

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

John T. Herron  
Vice President, Browns Ferry Nuclear Plant

December 17, 1999

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

10 CFR 50.73

Dear Sir:

**BROWNS FERRY NUCLEAR PLANT (BFN) - UNIT 2 - DOCKET 50-260 -  
FACILITY OPERATING LICENSE DPR-52 - LICENSEE EVENT REPORT (LER)  
50-260/1999-011-000**

The enclosed report provides details concerning the Unit 2 High Pressure Coolant Injection System being made inoperable due to an oil system breach during corrective maintenance.

This condition is reportable in accordance with 10 CFR 50.73 (a)(2)(v) as a condition that alone could have prevented the fulfillment of the safety function of a structure or system needed to mitigate the consequences of an accident. There are no commitments contained in this letter.

Sincerely,

  
John T. Herron

cc: See page 2

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Enclosure

cc (Enclosure):

Mr. William O. Long, Senior Project Manager  
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Rockville, Maryland 20852-2739

Mr. Paul E. Frederickson, Branch Chief  
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NRC Resident Inspector  
Browns Ferry Nuclear Plant  
10833 Shaw Road  
Athens, Alabama 35611

FACILITY NAME (1) Browns Ferry Nuclear Plant Unit 2 DOCKET NUMBER (2) 05000260 PAGE (3) 1 of 5

TITLE (4) High Pressure Coolant Injection (HPCI) Inoperable Due To Oil System Breach

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER				FACILITY NAME	DOCKET NUMBER
11	18	99	1999	011	000	12	17	99	NA	NA
									NA	NA

OPERATING MODE (9)	POWER LEVEL (10)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)				
1	100	20.2201(b)		20.2203(a)(2)(v)	50.73(a)(2)(i)(B)	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)	50.73(a)(2)(iv)	OTHER
		20.2203(a)(2)(iii)		50.36(c)(1)	X 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: Gerald F. Moody, Licensing Project Manager TELEPHONE NUMBER (Include Area Code): (256) 729-7534

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)  
 YES (If yes, complete EXPECTED SUBMISSION DATE): X NO  
 EXPECTED SUBMISSION DATE (15) MONTH DAY YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)  
 On November 18, 1999, at approximately 1700 hours Central Standard Time (CST) work was begun to replace the Unit 2 High Pressure Coolant Injection (HPCI) System Oil Cooler Discharge Temperature Switch TS-73-52. This switch is used to monitor the HPCI System oil temperature and actuates a control room alarm if HPCI system oil temperature reaches the alarm set point. During the switch replacement, the switch cover was removed, the wires were lifted and the switch was extracted. Instrument Maintenance (IM) craftsmen then noticed the presence of oil on the switch. Inspection of the mounting location for the switch revealed that the oil system had been unexpectedly breached. Contrary to the Unit 3 drawing provided in the work package and a local tag that indicated the presence of a thermo-well, there was no thermo-well in place for mounting the switch. The Unit 2 drawing correctly indicated no thermo-well. The IM craftsmen installed the new switch, obtained the necessary pipe sealant and sealed the penetration. The HPCI oil system was breached for approximately 5 minutes. The event was caused by inattention to detail during the planning of the activity. On November 22, 1999, it was determined that HPCI had been inoperable during the time the oil system was breached. This condition was reported to the NRC pursuant to 10 CFR 50.72 (b) (iii) (D). This report is submitted pursuant to 10CFR 50.73 (a) (2) (v) as a condition that alone could have prevented the fulfillment of the safety function of a structure or a system needed to mitigate the consequences of an accident.

**LICENSEE EVENT REPORT (LER)**  
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

**I. PLANT CONDITIONS**

At the time of this event, Unit 2 was at 100 percent power, approximately 3458 Megawatts thermal. Unit 3 was at 100 percent power, approximately 3458 Megawatts thermal. Unit 1 was shutdown and defueled.

**II. DESCRIPTION OF EVENT**

**A. Event:**

On November 18, 1999, at approximately 1700 hours Central Standard Time (CST) work was begun to replace the Unit 2 High Pressure Coolant Injection (HPCI) [BJ] System Oil Cooler Discharge Temperature Switch [TS] TS-73-52. This switch is used to monitor the HPCI System oil temperature and actuates a control room alarm if HPCI system oil temperature reaches the alarm set point.

During the switch replacement, the switch cover was removed, the wires were lifted and the switch was extracted. Instrument Maintenance (IM) craftsmen then noticed the presence of oil on the switch. Inspection of the mounting location for the switch revealed that the oil system had been unexpectedly breached. Contrary to both the drawing provided in the work package and a local label that indicated the presence of a thermo-well for mounting the temperature switch, when in fact there was no thermo-well mounting for the temperature switch. The IM craftsmen installed the new switch pipe temporarily until sealant could be obtained. After obtaining the necessary pipe sealant the temperature switch was permanently installed and sealed. The HPCI oil system was breached for approximately 5 minutes.

The workers returned to the shop to complete the paperwork associated with the job at approximately 1730 hours. A Problem Evaluation Report was initiated by the IM supervisor to document what was initially perceived by the craft personnel as a Drawing Discrepancy. At approximately 1830 hours, Operations personnel were informed of the as-found field condition. Further investigation into the event revealed that the controlled drawing that had been included in the work package was a drawing for the Unit 3 HPCI system. The issue was not discussed with the off going STA or Shift Manager as this occurred during turnover and they had already been relieved. The oncoming Unit Supervisor was told that the problem had been evaluated and that there were no operability concerns. The oncoming STA reviewed the problem evaluation report and also found no operability issues.

