

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									
TITLE (4) ESF Actuation (Lightning Strike).																													
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 5 3 1		8 5		8 5		0 2 0		0 0 0		6 2 7 8 5								0 5 0 0 0											
OPERATING MODE (9) 4						THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)																							
POWER LEVEL (10) 10.0						20.402(b)						20.405(c)						<input checked="" type="checkbox"/> 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 365A)					
						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)(ix)																	
LICENSEE CONTACT FOR THIS LER (12) L.A. Kuczynski - Nuclear Plant Specialist, Level III																													
NAME																				TELEPHONE NUMBER									
																				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 NRC		CAUSE		SYSTEM		COMPONENT		MANUFACTURER		REPORTABLE TO NRC											
B B H		X C I		2 0 7		Y																							
SUPPLEMENTAL REPORT EXPECTED (14)																				EXPECTED SUBMISSION DATE (15)									
YES (If yes, complete EXPECTED SUBMISSION DATE)																				MONTH DAY YEAR									
<input checked="" type="checkbox"/> NO																													

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

On May 31, 1985, a lightning strike to or near the tie line between the 500KV and 230KV switchyards caused a voltage transient within Unit 2. All trips were per design and caused by a loss of motive power or loss of control power. The automatic start of the Control Room Emergency Outside Air Supply System was per system design. The trip of the Standby Gas Treatment System (SGTS) after its auto-restart was not per design. A malfunctioning SGTS damper actuator was replaced and proper operation was verified. A review of the possibility of additional lightning protection for offsite power sources has been requested.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

FACILITY NAME (1) Susquehanna Steam Electric Station Unit 2	DOCKET NUMBER (2) 0 5 0 0 0 3 8 8	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 5	- 0 2 0	- 0 0	0 2	OF	0 4

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

On May 31, 1985, Unit 2 was in Cold Shutdown to allow repair of a packing leak on the reactor recirculation pump 'A' discharge bypass valve. Unit 1 remained shutdown for its first refueling outage. (Refer to Attachment 1 for the switch yard line up.) At approximately 2247, lightning struck or struck near the tie line between the 500KV and 230KV switchyard (EIIIS code: FK). (Refer to Attachment 1 for the switchyard lineup prior to the lightning strike and Attachment 2 for the post strike lineup.) As a result, the 500KV switchyard completely de-energized because the yard's North Bus was open since Unit 2 was shut down. The loss of the 500KV switchyard actuated the Double Circuit Outage scheme and, per design, the Unit 2 lock-out relays operated.

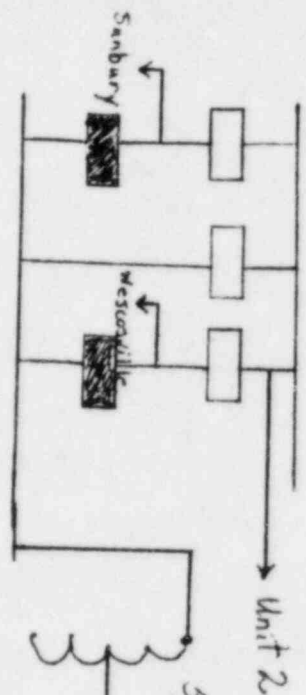
The Startup Transformer 20 - Bus 20 breaker (BKR) tripped on undervoltage. Both Unit 2 auxiliary buses were feeding from Bus 20 because Unit 2 was shutdown. With both Units down, the Bus 10 - Bus 20 tie breaker will not auto close. (The tie breaker was closed manually within one minute after Bus 20 tripped.) The loss of power caused the closure of radiation detection contacts for Division II instrumentation for Zone III (Refuel Floor) and subsequent start of the Control Room Emergency Outside Air Supply System (CREOASS) (BH) train 'B' (CREOASS is an Engineered Safety Feature.) Division I ESF logic was fed through Bus 10 and was unaffected throughout this occurrence.

Standby Gas Treatment System (SGTS) (BH) train 'B' had been in service prior to the lightning strike to provide Unit 2 drywell purge. The train tripped as it should have during the voltage transient due to the load shed scheme. Due to its logic system characteristics, SGTS train 'B' automatically restarted upon restoration of power. It tripped unexpectedly within five minutes. Further testing revealed a failed damper actuator (XC) on Recirc System/SGTS damper PDD-07554B. (LER 85-011-00 reports a similar failure. Engineering evaluations have been requested to provide a long-term fix.) The actuator was replaced and proper damper operation was verified.

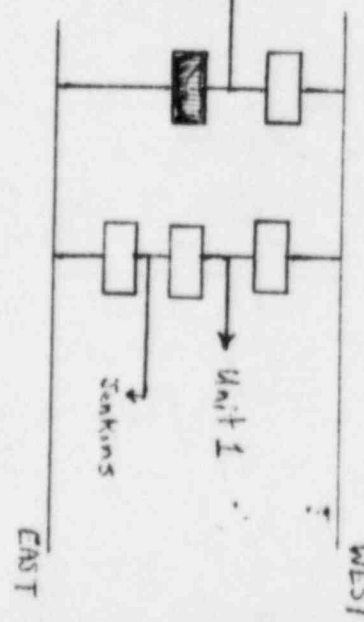
Reactor Water Cleanup (RWCU) (CE) containment outboard isolation valve closed due to the momentary loss of power to its temperature monitoring circuit giving a false non-regenerative heat exchanger high outlet temperature signal.

