

March 8, 2002

U.S. Nuclear Regulatory Commission
50.73
ATTN: Document Control Desk
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Washington, D. C. 20555-0001

10 CFR

Dear Sir:

**TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT (BFN) -
UNIT 3 - DOCKET 50-296 - FACILITY OPERATING LICENSE DPR-68 -
LICENSEE EVENT REPORT (LER) 50-296/2002-001-00**

The enclosed report provides details of a failure to meet the requirements of Technical Specification (TS) Limiting Condition for Operation due to inoperability of the primary containment isolation instrumentation for the Reactor Core Isolation Cooling system.

TVA is reporting this event pursuant to 10 CFR 50.73(a)(2)(i)(B), as any operation or condition prohibited by the plant's Technical Specifications. There are no commitments contained in this letter.

Sincerely,

original signed by

Ashok S. Bhatnagar

cc: See page 2

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Enclosure

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Enclosure

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NRC FORM 366 (6-1998)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001 Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If 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) (See reverse for required number of digits/characters for each block)		
FACILITY NAME (1) Browns Ferry Nuclear Plant, Unit 3		DOCKET NUMBER (2) 05000296
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TITLE (4)
 Failure to Meet Technical Specification Requirements for Inoperable Primary Containment Isolation Instrumentation Due to Removal of Incorrect Temperature Switches

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
01	09	2002	2002	-- 001 --	00	03	08	2002	NA	05000
									NA	DOCKET NUMBER 05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10)	100	20.2201(b)			20.2203(a)(2)(v)			X	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)				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 E. Dorris Charlton, Nuclear Engineer, Industry Affairs	TELEPHONE NUMBER (Include Area Code) 256.729.7533

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

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) **(16)**

On January 9, 2002, at 0849 hours, four Reactor Core Isolation Cooling (RCIC) steam line space temperature switches were replaced with temperature switches intended for replacement of the High Pressure Coolant Injection (HPCI) steam line space temperature switches. This resulted in the Primary Containment Isolation Instrumentation being inoperable. At 1425 hours, the Control Room was notified of the error and technical specification actions were initiated to isolate the affected penetration flow path. Since the Primary Containment Isolation instrumentation was made inoperable without the knowledge of Operations, TVA did not take the required technical specification actions within one hour of the instrumentation becoming inoperable. In accordance with 10 CFR 50.73 (a) (2) (i) (B), this report is being submitted as any operation or condition prohibited by the plant's technical specifications

The root cause for this event was personnel error. Maintenance personnel failed to properly execute the verification process required by site procedures. The individuals focused only on the address portion of the component identifier rather than on the complete component identifier. Actions to prevent recurrence included appropriate personnel corrective actions for involved personnel and stand-down briefings and refresher training for Instrument and Controls (I&C) maintenance personnel.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)**I. PLANT CONDITION(S)**

At the time of the event, Unit 3 was in Mode 1 at 100 percent reactor power, approximately 3458 megawatts thermal. Unit 2 was in Mode 1 at 100 percent reactor power, approximately 3458 megawatts thermal. Unit 1 was shutdown and defueled.

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

On January 9, 2002, at 0421 hours CST, maintenance personnel (other utility, non-licensed) commenced surveillance 3-SR-3.3.6.1.3(3D), High Pressure Coolant Injection (HPCI) [BJ] Steam Line Space High Temperature Calibration. This surveillance involved replacement of primary containment isolation instrumentation [JM] temperature switches [TS] with shop-calibrated switches, then returning the removed switches to the shop to obtain as-found calibration data.

At 0849 hours, the maintenance personnel removed the primary containment isolation temperature switches for the Reactor Core Isolation Cooling (RCIC) system [BN] and replaced them with the temperature switches intended for the HPCI system. The switches for the RCIC system are the same type switches and located in close proximity to the HPCI switches. However, the actuation temperature for the HPCI switches is 170 degrees F increasing instead of the 147 degrees F increasing required for the RCIC system. Similar component identifiers are used which differ only by the system number (e.g. 3-TS-071-0002N (RCIC) and 3-TS-073-0002N (HPCI)).

