

LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Susquehanna Steam Electric Station - Unit 1 DOCKET NUMBER (2) 0 5 0 0 0 3 8 7 1 OF 0 4 PAGE (3)

TITLE (4) Operation Prohibited by Technical Specifications - Entry Into 3.0.3

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	9	2	4	9	3	9	3	0	1	2	0	0	1	0	2	5	9	3	0	5	0	0	0

OPERATING MODE (9) 1

POWER LEVEL (10) 1 0 0

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

<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.38(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)
<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.38(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
<input type="checkbox"/> 20.405(a)(1)(iii)	<input checked="" 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 J. J. Meter - Power Production Engineer TELEPHONE NUMBER 7 1 7 5 4 2 1 1 8 7 3

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS
X	B	PIS	I 2 0 1 4	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO X

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

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

On September 24, 1993, at 0102 hours with Unit 1 at 100% power, Emergency Core Cooling Systems Low Reactor Pressure Permissive Switch (PIS-B21-1N021D) was found in the tripped condition with the low pressure side bellows leaking transducer fluid. This switch provides inputs to the Core Spray (CS) system and the Residual Heat Removal (RHR) system logics. Control Room Operators then reviewed the actuation logic for both systems and declared division II of Core Spray inoperable and division II of RHR Low Pressure Coolant Injection (LPCI) inoperable. Technical Specification 3.5.1 for Emergency Core Cooling Systems (ECCS) could not be met in this configuration and Technical Specification 3.0.3 was entered as a failure to meet LCO 3.5.1. Technical Specification 3.0.3 was entered as of the time of the failure of PIS-B21-1N021D. Power reduction toward Startup was commenced at 0255 hours. Efforts to replace switch PIS-B21-1N0321D were pursued concurrently with power reduction. The switch was replaced and successfully tested and returned to Operable prior to reaching the time limits in Technical Specification 3.0.3. At 0743 hours LCO 3.0.3 was exited and reduction of Reactor power was stopped at 23% power. The cause of the switch failure could not be determined at this time and will be returned to the manufacturer for further analysis. There was no compromise to the health and safety of the public due to this event.

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LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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

DESCRIPTION OF EVENT

On September 24, 1993, at 0102 hours with Unit 1 in Condition 1 at 100% power, the Unit 1 Control Room received alarms for 'Residual Heat Removal Injection Permissive Loop B Reactor Low Pressure' and 'Reactor Recirculation Loop B Discharge Valve Auto Closure'. The Instrumentation and Controls (I&C) group was notified immediately and discovered that Emergency Core Cooling Systems Low Reactor Pressure Permissive Switch (PIS-B21-1N021D) was in the tripped condition with the low pressure side bellows leaking transducer fluid. This switch provides inputs to the Core Spray (CS; EIIS Code: BM) system, the Reactor Recirculation (EIIS Code: AD) system, and the Residual Heat Removal (RHR; EIIS Code: BO) system logics. Control Room operators (licensed, utility) then entered Technical Specification 3.3.3 action b. for inoperable Emergency Core Cooling System actuation instrumentation. Based upon the requirements in Technical Specification 3.3.3 action b., Operations personnel then reviewed the actuation logic associated with switch PIS-B21-1N021D and declared division II of Core Spray inoperable and division II of RHR Low Pressure Coolant Injection (LPCI) inoperable. The Reactor Recirculation Loop B discharge valve is associated with LPCI injection logic. Technical Specification 3.5.1 for Emergency Core Cooling Systems (ECCS) was then reviewed for Compliance. An inoperable division of both Core Spray and LPCI is not described in the action statements of 3.5.1 and Technical Specification 3.0.3 was entered as a failure to meet LCO 3.5.1. Technical Specification 3.0.3 was entered as of the time of the failure of PIS-B21-1N021D, 0102 hours on 9/24/93. Power reduction toward Startup was commenced at 0255 hours. Efforts to replace switch PIS-B21-1N021D were pursued concurrently with power reduction. The switch was replaced and successfully calibrated and functionally tested at 0614 hours. Switch response time testing was successfully completed at 0743 hours. Since switch PIS-B21-1N021D was returned to Operable status prior to reaching the one hour time limit to take action plus the six hour time limit to be in at least Startup, LCO 3.0.3 and LCO actions 3.5.1 and 3.3.3 were exited and reduction of Reactor power was stopped at 23% power.

