

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) **THREE MILE ISLAND, UNIT 1** DOCKET NUMBER (2) **0500002891** OF **05**

TITLE (4) **FAILURE OF CRD BREAKER UNDERVOLTAGE DEVICE DURING SURVEILLANCE TESTING**

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 (5)
03	16	88	88	001	0	06	03	88			050000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)

OPERATING MODE (9) <b>N</b>	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.408(e)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
POWER LEVEL (10) <b>100</b>	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.38(a)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.38(a)(2)	<input type="checkbox"/> 50.73(a)(2)(vi)	<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 365A)
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
	<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)  
NAME **M. R. KNIGHT, TMI-1 LICENSING ENGINEER** TELEPHONE NUMBER **717 948-8554**

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS
B	AA	BKLR	G180	Y					

SUPPLEMENTAL REPORT EXPECTED (14)  YES (If yes, complete EXPECTED SUBMISSION DATE: )  NO  
EXPECTED SUBMISSION DATE (15) MONTH  DAY  YEAR

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

At approximately 1100 hours on March 16, 1988 during the Reactor Protection System surveillance test, a Control Rod Drive (CRD) Breaker failed the undervoltage (UV) trip test. The breaker did however trip via the shunt trip device. The UV trip paddle had lodged over the UV armature disk. This event is not reportable in accordance with 10 CFR 50.72 or 50.73. Therefore this LER is submitted voluntarily. The breaker was replaced and tested satisfactorily. Investigation revealed defects in two parts (the undervoltage device armature disk and the undervoltage trip paddle). Both parts were replaced and the unit tested satisfactorily. No safety systems actuated as a result of this component failure. This malfunction would not have prevented the breaker from tripping because of the redundant shunt trip device feature. Redundant breakers are also provided. All CRD breakers will be checked. Maintenance procedures will be changed to provide direction for verifying dimensions. Receipt inspection for replacement parts will be required if the vendor cannot provide dimensional certification.

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

FAILURE OF CRD BREAKER UNDERVOLTAGE DEVICE DURING SURVEILLANCE TESTING

I. Plant Operating Conditions Before the Event

TMI-1 was operating at 100% power. The plant was being controlled by the Integrated Control System [JA/-] which was in full automatic control. The plant was 327.8 EFPD (effective full power days) into Operating Cycle 6.

II. Status of Structures, Components, or Systems that were Inoperable at the Start of the Event and that Contributed to the Event

There were no structures, systems, or components known to be inoperable at the time of the event that had any effect on the failure of Breaker #4 to trip during the test of the undervoltage device.

III. Event Description

At approximately 1100 hours on March 16, 1988 during the performance of Surveillance Procedure 1303-4.1, "Reactor Protection System" [AA/-], Step 8.10.2.2a, Control Rod Drive (CRD) Breaker CB-4 [AA/BKR] failed to trip during the undervoltage (UV) trip test. CRD Breaker CB-4 did however trip via the shunt trip device. This event was determined not to be reportable in accordance with 10 CFR 50.72 and 50.73. Therefore this LER is being submitted voluntarily. This event has previously been reported via the Nuclear Plant Reliability Data System (NPRDS) and the Nuclear Network.

The UV device was tested several times to establish the failure mechanism. Prior to replacing CB-4, the failure was identified as the UV trip paddle lodging itself over the UV armature disk. This failure mode prevented the UV device (when de-energized) from moving upward and striking the UV trip paddle to trip the breaker (See Figure 1).

Defective Breaker CB-4 was replaced with a spare breaker. The replacement breaker was then tested to verify proper operation of the UV and shunt trip devices. The replacement breaker tested satisfactorily. Breaker CB-4 was moved to the Electrical Maintenance Shop for further

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TEXT (If more space is required, use additional NRC Form 306A's) (17)

observation, and investigation of the root cause of the problem.

Subsequent investigation of the defective breaker CB-4 revealed two (2) parts that had dimensional or manufacturing defects (the undervoltage device armature disk and the undervoltage trip paddle). These dimensional tolerances caused the mating surface area between the UV trip paddle and armature disk to be reduced. Both parts were replaced and the breaker was successfully tested in accordance with Preventive Maintenance Procedure E-36.

CRD Breaker CB-4 had been in service since September 16, 1987 and had functioned normally during the last performance of Surveillance Procedure 1303-4.1 on February 18, 1988.

IV. Component Failure Data

GE Model AK-2-15-2 d.c. breaker parts:  
 GE Undervoltage Device, Type 56B309G7 120V-60HZ  
 GE Undervoltage Trip Paddle, Part No. 29B492G1

V. Automatic or Manually Initiated Safety System Responses

No safety systems actuated as a result of this component failure.

VI. Assessment of the Safety Consequences and Implications of the Event

Failure of the undervoltage trip device did not create an unsafe condition. Malfunction of the undervoltage device would not have prevented the breaker from tripping because of the shunt trip device feature which is redundant to the undervoltage device feature. The shunt trip device would have tripped the breaker as designed. In addition, redundant breakers are provided to serve as backup to the performance of this safety function to trip the reactor.

