

# CATEGORY 1

## REGULATOR INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9709170105    DOC. DATE: 97/09/11    NOTARIZED: NO    DOCKET #  
 FACIL: 50-387 Susquehanna Steam Electric Station, Unit 1, Pennsylvania    05000387  
 AUTH. NAME    AUTHOR AFFILIATION  
 ELLIS, S.J.    Pennsylvania Power & Light Co.  
 KUCZYNSKI, G.J.    Pennsylvania Power & Light Co.  
 RECIP. NAME    RECIPIENT AFFILIATION

SUBJECT: LER 97-019-00: on 970813, determined that "A" control structure chiller may not have automatically started. Caused by less than adequate design & test control during pre-operational phase. Logic modified. W/970911 ltr.

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NOTES: 05000387

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U.S. Nuclear Regulatory Commission  
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SUSQUEHANNA STEAM ELECTRIC STATION  
LICENSEE EVENT REPORT 50-387/97-019-00  
PLAS - 722 FILE R41-2

Docket No. 50-387  
License No. NPF-14

Attached is Licensee Event Report 50-387/97-019-00. This event was determined to be reportable per 10CFR50.73(a)(2)(ii) in that one of the Control Structure Chillers would not have automatically started on the trip of the operating chiller as described in the FSAR (for the low oil pressure condition only) prior to its being corrected on March 1, 1997. This constituted a condition in which the plant was outside of its design basis from initial operation until March 1, 1997.

  
G. J. Kuczynski  
General Manager - Susquehanna SES

Attachment

cc: Mr. H. J. Miller  
Regional Administrator  
U. S. Nuclear Regulatory Commission  
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King of Prussia, PA 19406

Mr. Kenneth M. Jenison  
Sr. Resident Inspector  
U. S. Nuclear Regulatory Commission  
P. O. Box 35  
Berwick, PA 18603-0035

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PDR ADDCK 05000387  
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*IE221*

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-530), U7.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				PAGE (3) OF 0 4	
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TITLE (4)  
Control Structure Chiller Will Not Auto-Start

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	8	1	3	9	7	9	7	9	7	0	1	9	0	0	0	0	9	1	1	9	7	Susquehanna SES	0	5	0	0	0	3	8	7	1
													0 5 0 0 0																		

OPERATING MODE (9) 1		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 101.11: (Check one or more of the following) (11)													
POWER LEVEL (10) 1 0 0	20.402(b)			20.405(e)			50.73(a)(2)(v)			73.71(b)					
	20.405(a)(1)(v)			50.36(c)(1)			50.73(a)(2)(v)			73.71(c)					
	20.405(a)(1)(v)			50.36(c)(2)			50.73(a)(2)(v)			OTHER (Specify in Abstract below and in Text, NRC Form 368A)					
	20.405(a)(1)(v)			50.73(a)(2)(v)			50.73(a)(2)(v)(A)								
	20.405(a)(1)(v)			X 50.73(a)(2)(v)			50.73(1)(2)(v)(B)								
20.405(a)(1)(v)			50.73(a)(2)(v)			50.73(a)(2)(v)									

(LICENSEE CONTACT FOR THIS LER (12))

NAME Stephen J. Ellis - Licensing Engineer							TELEPHONE NUMBER				
							AREA CODE				
							7 1 7		5 4 2 - 3 5 3 7		

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 fifteen single-space typewritten lines) (16)

On August 13, 1997 at 1200 hours, with Unit 1 and Unit 2 in Condition 1 (Power Operations) at 100% Power, engineering personnel determined that prior to March 1, 1997, the Control Structure Chilled Water System was operating outside of its design basis, constituting a reportable condition per 10CFR50.73(a)(2)(ii). The Final Safety Analysis Report (FSAR) states in part that the standby Control Structure Chiller will auto-start on a failure signal to the operating chiller. Contrary to this, there was a condition that existed for the 'A' chiller that inhibited its auto-start while in standby. No similar condition existed for the 'B' Control Structure Chiller. The condition, once identified, was promptly corrected via the temporary modification process, and tested to operate as described in the FSAR. The logic changes have subsequently been made permanent. At the time of discovery of the logic error on March 1, 1997, the condition was entered into the Susquehanna SES corrective action program. It was incorrectly identified as not reportable at that time. Subsequent review has determined this to be reportable. The Control Structure Chiller is required to maintain Control Structure habitability and the Unit 1 emergency switchgear cooling post-accident. Although the standby chiller would not have auto-started on a trip of the operating chiller (for one specific failure signal), it would have started on high return air temperature approximately one to two hours following loss of cooling. Evaluations have been performed that indicate cooling to the emergency switchgear could be lost for up to ninety-six hours post-accident with no loss of safety function. Similarly, no significant degradation of Control Structure habitability would occur. Based on this, the safety significance of this event is minor. Corrective actions completed were the permanent modification of the Control Structure Chiller logic to allow auto-start of the standby compressor on all operating chiller failure trips and reportability determination training for the involved personnel.

