedural guidance allowing the performer to interpret the requirements in the procedure and inappropriately place multiple VOMs on the associated circuit. The HPCI Low Steam Header Isolation Switch Functional test was revised to eliminate the need for performer interpretation. The procedure revisions included steps to connect and disconnect each VOM during checks for voltage.

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Browns Ferry Nuclear Plant Unit 2	05000260	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 of 5
		2010	-- 005	-- 00	

NARRATIVE

I. PLANT CONDITION(S)

Browns Ferry Nuclear Plant (BFN) Units 2 and 3 were operating in Mode 1 at 100 percent thermal power. BFN Unit 1 was operating in Mode 1 at approximately 80 percent power.

II. DESCRIPTION OF EVENT

A. Event:

On July 12, 2010, at approximately 1230 Central Daylight Time (CDT), BFN maintenance personnel commenced a scheduled performance of Surveillance Procedure, 2-SR-3.3.6.1.2(3B), High Pressure Coolant Injection (HPCI) [BJ] Steam Line Supply Low Pressure Functional Test on the Unit 2 HPCI system. At 1310 CDT, the Unit 2 HPCI [BJ] system unexpectedly received a Unit 2 Group 4 Primary Containment Isolation Signal (PCIS) [JE]. Group 4 isolation provides for isolation of the HPCI system, and includes the HPCI steam supply isolation valve, and the HPCI pump torus suction isolation valves. Also, at 1310 hours CDT, Operations personnel declared the HPCI system inoperable and entered Technical Specification (TS) Limiting Condition for Operation 3.5.1 Action C, which requires verifying by administrative means that the Reactor Core Isolation Cooling (RCIC) [BN] system is operable, and restoring the HPCI system to operable status within 14 days. Operations verified that the RCIC system was operable. Operations entered Abnormal Operating Instruction, 2-AOI-64-2B, Group 4 High Pressure Coolant Isolation.

By 1325 hours CDT, Operations personnel reset the Unit 2 HPCI system isolation and placed the HPCI system in standby readiness, exiting the TS Action.

The Tennessee Valley Authority (TVA) is submitting this report in accordance with 10 CFR 50.73(a)(2)(v)(D), as any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident.

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

None

C. Dates and Approximate Times of Major Occurrences:

July 12, 2010, at 1310 hours CDT	Inadvertent isolation of the Unit 2 HPCI system during performance of 2-SR-3.3.6.1.2(3B).
July 12, 2010, at 1325 hours CDT	Operations returned the Unit 2 HPCI system to standby readiness.
July 12, 2010, at 1731 hours CDT	Operations made an Non-Emergency Notification System report to the NRC in accordance with 10 CFR 50.72(b)(2)(v).

D. Other Systems or Secondary Functions Affected

None

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E. Method of Discovery

Unit 2 main control room Operations personnel noted the Unit 2 HPCI system had isolated. The surveillance performer also realized that there was an unexpected response to the procedure.

F. Operator Actions

None

G. Safety System Responses

None

III. CAUSE OF THE EVENT

A. Immediate Cause

The immediate cause for the HPCI System isolation was the installation of multiple volt ohm meters (VOMs) in the associated pressure switch circuits during performance of the surveillance. The VOMs were placed on terminals specified by the surveillance procedure to determine the presence of voltage on the pressure switch circuits to be tested. TVA's evaluation concluded that multiple VOMs installed across multiple circuits simultaneously, and set to the procedure specified range or scale, caused the PCIS Group 4 isolation signal.

B. Root Cause

The cause of the event is a lack of clear procedural guidance that allowed the performer to interpret the requirements in the surveillance procedure.

The steps in the procedure did not clearly indicate that the intent was to only momentarily place a VOM on terminals and then remove the VOM once the required checks were completed. It was not understood by the performer that placing multiple VOMs across the terminals would allow current to flow across the terminals and cause the Group 4 isolation when simulating the HPCI system low steam supply pressure test.

C. Contributing Factors

None

IV. ANALYSIS OF THE EVENT

The PCIS Group 4 isolation was received during the performance of Section 7.2, HPCI Low Pressure Steam Supply (2-PS-073-0001A) of the surveillance procedure. The investigation concluded the maintenance personnel involved in performance of the surveillance performed the procedure as written.