On November 22, 1999, after further review, it was determined that the HPCI System had been made inoperable during the breach of the oil system. TVA made a 4 hour report to the NRC in accordance with 10 CFR 50.72 (b) (iii) (D). This report is submitted pursuant to 10CFR 50.73 (a) (2) (v) as a condition that alone could have prevented the fulfillment of the safety function of a structure or a system needed to mitigate the consequences of an accident.

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

None.

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**C. Dates and Approximate Times of Major Occurrences:**

November 18, 1999 1700 hours CST	Work began to replace Unit 2 temperature switch 2-TS-73-52.
November 18, 1999 1715 hours CST	Craftsmen recognized the oil system had been breached. The new switch was temporarily installed to close the system.
November 18, 1999 1830 hours CST	Operations was notified of the oil system breach.
November 22, 1999 2218 hours CST	Subsequent review revealed that this event had resulted in HPCI system inoperability and therefore was reportable. TVA made a 4 hour non-emergency report to the NRC in accordance with 10 CFR 50.72 (b) (iii) (D).

**D. Other Systems or Secondary Functions Affected:**

None.

**E. Method of Discovery**

The breach of the HPCI oil system was discovered after removing the temperature switch from the lubricating system piping.

**F. Operator Actions**

No operator actions contributed to this event.

**G. Safety System Responses**

None.

**III. CAUSE OF THE EVENT**

**A. Immediate Cause**

The HPCI oil system was breached causing the system to be inoperable.

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**B. Root Cause**

The root cause of this event was the use of the wrong unit (Unit 3) controlled drawing in the work order package as a result of inattention to detail (cognitive error) by the maintenance planner [utility, non-licensed]. The Unit 3 drawing correctly showed the presence of a thermo-well for the Unit 3 HPCI system, which when used to plan the Unit 2 corrective maintenance, led to the incorrect conclusion that there was a thermo-well present in Unit 2. The Unit 2 drawing correctly indicated no thermo-well. The incorrect label that indicated the presence of a thermo-well contributed to this event. There were no other unusual characteristics in the work location that would have contributed to this event. No procedures errors contributed to this event.

**IV. ANALYSIS OF THE EVENT**

During this event, personnel exhibited a lack of attention to detail as well as a lack of a questioning attitude. This is evidenced by reviews of the work package which failed to identify the incorrect unit controlled drawing. However, when the craft personnel performing the work realized that the oil system piping had been breached, they installed new switch to temporarily close the oil system until pipe sealant could be obtained and applied. Additionally, they immediately notified their supervisor of their findings. The HPCI lubricating oil system was breached for less than the 5 minute total time period. With the lubrication system breached, the oil system would not attain designed pressure. Initial reviews by Operations did not identify any operability or reportability issues with this event. Upon further review, it was determined that HPCI had been inoperable during the time the oil system was breached. Therefore, this condition was reportable to the NRC.

**V. ASSESSMENT OF SAFETY CONSEQUENCES**

The HPCI system is designed to ensure that the reactor is adequately cooled to limit fuel cladding temperature in the event of a small pipe break in the nuclear system and a resulting loss of coolant which does not rapidly depressurize the reactor vessel. The HPCI system permits the nuclear plant to be shut down while maintaining sufficient reactor vessel water inventory until the reactor vessel is depressurized. The HPCI system continues to operate until the reactor vessel is below the pressure at which Low Pressure Coolant Injection (LPCI) [BO] operation or Core Spray (CS) [BM] operation maintains core cooling. In the event HPCI is not available or not sufficient to maintain reactor water level, the Automatic Depressurization System (ADS) [SB] functions to reduce reactor pressure so that flow from the LPCI and CS enters the reactor vessel in time to cool the core and limit fuel cladding temperature.

BFN Technical Specifications allow continued reactor operation for up to fourteen days if HPCI is inoperable, provided the ADS, CS, LPCI and Reactor Core Isolation Cooling (RCIC) [BN] systems are operable. RCIC provides an alternate supply of high pressure reactor coolant makeup while ADS would depressurize the reactor to allow CS and LPCI to provide adequate low pressure ECCS makeup to the reactor. The availability of these redundant and diversified systems provides adequate assurance of core cooling while the HPCI system is inoperable. During this event HPCI was inoperable approximately 5 minutes out of the fourteen days allowed by the Technical Specifications LCO. The above required systems were operable and would have performed their designed function if called upon. Accordingly, there was no significant reduction in the degree of protection provided to the public health and safety.

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**VI. CORRECTIVE ACTIONS**

**A. Immediate Corrective Actions**

Upon discovery of the condition, the new temperature switch was temporarily installed to close the breach of the HPCI oil system.

**B. Corrective Actions to Prevent Recurrence**

Human Performance stand down briefings were conducted with the appropriate Operations, Maintenance, Scheduling and Work Control personnel. Additionally, briefings will be held with appropriate plant personnel on the lessons learned as a result of this event.

The incorrect label that indicated the presence of a thermo-well was removed from the Unit 2 temperature switch.

**VII. ADDITIONAL INFORMATION**

**A. Failed Components**

None.

**B. Previous LERs on Similar Events**

A review was performed of previous LERS for events resulting from inattention to detail during work planning, and none were identified.

**C. Additional Information**

None.

**D. Safety System Functional Failure:**

This event resulted in a safety system functional failure in accordance with draft NEI 99-02 Revision D.

**VIII. COMMITMENTS**

None.

Energy Industry Identification System (EIS) system and component codes are identified in the text by brackets (e.g., [XX]).

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