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 FACIL: 50-387 Susquehanna Steam Electric Station, Unit 1, Pennsylvania 05000387
 AUTH. NAME AUTHOR AFFILIATION
 LLOYD, H. Pennsylvania Power & Light Co.
 STANLEY, H.G. Pennsylvania Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 93-011-00: on 930912, unplanned invalid ESF actuation occurred. Cause unknown. Switch & relays tested satisfactorily & surveillance re-performed satisfactorily. W/931011 ltr.

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 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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	RGNI FILE 01	1	1			
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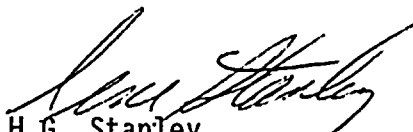
October 11, 1993

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

SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 93-011-00
FILE R41-2
PLAS - 576

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

Attached is Licensee Event Report 93-011-00. This report is being made pursuant to 10CFR50.73(a)(2)(iv), in that an unplanned invalid ESF actuation occurred when an Engineered Safeguards System bus was momentarily de-energized during Surveillance Testing.


H.G. Stanley
VP - Nuclear Operations

HL/mjm

cc: Mr. T. T. Martin
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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), 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	PAGE (3) 1 OF 0 3
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TITLE (4)
1A201 4KV Bus Momentarily De-energized - Unplanned ESF Actuation

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	1	2	9	3	9	3	0	1	1	0	0	1	0	1	1	9	3	S.S.E.S. - Unit 2	0 5 0 0 0 3 8 8
										0 5 0 0 0										

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																			
POWER LEVEL (10) 0 9 6	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 50.73(a)(2)(ix)	<input type="checkbox"/> 73.71(b)	<input type="checkbox"/> 73.71(c)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER
NAME Harrison Lloyd, Jr. - Power Production Engineer	AREA CODE 7 1 7	5 4 2 - 3 9 1 7

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

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO				

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

On September 12, 1993, with Units 1 & 2 in Condition 1, an unplanned invalid ESF actuation occurred on Unit 1 when the 1A ESS bus momentarily de-energized during the monthly degraded voltage channel functional surveillance test. This power interruption resulted in the following actuations and isolations: 'A' Emergency Diesel Generator start, Division 1 RPS 'A' 1/2 scram, Division 1 Nuclear Steam Supply System Shutoff isolation, Reactor Building Ventilation isolation and start of CREOASS and SBT systems, and automatic swap from A to B of various operating equipment. System response was verified to be proper and once the bus was restored to its normal power supply, all affected equipment was restored to its normal alignment. The root cause has not yet been determined. However, based on investigation to date, it was most likely caused by a misoperation of one of three (or combination thereof) components in the undervoltage test circuit (i.e. test switch, blocking relay, or timing relay). This event was determined to be reportable per 10CFR50.73(a)(2)(iv) as an unplanned invalid ESF actuation. There were no safety consequences or compromises to the public health or safety during this event. The switch and relays were tested satisfactorily and the surveillance was re-performed satisfactorily. Additional troubleshooting/testing is planned and if the root cause is determined or additional correction actions are identified, an update to this LER will be submitted.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 60.0 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.

FACILITY NAME (1) Unit 1 Susquehanna Steam Electric Station	DOCKET NUMBER (2) 0 5 0 0 0 3 8 7	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		9 3	- 0 1 1	-	0 0	0 2	OF 0 3

