



GPU Nuclear Corporation  
Route 441 South  
P.O. Box 480  
Middletown, Pennsylvania 17057-0480  
(717) 944-7621  
Writer's Direct Dial Number:

(717) 948-8005

February 25, 1993  
C311-92-2028

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 93-001-00

This letter transmits Licensee Event Report (LER) No. 93-001-00 concerning the failure of BS-PS-286 during the performance of a monthly Technical Specification (TS) surveillance.

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-1

WGH

Attachment

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

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S PDR

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) THREE MILE ISLAND, UNIT 1										DOCKET NUMBER (2) 0 5 0 0 0 2 8 9 1 OF 0 5										PAGE (3) 1 OF 0 5					
TITLE (4) BS-PS-286 (RB 30 PSIG PRESSURE SWITCH) FAILURE AND SUBSEQUENT ENTRY INTO TECHNICAL SPECIFICATION 3.0.1																									
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)										
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OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)																							
		20.402(b)						20.408(c)						50.73(a)(2)(iv)						73.71(b)					
POWER LEVEL (10)		20.405(a)(1)(i)						50.38(a)(1)						50.73(a)(2)(v)						73.71(c)					
1 0 0		20.405(a)(1)(ii)						50.38(a)(2)						50.73(a)(2)(vi)						OTHER (Specify in Abstract below and in Text, NRC Form 355A)					
		20.405(a)(1)(iii)						50.73(a)(2)(i)						50.73(a)(2)(vii)(A)											
		20.405(a)(1)(iv)						50.73(a)(2)(ii)						50.73(a)(2)(vii)(B)											
		20.405(a)(1)(v)						50.73(a)(2)(iii)						50.73(a)(2)(ix)											
LICENBEE 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 NRC		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC															
X	B	E	P	S		5	3	4	5	Y															
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)										MONTH	DAY	YEAR			
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)										<input checked="" type="checkbox"/> NO															

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

On January 26, 1993 TMI-1 was operating at 100% power. Plant operations personnel were performing Technical Specification Surveillance 1303-4.14 to test the operation of the Reactor Building 30 PSIG analog channels. Pressure switch BS-PS-286 [BE/PS] was declared inoperable. Because of failure to meet the redundancy requirement of Technical Specification table 3.5-1, the unit entered Technical Specification section 3.0.1 (equivalent to STS 3.0.3). Actions were taken to complete corrective measures to permit continued operation. A jumper initially installed provided normal control room indication of an actuated channel but did not completely provide an actuated channel. Further evaluation by the plant staff identified the weakness and two additional jumpers were installed to provide the proper degree of redundancy. The faulty switch was inspected, cleaned, exercised and lubricated. The deadband setting of the switch was increased and after reliable operation was confirmed, the switch was returned to service.

The root cause of the entry into Technical Specification 3.0.1 was the failure of BS-PS-286 during performance of the surveillance. The remaining five similar switches will be inspected and the deadbands reset as required. The Technical Specification requirements for events of this nature will also be reviewed and revised as appropriate.

The event is being reported per 10CFR50.73(a)(2)(i)(b).

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
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TEXT (If more space is required, use additional NRC Form 305A's) (17)

BS-PS-286 (RB 30 PSIG PRESSURE SWITCH) FAILURE  
AND SUBSEQUENT ENTRY INTO TECHNICAL SPECIFICATION 3.0.1

I. PLANT OPERATING CONDITIONS BEFORE THE EVENT

The plant was operating at 100% power prior to the event.

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

Surveillance Procedure SP 1303-4.14 "Reactor Building 30 psig Analog Channels" was being performed. While testing BS-PS-286 [BE/PS], it was observed to give an intermittent indicating light on the ES panel in the Control Room and data logger printer in the Control Room. PS-286 was retested in accordance with procedure steps approximately 3 times and it was observed to operate properly. The remainder of the surveillance was successfully completed.

At 0403 hours, after successful completion of the test and while trying to determine the exact problem with the indication for a follow-up job ticket, the test switch for BS-PS-286 was intentionally actuated again and responded intermittently again. Personnel were dispatched to the auxiliary relay that operated the ES light contact and it was found to be operating intermittently also. Further investigation revealed the problem was either a PS-286 contact failing to energize the relay or PS-286 itself wasn't operating correctly. Personnel were dispatched to PS-286 to observe its physical operation. Upon actuation, it was discovered that the contact mechanism appeared to be malfunctioning, causing the PS-286 contacts not to operate properly.

With BS-PS-286 inoperable, the minimum degree of redundancy of one as required in TS Table 3.5-1, item C.4.a, Column B was no longer satisfied. The operator action required for failure to meet the condition is to take the unit to hot shutdown. Since no specific time clock applies and TS 3.5.1.1 specifies for unit instrumentation and control systems that TS 3.0.1 applies, the time clock limits stipulated in TS 3.0.1 are applicable. TS 3.0.1 stipulates that "When a Limiting Condition for Operation is not met ... within one hour action shall be initiated to place the unit in a condition in which the specification does not apply by placing it, ... in: at least Hot Standby within the next 6 hours...."

