

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) Susquehanna Steam Electric Station - Unit 1		DOCKET NUMBER (2) 05000387	PAGE (3) 1 OF 4
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TITLE (4)
A Portion Of Residual Heat Removal Logic Not Tested

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
2	11	98	98	004	00	3	13	98	Susquehanna SES - Unit 2	05000388
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10) 100	20.2201(b)	20.2203(a)(2)(v)	<input checked="" type="checkbox"/>	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)	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 Stephen J. Ellis - Senior Engineer, Licensing	TELEPHONE NUMBER (Include Area Code) 717 / 542-3537
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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).	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On February 11, 1998, with both Unit 1 and Unit 2 in Condition 1 (Power Operation) at 100% power, it was identified, during an engineering review, that a small portion of Residual Heat Removal (RHR) start logic for the 'A' and 'B' pumps had not been tested. As a result of further review, on February 18, 1998, with both Unit 1 and Unit 2 in Condition 1 (Power Operation) at 100% power, it was identified that a small portion of the RHR start logic for the C and D pumps also had not been tested. For both of these events, Technical Specification Limited Condition for Operation (LCO) 4.0.3 was entered, the appropriate testing was successfully completed and reviewed within the allowed time, and the LCO was cleared. The most likely cause of the event was determined to be a lack of a clear definition of a "Logic System". At the time the original surveillance tests were prepared, this portion of the logic was not considered within the scope of the logic system. These events were determined to be reportable per 10CFR50.73(a)(2)(i)(B). Corrective actions completed include completion of the appropriate testing, and review of the similar portion of logic in Core Spray, with no problems identified. The following actions are scheduled for completion: develop a clear definition of "Logic System"; revise existing surveillances to include testing of the missed components; perform a vertical slice review of the logic system functional test surveillances for compliance with the Technical Specification requirements; and based on surveillance review results, evaluate the need to revise PP&L's response to Generic Letter 96-01.

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

EVENT DESCRIPTION

On February 11, 1998, at 1145 hours, with both units in Condition 1 (Power Operation) at 100% power, it was identified that a small portion of the Residual Heat Removal (RHR) (EIS Code: BO) start logic for the 'A' and 'B' pumps had not been surveillance tested as required by Technical Specification 4.3.3.2. During the review of the Logic System Functional Tests (LSFT), being performed to ensure that the requirements of the Improved Technical Specifications (ITS) will be fulfilled, the system engineer (utility; non-licensed) identified that the power monitoring circuit for the 'A' and 'B' RHR pump start logic had not been completely tested. (ITS is currently with the Commission for review.) The portion of the logic in question is associated with monitoring the 4 KV power being supplied to the buses at the time of a start. Limited Condition for Operation (LCO) 4.0.3 was entered on both units. Testing of the missed components was completed on February 11, 1998, the appropriate reviews performed, and the LCO cleared.

On February 18, 1998, at 1730, with both units in Condition 1 (Power Operation) at 100% power, it was identified that a small portion of the RHR start logic for the 'C' and 'D' pumps was not tested as required by Technical Specification 4.3.3.2. This was identified as a result of action taken in response to the previous event noted above. The portion of the logic not fully tested is associated with monitoring the power supplies to the 4 KV buses. LCO 4.0.3 was entered on both units. Testing of the missed components was completed on February 19, 1998 and the appropriate reviews were performed. The LCO was then cleared.

The logic for the 'C' and 'D' RHR pumps is different than the logic for the 'A' and 'B' pumps. The power monitoring logic for the 'A' and 'B' pumps is located on the General Electric (GE) elementary drawing. The actuating component to the power monitoring circuitry for the 'C' and 'D' pumps is not on the GE elementary. The logic shown on the GE elementary of the 'C' and 'D' pumps was reviewed at the time of the initial event and initially found to be acceptable. The scope of the surveillance test review was expanded in an effort to ensure that any similar condition would be identified and corrected. At this point the condition described for the 'C' and 'D' pumps was recognized.

Both events were determined to be a condition reportable per 10CFR50.73(a)(2)(i)(B).

