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October 3, 1995
C311-95-2404

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

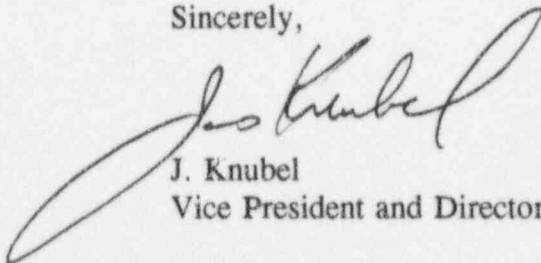
Dear Sir:

Subject: Three Mile Island Nuclear Station, Unit I (TMI-1)
Operating License No. DPR-50
Docket No. 50-289
LER 95-004-00

The purpose of this letter is to transmit Licensee Event Report (LER) No. 95-004-00 regarding the short term interruption of decay heat removal flow due to inadvertent operation of DH-V-1 during Engineered Safeguards Actuation System relay coil replacement activities. Although no reporting requirement thresholds were exceeded, this event represents an opportunity to develop corrective actions which may prevent a more significant event, and therefore a root cause analysis and voluntary LER are being submitted.

This event did not adversely affect the health and safety of the public.

Sincerely,



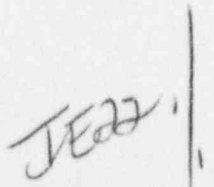
J. Knubel
Vice President and Director, TMI

AWM

Attachments

cc: Administrator, Region I
TMI Senior Resident Inspector
TMI Senior NRC Project Manager

9510110001 951003
PDR ADOCK 05000289
S PDR



LICENSEE EVENT REPORT (LER)

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), 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)

05000289

PAGE (3)

1 OF 3

TITLE (4)

SHORT TERM INTERRUPTION OF DECAY HEAT REMOVAL FLOW DUE TO INADVERTENT OPERATION OF DH-V-1 DURING ESAS RELAY COIL REPLACEMENT

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
09	12	95	95	-- 004	-- 00	10	03	95	FACILITY NAME	DOCKET NUMBER
OPERATING MODE (9)		N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)							
POWER LEVEL (10)		000	20.2201(b)			20.2203(a)(2)(v)			50.73(a)(2)(i)	50.73(a)(2)(viii)
			20.2203(a)(1)			20.2203(a)(3)(i)			50.73(a)(2)(ii)	50.73(a)(2)(x)
			20.2203(a)(2)(i)			20.2203(a)(3)(ii)			50.73(a)(2)(iii)	73.71
			20.2203(a)(2)(ii)			20.2203(a)(4)			50.73(a)(2)(iv)	<input checked="" type="checkbox"/> OTHER
			20.2203(a)(2)(iii)			50.36(c)(1)			50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A
			20.2203(a)(2)(iv)			50.36(c)(2)			50.73(a)(2)(vii)	

LICENSEE CONTACT FOR THIS LER (12)

NAME

A. W. Miller, TMI Licensing Engineer

TELEPHONE NUMBER (Include Area Code)

(717) 948-8128

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

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 15 single-spaced typewritten lines) (16)

This report is being submitted as a voluntary LER. On September 12, 1995, during replacement of relay coils located in an Engineered Safeguards Actuation System (ESAS) cabinet with the plant in Cold Shutdown, there was a short term interruption of decay heat removal flow. DH-V-1, one of the drop line isolation valves for the Decay Heat Removal System, began to travel in the closed direction after its relay contactors were disturbed. An alarm announced the event to the control room staff. The Control Room Operator (CRO) promptly verified the valve was closing and attempted to open the valve without success. When the valve indicated fully closed, the CRO secured the operating DH pump. The CRO then reopened DH-V-1 and restarted the DH pump. DH-V-1 again began closing; the CRO then successfully tripped the breaker for the valve by pressing the open pushbutton switch while the valve was traveling in the closed direction. The valve travel was stopped while still nearly full open. DH-V-1 was then manually opened fully and its breaker was opened. The cause of this event was less than adequate procedural guidance. The procedure will be revised to include the necessary precautions concerning work on the relay coil for DH-V-1. There were no adverse safety consequences or safety implications that resulted from this event, and this event did not affect the health and safety of the public.

LICENSEE EVENT REPORT (LER)
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THREE MILE ISLAND, UNIT 1	05000289	95	-- 004	-- 00	2 OF 3

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

SHORT TERM INTERRUPTION OF DECAY HEAT REMOVAL FLOW DUE TO INADVERTENT OPERATION OF DH-V-1 DURING ESAS RELAY COIL REPLACEMENT

I. Related History and Background Information:

While performing preventive maintenance (PM) work in an Engineered Safeguards Actuation System (ESAS) relay cabinet [JE/CAB]* in October 1994, it was determined that relay coil [JE/RLY]* replacement would be necessary. Job Order #00094767 was initiated which referenced procedure 1420-Y-11, "ESAS Channel Relay Maintenance" to do the work. Since 1420-Y-11 is an approved procedure, further review of the job order is not required by GPUN administrative procedures. This relay replacement work was scheduled to be performed during the 11R outage.

