NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Browns Ferry Unit 2	0 5 0 0 0 2 6 0	1 OF 0 3

TITLE (4)
Unplanned Diesel Generator Start Due To Insulating Boot Falling Off Logic Relay Contact Arm

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 NAMES	DOCKET NUMBER(S)
0 5	1 0	8 8	8 8	0 0 1	0 0	0 6	0 7	8 8	Browns Ferry Unit 3	0 5 0 0 0 2 9 6
										0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
	N	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	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)	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
	AREA CODE
Stephen C. Willard, Engineer, Plant Operations Review Staff	2 0 5 7 2 9 - 2 5 3 1 6

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 fifteen single-space typewritten lines) (16)

On May 10, 1988, at 1923 hours, with all three units defueled, the 3A diesel generator started due to an inadvertent start signal. The start signal was generated during a logic functional test of the unit 2 core spray system when a rubber insulating boot fell off of a relay contact arm.

The test was stopped while the cause of the diesel start was being investigated. The operators verified the start signal was not valid, shutdown the diesel at 2003 hours and resumed the test.

Boots are lightweight flexible electrical insulating material and fit loosely over the contact arms and are allowed random movement during relay cycling. This movement allowed the boot to work its way off the contact arm.

Experiments were conducted with identical relays and boot material. The testing included different boot length and placement on the contact arm and calibration of the relay. The only test condition which allowed the boot to fall off was gross misplacement of the boot at the very top of the contact arm.

This is the first identified problem with these boots during the three years they have been used at Browns Ferry Nuclear Plant (BFN). Approximately 1500 of these boots have been used. BFN considers the performance of these boots to be acceptable and will continue to use them unless a better method is determined. The maintenance organization is considering other methods as possible improvements.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Browns Ferry Unit 2	0 5 0 0 0 2 6 0	8 8	— 0 0 1	— 0 0	0 2 OF 0 3

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

DESCRIPTION OF EVENT

Browns Ferry Nuclear Plant (BFN) units 1, 2, and 3 were defueled during this event. The unit 2 core spray system (EIIS Code BM), and the unit 3 diesel generator (DG) 3A (EIIS Code EK) were affected.

On May 10, 1988, at 1923 hours, the 3A DG started due to an inadvertent start signal. The start signal was generated during a logic functional test of the unit 2 core spray system when a rubber insulating boot fell off of a relay contact arm. The test was run to verify proper operation of relay logic in response to a simulated accident signal. The relay involved was a GE HFA relay. The logic was reset and the DG was shutdown at 2003 hours.

CAUSE OF EVENT

Boots are lightweight flexible electrical insulating material and fit loosely over the contact arms and are allowed random movement during relay cycling. This movement allowed the boot to work its way off the contact arm.

CORRECTIVE ACTION

The test was stopped while the cause of the DG start was being investigated. The operators verified the start signal was not valid, shutdown the DG at 2003 hours and resumed the test.

Experiments were conducted with identical relays and boot material. The testing included different boot length and placement on the contact arm and calibration of the relay. The only test condition which allowed the boot to fall off was gross misplacement of the boot at the very top of the contact arm.

This is the first identified problem with these boots during the three years they have been used at BFN. Approximately 1500 of these boots have been used. BFN considers the performance of these boots to be acceptable and will continue to use them unless a better method is determined. The maintenance organization is considering other methods as possible improvements.

ANALYSIS OF EVENT

The logic involved is designed to provide a preemptive start of the DG during accident conditions protecting against a concurrent loss of offsite power. The DGs are designed to provide a self-contained, highly reliable source of power for the core standby cooling functions and their auxiliaries. In this case, the systems responded correctly, placing the plant in a conservative

configuration. This test is not run while the unit is at power; however, the start of a DG during power operation is not adverse to nuclear safety.

This event lasted 40 minutes.

PREVIOUS SIMILAR EVENTS - None

COMMITMENTS - None

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant
Post Office Box 2000
Decatur, Alabama 35602

JUN 09 1988

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

Dear Sir:

TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT UNIT 2 - DOCKET NO. 50-260 - FACILITY OPERATING LICENSE DPR-52 - REPORTABLE OCCURRENCE REPORT BFRO-50-260/88001

The enclosed report provides details concerning the unplanned diesel generator start due to insulating boot falling off logic relay contact arm. This report is submitted in accordance with 10 CFR 50.73 (a)(2)(iv).

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. G. Walker
Plant Manager
Browns Ferry Nuclear Plant

Enclosures
cc (Enclosures):
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U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region II
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Atlanta, Georgia 30303

INPO Records Center
Suite 1500
1100 Circle 75 Parkway
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NRC Resident Inspector, Browns Ferry Nuclear Plant

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