CAUSE OF EVENT

The most probable cause for the event was determined to be a lack of a clear definition of a "Logic System". At the time the surveillances were originally prepared and reviewed for completeness, approximately fifteen years ago, this portion of the logic was most likely considered to be outside of the scope of required testing. Although it can not be positively established that this is the root cause of the event, the fact that the balance of the logic is tested so thoroughly, including portions that are not required by the Technical Specifications, leads to the conclusion that this is the most probable cause.

It should be noted that there have been several industry notifications that have addressed the lack of adequate logic circuit testing, the most recent being Generic Letter 96-01. In our response to the Generic Letter, PP&L stated that we believed we were in compliance with Susquehanna SES Technical Specifications with regard to

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system logic testing. This conclusion was based on having implemented an earlier comprehensive review of applicable surveillances and the programmatic controls in place were adequate to capture changes made to logic as a result of modifications. It is PP&L's position that the subject missed surveillance testing is an exception and not an indication of a more generic condition. PP&L maintains that Susquehanna's surveillance testing program is strong.

REPORTABILITY/ANALYSIS

Under ITS, the cross divisional logic of RHR will be considered surveillance acceptance criteria, requiring the system engineer to review/revise the RHR LSFT. During his review, new highlighted drawings were generated. Highlighted drawings are used to assure that the entire logic system is tested, with appropriate overlap noted. Upon completion of the highlighted drawings, it was noted that a small portion of the start logic had not been tested. The part of the logic not tested monitors the 4 KV breakers that supply power to the buses. As noted above, there was a period of time between identifying the missed surveillance for the 'A' and 'B' pumps and then for 'C' and 'D' pumps. The reason for this delay was due to the different logic. The 'A' and 'B' pumps use a single relay per pump as the power monitor, while the 'C' and 'D' pumps have 2 power monitoring relays per pump, and there is an additional layer of logic not shown on the GE elementary drawings. The comparable relay contacts on the GE elementary drawing for the 'C' and 'D' pumps were checked at the time the missed surveillance for the 'A' and 'B' pumps was identified and initially believed to be adequately tested. More detailed reviews were being completed as an action from the first event. It was at that point that the missed portion of the 'C' and 'D' logic was identified.

These events were determined to be reportable per 10CFR50.73(a)(2)(i)(B) in that the surveillance requirements of Technical Specification 4.3.3.2 had not been fulfilled.

All the required testing to ensure completion of the LSFT surveillance was completed satisfactorily and the equipment was restored to operable status. The testing demonstrated that the RHR logic was always functional and capable of performing its design safety function. The testing performed identified no inconsistencies in relay/contact operation. As such, there were no safety consequences and the safety significance of the described events was minor. At no time was the health and safety of the public compromised.

In accordance with the guidance of NUREG 1022, the required submission date for this report was determined to be March 13, 1998.

CORRECTIVE ACTIONS

The following corrective actions have been completed:

- Appropriate testing has been completed and approved to fulfill the requirement of Technical Specification 4.3.3.2.

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- The Core Spray (EISS Code: BM) pumps' start power monitoring circuitry was checked and found not to have a similar untested condition.

The following actions are scheduled to be taken:

- Revise subject surveillances to incorporate the required testing of the previously untested portions of logic.
- Develop a clear definition of "Logic System" for logic system functional testing.
- Review a sample of LSFT surveillances against surveillance requirements of Technical Specifications to determine if any additional testing has been missed.
- Based on the results of the above review, evaluate the need to revise PP&L's response to Generic Letter 96-01.

ADDITIONAL INFORMATION

Past Similar Events:

The LERs listed below were written on events where some portion of a logic circuit was not adequately tested as required by the Technical Specification. This includes only those reports where the surveillance requirements were not included in the surveillance procedure.

Docket No. 50-388	LER 93-008-00
Docket No. 50-387	LER 95-012-00
	LER 97-018-00

Of the three LERs listed, the first two deal with omissions due to modifications of the plant. The last LER deals with missed testing of relay for Response Time Testing (RTT) requirements. In this case the error of omission was at the time of the original generation of the RTT surveillance.

Failed Component: None