DH-V-1 and DH-V-2 [BP/ISV]* are series drop line isolation valves connecting the Reactor Coolant System to the Decay Heat Removal System which have electrical interlocks to prevent overpressurization of the Decay Heat Removal System. These interlocks are controlled by relays physically located in the ESAS relay cabinet but are not part of the ESAS configuration. Decay Heat Removal System flow is from the RCS, through DH-V-1 and DH-V-2 to the suction of two redundant pumps.

II. Plant Operating Conditions Before Event:

On September 12, 1995, TMI-1 was in cold shutdown in the 4th day of the 11R outage. The "A" Decay Heat Removal String was in service with a reactor vessel outlet temperature of 134 degrees Fahrenheit. The Reactor Coolant System (RCS) was vented via removed manways on the Steam Generators, and the pressurizer level was in the range of 50 inches. The RCS was being drained down but had not reached the mid-loop condition.

III. Event Description:

The job package for relay change out in the ESAS relay cabinets was presented to the Shift Foreman at approximately 20:00 on 9/11/95. Approval to begin work was given at that time. During performance of the work electricians were in the ESAS relay cabinet changing out the relay coil for DH-V-1 at approximately 3:26 am on 9/12/95. DH-V-1 then began to drive in the close direction. A computer alarm alerted the control room staff that DH-V-1 was closing. The Control Room Operator (CRO) verified via indication that the valve was closing and attempted to open the valve, without effect. When the valve closed, an overhead annunciator alarm indicated low DH flow and high DH Pump vibration. The CRO secured DH-P-1A.

The CRO electrically opened DH-V-1 and restarted DH-P-1A, about 45 seconds after having tripped DH-P-1A. After flow was reestablished and temperatures were decreasing, DH-V-1 began closing again. The CRO successfully tripped the breaker for DH-V-1 by pressing the open switch while the valve was travelling in the closed direction. The valve travel was stopped while still nearly completely open. DH-V-1 was fully opened manually and the electrical breakers for DH-V-1 and DH-V-2 were opened to prevent any further inadvertent movement. During this event incore thermocouple 7B showed a temperature increase from 131 to 138 degrees Fahrenheit. Pressurizer level increased about 5 inches due to the expansion from the heatup.

IV. Identification of Root Cause:

As part of the root cause investigation, the electricians and the operations staff involved in the event were interviewed. Root cause was determined using GPUN Administrative Procedure 1080, "Human Performance Event or Near Miss Reporting", NUREG CR/5455, "Human Performance Investigation Process", and Root Cause Tree Analysis.

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TEXT CONTINUATION

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

The root cause of this event is a wrong assumption made by the originator of procedure 1420-Y-11. A necessary precaution concerning work on the relay coil for DH-V-1 and DH-V-2 was omitted because the originator assumed that individual relays in the cabinet could not actuate components due to the ESAS two out of three actuation logic. This assumption does not apply to non ESAS components like DH-V-1 and DH-V-2 even though the respective relays are located in the ESAS cabinets. A contributing cause to this event was less than adequate technical review during the safety review of 1420-Y-11. The technical review of 1420-Y-11 during the safety review process failed to reveal that relay coil replacement would cause DH-V-1 or DH-V-2 closure during a time when those valves were in the flowpath for core heat removal while their motor operators were energized.

V. Automatic or Manually Initiated Safety System Responses:

No safety system responses occurred or were required to occur.

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

The response of the system to the maintenance activity was unexpected, but did not result in a violation of Technical Specifications. The flow through the Decay Heat Removal "A" Loop was decreased and terminated for approximately 40 seconds. This interruption in flow resulted in a local temperature increase in the RCS of approximately 7 degrees Fahrenheit. There were no adverse safety consequences or safety implications that resulted from this event, and this event did not affect the health and safety of the public.

VII. Previous Events of a Similar Nature

There have been no previous LERs at TMI-1 related to inadvertent operation of DH-V-1.

VIII. Corrective Action

A. Immediate Corrective Action:

- DH-V-1 was opened manually and independently verified open. The circuit breakers for DH-V-1 and DH-V-2 were opened to prevent further inadvertent operation.
- Work on this task was stopped until the functional impact of manipulating relay contacts was determined for each relay to be worked. The evaluation of functional impact was performed by a qualified engineer at the job site.

B. Action to Prevent Recurrence:

- Procedure 1420-Y-11 will be revised to include the necessary precautions concerning work on the relay coils for DH-V-1 and DH-V-2 by December 29, 1995.
- The TMI Safety Review Training Program will include this event as an example of less than adequate technical review during the safety review process.

*The Energy Industry Identification System (EIS), 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).