While preparing to obtain the as-found calibration data, it was discovered that the RCIC steam line space temperature switches had been replaced instead of the HPCI switches as intended.

At 1425 hours, maintenance personnel notified control room operators that the incorrect temperature switches had been replaced. Operators initiated technical specification action for inoperable primary containment isolation instrumentation; within one hour, isolate the affected penetration flow path(s).

At 1509 hours, operators completed the technical specification required action to isolate the RCIC steam supply line by closing valve 3-FCV-71-3 [FCV]. RCIC was declared inoperable and Technical Specification LCO 3.5.3.A.2 was entered.

At 1818 hours, after replacement of the RCIC temperature switches, Operations personnel exited LCO 3.3.6.1.F.1.

At 1840 hours, after returning RCIC to service, Operations personnel exited Technical Specification LCO 3.5.3.A.2.

Because the Primary Containment Isolation Instrumentation was inoperable for a period longer than that allowed by Technical Specifications, this event is reportable in accordance with 10 CFR 50.73(a) (2) (i) (B), as any operation or condition prohibited by plant's Technical Specifications.

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

None

C. Dates and Approximate Times of Major Occurrences:

January 9, 2002, at 0421 hours CST

Maintenance personnel began performance of surveillance 3-SR-3.3.6.1.3(3D), HPCI Steam Line Space High Temperature Calibration.

January 9, 2002, at 0849 hours CST

Maintenance personnel incorrectly replaced temperature switches for the RCIC steam line space high temperature instead of for the HPCI system as required by the surveillance.

January 9, 2002, at 1425 hours CST

Maintenance personnel notified Operations personnel of incorrect temperature switch replacement. Operations personnel initiated technical specification LCO action 3.3.6.1.F.1 to manually isolate the RCIC steam line.

January 9, 2002, at 1509 hours CST

Operations personnel completed the technical specification LCO action. RCIC system was declared inoperable and Technical Specification LCO 3.5.3.A.2 was entered.

January 9, 2002, at 1818 hours CST

Operations personnel exited Technical Specification LCO action 3.3.6.1.F.1 after satisfactory replacement of the RCIC temperature switches.

January 9, 2002, at 1840 hours CST

Operations personnel declared RCIC system operable and exited Technical Specification LCO 3.5.3.A.2.

D. Other Systems or Secondary Functions Affected

None

E. Method of Discovery

While preparing to perform the as-found portion of the calibration surveillance, it was determined that the incorrect switches were replaced. Control room operators were notified of the error at 1425 hours.

F. Operator Actions

Upon notification of the error, Operations personnel initiated technical specification LCO action 3.3.6.1.F.1, manually isolate the RCIC steam line. The RCIC system was declared inoperable and Technical Specification LCO 3.5.3.A.2 was entered.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)**G. Safety System Responses**

None

III. CAUSE OF THE EVENT**A. Immediate Cause**

Maintenance personnel removed the temperature switches for the RCIC system instead of the HPCI switches as required by 3-SR-3.3.6.1.3(3D).

B. Root Cause

The root cause of this event was personnel error. The Maintenance personnel involved failed to properly execute the verification process in accordance with approved site procedures. The personnel focused on the "address" portion of the unique identification number (UNID) rather than the complete UNID.

C. Contributing Factors

HPCI and RCIC switches are of the same type and located in close proximity to each other. The UNIDs for the HPCI and RCIC temperature switches are identical with the exception of the system identification number. (e.g. 3-TS-071-0002N (RCIC) and 3-TS-073-0002N (HPCI))

IV. ANALYSIS OF THE EVENT

Surveillance Requirement 3-SR-3.3.6.1.3(3D), High Pressure Coolant Injection Steam Line Space High Temperature Calibration, requires the HPCI steam line space temperature switches 3-TS-073-0002N, -0002P, -0002R, and -0002S to be replaced with calibrated switches. Procedure steps for removal and replacement of the temperature switches require first and second party verification. Procedure SPP-10.3, "Verification Program" requires the second-party verifier to ensure that the actual component identification matches the identification of the component required to be verified. The maintenance personnel did not properly implement error prevention techniques such as self-checking. The verifications focused on only the address portion of the UNID instead of the entire UNID. This resulted in the incorrect switches being replaced.

