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ACCESSION NBR:8807070414 DOC.DATE: 88/07/01 NOTARIZED: NO DOCKET #
FACIL:50-387 Susquehanna Steam Electric Station, Unit 1, Pennsylva 05000387
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RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 88-010-00:on 880618,reactor scram initiated by ground fault on 500 kV transmission line.

W/8 ltr.

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

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NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Susquehanna Steam Electric Station - Unit 1	0 5 0 0 0 3 8 7	1 OF 0 3

TITLE (4)
Reactor Scram Initiated by Ground Fault on 500 KV Transmission Line

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 5 0 0 0
0 6	1 8	8 8	8 8	— 0 1 0	— 0 0	0 7	0 1 8	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)	1 0 0	20.402(b)	20.405(c)	X	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)	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
	AREA CODE
Glenn G. Shaffer, Power Production Engineer - Compliance	7 1 7 5 4 2 - 3 7 5 9

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	
C	F J	1 6 4	G 0 8 0	N							

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)

At 1621 on June 1, 1988, an Unplanned Engineered Safety Feature (ESF) actuation occurred on Unit 1. A ground fault which occurred on a distant 500 KV transmission line resulted in apparent ground fault relay misoperation. A Generator Load Unbalance (Load Reject) occurred and resulted in a Turbine Control Valve Fast Closure, Turbine Trip, and Reactor Scram. All systems responded properly to the transient. No off-site release occurred. The Unit was placed in a stable condition.

The cause of the relay misoperation could not be determined. Extensive followup testing could not duplicate the failure. As a result, the trip function of the relay was blocked from service. Monitoring equipment was installed and relay response will be recorded. Redundant fault detection will provide fault protection in the interim.

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1/1

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

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

On June 1, 1988 at 1621 a suspected lightning strike resulted in a ground fault on the Juniata-Alburtis 500KV line. Consequently, the Susquehanna Steam Electric Station (SSES) Unit 1 Reactor scrammed. A sensitive fault detection device located in the Unit 1 Control Room sensed the fault which occurred on a distant transmission line located over fifty (50) miles from SSES. Fault detection devices located in the SSES Unit 1 switchyard (EIIS:FC) determined that the location of the fault was not on the SSES Unit 1 output line. Accordingly, momentary trip blocking signals were generated to allow the ground fault protection relay time to reset prior to the protective trip function occurring. The ground fault relay apparently failed to reset when the fault cleared. When the trip blocking signals ceased, Main Generator lockouts and Generator Span Protection trips (EIIS:FC) initiated a Generator Load Unbalance (Load Reject) signal. This in turn activated the Turbine Overspeed Protection, created a Turbine Control Valve Fast Closure, and subsequently scrammed the Unit 1 Reactor.

This event was determined reportable as an Engineered Safety Feature (ESF) actuation (EIIS:JE) in accordance with 10 CFR 50.73(a)(2)(iv).

Plant response to the transient was per design. Opening of the Generator Output Breaker resulted in a Generator Load Unbalance. Subsequently the Turbine Control Valves fast-closed which in turn created a full Reactor Protection System (RPS) actuation/Reactor Scram from 100% Power. The Main Condenser served as the heat sink as the Main Steam Isolation Valves (MSIV's) remained open. Two Safety Relief Valves (SRV's) lifted for approximately ten (10) seconds to limit Reactor pressure to a maximum of 1075 psig. All Control Rods fully inserted within the time constraints imposed by Tech Spec and Administrative Limits. The Reactor Recirc Pumps tripped due to activation of the End-of-Cycle Recirc Pump Trip (EOC-RPT) circuit. All major equipment operated per design during the transient. No Emergency Core Cooling Systems (ECCS) actuated and none were required. Primary Containment Integrity was maintained throughout the transient. The Unit was placed in a stable condition.

Analysis of the transient was performed by the Shift Technical Advisors (STA's). FSAR section 15.2.2 (Generator Load Reject with Bypass) was reviewed and all actual parameters were within the confines of the FSAR Analysis. A review of RPS performance revealed acceptable RPS response. Plant response was determined satisfactory.

Investigation of the ground fault detection scheme did not detect any abnormalities. The relay suspected of failing was a General Electric model CLPG Carrier Ground Relay. Relay testing was performed but no failure mechanism could be established. As a result, the ground fault relay was blocked from service. Monitoring equipment was installed to analyze its future operation during actual ground faults on the transmission line. The relay will be returned to service pending identification and correction of the failure mechanism. If the mechanism cannot be identified, the relay will be replaced. In the interim, fault protection will be provided by a redundant fault protection scheme.

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

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

A search of past occurrences did not reveal any previous failures of the ground fault relay. A search of Manufacturer's and Corporate's Equipment Problem List conducted by System Operating also failed to identify any previous occurrences of relay misoperation.

Pennsylvania Power & Light Company
Two North Ninth Street • Allentown, PA 18101 • 215/770-5151

July 1, 1988

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

SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 88-010-00
FILE R41-2
PLAS - 324

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

Attached is Licensee Event Report 88-010-00. This event was determined reportable per 10CFR50.73(a)(2)(iv) in that the unit experienced an unanticipated Engineered Safety Feature actuation when a Reactor Scram occurred due to a ground fault on a 500 KV transmission line.

R.G. Byram
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GGS/mjm

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