After confirmatory review with Operations Management, the Shift Supervisor entered into T.S. Action 3.0.1 in parallel with taking action to restore the degree of redundancy by placing PS-286 in a tripped condition. Per Administrative Procedure 1013, "Temporary Modifications and Bypass of Safety

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES 6/30/85

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		9 3	— 0 0 1	— 0 0	0 3	OF 0 5	

TEXT (If more space is required, use additional NRC Form 386A's) (17)

Functions", a jumper was installed at 0437 across the PS-286 contact required to give the ES actuation light and the data logger printout data. At the time, this action was thought to satisfy the degree of redundancy required by T.S. Table 3.5-1, and T.S. 3.0.1 was no longer applicable. Job Ticket preparations for repair/replacement of BS-PS-286 were commenced. Following normal shift change at 0700 hours, plans for removal of PS-286 for more complete troubleshooting on a test bench were established.

During review of the PS-286 in-field contact conditions, the I&C technician challenged the adequacy of the installed jumper and the status of the remaining unjumped contacts prior to removing PS-286 for bench testing. At this time, about 0810 hours, it was realized that the degree of redundancy required by T.S. 3.5-1 had not been satisfied by the first jumper. Immediate steps were taken to install the additional two temporary jumpers required. This was completed satisfactorily by about 0830 hours.

Testing of BS-PS-286 revealed that the switch linkage did not make a positive transition to the actuated state. The linkage was cleaned, exercised and lubricated, and the deadband was increased. After these actions were completed, the switch operated reliably and was returned to service. The "as found" deadband setting was within but at the low end of the manufacturer's suggested operating range. The vendor manual does not specify any periodic maintenance.

The event is reportable under 10CFR50.73(a)(2)(i)(b) because the pressure switch failure caused entry into TS 3.0.1. The root cause of the event was determined to be equipment failure.

#### IV. COMPONENT FAILURE DATA

Pressure switch BS-PS-286 is a model 9013-AMG5 Form R unit manufactured by Square D.

#### V. AUTOMATIC OR MANUAL INITIATED SAFETY SYSTEM RESPONSES

There were no safety system actuations.

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

The malfunctioning pressure switch affects only the A train of the Building Spray system. The switch may have functioned if called upon for a Loss of Coolant event since the failure was intermittent. Failure of the switch, in itself, would not cause any loss of safety function. The switch is in a 2 of 3 logic to start BS-P-1A. An additional failure would be required to cause the loss of the A train. The B train is fully redundant and was not affected by the malfunctioning switch.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/95

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THREE MILE ISLAND, UNIT 1	0 5 0 0 0 2 8 9 9 3 —	0 0 1 —	0 0	0 4 OF 0 5	

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

The incomplete jumpering was judged an isolated event caused in part by personnel error. It was a consequence of the system design, the overly restrictive time clock and the misreading of the system print by the on shift crew and the engineer. The procedure employed to review and install the jumpers was followed and was appropriate. An appropriate level of attention was demonstrated in that evaluation continued after the initial determination and corrective action were completed. Revision of the TS, an appropriate action for the reasons given below, will eliminate the unwarranted time restraint and the potential for recurrence of the specific event. The shortcomings of the initial jumpering were recognized and rectified. Although the incomplete jumpering resulted in ineffective compensation for the malfunctioning switch, it did not cause any further degradation in equipment availability.

An inoperable Building Spray Pump is permitted for up to 72 hours by Technical Specification 3.3.1.3. Therefore the safety significance of this event is negligible in terms of allowable time to repair this degraded condition.

TS Table 3.5-1 does not provide for an allowable outage time for the listed instrumentation, nor does it account for the redundant trains of instrumentation. TS 3.3.2 provides an allowable outage time of 72 hours for mechanical components, such as a pump, in one train; the redundant train is assumed to be fully operational. The requirements of Table 3.5-1 are inappropriate and inconsistent with the requirements of TS 3.3.2. Based on the inconsistency of the action requirements noted above, the "shutdown" action required for the pressure switch is considered to be overly restrictive. The action statement for the pressure switch should be revised to be consistent with that of the pump.

The complication presented by the inadequacy of the initial application of the electrical jumper is considered to be an isolated deficiency that did not significantly affect safety, since the 'B' ES train of Building Spray remained operable.

#### VII. PREVIOUS EVENTS OF A SIMILAR NATURE

No similar failures of these pressure switches have occurred at TMI-1.

#### VIII. CORRECTIVE ACTION PLANNED

1. Inspect the five remaining similar pressure switches and reset the deadband as required. After checking the remaining switches, the procedure used to calibrate the switches, SP 1302-11.5 "Reactor Building 30 PSIG Channels" will be revised to specify the desired deadband. The switch inspection and procedure revision will be completed by October 31, 1993.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/95

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		

TEXT (If more space is required, use additional NRC Form 386A's) (17)

2. Review and request changes to the T.S. requirements in T.S. Table 3.5-1 to be consistent with the related pump outage time specified in TS 3.3.1.3. The Technical Specification Change Request will be submitted by July 31, 1993.

\* 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).