NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

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

TITLE (4)
'A' Loop ESW Exceeded Limiting Condition of Operation.

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 4	2 1	8 5	8 5	0 1 5	0 0	0 5	3 0	0 0	SSES - Unit 1	0 5 0 0 0 3 8 7
										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)

	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)
	20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)
	20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		
	20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		
	20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
D.J. Gandenberger, Power Production Engineer	AREA CODE 7 1 7 5 4 2 - 3 9 1 4

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)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On April 21, 1985, two open sliding states link terminal blocks were found open in the auxiliary control circuit for the Spray Pond Bypass Valve in the 'A' loop of Emergency Service Water (ESW). This circuit provides for the automatic functioning of the valve on pump starts and shutdowns. Investigation determined that the 'A' loop of ESW was inoperable from April 4, 1985 until April 21, 1985, which exceeds the Limiting Condition for Operation allowed by Technical Specifications. A walkdown was performed of safety related panels in Unit 1, 2, and Common to identify and correct open states links. A station policy is being implemented to better control the status of states links position including an administrative procedure.

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On April 21, 1985 at 0115, the 'A' Emergency Service Water (ESW) (BI) pump was started and the Spray Pond Bypass valve (HV-01222A) did not automatically open as required by design. The pump was tripped and the circuit breaker and motor overloads for HV-01222A were verified to be closed. The 'A' ESW pump was restarted at 0120 and again the Spray Pond Bypass valve did not automatically open. The pump was tripped and a Limiting Condition for Operation (LCO) was declared at 0125 for the 'A' loop of ESW being inoperable. Investigation by Electrical Maintenance personnel (utility, non-licensed) determined that HV-01222A did not operate automatically due to two open sliding states link terminal blocks in a relay panel. The open states links de-energized the auxiliary control circuit which provides the automatic opening of HV-01222A on a start of the 'A' or 'C' ESW pump. The states links were closed, the bypass valve operated satisfactorily per design, and the LCO was cleared at 0500 on April 21, 1985.

An extensive investigation of the incident revealed the following sequence of events: The states links were opened by an electrician (contract, non-licensed) on March 27, 1985 during the performance of modification work to add a transfer switch and a new cable to the relay panel. Opening the states links was not included in the work instructions which the electrician was using and the fact that the electrician opened the states links was not recorded in the work document. On March 28, 1985, a scheme check of the cable and transfer switch was performed which included an energized test of the circuit, but only up to the open states links. The electrician (utility, non-licensed) who performed the scheme checks saw the states links open, but did not quesiton or document their status. During this time frame the 'A' ESW pump was running and HV-01222A was open providing a flow path back to the spray pond. At 1814 on April 4, 1985, the 'A' ESW pump was shutdown and HV-01222A did not automatically close. The operator (utility, licensed) depressed the CLOSE pushbutton for HV-01222A and the valve closed electrically. A Work Authorization (WA) was submitted that the valve failed to automatically close on shutdown of the 'A' ESW pump. Since there was no LCO associated with the WA, it was assigned a low priority by Maintenance and was not immediately worked. At 0820 on April 11, 1985, the 'C' ESW pump was started. When HV-01222A did not open automatically within a reasonable length of time, the operator (utility, licensed) depressed the OPEN pushbutton for HV-01222A and the valve opened electrically. Due to the open states links, the 'A' loop of ESW was therefore inoperable from 1814 on April 4, 1985 until 0500 on April 21, 1985, but not recognized.

In addition to interrupting power to the auxiliary control circuit for the automatic function of HV-01222A, the open states links de-energized the ESW 'A' loop Bypass Indication System (BIS) alarms and portion of the Division 1 Auxiliary Load Shed circuits for Unit 1. The loss of BIS alarms would have prevented any indication in the event of a control power loss or motor overload for the ESW Loop A diesel generator cooler valves. The Unit 1 Division 1 Auxiliary Load Shed circuit is designed on the basis of a LOCA signal with one of two startup transformer and two of four ESS transformers supplied by off-site power. It affects Non-Class 1E 13.8KV and 480V loads,

