



Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

Joseph R. Bynum  
Vice President, Nuclear Operations

FEB 14 1991

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  
BFRO-50-260/91001

The enclosed report provides details concerning the unplanned Engineered  
Safety Feature actuation due to a blown fuse caused by a failed relay.  
This report is submitted in accordance with 10 CFR 50.73(a)(2)(iv).

Very truly yours,

TENNESSEE VALLEY AUTHORITY

  
J. R. Bynum

Enclosure  
cc: see page 2

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U.S. Nuclear Regulatory Commission

FEB 14 1991

cc (Enclosure):

INPO Records Center  
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NRC Resident Inspector, BFN

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Rockville, Maryland 20852

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Browns Ferry Unit 2 DOCKET NUMBER (2) PAGE (3) 10510101 2 6 01101 0 3

TITLE (4) Unplanned Engineered Safety Features Actuation Due to a Blown Fuse Caused By a Failed Relay

EVENT DAY (5) LER NUMBER (6) REPORT DATE (7) OTHER FACILITIES INVOLVED (8) MONTH DAY YEAR YEAR SEQUENTIAL REVISION FACILITY NAMES DOCKET NUMBER(S) 0 1 1 6 9 1 9 1 0 0 1 0 0 0 2 1 4 9 1 10510101 1

OPERATING MODE (9) THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following)(11) 20.402(b) 20.405(c) X 50.73(a)(2)(iv) 73.71(b) POWER LEVEL (10) 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, GRC 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 Stewart A. Wetzel, Compliance Licensing Engineer 2 0 5 7 2 9 - 2 0 4 8

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

Table with columns: CAUSE, SYSTEM, COMPONENT, MANUFACTURER, REPORTABLE TO NPRDS. Row 1: X, J, M, R, L, Y, G, O, B, O, Y

SUPPLEMENTAL REPORT EXPECTED (14) EXPECTED MONTH DAY YEAR 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 January 16, 1991 at 0430 hours, a blown fuse in the Primary Containment Isolation System (PCIS) logic circuitry resulted in unplanned actuations of various engineered safety features. This would normally include isolation of the drywell equipment and floor drain discharge isolation valves, isolation of the main steam line drain valve, and withdrawal of any inserted traversing incore probes (TIPs). However, the main steam line drain valve did not isolate because it was tagged out of service, and the TIPs did not withdraw because they were not inserted.

The root cause of this event was the failure of a General Electric (GE) type CR120 relay in the PCIS circuitry due to a faulted coil. The relay failure caused a faulted condition which resulted in blowing the fuse and subsequent loss of PCIS logic power.

As a result of this event, the relay coils in GE type CR120 relays used in normally energized, safety-related applications in all three units will be replaced.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	NUMBER	REVISION NUMBER	PAGE NUMBER	OF	PAGES
Browns Ferry Unit 2	0500026091	0	0	1	0	0	0203

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

Description of Event

On January 16, 1991 at 0430 hours, a blown fuse in the Primary Containment Isolation System (PCIS) [JM] logic circuitry resulted in unplanned actuations of various engineered safety features (ESFs) [JE]. This would normally include isolation of the drywell equipment and floor drain discharge isolation valves [WD], isolation of the main steam line drain valve [SB], and the withdrawal of any inserted traversing incore probes (TIPs) [IG]. However, the main steam line drain valve did not isolate because it was tagged out of service, and the TIPs did not withdraw because they were not inserted. The drywell equipment and floor drain discharge isolation valves responded as expected.

As a result of this event, Operations personnel initiated an investigation into the cause of the blown fuse. This investigation determined that a General Electric (GE) type CR120 relay in the PCIS circuitry failed due to a faulted coil. This caused a faulted condition which resulted in blowing the fuse and subsequent loss of PCIS logic power. This loss of power actuated/isolated the ESFs.

Following identification of the failed relay, the relay was replaced and post-maintenance testing completed. At approximately 1700 hours, on January 17, 1991, the PCIS logic was reset and the affected systems realigned to normal.

All three units were shut down and defueled at the time of this event. No fuel handling or operations over spent fuel were in progress during this event. The unplanned ESF actuations are reportable in accordance with 10 CFR 50.73(a)(2) (iv).

Analysis of Event

The systems involved in this event are designed to collect and remove leakage from drywell equipment and the general drywell area, and to fulfill their safety functions upon loss of initiation logic power. Plant safety was not adversely affected by this event, nor would it have been had any or all units been operating at power, since the affected circuits and isolated equipment responded properly to the loss of power and were placed in their safe configuration.

Cause of Event

The root cause of this event was failure of the relay due to a faulted coil.



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		SEQUENTIAL	REVISION				
		YEAR	NUMBER	NUMBER			
Browns Ferry Unit 2	0500026091	001	00	00	03	03	

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

Previous Similar Events

Several previous LER events have occurred due to a failed relay which in turn cleared a fuse. Two of these events, LERs 259/90013 and 296/90003, involved Westinghouse type MG-6 relays. The remaining events, LERs 296/87006, 260/86013, 259/85024, and 259/85011, were caused by failures of GE type CR120 relays due to faulted coils.

Corrective Actions

Although BFN maintenance history indicates that these type relays do not have a high failure rate, industry experience indicates an increasing incidence of failures in normally energized relay coils as the coils attain a service life of 15 to 20 years. Further, vendor information provided to TVA indicates that a service life of 20 years can be expected for these type relays in normally energized applications. Since some relays installed in Unit 2 are approaching a service life of approximately 15 years, TVA has determined that the following corrective actions are necessary: (1) the relay coils in GE type CR120 relays used in normally energized, safety-related applications in Unit 2 will be replaced prior to startup following the Unit 2, Cycle 7 refueling outage; and (2) the relay coils in GE type CR120 relays used in normally energized, safety-related applications in Units 1 and 3 will be replaced prior to each respective unit's startup.

Commitments

1. TVA will replace relay coils in GE type CR120 relays used in normally energized, safety-related applications in Unit 2 prior to startup following the Unit 2, Cycle 7 refueling outage.
2. TVA will replace relay coils in GE type CR120 relays used in normally energized, safety-related applications in Units 1 and 3 prior to each respective unit's startup.

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].