

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) SUSQUEHANNA STEAM ELECTRIC STATION - UNIT 2	DOCKET NUMBER (2) 0 5 0 0 0 3 8 8	PAGE (3) 1 OF 0 4
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TITLE (4)  
CORE SPRAY ISOLATION LOGIC MODIFICATION

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 7	0 9	8 4	8 4	0 1 2	0 0	0 8	0 9	8 4			0 5 0 0 0
											0 5 0 0 0

OPERATING MODE (9) 1

POWER LEVEL (10) 0 2 0

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

20.402(b)	20.406(e)	50.73(a)(2)(iv)	73.71(b)
20.406(a)(1)(i)	50.36(e)(1)	50.73(a)(2)(v)	73.71(e)
20.406(a)(1)(ii)	50.36(e)(2)	50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.406(a)(1)(iii)	X 50.73(a)(2)(ii)	50.73(a)(2)(viii)(A)	
20.406(a)(1)(iv)	50.73(a)(2)(iii)	50.73(a)(2)(viii)(B)	
20.406(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME R. W. Stanley Compliance Engineer	TELEPHONE NUMBER 7 1 1 7 5 4 2 1 - 3 1 1 6 1 6
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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
A	B   M	*	*	N					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)  NO

EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	0 2	0 8	8 5

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

During modification of the core spray logic, two (2) control power fuses were removed. These fuses were mentioned in the Construction Work Order (CWO) as a possible blocking point for personnel protection. The fuses were construed to be a local blocking point. These fuses were not mentioned in the Equipment Release Form (ERF), which tracks equipment taken out of service, since other suitable blocking was identified. The below equipment was affected upon fuse removal:

- 1) The "A" loop of core spray would not receive an injection signal to the A&C core spray pumps and the "A" injection valves would not position properly. (LCO was specified prior to work release.)
- 2) Removed the Unit 2 LOCA signal to the "A" Diesel Generator.
- 3) Removed the RHR signals from "A" and "C" channels for Rx vessel low level/Rx vessel low pressure.
- 4) Removed the HPCI signals from "A" and "C" channels for the Rx vessel low level/Hi Drywell pressure.
- 5) The "A" and "C" 4KV ESS buses in Unit 1 and Unit 2 would not receive a load shed initiation time change if a LOCA was present.

An investigation was performed and the fuses were reinstalled. Corrective actions were taken which stopped all Electrical Plant Modification work until training sessions were conducted to prevent a recurrence.

\* Not Applicable

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

Plant Modification Request (PMR) 84-3086 required a Core Spray Isolation Logic Modification, to correct the Core Spray full flow test valves HV-252F015A/B isolation signal.

Construction Work Order (CWO) 40401 was written to implement the above mentioned Modification. The work group received and reviewed CWO 40401. At approximately 10:00 on July 9, 1984 two (2) core spray logic control fuses were removed by the Electricians. These fuses were mentioned in the CWO as a possible blocking point for personnel protection. The electricians construed the fuses to be a local blocking point. These fuses were not mentioned in the Equipment Release Form (ERF), which tracks equipment taken out of service, since other suitable blocking was identified.

The removal of the fuses affected the below systems:

1. Div. I of the Core Spray System - the A loop of core spray would not receive an initiation signal to the A&C core spray pumps and the A injection valves would not position properly.
2. "A" Diesel Generator - the A diesel Generator would not receive an initiation signal from the Div. I Core Spray Logic (Unit 2 only) to start from a LOCA. This would INOP the D/G from Unit 2 only.
3. Div. I of the RHR System - the A and C channels for the Rx vessel low level and the Rx Vessel low pressure instrumentation would not function. Tech Spec 3.3.3.-1 requires a minimum of 2 operable channels per trip system. With the above instrumentation not available, we are unable to meet the Tech Spec Requirements. The Div. I RHR System would have operated properly due to the cross connection of the divisions in the RHR logic, however Tech Spec does not recognize the cross divisionalization of the logic.
4. HPCI System - the A&C channels for the Rx vessel low level and the Hi Drywell pressure instrumentation would not function. Tech Spec Table 3.3.3-1 requires a minimum of 2 operable channels per trip system. Due to the way a trip system is defined in the HPCI logic, the above Tech Spec requirements are not met. The HPCI System would have operated properly from the B&D instrumentation.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

Text Continued:

