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

Joseph R. Bynum
Vice President, Nuclear Operations

MAY 11 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-50-260/91008

The enclosed report provides details concerning an unplanned Engineered Safety Feature actuation due to 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

MAY - 1 1991

cc (Enclosure):
INPO Records Center
Suite 1500
1100 Circle 75 Parkway
Atlanta, Georgia 30339

NRC Resident Inspector, BFN

Regional Administration
U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region II
101 Marietta Street, Suite 2900
Atlanta, Georgia 30323

Thierry M. Ross
U.S. Nuclear Regulatory Commission
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852

NRC Form 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

Approved OMB No. 3150-0104
Expires 4/30/92

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 Engineered Safety Features Actuations Due to a Failed PCIS Relay

EVENT DAY (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 4	1 1	9 1	9 1	0 0 8	0 0	0 5	1 1	9 1	Browns Ferry Unit 1	0 5 0 0 0 2 5 9
									Browns Ferry Unit 3	0 5 0 0 0 2 9 6

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following)(11)			
POWER LEVEL (10)	0 0 0	20.402(b)	20.405(c)	x 50.73(a)(2)(iv)	73.71(b)
		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)
Clare S. Hsieh, Compliance Licensing Engineer	2 0 5 7 2 9 - 2 6 3 5

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	J M	R L Y	G 0 8 0	Y					

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 April 11, 1991, at 1055 hours, a Unit 2 Primary Containment Isolation System logic relay failed. This resulted in the unplanned actuations of various Engineered Safety Features.

The root cause of this event was the end-of-life failure of a normally energized General Electric (GE) type CR120 relay. The failed relay was due to a burned coil in the relay.

The faulty coil was identified and replaced. TVA has committed to replace GE type CR120 relay coils used in normally energized safety-related applications in all three units.

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	9 1	-- 0 0 8	-- 0 0	0 2 OF 0 3

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

DESCRIPTION OF EVENT

On April 11, 1991, at 1055 hours, a relay in the Unit 2 Primary Containment Isolation System (PCIS) [JM] logic panel failed. This resulted in the unplanned actuations of various Engineered Safety Features (ESF) [JE] including the Standby Gas Treatment System [BH], Control Room Emergency Ventilation System [VI], and isolation of the refueling zone normal ventilation [VG] for all three units. The affected system responded as expected.

Investigation of this event revealed that a General Electric (GE) type CR120A relay in the PCIS logic circuitry failed due to a burned coil. Following identification of the burned relay coil, the relay was replaced and post-maintenance testing completed. The PCIS logic was reset at 0334 hours on April 12, 1991 and affected systems were returned to normal.

During this event, Units 1 and 3 were defueled. Unit 2 was in cold shutdown. These unplanned ESF actuations are reportable in accordance with 10 CFR 50.73(a)(2)(iv).

ANALYSIS OF EVENT

The systems affected during this event are designed to shutdown the reactor, contain and process any radioactive releases, and to fulfill their safety functions upon loss of initiation logic power. The burned coil de-energized the normally energized PCIS relay. The failure of the PCIS relay coil resulted in a loss of PCIS logic power. This loss of power actuated/isolated the ESFs.

Plant safety was not adversely affected due to the system responding correctly to the loss of power. The plant's safe shutdown capabilities would not have been diminished had the unit been in power operation.

CAUSE OF EVENT

The root cause of this event was an end-of-life failure of the relay. The failure of the GE type CR120 relay coil is tied directly to the thermally aged relay coil failure.

CORRECTIVE ACTIONS

Following the actuation of PCIS logic, a work request was initiated to troubleshoot the cause of the PCIS signal. The PCIS signal was not reset immediately after the event to prevent another random initiation before the cause could be determined and corrected. The faulty coil in the GE type CR120 relay was identified and replaced at 0240 hours on April 12, 1991.

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	9 1	-- 0 0 8	-- 0 0	0 3 OF 0 3

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

The failure of relay coils due to thermal aging is not uncommon. Vendor information provided to TVA indicates a service life of 15 to 20 years for GE type CR120 relays in normally energized applications. Some relays installed in Unit 2 are approaching a service life of approximately 15 years.

In Licensee Event Reports (LERs) 260/91001 and 260/91005, TVA has committed to replace the GE type CR120 relays used in normally energized, safety-related applications in Unit 2 before startup following the Unit 2, Cycle 6 refueling outage and Units 1 and 3 CR120 relays before startup of each of these two units.

PREVIOUS SIMILAR EVENTS

Several previous LER events have occurred due to a failed GE type CR120 relay. The relay failures have all been to a random or an end-of-life failure. (See LERs 259/85011, 259/85024, 260/86013, and 296/87006).

COMMITMENTS

The corrective actions to address increasing incidence of relay failure are listed as commitments in LERs 260/91001 and 260/91005.

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