

TENNESSEE VALLEY AUTHORITY

Browns Ferry Nuclear Plant
Post Office Box 2000
Decatur, Alabama 35609-2000

DEC 21 1989

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

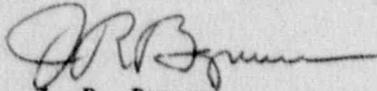
Dear Sir:

TVA - BROWNS FERRY NUCLEAR PLANT (BFN) UNIT 2 - DOCKET NO. 50-260 - FACILITY OPERATING LICENSE DPR-52 - REPORTABLE OCCURRENCE REPORT BFRG-50-260/89022, R1

The enclosed report provides details concerning the technical specification violation due to loss of two trains of Standby Gas Treatment System. This report is submitted in accordance with 10 CFR 50.73(a)(2)(i). As discussed with W. S. Little, NRC, Region II, on November 30, 1989, this revision is being submitted later than originally expected.

Very truly yours,

TENNESSEE VALLEY AUTHORITY



J. R. Bynum
Vice President
Nuclear Power Production

Enclosures

cc (Enclosures):

Regional Administration
U.S. Nuclear Regulatory Commission
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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) | DOCKET NUMBER (2) | PAGE (3)
BROWNS FERRY UNIT 2 | 050002 | 6 | 01 | 04

TITLE (4) TECHNICAL SPECIFICATION VIOLATION DUE TO LOSS OF TWO TRAINS OF
STANDBY GAS TREATMENT SYSTEM

EVENT DAY (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)												
MONTH	DAY	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER(S)											
0	7	2	1	8	9	8	9	0	2	2	0	1	1	2	2	1	8	9	BROWNS FERRY UNIT 1	050002	59
																			BROWNS FERRY UNIT 3	050002	96

OPERATING MODE (9) | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following)(11)

OPERATING MODE (9)	N	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	0	0	0	0	0
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
SHERRI ANDERSON-HUDGINS, ENGINEER, COMPLIANCE LICENSING	2 0 5 7 2 9 - 2 0 4 7

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	
X	E	D	B	K	R	G	0	8	0	Y

SUPPLEMENTAL REPORT EXPECTED (14) | EXPECTED SUBMISSION DATE (15)

YES (If yes, complete EXPECTED SUBMISSION DATE) | X | NO

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On July 21, 1989 at 1345, trains A and B of the Standby Gas Treatment (SBGT) system were declared inoperable following the discovery that the circuit breakers for their relative humidity control heaters were tripped. This resulted in not meeting the requirements of technical specification 3.7.B for the SBGT system. As a result of this event, extensive investigation, testing, and evaluation of the cause of the circuit breaker operations were performed.

The root cause of this event was an inadequate initial design application of this type circuit breaker. This initial design application did not address the high temperatures encountered at the present circuit breaker location. Contributing to this event was the fact that the room exhaust fans were not operating which resulted in elevated room temperatures. Additionally, a possible contributor to this event was bad contacts which were identified on one phase of the relative humidity control heater circuit breaker for train A of the SBGT system.

As a result of this event, the circuit breaker for train A has been replaced. Appropriate plant instructions will be prepared addressing the operation of the exhaust fans. A design change notice has been initiated to eliminate spurious tripping of the breaker caused by the excessive temperature in the 480 volt Diesel Generator Auxiliary Board Rooms A and B.

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TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	NUMBER	NUMBER			
		SEQUENTIAL	REVISION				
BROWNS FERRY UNIT 2	0500026089	0	2	2	0	1	02 of 04

TEXT (If more space is required, use additional NRC Form 366A's) (17)

DESCRIPTION OF EVENT

On July 21, 1989 at 1345, trains A and B of the Standby Gas Treatment (SBGT) system [BH] were declared inoperable following the discovery that the circuit breakers [BKR] for their relative humidity control heaters were tripped. This resulted in not meeting the requirements of technical specification 3.7.B for the SBGT system. Refueling activities were verified to be stopped and train C of the SBGT system was verified operable by performance of its surveillance instruction. Additionally, investigation of the tripping of the relative humidity control heater circuit breakers was initiated.

At the time of discovery of this event, unit 2 was in cold shutdown with irradiated fuel in the reactor vessel and the fuel pool gates were removed. Units 1 and 3 were defueled. This event is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B), operation prohibited by technical specifications.

ANALYSIS OF EVENT

Following this event, initial investigation of the tripping of the relative humidity control heater circuit breakers was conducted. This investigation included testing the circuit breakers operation, checking the insulation condition of the breaker and its contact resistance, and performing a visual and physical examination of all electrical terminations in each circuit breaker compartment. No discrepancies were identified with the circuit breakers or the associated circuitry during this initial investigation.

