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November 30, 1989
C311-89-2131

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 89-001-00

This letter transmits Licensee Event Report (LER) No. 89-001-00 which deals with Inadvertent ES Actuation During Surveillance Testing Due to Operator Error. Public health and safety were not affected.

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/WGH/spb

Attachment

cc: R. Hernan
W. Russell
F. Young

IE22
1/1

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES 8/31/85

LICENSEE EVENT REPORT (LER)

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TITLE (4)

INADVERTENT ES ACTUATION 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(S)
										0 5 0 0 0
1 0	3 0	8 9	8 9	— 0 0 1	— 0 0	1 1	3 0	8 9		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)	X 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)
1 0 0		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
W. G. HEYSEK, TMI-1 LICENSING ENGINEER	AREA CODE 7 1 7 — 9 4 8 - 8 1 9 1

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)		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 October 30, 1989, at 8:30 a.m. operator error resulted in an inadvertent actuation of "B" ES components during performance of the "Reactor Building Cooling and Isolation System Logic Channel and Component Test". The components affected by the ES actuation operated as required in response to the inadvertent actuation signal. Operators verified that the ES actuation was inadvertent, secured the High Pressure Injection Pump within 20 seconds and returned the remaining actuated components to their standby ES condition.

No equipment was damaged and the volume of borated water injected into the Reactor Coolant System was minimal, approximately 80 gallons. Corrective actions to prevent recurrence of the event include counseling operators in the need to understand and follow procedures precisely and to revise the procedure to provide additional guidance to the operators.

The event was reported per 10 CFR 50.72 (b)(1)(iv).

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

INADVERTENT ES ACTUATION DURING SURVEILLANCE TESTING

I. PLANT OPERATING CONDITIONS BEFORE THE EVENT

TMI-1 was operating at 100% power with the Integrated Control System (JA/-) in full automatic. The plant was 412 effective full power days into Operating Cycle 7. The Reactor Building Cooling and Isolation System Logic Channel and Component Test surveillance per 1303-5.1 was in progress.

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

At 8:30 a.m., on October 30, 1989, during performance of the Relay Defeat Interlock Test section of Surveillance Procedure 1303-5.1, "Reactor Building Cooling and Isolation System Logic Channel and Component Test", a Reactor Building High Pressure "B" ES (JE/-) actuation occurred. It was the result of operator error. The event was reported within 1 hour in accordance with 10 CFR 50.72 (b)(1)(iv). It is also reportable within 4 hours in accordance with 10 CFR 50.72 (b)(2)(ii) and within 30 days by a written report in accordance with 10 CFR 50.73 (a)(2)(iv).

The operating crew scheduled to perform Surveillance Procedure 1303-5.1 was notified approximately one week prior to the test in order for them to review the procedure. SP 1303-5.1 is a complex procedure which requires careful attention to procedure compliance. The procedure was reviewed by all appropriate test personnel prior to performance of the test. On the morning of October 30, the dedicated operations test personnel were briefed by the Test Coordinator (the senior Operation's person working with the crew). Since a systematic approach to the performance of this type of procedure is required to maintain control, the Test Coordinator directed the test from the Control Room and an operator in the Control Room coordinated the communications with the other test personnel located at various stations around the plant. When the Test Coordinator left the Control Room to perform steps at the ESAS Bistable Cabinets, headset communication between the Test Coordinator and the test personnel in the Control Room was maintained while the procedure steps were being completed.

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

III. EVENT DESCRIPTION (CONT'D.)

In the Control Room, while one operator maintained communication with the Test Coordinator, another operator read the procedure, directed and verified the actions taken and signed off the steps. The third operator performed the steps. When the Reactor Building High Pressure Bistable BT-1 (JE/MDR) was tripped per procedure, the operators in the Control Room were not cognizant of the overall ES system status. They were not aware that the BT-1 trip had effected the "B" Train as well as the "A" Train logic. Performance of the surveillance continued with operator attention focused on the "A" Train. With the "A" Actuation Group 1 components in the test (actuated) position, and BT-1 tripped and then reset, the operator re-enabled "A" ES logic but failed to re-enable "B" ES logic. He also failed to "verify on PCR panel that the all blue lights extinguish except ...Group 1" as procedurally required. The operator reviewed the "A" side ES panel (PCR) but did not carefully observe all the ES logic lights on the PCR panel. These steps were performed by a single operator who both read and performed the steps. Though this is not in violation of the approved procedure, it is a deviation from the previously successful routine wherein one operator reads the procedure steps and directs the actions of another.

The status of "B" ES logic was not of consequence until the test proceeded to the point of tripping the second Reactor Building High Pressure Bistable (BT-2). The two out of three logic was satisfied and a Reactor Building High Pressure "B" ES actuation occurred.

IV. COMPONENT FAILURE DATA

No component failures were associated with this event.

V. AUTOMATIC OR MANUALLY INITIATED SAFETY SYSTEM RESPONSES

As a result of the improperly performed procedure steps, the ES actuation affected the equipment listed on Attachment 1.