This was the first time that these particular individuals had performed this task. The planned access route to the area was not accessible and another route was used. This resulted in the individuals becoming disoriented with respect to the correct work location. The similarity and proximity of the HPCI and RCIC switches and the similarities in their UNIDs led the individuals to believe that they were at the correct location.

When commencing the portion of the surveillance to obtain the as-found data for the removed switches, it was discovered that the incorrect switches had been replaced. Operations was notified of the error and initiated the required Technical Specification actions.

V. ASSESSMENT OF SAFETY CONSEQUENCES

The function of RCIC steam space temperature switches 3-TS-071-0002N, -0002P, -0002R, and -0002S is to monitor for postulated breaks in the piping supplying motive steam to the RCIC system turbine. The Browns

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Ferry Updated Final Safety Analysis Report Section 7.3.4.7 states:

High temperature in the vicinity of the RCIC equipment could indicate a break in the RCIC steam line. The automatic closure of certain Group A valves prevents the excessive loss of reactor coolant and the release of significant amounts of radioactive material from the nuclear system process barrier. When high temperature occurs near the RCIC equipment, the RCIC turbine steam line is isolated. The high temperature isolation setting was selected far enough above anticipated normal RCIC system operational levels to avoid spurious operation, but low enough to provide timely detection of an RCIC turbine steam line break.

In this case the "Group A" valves referenced are the RCIC steam line isolation valves, which are signaled to close upon detection of a possible leak from the RCIC steam line piping.

Through the installation of additional supports, the RCIC steam line piping in the torus area has been made particularly rugged. The piping stresses seen therefore by the RCIC steam line piping in the areas monitored by these temperature switches are very low.

Upon confirmation that the incorrect switches had been replaced, the RCIC steam line was isolated in accordance with the technical specification required LCO action. This was completed within 7 hours of the original error. The correct switches were reinstalled and demonstrated to be operable within 10 hours of the original error.

The RCIC temperature switches which were removed had a nominal actuation setpoint of 147 degrees F increasing, whereas the HPCI temperature switches which were installed in their place had a nominal actuation setpoint of 170 degrees F increasing. The installed switches were functional in this location, though the isolation of the RCIC steam line upon a postulated RCIC steam line pipe break in the area would have occurred at a higher temperature. This could have resulted in a greater loss of steam from the reactor pressure boundary into secondary containment prior to isolation.

The following factors are seen to reduce the risk impacts of this event:

1. The BFN design basis has demonstrated that the RCIC steam piping is exposed to very low stresses in the areas monitored by these temperature switches, making the likelihood of a pipe break very small
2. The incorrect switches were in place for only a short period of time prior to taking the appropriate LCO action (7 hours)
3. During this short interval, the isolation function would have occurred for a postulated pipe break, though at a higher isolation temperature
4. The BFN risk-informed in-service inspection (RI-ISI) program estimated the total risk contribution of all RCIC system piping (water and steam) breaks to be only 0.02% of the BFN total CDF.

Based on the above discussion, the safety effects of this event are considered to be negligible.

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

Initiated and implemented work order to replace, functionally test, and return to service the RCIC temperature switches.

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B. Corrective Actions to Prevent Recurrence

Administered appropriate personnel corrective actions to involved personnel.

Conducted stand-down briefings on each shift with Instrument and Controls (I&C) Maintenance personnel to stress the proper verification methods and importance of following those methods.

Refresher verification training was administered to I&C Maintenance personnel.

VI. ADDITIONAL INFORMATION

A. Failed Components

None

B. Previous LERs on Similar Events

None

C. Additional Information

None

D. Safety System Functional Failure:

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

VII. COMMITMENTS

None

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