NRC FORM 366a (6-89)	U.S. NUCLEAR REGULATORY COMMISSION  <b>LICENSEE EVENT REPORT (LER) TEXT CONTINUATION</b>	APPROVED OMB NO. 3159-0104 EXPIRES: 4/30/92 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-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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<b>FACILITY NAME (1)</b>  Unit 1  Susquehanna Steam Electric Station	<b>DOCKET NUMBER (2)</b>  0   5   0   0   0   3   8   7	<b>LER NUMBER (6)</b>	<b>PAGE (3)</b>									
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YEAR	SEQUENTIAL NUMBER	REVISION NUMBER										
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TEXT (if more space is required, use additional NRC Form 366A's) (17)

**EVENT DESCRIPTION**

On August 13, 1997 at 1200 hours, with Unit 1 and Unit 2 in Condition 1 (Power Operation) at 100% Power, engineering personnel determined that the 'A' Control Structure Chiller (EISS Code: KM) may not have automatically started prior to March 1, 1997 while in standby following the failure of the 'B' Control Structure Chiller as described in the Final Safety Analysis Report (FSAR), and was determined to be reportable. No similar condition existed with the 'B' Control Structure in standby. The condition was actually identified on March 1, 1997, and documented in the Susquehanna SES corrective action program, but was not determined to be reportable at that time.

Upon identification of the logic problem on the 'B' Control Structure Chiller, the logic was promptly corrected and tested. The correction was made via the plant's temporary modification system (Bypass Program). During a review of outstanding bypasses, it was questioned whether the original condition (before the bypass was installed) constituted a condition outside of the design basis. This prompted further investigation into the condition, including a more thorough review of the FSAR. At the conclusion of the review, the original condition was determined to be a condition outside of the design basis and was again entered into the corrective action program for evaluation and resolution. The logic modification was made permanent using the plant's design change process.

**CAUSE OF EVENT**

As part of corrective actions associated with a similar condition on the Reactor Building Chiller Water System (EISS Code: KM), it was identified that, for a low oil pressure condition on the 'B' Control Structure Chiller, the 'A' chiller, in standby, would not auto-start. It has been determined that this condition had existed since the initial start-up of the equipment. The logic for the 'A' Control Structure Chilled Water System (which automatically starts the 'B' Chiller) has been verified to always operate as designed. The causes of this event were identified as:

- Less than adequate design and test control during the Pre-Operational phase. At the time of the Pre-Operational test, design changes were occurring to the chiller control logic. The chiller manufacturer was making the changes with minimal documentation. The Pre-Operational test did not adequately retest this portion of the logic.
- Less than adequate problem investigation on past occurrences. The condition being reported only occurs for a chiller trip on low oil pressure. As a result, chiller trips of this type are infrequent. However, when these trips did occur, the scope of the problem investigation focused on the cause and correction of the immediate condition, and did not address the failure of the standby chiller to auto-start.

NRC FORM 366a (6-89)	U.S. NUCLEAR REGULATORY COMMISSION  <b>LICENSEE EVENT REPORT (LER) TEXT CONTINUATION</b>	APPROVED OMB NO. 3159-0104 EXPIRES: 4/30/92 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-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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Unit 1		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER				OF	
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

The cause for the condition not being determined to be reportable when identified on March 1, 1997 was attributed to a less than adequate experience level for reportability determinations within the responsible organization (Operating Experience Services) at that time.

**REPORTABILITY/ANALYSIS**

The event was determined reportable per 10CFR50.73(a)(2)(ii) as a condition outside of the design basis, in that the 'A' Control Structure Chiller would not auto-start on a chiller trip signal on low oil pressure to the 'B' Chiller, as described in the FSAR. The FSAR states in Table 9.2.15, that on a chiller failure signal (low oil pressure is one of several failure signals), the in-service chiller will trip and the standby chiller will automatically start with no loss of safety function. The standby chiller would have auto-started on any other trip of the in-service chiller. This condition existed since the initial start-up of the equipment. The Control Structure Chilled Water System is required to maintain Control Structure habitability and Unit 1 Emergency Switchgear Cooling Post-Accident. Although the standby chiller would not have started from a trip condition of the operating chiller, the standby chiller would automatically start on a "High Return Air Temperature" condition as described in the FSAR. Upon chiller start, all fans in that loop would also start, including those required for Emergency Switchgear cooling and Control Structure habitability. The start of the Control Structure Standby Chiller and associated fans assures adequate temperature control of the Control Structure spaces. Operating experience has shown that Control Structure return air temperature reaches its setpoint to start the standby unit within one to two hours after loss of cooling. PP&L has evaluated the cooling requirement for the emergency switchgear rooms and has determined that the switchgear can continue to perform its safety function for at least ninety-six hours post-accident with no cooling in operation. Based on the analysis above, the condition described in this report is deemed to have no adverse affect on the safe shutdown of the plant. The health and welfare of the public as a result of this condition was not compromised.

In accordance with the guideline provided in NUREG-1022, Supplement 1, Item 14.1 and 14.2, the required submission date for this report was determined to be September 12, 1997.

**CORRECTIVE ACTIONS**

The logic has been modified for the 'B' Control Structure Chiller to allow auto-start of the standby chiller. Testing of this modification has been completed.

**LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION**

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

This condition was initiated in the pre-operational period of plant construction. The existing plant design and configuration control is tightly controlled and maintained, with plant modifications requiring a change to be reviewed and approved prior to implementation.

Similarly, the existing modification program requires adequate testing of plant changes. Testing is performed after completion of the change, but prior to being declared operable. This assures that design changes do not occur concurrent with the system performance testing as occurred during this pre-operational test. It is believed that the condition described is an isolated case, and does not represent a general deficiency in the pre-operational test program. Satisfactory performance of the surveillance and logic system functional testing program provides a very high degree of confidence that the station safety related systems are functioning within their design basis.

Reportability training has been completed for the Operating Experience Services (OES) organization. This training will continue periodically as refresher training for experienced OES personnel and as initial training for new, incoming OES personnel.

**ADDITIONAL INFORMATION**

Failed Component: None

Past Similar Events: None