The procedural steps for placement of the VOMs are as follows:

7.2 HPCI Low Press Steam Supply (2-PS-073-0001A)

[2] PLACE VOM set on 300 VDC Scale between 2-TB-073-0111/JJ-13 and 2-TB-073-0111/JJ-14 for 2-PS-073-0001A and VERIFY no voltage is present if voltage is present, THEN

PERFORM the following; otherwise, NA Step 7.2[3] and CONTINUE.

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[3] CHANGE voltage scale of VOM and VERIFY voltage is induced. IF voltage is not induced, THEN STOP work and notify the Instrument Foreman.

The above steps were repeated during the performance of the surveillance until an individual VOM was installed on each of four sets of terminals. The personnel involved misinterpreted the procedural steps to require installing a separate VOM on each set of terminals assuming that each VOM would be removed at a later step.

During the progression of the procedural steps which immediately followed the installation of the VOMs, the performers were instructed, if voltage is present, change the voltage scale of the VOM down to the 30 volts direct current (VDC) range and verify that voltage present is induced. Each of the VOMs had been ranged down to the 30 VDC range. The intent of these procedural requirements is to check for stray or induced voltage across the pressure switch circuits to be tested.

Subsequently, the procedure required that (1) a VOM set on the resistance (i.e., ohm) scale be connected across terminals 2-TB-073-0111/KK-18 and 2-TB-073-0111/KK-19 to verify the operability of the HPCI Steam Line Pressure - Low function of pressure switch (PS) 2-PS-073-1A and (2), a drain valve momentarily opened to simulate low pressure in the HPCI steam supply line. When the drain valve was opened, the Group 4 isolation occurred. The performer, realizing that there was an unexpected response to the surveillance steps, stopped the performance of the surveillance and notified the main control room.

At the time the unexpected PCIS Group 4 isolation signal was received, there were four VOMs in the PS circuit. Three of the VOMs were set on 30 VDC and the fourth VOM was on the ohm scale as directed by the surveillance procedure.

Following the initial event, troubleshooting activities confirmed that when multiple VOMs are installed with the range setting on the lower ranges approximately 2.88 milliamps was passed through the circuit. This amount is enough current to complete the 1 out of 2 taken twice logic, causing the PCIS Group 4 isolation signal.

V. ASSESSMENT OF SAFETY CONSEQUENCES

The safety consequences of the event were not significant. BFN TSs allows continued power operation for up to 14 days with the HPCI system inoperable provided the RCIC system is operable. The RCIC system was verified by administrative means to be operable during the time HPCI was inoperable. Therefore, TVA concludes that there was no significant reduction in the protection of the public by this event.

VI. CORRECTIVE ACTIONS

A. Immediate Corrective Actions

Unit 2 Operations personnel terminated the performance of 2-SR-3.3.6.1.2(3). Operations personnel subsequently entered 2-AOI-64-2B and returned the Unit 2 HPCI to standby readiness.

B. Corrective Actions to Prevent Recurrence

The corrective actions to prevent recurrence are being managed by TVA's Corrective Action Program.

During the investigation, maintenance personnel recognized that similar step guidance was contained within the surveillance procedures for the Units 1 and 3 HPCI Low Steam Header

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Isolation Switch Functional Test, and the Units 1, 2, and 3 RCIC Low Steam Header Isolation Switch Functional Test. The surveillance procedures for Units 1 and 3 HPCI Low Steam Header Isolation Switch Functional Test and the surveillance procedures for the Units 1, 2, and 3 RCIC Low Steam Header Isolation Switch Functional Test were revised to eliminate the need for performer interpretation. The procedure revisions included steps to connect and disconnect each VOM during checks for voltage.

This event will be discussed in the Continuing Training program and the Initial Training programs.

VII. ADDITIONAL INFORMATION

A. Failed Components

None

B. Previous LERs on Similar Events

None

C. Additional Information

Corrective action document for this report is Problem Evaluation Report - 239313.

D. Safety System Functional Failure Consideration:

This event is a safety system functional failure in accordance with NEI 99-02.

E. Scram With Complications:

This event was not a complicated scram according to NEI 99-02.

VIII. COMMITMENTS

None