5. The A&C 4.16 KV ESS Buses in Unit 1 and Unit 2 - these buses would not receive load shed initiation time change if a LOCA was present. Table 3.3.3-2 of Tech Spec requires these buses to load shed with a  $10 \pm 1.0$  second time delay with a LOCA signal present (degraded voltages  $< 84\%$ ). Due to the core spray logic not functioning, the time delay would be 5 minutes.
6. Other items which would be affected but not result in inoperability of a system:
  - a. Div. I of the drywell cooling fans would not trip in a LOCA.
  - b. A half drywell cooling isolation trip would be received.
  - c. The ESW Pump (A) would not receive the reset of the start timer, therefore a potential would exist for an RHR Pump A & ESW Pump A to start simultaneously during a LOOP/LOCA.
  - d. The Unit 2 Instrument Air Compressors, 2K107A & 2K107B, would not receive a trip on a Unit 2 LOCA (Div. I).
  - e. The Unit I Containment Instrument Gas Compressor would not receive a trip on a Unit 2 LOCA (Div.I).

LCO's for item 1 were entered based upon the Equipment Release Form (ERF) submitted for the PMR work. LCO's were not entered for items 2 thru 5 prior to work commencing as these were caused by the pulled fuses. When the fuses were pulled, operations personnel received an alarm indicating a half drywell isolation. They immediately contacted Unit coordination to determine if any work had been released which could have caused the half isolation.

Unit coordination and operations personnel began an immediate investigation of the work involved with the PMR. By the time the workers were located, the physical work was completed. The work involved in the Modification was minor and required only determining several wires and reterminating at a new location in the same panel. The fuses were reinstalled, which cleared the half isolation and restored all other systems at approximately 1430 on July 9, 1984.

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TEXT (If more space is required, use additional NRC Form 388A's) (17)

Text Continued:

When the ERF was submitted to the operations for the PMR work, it was determined that the work would cause Div. I of core spray to be INOP. Per operations procedures the "CORE SPRAY OUT OF SERVICE" switch is placed in the INOP position which indicated the inoperable status of core spray. However, this same switch causes the loss of core spray logic power status indicating light to become energized. Thus, when the fuses were pulled (which also causes this light to energize) it was already on, thus masking the loss of core spray logic. A Human Factors Analysis will be performed on the Core Spray Status Switch. Design changes and procedure changes will be made as required.

The below corrective action was taken:

- a. All electrical PMR work stopped.
- b. Training session held with Utility Electrical Construction Personnel and Outside Vendor Personnel, emphasizing that operation of circuit breakers, pulling of fuses, opening states links is not to be done.
- c. A training session was held with Installation Engineering Group engineers directing them not to direct operation of breakers, etc., as recommended blocking.
- d. A review was conducted of open CWO's to ensure that none specified blocking as part of the work plans.
- e. Following the above steps, work was released.

Unit 2 was at 20% Power during the above mentioned event.

Assessment of Plant Conditions:

The "A" LOOP of Core Spray was inoperable. This was identified prior to commencing work activities on this modification. The appropriate LCO's were identified. The "B" LOOP of the Core Spray System B&D Core Spray Pumps were fully functional.

Although the "A" Diesel Generator would not receive a start signal from the Unit 2 LOCA, the Diesel Generator would have received a start signal from a Unit 2 loss of 4KV Bus. The Diesel Generator Breaker would close to energize the bus. The Unit 2 LOCA signal to the Diesel Generator only starts the diesel, which then runs unloaded. The "A" Diesel Generator therefore would perform its design function. The "B", "C", "D" Diesels were fully functional. The Div I of RHR would have operated properly due to the redundant initiation logic for Div I RHR. The Div II would have operated correctly. The HPCI System would have operated properly due to redundant initiation logic.

When the Control Room received indication of a half Drywell Isolation an investigation was immediately initiated to identify the cause.



**Pennsylvania Power & Light Company**

Two North Ninth Street • Allentown, PA 18101 • 215 / 770-5151

August 9, 1984

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

SUSQUEHANNA STEAM ELECTRIC STATION  
LICENSEE EVENT REPORT 84-012-00  
ER 100450 FILE 841-23  
PLA - 2277

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Docket No. 50-387 / 50-388  
License No. NPF-14 / NPF-22

Attached is Licensee Event Report 84-012. This event was determined reportable per 50.73 (a) (2) (1), in that the removal of a Core Spray Control Fuse caused a deviation from the Plant's Technical Specifications.

H. W. Keiser  
Superintendent of Plant-Susquehanna

RWS/jls

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