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October 30, 1994
C311-94-2149

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

Dear Sir:

Subject: Three Mile Island Nuclear Station Unit I, (TMI-1)
Operating License No. DPR-50
Docket No. 50-289
LER 94-006-00

This letter transmits Licensee Event Report (LER) No. 94-006-00 concerning an event on October 2, 1994. While performing preventive maintenance on the 1E 4KV bus feeder breaker, action taken by an electrician caused the loss of the 1E 4KV bus and the Emergency Diesel Generator EG-Y-1B to automatically start.

This LER is being submitted pursuant to 10 CFR 50.73. 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 provided on Form 366A.

Sincerely,

T. G. Broughton
Vice President & Director, TMI

WGH

Attachment

cc: Administrator, Region I
TMI Senior Resident Inspector
TMI-1 Senior Project Manager
T94228

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LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH
THIS INFORMATION COLLECTION REQUEST: 50.0 HRS.
FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO
THE INFORMATION AND RECORDS MANAGEMENT BRANCH
(MNB 7714), U.S. NUCLEAR REGULATORY COMMISSION,
WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK
REDUCTION PROJECT (3150-0104), OFFICE OF
MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

THREE MILE ISLAND, UNIT 1

DOCKET NUMBER (2)

05000-289

PAGE (3)

1 OF 4

TITLE (4)

INADVERTENT ACTUATION OF EG-Y-1B DUE TO PERSONNEL ERROR DURING PREVENTIVE MAINTENANCE

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 NAME	DOCKET NUMBER	
10	02	94	94	-- 006 --	00	10	30	94	FACILITY NAME	DOCKET NUMBER	
										05000	
										05000	
OPERATING MODE (9)		N		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
				20.402(b)		20.405(c)		X		50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)		100%		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
				20.405(a)(1)(iii)		50.73(a)(2)(i)				50.73(a)(2)(viii)(A)	(Specify in
				20.405(a)(1)(iv)		50.73(a)(2)(ii)				50.73(a)(2)(viii)(B)	Abstract below
				20.405(a)(1)(v)		50.73(a)(2)(iii)				50.73(a)(2)(x)	and in Text, NRC Form 366A)

LICENSEE CONTACT FOR THIS LER (12)

NAME

W. G. HEYSEK, TMI LICENSING ENGINEER

TELEPHONE NUMBER (Include Area Code)

717 - 948 - 8191

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	KP	RLY	A348	N					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

At 1637 on October 2, 1994, the plant was operating at 100% power and preventive maintenance was being performed on the 1E 4160 volt bus metering accordance with Procedure E-55, "Switchgear and Main Generator/Transducer Calibration."

While lifting a current transformer lead within the bus breaker 1SB-E2 cubicle to configure the 'A' phase ammeter for calibration, the Electricians unknowingly opened the common ground for protective circuitry. The neutral overcurrent relay, 86B/E, tripped the closed feeder breaker and the subsequent undervoltage condition on the 1E 4160 volt bus automatically started the emergency diesel generator (EG-Y-1B). The EG-Y-1B breaker could not close on the 1E 4160 volt bus to restore power because the overcurrent relay was tripped and locked out.

At 1640, the lead was replaced, the 86B/E relay was reset and the EG-Y-1B breaker was automatically closed to re-power the 1E bus. Plant emergency and abnormal condition procedures were implemented to restart required plant equipment. After the 1E bus was transferred back to the normal power supply, the diesel was secured.

The automatic start of EG-Y-1B is reportable under 10 CFR 50.73(a)(2)(iv).

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
THREE MILE ISLAND, UNIT 1	05000-289	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
		94	- 006 -	00	

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

I. PLANT OPERATING CONDITIONS BEFORE THE EVENT

The plant was operating at 100% power with the Integrated Control System (ICS) in full automatic. Maintenance Procedure E-55 "Switchgear and Main Generator/Transducer Calibration" was in progress on the 1E 4160 volt bus breaker [EA/BRK] 1SB-E2 "A" phase ammeter [EA/II].

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

No systems, structures or components were out-of-service that contributed to this event.