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

High Pressure Injection via MU-P-1C (BP/P) was secured by the control room operators within 20 seconds. No equipment was damaged but concerns resulted which were allayed as described below:

VI. ASSESSMENT OF THE SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT (CONT'D.)

a) Approximately 80 gallons of borated water were injected into the core. A change in Boron concentration was not detected in either of two reactor coolant samples taken. A calculated increase in concentration of 3 ppm was compensated for by slight reactor control rod (AA/ROD) withdrawal and deborating demineralizer (WD/FDM) operation to reduce the concentration.

b) River water was injected into the RB Emergency Cooling Coils (VA/CCL) which is undesirable from a chemistry control standpoint. The coolers were drained and refilled from the Nuclear Services Closed Cooling System (CC/-).

c) Valve repositioning allowed direct connection of the Borated Water Storage Tank (BWST) (BP/TK) and the Sodium Hydroxide (NaOH) Tank (VA/TK). This lineup could result in NaOH flow to the Decay Heat (DH) suction header (BP/-) exceeding spec for Na or pH during operations. However, tank level changes indicated a slight rise (less than 1 inch) in NaOH tank level. Chemistry sample results found the NaOH concentration within specification. Results of DH suction header chemistry samples confirmed that no NaOH flowed from the tank to the header.

d) Additional thermal cycles on the letdown coolers (CB/CLR) and the HPI nozzles (BJ/NZL) is always undesirable. There was no indication of a degradation of component integrity. Letdown cooler integrity was considered maintained since there was no change in Intermediate Closed Cooling System activity or increase in surge tank level. Actual thermal cycles on HPI nozzles remain well within the allowable design.

VII. PREVIOUS EVENTS OF SIMILAR NATURE

This is the second inadvertent ES actuation at TMI-1 to occur during ES surveillance testing where personnel error was the root cause. A similar incident occurred on 6/25/85 and was reported by LER 85-001. None of the personnel involved in this most recent incident were involved in the 1985 incident.

Two other inadvertent ES actuations have occurred during performance of the same surveillance test. They were the result of equipment failure (a blown fuse) and an equipment malfunction. Those events were reported by LERs 78-019 and 74-029 respectively.

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

VIII. CORRECTIVE ACTIONS PLANNED

a) Review with all operators the importance of understanding the procedure step and following it precisely.

b) Revise Surveillance Procedure 1303-5.1, "Reactor Building Cooling and Isolation System Logic Channel and Component Test" to:

1) Provide a test sequence summary at the beginning of the procedure to improve preparation for the test. This will include recommendations based on previous positive and negative experiences.

2) Add a verification step to use the status lights on the ES cabinets to assure that the other channels are reset prior to tripping the bistable.

3) Place appropriate procedural cautions to identify situations when the test affects equipment control outside of the specific section being tested.

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

"COMPONENTS AFFECTED"

		Condition After Inadvertent ES	Effect on Plant/Equipment
1.	WDG-V-4	CL	1. Isolated RCDT gas space for vent header.
2.	CA-V-189	CL	2. Isolated RC pump #3 seal purge.
3.	MU-V-18	CL	3. Isolated norm MU & recirc flow path for MU-P-1B, seal flow remained.
	MU-V-37	CL	
4.	MU-V-14B	OP	4. BWST injected into RCS thru HPI nozzles. Thermal cycles on HPI nozzles. Boron injected in RCS required >2000 gals of Feed & Bleed to return to required boron concentration.
	MU-P-1C	START	
	MU-V-16C	OP	
	MU-V-16D	OP	
5.	MU-V-2A	CL	5. Isolated letdown, restoration was performed IAW OP 1104-2.
	MU-V-2B	CL	
6.	RB-V-2A	CL	6. Isol. RB normal cooling.
	RB-V-7	CL	
7.	CM-V-2	CL	7. None - CM-V-1 & 3 were already closed per SP 1303-5.1.
	CM-V-4	CL	
8.	BS-V-1B	OP	8. None
9.	BS-V-2B	OP	9. Lined up NaOH tank to DH Suct. Hdr./BWST. Slight decrease in BWST (~1") & slight increase in NaOH tank were noted.
	BS-V-3B	OP	
10.	PP-V-165	OP	10. Elec. & Mech. RB penetrations were cross tied. Air flowed to elec. penetrations until equalized.
11.	NR-V-4B	CL	11. Isolated NR makeup to CW flume.
12.	DH-P-1B	START	12. None
	DH-V-4B	OP	
13.	RR-V-1B	OP	13. River water circulated thru RB coolers. RB coolers were flushed & refilled.
	RR-P-1B	START	
	RR-V-4B	OP	
	RR-V-3C	OP	
	RR-V-4C	OP	
14.	DR-P-1B	START	14. None
15.	DC-P-1B	START	15. None
16.	AH-E-1B	ON/SLOW	16. None
17.	AH-E-1C	NOT VERIFIED	17. The actuation of AH-E-1C will be verified during the next performance of 1303-5.2.
18.	EG-Y-1B	START	18. None
19.	1C-ES Valves Transfer Locked Out	LOCKED OUT	19. Transfer was reset at 0610 11/2/89.
20.	1M DC Dist. Panel Transfer Locked Out	LOCKED OUT	20. Transfer was reset at 0610 11/2/89.

ACRONYMS

RB	Reactor Building
RCS	Reactor Coolant System
RCDT	Reactor Coolant Drain Tank
RC	Reactor Coolant
MU	Make up
BWST	Borated Water Storage Tank
HPI	High Pressure Injection
CW	Circulating Water
NR	Nuclear Services River Water