In summary, loss of voltage to Bus 20, caused by a lightning strike, initiated a voltage transient within Unit 2. All trips were per design and caused by a loss of motive or control power. The automatic start of CREOASS train 'B' was per design; the trip of SGTS, after its auto-restart, was not. A malfunctioning SGTS damper actuator was replaced and proper damper operation was verified. A review of the possibility of additional lightning protection for offsite power sources has been requested.

500 KV Switchyard



230 KV Switchyard



Start Up Transformer T-20

Start Up Transformer T-10

BUS 20

BUS 10

13.8 TIE Breaker

Unit 2 Aux Bus

Unit 2 Aux Bus

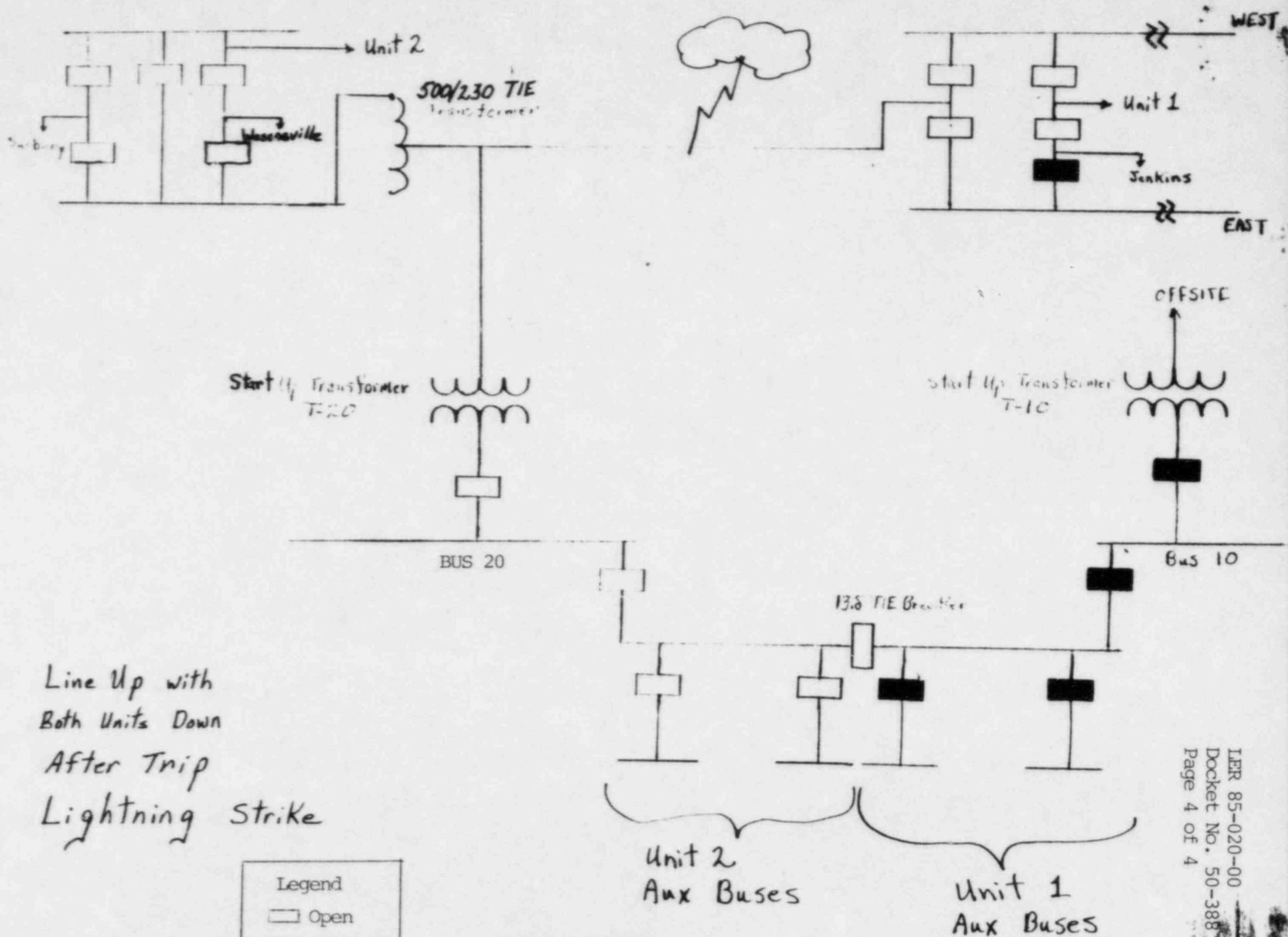
Unit 1 Aux Bus

Unit 1 Aux Bus



May 31, 1985
 Pre Trip line up

ATTACHMENT 1





Pennsylvania Power & Light Company

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

June 27, 1985

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

SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 85-020-00
ER 100450 FILE 841-23
PLAS- 097

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

Attached is Licensee Event Report 85-020-00. This event was determined reportable per 10CFR50.73(a) (2) (iv), in that a lightning strike caused the unanticipated actuation of Engineered Safety Features.

H.W. Keiser
Superintendent of Plant-Susquehanna

LAK/pjg

Attachments

cc: Dr. Thomas E. Murley
Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Mr. R.H. Jacobs
Senior Resident Inspector
U.S. Nuclear Regulatory Commission
P.O. Box 52
Shickshinny, PA 18655

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