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)
THREE MILE ISLAND, UNIT 1	0 5 0 0 0 2 8 9	1 OF 0 3

TITLE (4)
UNDERVOLTAGE RELAY FAILURE FOR CRD TRIP BREAKER

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 0 0 0
0 1	1 4	8 6	8 6	—	0 0 3	—	0 0	0 2	1 4	8 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)	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)
0 9		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	X 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
Susan Otto, Licensing Engineer	AREA CODE 7 1 7 9 4 8 - 8 3 5 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	
B	A A	0 1 2 7	0 5 3 5	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)

This LER is being submitted for information purposes only at the request of the NRC.

On January 14, 1986, the ITE/Brown-Boveri undervoltage relay associated with the shunt trip feature for Control Rod Drive (CRD) Trip Breaker Unit 11 failed to function during monthly surveillance testing. Failure of the relay resulted in inoperability of the shunt trip feature for Unit 11. The General Electric undervoltage trip feature was operable as verified by testing. CRD Trip Breaker Unit 11 was opened until the cause of the failure could be determined. The shunt trip features on the remaining three Reactor Protection System (RPS) channels were verified to be operable by testing.

The failure was caused by the incorrect positioning of a jumper internal to the relay. The jumper allows use of different levels of DC control voltage. The 48/125 VDC jumper is believed to have been in the 48 VDC position instead of the 125 VDC position when the relay was shipped from the factory. The test procedure for initial installation of the relay did not specify checking the position of the jumper. The relay passed acceptance tests and functioned several times after installation with the jumper in the incorrect position.

The jumper position in the undervoltage relays for the other three RPS channels was visually checked and found to be in the correct position. A spare undervoltage relay was tested and installed. The shunt trip feature for CRD Trip Breaker Unit 11 was successfully tested.

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(9-83)

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
THREE MILE ISLAND, UNIT 1	0 5 0 0 0 2 8 9	8 6	— 0 0 3	— 0 0	0 2 OF 0 3

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

I. PLANT OPERATING CONDITIONS BEFORE THE EVENT

TMI-1 was operating at 98.9% reactor power producing 830 MW electrical.

II. STATUS OF STRUCTURES, COMPONENTS, OR SYSTEMS THAT WERE INOPERABLE AT THE START OF THE EVENT AND THAT CONTRIBUTED TO THE EVENT

None.

III. EVENT DESCRIPTION

This LER is being submitted for information purposes only at the request of the NRC.

On January 14, 1986, the ITE/Brown-Boveri undervoltage relay associated with the shunt trip feature for Control Rod Drive (CRD) Trip Breaker Unit 11 failed to function during monthly surveillance testing. Failure of the relay resulted in inoperability of the shunt trip feature for Unit 11. The General Electric undervoltage trip feature was operable as verified by testing. CRD Trip Breaker Unit 11 was opened until the cause of the failure could be determined. The shunt trip features on the remaining three Reactor Protection System (RPS) channels were verified to be operable by testing.

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IV. COMPONENT FAILURE DATA

a. Component Name: ITE Single Phase Voltage Relay
b. System Name: Control Rod Drive System
c. Cause Code: B (Installation)
d. Component Manufacturer/Model No.: Brown-Boveri/ITE-27H
e. Reportable to NPRDS: Yes
f. Method of Discovery: Surveillance Testing

V. AUTOMATIC OR MANUALLY INITIATED SAFETY SYSTEM RESPONSES

None.

VI. ASSESSMENT OF THE SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

The safety function of Control Rod Drive Trip Breaker Unit 11 was not prevented by the loss of the undervoltage relay. The General Electric undervoltage device was operable and was used to trip the breaker. None of the other control rod drive trip breakers were affected.

VII. PREVIOUS EVENTS OF A SIMILAR NATURE

None.

VIII. CORRECTIVE ACTIONS

Troubleshooting revealed that the K1 relay contact of the undervoltage relay was not closing when RPS output was de-energized. It was discovered that the 48/125 VDC jumper had been installed in the 48 VDC position instead of the 125 VDC position. A visual inspection indicated yellow discoloration on the clear plastic cover of the K1 relay. The incorrect jumper position resulted in heating of the K1 relay and subsequent failure of the undervoltage relay.

The jumper position in the undervoltage relays for the other three RPS channels was visually checked and found to be in the correct position.

A spare undervoltage relay was tested and installed. The shunt trip feature for CRD Trip Breaker Unit 11 was successfully tested.

A corrective maintenance procedure has been developed to provide on-site maintenance and calibration of the undervoltage relays. Proper setting of the voltage selection jumper will be verified as part of this procedure.

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Writer's Direct Dial Number

February 14, 1986
5211-86-2026

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

Dear Sir:

Three Mile Island Nuclear Station Unit 1 (TMI-1)
Operating License No. DPR-50
Docket No. 50-289
LER 86-003-00

This letter transmits Licensee Event Report (LER) No. 86-003-00 which deals with an undervoltage relay failure for a control rod drive trip breaker. Public health and safety were unaffected.

This LER is being submitted for information purposes only at the request of the NRC, using the required LER forms (attached). NRC Form 366 contains an abstract which provides a brief description of the event. For a complete understanding of the event, refer to the text of the report which appears on Form 366A.

Sincerely,

H. D. Hukill
Director, TMI-1

HDH/SMO/spb

Enclosure

cc: Dr. T. Murley
R. Conte
J. Thoma

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