tap setting changers to the startup transformers, degraded grid voltage protection for Division 1 ESS busses, and load shed of miscellaneous ESW pumphouse panels. The turbine generator lockout relays were reset during the time of the incident. Per design, the load shed logic for the Non-Class 1E 13.8KV and 480V loads does not function with these relays reset, therefore, there was no consequence due to the open states links. The Unit 1 Division 1 Auxiliary Load Shed circuit sends a signal to boost the tap changer setting on the startup transformers during accident conditions. No credit is taken in the voltage study for this boost, therefore, there is no consequence of loosing this capabilaity. Since Unit 1 was defueled during the time the states links were open, the Unit 1 LOCA signal into the degraded grid voltage protecton circuit was not required since the ECCS loads were not required by Technical Specifications. The ESW pumphouse loads are common to both units and either a Unit 1 or Unit 2 LOCA signal is required for load shedding. The Unit 2 LOCA load shed was disabled, however since both startup transformers and all four ESS transformers were in service there was no consequences of the loss of the load shed circuitry.

During the investigation it was identified that the Auxiliary Load Shed circuitry was not identified on the electrical drawings for breaker loads. This load was inadvertently omitted from the Circuit Breaker Interruption Impact Diagrams which were developed in the second half of 1983.

A comprehensive walkdown was conducted on safety related panels to identify and correct open states links. Any states link which was found open was documented and evaluated for operational impact by the Plant Engineering Staff. Any open states link which was determined to have operational impact on Unit 2 or fuel load impact on Unit 1, was closed by a WA. Open states links without operational or fuel load impact are being closed on a continuing basis as manpower is available. The Unit 2 walkdown was completed prior to starting up the Unit on May 3, 1985 after a one week outage for turbine generator maintenance. Unit 1 panels will be reinspected prior to start up of Unit 1, currently scheduled for mid-June.

The walkdown of the panels identified open links in the circuitry for the 'C' diesel generator cooler inlet and return valves from the 'A' loop of ESW. The links connect the motor overload bypass switch to the circuitry for the valves. With the links open, the valves' motor overloads were not continuously bypassed as required by Technical Specification. The links were apparently opened during the performance of modification work in the panel where the bypass switch is located. When the motor overload bypass switch for these and other BOP system valves is taken to BYPASS, there is no indication of this in the Control Room. The Nuclear Plant Engineering group has reviewed the design and no further changes are planned. The panel walkdown also identified an open link in the Standby Gas Treatment System (SGTS) (VL) control logic from Zone II (Unit 2 Reactor Building). The open link prevented the

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

Zone II differential pressure instrument from providing a signal to the differential pressure indicating controller which maintains the lowest differential pressure of Zones I, II, and III at greater than or equal to 0.25 inches. Without this input, if Zone II had more inleakage than the other two zones, the 'A' SGTS train would not have maintained Zone II at the required differential pressure. No differential pressure anomalies were noted during regularly scheduled surveillance testing of the 'A' SGTS train. The 'B' SGTS train was not affected.

A station policy is being implemented to better control the status of states link position. Each contract electrician presently on site working on modifications and all future contract electricians working on modifications will be required to sign a statement that they understand station work practices and that they are required to log the opening and closing or any states link in their work document. Additionally, an administrative procedure is being developed which will define the method of control and/or tagging of open states links by work groups. Nuclear Plant Engineering is performing an update of the Circuit Breaker Interruption Diagrams. This update will incorporate all outstanding modification related information to provide an accurate as-built representation of each 120VAC and 125VDC distribution curcuit in Units 1, 2, and Common. It will also incorporate all necessary drawing reference information in order to ensure that any drawing is bi-directional reference. In the interim, work planners are being instructed to thoroughly investigate all 120VAC and 125VDC distribution circuits considering the possible limitations in the drawing representation.

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May 30, 1985

U.S. Nuclear Regulatory Commission
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SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 85-015-00
ER 100450 FILE 841-23
PLAS-083

Docket No. 50-388
License No. NPF-22

Attached is Licensee Event Report 85-015-00. This event was determined reportable per 10CFR50.73(a)(2)(i), in that the 'A' loop of the Emergency Service Water system was inoperable for a time period exceeding the Limiting Condition for Operation allowed by Technical Specifications.

H.W. Keiser
Superintendent of Plant-Susquehanna

DJG/pjg

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