III. EVENT DESCRIPTION

At 1637 hours on October 2, 1994 the Control Room received numerous alarms and one-half of the Control Room lights de-energized. While lifting a current transformer (CT) lead from bus breaker 1SB-E2 to configure the 'A' phase ammeter for calibration, the Electricians unknowingly opened the common protective circuitry. An assessment of plant conditions found that the 1E 4160 volt bus [EA/BU] had de-energized, the emergency diesel generator EG-Y-1B [EK/DG] had started and the EG-Y-1B breaker [EB/BRK] had not closed onto the 1E 4160 volt bus to restore power. Overcurrent relay 86B/E [EB/RLY] was tripped and locked out. The automatic start of the emergency diesel generator is reportable under 10 CFR 50.73 (a)(2)(iv).

The lockout was reset on the 1SB-E2 breaker cubicle which resulted in the automatic closure of the EG-Y-1B breaker and restoration of the bus. The event was caused by a combination of circumstances: performing the maintenance task with the bus energized was an activity not compatible with plant conditions, the procedure direction was inadequate to prevent the event when performed on an energized feeder breaker and the Electrical Maintenance technician made a technical error in that a drawing he referred to while performing the task did not show the complete circuitry. As a result CT [EA/XCT] circuit continuity to the bus protective relaying scheme was not maintained.

During the plant's automatic response to the event, a regulatory required Fire service pump (FS) P-3 [KP/P], the River Water System Fire Diesel, failed to auto-start as designed on a loss of power. The failure of FS-P-3 to start was initially attributed to the failure of a time delay relay [KP/RLY] to time out. The cause was later confirmed during trouble shooting when technicians found the relay to operate intermittently even after tightening a loose wire on a relay terminal.

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

IV. Component Failure Data

There were no safety related equipment failures associated with the initiation of this event.

V. Automatic or Manually Initiated Safety System Responses

EG-Y-1B fast started as a result of an undervoltage condition on the 1E 4160 volt bus. The diesel output breaker did not close due to the condition of the neutral overcurrent relay; tripped and locked out. Once the protective relaying scheme CT circuit continuity was re-established, the lockout was reset, the diesel breaker closed and re-powered the ES bus. The safety equipment functioned as designed.

Failure of FS-P-3 to auto-start was not a problem since two other pumps were available. One pump is an emergency diesel driven pump and the other is supplied power from either the R or T 480 volt buses through an automatic transfer switch. In addition, all pumps receive start signals on low system pressure as a result of fire system demand.

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

There were no safety consequences as a result of this event. The reactor was maintained in a safe condition. Although plant equipment was de-energized, standby equipment automatically started or was placed in-service by the operating crew in accordance with applicable Emergency and Abnormal procedures. The unit remained at 100% power. Reactor coolant pump seal injection was lost when MU-P-1B [AB/P] lost electrical power. Seal water flow was reestablished when MU-P-1A was placed in-service by the operating crew. The thermal barrier heat exchanger [CC/HX] maintained cooling by intermediate closed cooling water system as designed.

VII. Previous Events of a Similar Nature

TMI-1 experienced an emergency diesel auto-start as a result of a maintenance personnel error on January 9, 1987. The event was caused by an Electrical Technician lifting a wire in the circuit for a 4160 volt CT to perform an Appendix R modification task. During the 1987 event, a lockout occurred and a reset was required to re-energize the 4160 volt bus. The cause of the event was determined to be inadequate modification instructions.

Although inadequate instruction played a role in both events, they are dissimilar in that the earlier event involved instructions in a modification installation /test package and the most recent event involved a preventive maintenance procedure.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
THREE MILE ISLAND, UNIT 1	05000-289	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 4
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

VIII. Corrective Actions Taken

- A. The event was reviewed with Electrical Maintenance personnel during shop meetings held prior to October 24, 1994. The need to know and understand the application of the CT being worked on and the generic industrial safety concern identified with shorting CTs were specifically addressed during the discussion.
- B. The performance code for tasks relating to preventative maintenance on CTs has been changed to identify that work can only be performed while the CT is de-energized. This action was verified complete on October 20, 1994.

IX. Corrective Actions Planned

- A. Procedure E-55 is being revised to include a step in the procedure to check the circuit for current with a clamp-on ammeter with an appropriate range. The revised procedure will be issued by December 30, 1994.
- B. The remaining Electrical Maintenance Procedures addressing Current Transformer work will be reviewed, revised to include an appropriate caution and issued by January 27, 1995.
- C. Electrical Maintenance Training on Current Transformer Circuits will be evaluated and revised to include a discussion of the appropriate method to determine the status of the circuit and correctly jumper the device. This will be completed by July 30, 1995.

* 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).