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

August 16, 2010

10 CFR 50.73

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

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

Subject: **Licensee Event Report 50-260/2010-004-00**

The enclosed Licensee Event Report provides details of inadvertent isolation of the high pressure coolant injection system during testing activities. The Tennessee Valley Authority is submitting this report in accordance with 10 CFR 50.73(a)(2)(v)(D), 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 new regulatory commitments contained in this letter. Should you have any questions concerning this submittal, please contact Dan Williamson, Acting Site Licensing and Industry Affairs Manager, at (256) 729-2636.

Respectfully,

K. J. Polson
Vice President

Enclosure
cc (w/ Enclosure):

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

IE22
NRR

NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 08/31/2010

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.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
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4. TITLE: HPCI Isolation During Time Delay Relay Calibration

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
									N/A	N/A
06	16	2010	2010	- 004 -	00	08	16	2010	FACILITY NAME N/A	DOCKET NUMBER N/A

9. OPERATING MODE

1

10. POWER LEVEL

89

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)	☐ 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)*
Eric Bates, Licensing Engineer	256-614-7180

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

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

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR
NA	NA	NA

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

On June 16, 2010, at 1258 Central Daylight Time (CDT), the High Pressure Coolant Injection (HPCI) system received an isolation signal during the performance of procedure 2-SR-3.3.6.1.6(3), the surveillance for the HPCI time delay relay calibration. At 1320 hours CDT, operations personnel discovered 2-FCV-73-2 (HPCI steam line inboard isolation valve) and 2-FCV-73-3 (HPCI steam line outboard isolation valve) were isolated. Operations personnel entered Abnormal Operating Instruction, Group 4 HPCI Isolation, 2-AOI-64-2B. HPCI Auto Isolation Logic was reset at 1807 hours CDT. The surveillance was re-performed without incident at 2034 hours CDT.

Subsequent investigation determined that contacts 1 and 2 of relay 2-RLY-073-23A-K9 made contact during the testing of this relay.

The cause is relay contact protective boots failed to prevent a contact pair from making contact during testing that resulted in the HPCI isolation. The contact boots that are used during the surveillance are made by cutting off the fingers of a heavy rubber glove. TVA has determined that depending on this type of boot used for circuit isolation during testing is a weak maintenance practice.

The corrective action is to survey other sites and utilities to determine what alternative "booting" methods are available, and implement use of the appropriate alternative method at BFN to improve boot effectiveness and reliability.

I. PLANT CONDITION(S)

At the time of discovery, Browns Ferry Nuclear Plant (BFN), Units 1 and 3 were at approximately 100 percent power (3458 MWT) and unaffected by the event. Unit 2 was at approximately 89 percent power.

II. DESCRIPTION OF EVENT

A. Event:

On June 16, 2010, at 0900 Central Daylight Time (CDT), the High Pressure Coolant Injection (HPCI) [BJ] system was declared inoperable for the purpose of performing the surveillance instruction for the "HPCI Time Delay Relay Calibration" (2-SR-3.3.6.1.6(3)). Operations entered Technical Specification (TS) Limiting Condition for Operation (LCO) 3.5.1 Condition C, requiring immediate verification by administrative means that the RCIC system is operable and restoring the HPCI system to operable status in 14 days. The Reactor Core Isolation Cooling (RCIC) [BN] system was verified operable.

At 1258 CDT, the HPCI system received an isolation signal during the performance of 2-SR-3.3.6.1.6(3). Operations personnel discovered the 2-FCV-73-2 (HPCI steam line inboard isolation valve) and 2-FCV-73-3 (HPCI steam line outboard isolation valve) were isolated, at 1320 hours CDT, while removing Unit 2 Loop II Residual Heat Removal from the Suppression Pool Cooling mode of operation. Operations personnel entered Abnormal Operating Instruction, Group 4 HPCI Isolation, 2-AOI-64-2B.

At 1807 hours CDT, HPCI Auto Isolation Logic was reset.

At 2034 hours CDT, 2-SR-3.3.6.1.6(3) was re-performed without incident.

On June 17, 2010, at 0230 hours CDT, HPCI was declared operable.

Subsequent investigation determined that contacts 1 and 2 of relay 2-RLY-073-23A-K9 made contact during the testing of this relay.