VII. Previous Events of a Similar Nature

None

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

VIII. Corrective Actions Planned

A procedure has been prepared to check the remaining in-service and spare CRD breakers and the spare undervoltage devices. These checks will include verifying the:

1. Interface between the undervoltage device armature disk and the undervoltage trip paddle.
2. Length of the trip paddle.
3. Distance between the disk and the armature.

Preventive Maintenance Procedure E-36 will be changed to provide additional direction to verify the proper location of the undervoltage trip paddle and the undervoltage device armature disk. Receipt inspection for replacement parts will be required if the vendor cannot provide dimensional certification.

GPUN intends to complete CRD breaker checks by August, 1988 and procedural changes by September, 1988.

NOTE: The Energy Industry Identification System (EIIS), System Identification (SI) and Component Function Identification (CFI) Codes are included in brackets, "[SI/CFI]", where applicable, as required by 10 CFR 50.73(b)(2)(ii)(F).

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THREE MILE ISLAND, UNIT 1

DOCKET NUMBER (2)

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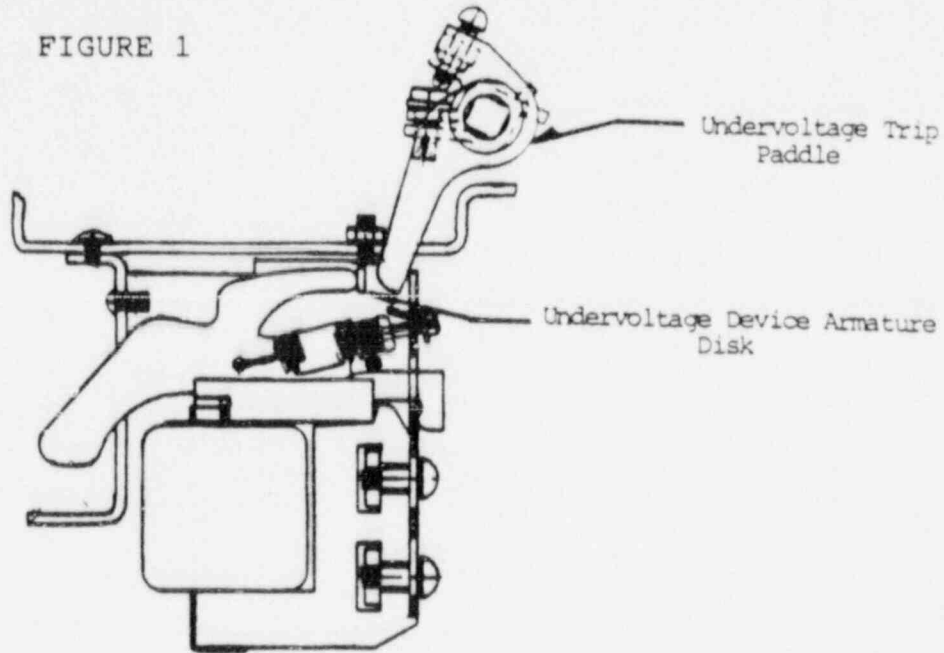
LER NUMBER (6)

PAGE (3)

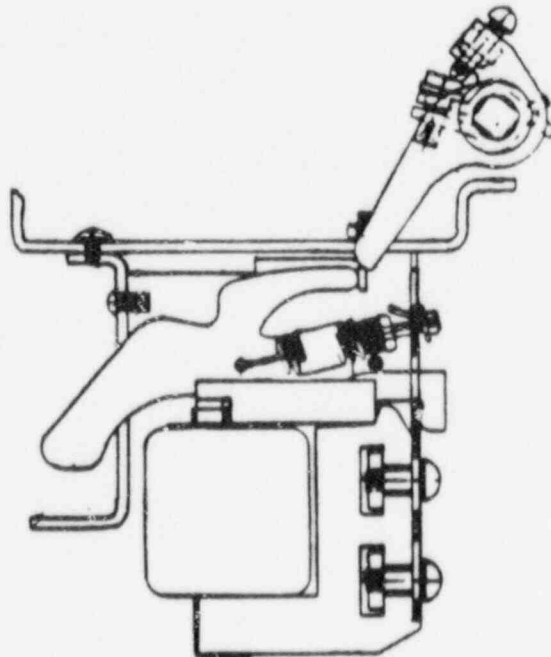
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TEXT (If more space is required, use additional NRC Form 368A's (17))

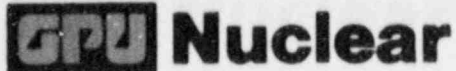
FIGURE 1



G.E. Undervoltage Device  
Energized Position



G.E. Undervoltage Device  
Simulated Failure Position on CRD Bkr. CB-4



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June 3, 1988  
C311-88-2063

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

Dear Sir:

Three Mile Island Nuclear Station Unit I, (TMI-1)  
Operating License No. DPR-50  
Docket No. 50-289  
LER 88-001-00

This letter transmits Licensee Event Report (LER) No. 88-001-00 which deals with the Failure of a CRD Breaker Undervoltage Device During Surveillance Testing. Public health and safety were unaffected.

This LER is being submitted pursuant to 10 CFR 50.73, using the required NRC 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  
Vice President & Director, TMI-1

HDH/MRK/spb

Attachment

cc: R. Hernan  
W. Russell  
R. Conte

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