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

On September 12, 1993, at 2140 hours, with Unit 1 in Condition 1 at 96% power and Unit 2 in Condition 1 at 99% power, an unplanned invalid ESF actuation occurred on Unit 1 when the 1A201 Engineered Safeguards Systems (ESS) bus (EIIS Code: EK) momentarily de-energized during surveillance testing. The actuation occurred during performance of SO-104-001, "Monthly Bus 1A201, 1A202, 1A203, 1A204, and OB565 Degraded Voltage Channel Functional Test" and the following actuations and isolations occurred: The 'A' Emergency Diesel Generator auto-started, the 'A' ESW pump auto-started, a Division 1 RPS 'A' 1/2 scram occurred; all Division 1 Nuclear Steam Supply System Shutoff (NSSS) isolations/actuators occurred as follows: Reactor Building Zone I and III isolated and started in the Recirculation mode, the 'A' Control Room Emergency Outside Air Supply (CREOAS) and 'A' Standby Gas Treatment trains started, the Containment Atmosphere Control and Reactor Recirculation sample valves isolated, the Reactor Water Clean-up F001 valve isolated; the 'A' Reactor, Turbine and Control Structure Chillers tripped and the 'B' for each chiller auto-started, the 'A' Reactor and Turbine Building Closed Cooling Water pumps tripped and the 'B' for each pump auto-started. Procedure ON-104-201 "Loss of 4KV Bus 1A (1A201) was entered and verification of proper system response was completed satisfactorily.

The appropriate Technical Specification action statements were entered for Units 1 & 2. This event was initiated when the circuit test switch HSE-20102A was taken to the circuit test position causing the normal feeder breaker to open (causing the momentary power interruption) which should not have occurred if the test circuit had functioned properly. Power to the bus was automatically restored when the alternate feeder breaker closed.

Following investigation and testing of the test circuitry the 1A201 bus was restored to its normal power supply and all equipment affected by this event was then restored to its normal alignment.

CAUSE OF EVENT

The root cause of this event has not yet been determined. However, based on the sequence of events, it appears that the trip signal was transmitted to the trip relays prior to the expected automatic blocking of the signal which is suppose to occur via the test circuit (i.e. - if the test circuit functions properly, the trip signal is automatically blocked from the trip relays when the test switch is taken to circuit test). This failure to block the trip signal was most likely caused by failure of one of the following three (or combination thereof) components: the blocking relay (62A3-20101), the timing relay (62B3-20102), or the test switch (HSE-20102A). Further testing of these components is planned and if the root cause can be determined, an update to this LER will be submitted.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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.

FACILITY NAME (1) Unit 1 Susquehanna Steam Electric Station	DOCKET NUMBER (2) 0 5 0 0 0 3 8 7	LER NUMBER (6)			PAGE (3)		
		YEAR 9 3	SEQUENTIAL NUMBER — 0 1 1	REVISION NUMBER — 0 0	OF		

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

REPORTABILITY/ANALYSIS

This event was determined reportable per 10CFR50.73(a)(2)(iv), in that an unplanned invalid Engineered Safety Feature (ESF) actuation occurred when an Engineered Safeguards System (ESS) bus was momentarily de-energized and the associated automatic actions occurred. All major equipment operated per design during the event, ECCS was not challenged and no abnormal operator actions were required to maintain the plant in a stable condition. There were no safety consequences or compromises to the public health or safety during this event, nor would there have been under different initial operating conditions.

In accordance with guidance provided in NUREG 1022, Supplement 1, item 14.1, the required submission date for this report was determined to be October 12, 1993.

CORRECTIVE ACTION

The test circuit was isolated from the breaker control relays via states links. The blocking relay (62A3-20101) and timing relay (62B3-20102) were tested satisfactorily. The setpoint of the timing relay was found to be 10 seconds outside of the desired setpoint of 300 ± 15 seconds but this would not have caused this event. The as found setpoint was 275 seconds which was within the Technical Specification allowed value of 300 ± 30 seconds. The timing relay was replaced. Following this troubleshooting, the surveillance was re-performed twice satisfactorily. The first performance was done with the test circuit isolated (i.e. states links open) and the next performance was done with the test circuit restored and all components functioned properly. The technical specification Limiting Conditions for Operation were then cleared. Additional testing of these components is being planned and if additional corrective actions are identified an update to this LER will be submitted.

ADDITIONAL INFORMATION

Failed Component Identification: None

Previous Similar Reported Events: None