CAUSE OF EVENT

Emergency Core Cooling Systems Low Reactor Pressure switch PIS-B21-1N021D was found with transducer fluid leaking from the low pressure side of the bellows assembly. A visual inspection by the Instrumentation and Controls work group did not identify any failure mechanisms, i.e. the leak was not due to a gross failure of the bellows assembly. The exact cause of the failure is not known at this time and the switch will be returned to the manufacturer for analysis. However, since switch PIS-B21-1N021D had a correct and successful functional test completed at 0026 hours on 9/24/93 and was discovered failed at 0102 hours, the most likely cause is cyclic fatigue from the monthly depressurization and repressurization of the switch during surveillance testing.

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

Additionally, an Operations review of the Core Spray and RHR logic associated with PIS-B21-1N021D concluded that with the switch inoperable, division II of Core Spray and division II of LPCI had less than the needed two channels per trip system as required in LCO 3.3.3. This condition then required entry into Technical Specification 3.0.3.

REPORTABILITY/ANALYSIS

This event was determined to be reportable per 10CFR50.73(a)(2)(i)(B), as a condition prohibited by the plant's Technical Specifications in that Technical Specification 3.0.3 was entered when ECCS Reactor Low Pressure permissive switch PIS-B21-1N021D failed. Switch PIS-B21-1N021D failed closed which is the conservative position, i.e. the switch closes on low reactor pressure. Therefore with the switch in the failed position all Emergency Core Cooling Systems, including division II of Core Spray and Division II RHR LPCI, would have initiated as required. However if the switch is otherwise inoperable, such as when it was removed, replaced and tested, the following is true. RHR LPCI division II would have initiated as required with the remaining operable pressure switches since division I pressure switches provide input to the division II trip system. Although the division I inputs are confirmed operable during logic functional testing, division I switches are not considered part of the trip system when determining operability of division II RHR LPCI in accordance with Technical Specifications 3.3.3 and 3.5.1. Core Spray division II could not have relied on low reactor pressure switch inputs from division I for the initiating condition of low reactor pressure plus high drywell pressure. Initiation of Core Spray division II for the condition of reactor low water level would still have been possible.

Therefore, based on the above discussion, there was no compromise to the health and safety of the public. Even though a reactor shutdown was initiated in accordance with Technical Specification 3.0.3, if a design basis accident would have occurred during the time switch PIS-B21-1N021D was inoperable, the configuration of the Unit with the Emergency Core Cooling Systems that remained available is bounded by the accident analysis of the plant.

In accordance with guidance provided in NUREG 1022, Supplement 1 item 14.1 and 10CFR50.4(d), the required submission date for this report was determined to be 10/25/93.

CORRECTIVE ACTION

Operations personnel reviewed the effects of the failed pressure switch (PIS-B21-1N021D), entered the appropriate Technical Specification actions including reactor power reduction toward Startup. The failed pressure switch was replaced and satisfactorily tested. Technical Specification 3.0.3 was exited

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and the reactor power reduction was stopped at 23% power. Actions to prevent recurrence include returning the pressure switch to the manufacturer for failure analysis and implementing any necessary measures based on the results of the analysis. If the analysis shows the cause to be something other than cyclic fatigue, the LER will be updated at that time. Additionally, an engineering review of the Core Spray and RHR logic associated with pressure switch PIS-B21-1N021D and the other low reactor pressure switches will be conducted to determine if failure of one pressure permissive switch constitutes less than two channels per trip system as required in Technical Specification 3.3.3.

ADDITIONAL INFORMATION

Failed Component Identification:

Component - Pressure Switch PIS-B21-1N021D

Model - 288A

Manufacturer - Barton

Past Similar Events:

A review of past Licensee Event Reports (LERs) for the station identified no reports involving failed reactor low pressure permissive switches.



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