TVA is submitting this report in accordance with 10 CFR 50.73(a)(2)(v)(D), as any event that could have prevented fulfillment of a 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:

June 16, 2010, at 0900 hours CDT	HPCI inoperable for performance of procedure 2-SR-3.3.6.1.6(3). HPCI entered in TS LCO 3.5.1 Condition C. RCIC verified operable.
June 16, 2010, at 1258 hours CDT	HPCI isolated during 2-SR-3.3.6.1.6(3).
June 16, 2010, at 1320 hours CDT	Operations personnel discovered an isolation signal that resulted in isolation of 2-FCV-73-2 (HPCI steam line inboard isolation valve) and 2-FCV-73-3 (HPCI steam line outboard isolation valve).

June 16, 2010, at 1807 hours CDT	HPCI Auto Isolation Logic reset.
June 16, 2010, at 2001 hours CDT	Operations personnel made a non-emergency eight hour NRC phone call in accordance with 10 CFR 50.72(b)(3)(v)(D).
June 16, 2010, at 2034 hours CDT	Surveillance 2-SR-3.3.6.1.6(3) was re-performed without incident.
June 17, 2010, at 0230 hours CDT	HPCI declared operable.

D. Other Systems or Secondary Functions Affected

None

E. Method of Discovery

Operations personnel noted the HPCI isolation indicating light was illuminated on the main control room panel.

F. Operator Actions

Operations personnel performed actions in 2-AOI-64-2B to reset Group 4 HPCI isolation.

G. Safety System Responses

None

III. CAUSE OF THE EVENT

A. Immediate Cause

The immediate cause for HPCI Isolation was contacts 1 and 2 of relay 2-RLY-073-23A-K9 made contact during the testing of this relay.

B. Root Cause

The cause is relay contact protective boots failed to prevent a contact pair from making contact during testing that resulted in the HPCI isolation. The contact boots that are used during the surveillance are made by cutting off the fingers of a heavy rubber glove. TVA has determined that depending on this type of boot used for circuit isolation during testing is a weak maintenance practice.

C. Contributing Factors

None

IV. ANALYSIS OF THE EVENT

The HPCI system responded as designed by isolating valves 2-FCV-73-2 and 2-FCV-73-3.

It was determined the isolation occurred from an event involving relay 2-RLY-073-23A-K9, which should have had contacts 2 and 4 booted for testing. Data obtained from the integrated computer system indicated that only contact 4 was effectively booted.

Subsequent investigation determined contacts 1 and 2 of relay 2-RLY-073-23A-K9 made contact during the testing of this relay.

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

The boots, which are used for testing, are the tips of heavy rubber gloves that are shop made from cut-off glove fingers. There have been issues with boots coming off of the contacts during testing activities in the past. Currently, BFN uses two boots on a relay contact (double booting). However, the protective boots failed to prevent relay contacts 1 and 2 from making contact, which caused the HPCI isolation.

V. ASSESSMENT OF SAFETY CONSEQUENCES

The safety consequences of this event were not significant. TS allow continued power operation for up to 14 days with the HPCI system inoperable when the RCIC system is operable. HPCI was out of service for planned testing when the isolation occurred. For this event, the other required Emergency Core Cooling Systems were operable and remained capable of mitigating design basis accidents and transients assumed in the Updated Final Safety Analysis Report. The RCIC system was verified operable before declaring HPCI system inoperable for the performance of 2-SR-3.3.6.1.6(3) and entering LCO 3.5.1 Condition C. TVA concludes that there was no significant reduction in the protection of the public by this event.

VI. CORRECTIVE ACTIONS

The corrective actions are being managed within TVA's Corrective Action Program.

A. Immediate Corrective Actions

The HPCI isolation was reset. Involved employees were removed from work and an investigation was immediately performed. The testing was re-performed with a different work crew without incident.

B. Corrective Actions to Prevent Recurrence

Survey other sites and utilities to determine what alternative "booting" methods are available, and implement use of the appropriate alternative method at BFN to improve boot effectiveness and reliability.

VII. ADDITIONAL INFORMATION

A. Failed Components

None

B. PREVIOUS LERS ON SIMILAR EVENTS

None

C. Additional Information

The corrective action document for this report is PER 235338.

D. Safety System Functional Failure Consideration:

This event is classified as a safety system functional failure according to NEI 99-02.

LICENSEE EVENT REPORT (LER)

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

E. Scram With Complications Consideration:

This event did not include a reactor scram.

VIII. COMMITMENTS

None