At the time of the circuit breaker operations, the outside ambient temperature was approximately 90 degrees Fahrenheit (F). It was discovered that the exhaust fans for the rooms containing the relative humidity control heater circuit breakers (Diesel Generator Auxiliary Board Rooms) were not in operation at the time of the circuit breaker trips. The reason for the exhaust fans not being in operation could not be determined at the time.

During further testing of the circuit breakers, the relative humidity control heater circuit breaker for train A tripped two additional times. Circuit current and compartment temperature were being monitored during the last circuit breaker operation. The load current was measured at 63 amperes (70 percent of circuit breaker rating) and the compartment temperature was 126 degrees F. The current prior to these trips was normal.

Following this testing, the relative humidity control heater circuit breaker for train A of the SBGT system was replaced with a new circuit breaker and the old breaker (Manufacturer: General Electric, Model: THED-136090) was tested by an independent company. Additionally, testing was performed on a new breaker of

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		NUMBER	NUMBER	NUMBER	NUMBER								
BROWNS FERRY UNIT 2	0500026089	--	0	2	2	--	0	1	0	3	of	0	4

TEXT (If more space is required, use additional NRC Form 366A's) (17)

this same model number. This testing identified that the old circuit breaker would not carry a load of 70 percent of the circuit breaker rating above 135 degrees F. Additionally, bad contacts on one phase of the old circuit breaker were identified. These tests also revealed that the new breaker could not carry a load of 70 percent at temperatures above 140 degrees F.

Following the receipt of this information, a design application evaluation was performed for the relative humidity control heater circuit breakers based on worst case expected internal compartment temperatures. This evaluation concluded that this type breaker was a borderline design at the worst case temperatures expected in the compartment.

Train C of the SBTG system is not affected by this condition because of a different configuration in the compartment containing the relative humidity control heater circuit breaker for this train. The heat loading in the compartment for the circuit breaker for train C is lower than for trains A and B of the SBTG system. Also, the motor control center and circuit breaker is made by a different manufacturer.

SBTG is designed to provide a controlled, filtered, and elevated release path from secondary containment. The relative humidity control heaters are designed to reduce the moisture content of the air being drawn from secondary containment so that charcoal absorbers will function properly following a loss of coolant accident. With all three units shut down, a steam atmosphere in secondary containment is not likely. Therefore, the SBTG could have performed its required function under the existing plant conditions.

CAUSE OF EVENT

The root cause of this event was an inadequate initial design application of this type circuit breaker. This initial design application did not address the high temperatures encountered at the present circuit breaker location.

Contributing to this event was the fact that the room exhaust fans were not operating. This lack of ventilation resulted in the elevated room temperatures during the initial circuit breaker operations which led to identification of this condition. The cause of the nonoperating exhaust fans has been identified as a lack of a procedure covering the required operation of the exhaust fans.

Additionally, a possible contributor to this event was the bad contacts identified on one phase of the relative humidity control heater circuit breaker for train A of the SBTG system. The cause of the bad contacts could not be determined.

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TEXT CONTINUATION

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				NUMBER	NUMBER					
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

PREVIOUS SIMILAR EVENTS

On October 18, 1988 (LER 259/88034), a review of all open Condition Adverse to Quality Reports (CAQRs) was initiated which identified the potential loss of the diesel generators (DG) because of the premature tripping of the DG field breaker. The cause of the field breaker potentially tripping was high localized temperature in the field breaker control cabinet. The root cause of this event, however, was an inadequate design of the system. This deficiency was discovered when new testing requirements were established by the Design Baseline Verification Program. During actual testing, measurements were taken which identified that at a load of 2950 KW, the operating temperature of the generator field breaker exceeded its vendor rating and could be subject to failure.

CORRECTIVE ACTIONS

As a result of this event, extensive investigation, testing, and evaluation of the cause of the circuit breaker operations were performed. The relative humidity control heater circuit breaker for train A of the SBT system has been replaced. Following the replacement, no additional tripping of the relative humidity control heater circuit breakers for any train of the SBT system has occurred.

Appropriate plant instructions will be prepared addressing the operation of the exhaust fans for the Diesel Generator Auxiliary Board Rooms. This will ensure that expected operating temperatures will not be exceeded during normal operation.

A design change notice has been initiated to eliminate spurious tripping of the breaker caused by the excessive temperature in the 480 volt Diesel Generator Auxiliary Board Rooms A and B.

COMMITMENTS

1. Appropriate plant instructions will be prepared addressing the operation of the exhaust fans for the Diesel Generator Auxiliary Board Room. These instructions will be implemented by February 2, 1990.
2. A design change notice has been initiated to eliminate spurious tripping of the breaker caused by the excessive temperature in the 480 volt Diesel Generator Auxiliary Board Rooms A and B. Any design change that may result from this design change notice will be implemented before unit 2 restart.