

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Susquehanna Steam Electric Station	DOCKET NUMBER (2) 05000388	PAGE (3) 1 OF 04
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TITLE (4)
Two Scrams Due to Water in Crossaround Pipe.

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)	
08	26	84	84	017	00	09	25	84		05000	

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

OPERATING MODE (8) 1	20.402(b)	20.408(e)	80.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 043	20.408(a)(1)(i)	80.36(a)(1)	X 80.73(a)(2)(v)	73.71(e)
	20.408(a)(1)(ii)	80.38(a)(2)	80.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.408(a)(1)(iii)	80.73(a)(2)(i)	80.73(a)(2)(vii)(A)	
	20.408(a)(1)(iv)	80.73(a)(2)(ii)	80.73(a)(2)(vii)(B)	
	20.408(a)(1)(v)	80.73(a)(2)(iii)	80.73(a)(2)(viii)	
	20.408(a)(1)(vi)	80.73(a)(2)(iv)	80.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME L.A. Kuczynski - Nuclear Plant Specialist III	TELEPHONE NUMBER 7117 2541-137519
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS
X	T/A	2101	L121010	N					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

On August 26 and 28, 1984 (during the Startup Test Program), the unit experienced unanticipated actuations of the Reactor Protection System. On each date, the moisture separator 'B' drain tank level increased rapidly after the stroking of combined intermediate valve (CIV) 4, which is located between moisture separator 'A' and one of the low pressure turbines. It was determined that the drain valve in the associated crossaround piping had malfunctioned and a considerable volume of water accumulated in the pipe. The result was that when CIV4 was cycled, the pressure differential which was created on moisture separator 'A' was sufficient to force water out of the pipe, into the belly of the HP turbine, out into the 'B' moisture separator crossaround line to moisture separator 'B'. The extra water caused a high level in the 'B' moisture separator, which caused a turbine trip and reactor scram. The crossaround piping has been drained and the drain valve operator successfully reworked. A semi-annual visual inspection of the drain valves (to be scheduled as plant radiological conditions permit) will be performed to evaluate their operability.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		84	017	010	02	OF 04

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

On August 26, 1984 (during the Startup Test Program), with the Unit at 43% power, the weekly turbine overspeed protection system valve cycling test commenced at 0023. The main turbine stop valves tested satisfactorily, as did combined intermediate valves (CIV) 1, 2, and 3. (CIV's 1, 2, and 3 are located between moisture separator 'B' and the low pressure turbines. CIV's 4, 5, and 6 are located between moisture separator 'A' and the low pressure turbines. See attached figure.) When CIV4 was cycled, a high level condition occurred in the moisture separator 'B' drain tank. This caused a turbine trip and reactor scram on turbine control valve fast closure. (An unanticipated RPS actuation.) No ECCS actuated; none were required.

A review of computer data and hardware testing did not provide a clear-cut cause for the moisture separator high level. The reactor was brought critical at 2028 on August 26, with the direction that the testing during which the scram occurred be repeated at 5% power increments beginning at 20% power. Special computer logs were established to monitor and document this testing. The tests were performed without incident from 20% to 40% power. At 45% power, the Unit experienced another turbine trip on moisture separator 'B' drain tank high level, followed by a reactor scram. (An unanticipated RPS actuation.) No ECCS actuated; none were required. Retrieval of the data from the special computer logs was unsuccessful because the special log data became low priority to the post scram logs. (The computer ignores the special log computer points.)

After the second scram, a task force was established which accomplished the following:

- functionally tested the 'A' and 'B' moisture separator and determined that there were no significant discrepancies in their operational responses.
- inspected moisture separator 'B' internals and found no damage or blockage.
- performed a field inspection of crossaround piping which found a broken hanger on crossaround line CRO-242.
- checked the operability of drain valves on crossaround piping, which determined that drain valve HV-20151A1 on CRO-242 was malfunctioning.
- drained a significant amount of water from CRO-242 through the pipe's manway.

The resulting scenario was developed to explain the relationship between the moisture separator level problems and the crossaround piping damage: Drain valve HV-20151A1, located on CRO-242 was not cycling as required during normal turbine startup. The result was that when CIV4 was cycled during testing, it caused a pressure differential on moisture separator 'A' which was sufficient to force water out of CRO-242, into the belly of the high pressure turbine and out into the 'B' moisture separator crossaround line to moisture separator 'B'. This extra water could not be handled by the moisture separator's drain and dump system and resulted in the drain tank high level.

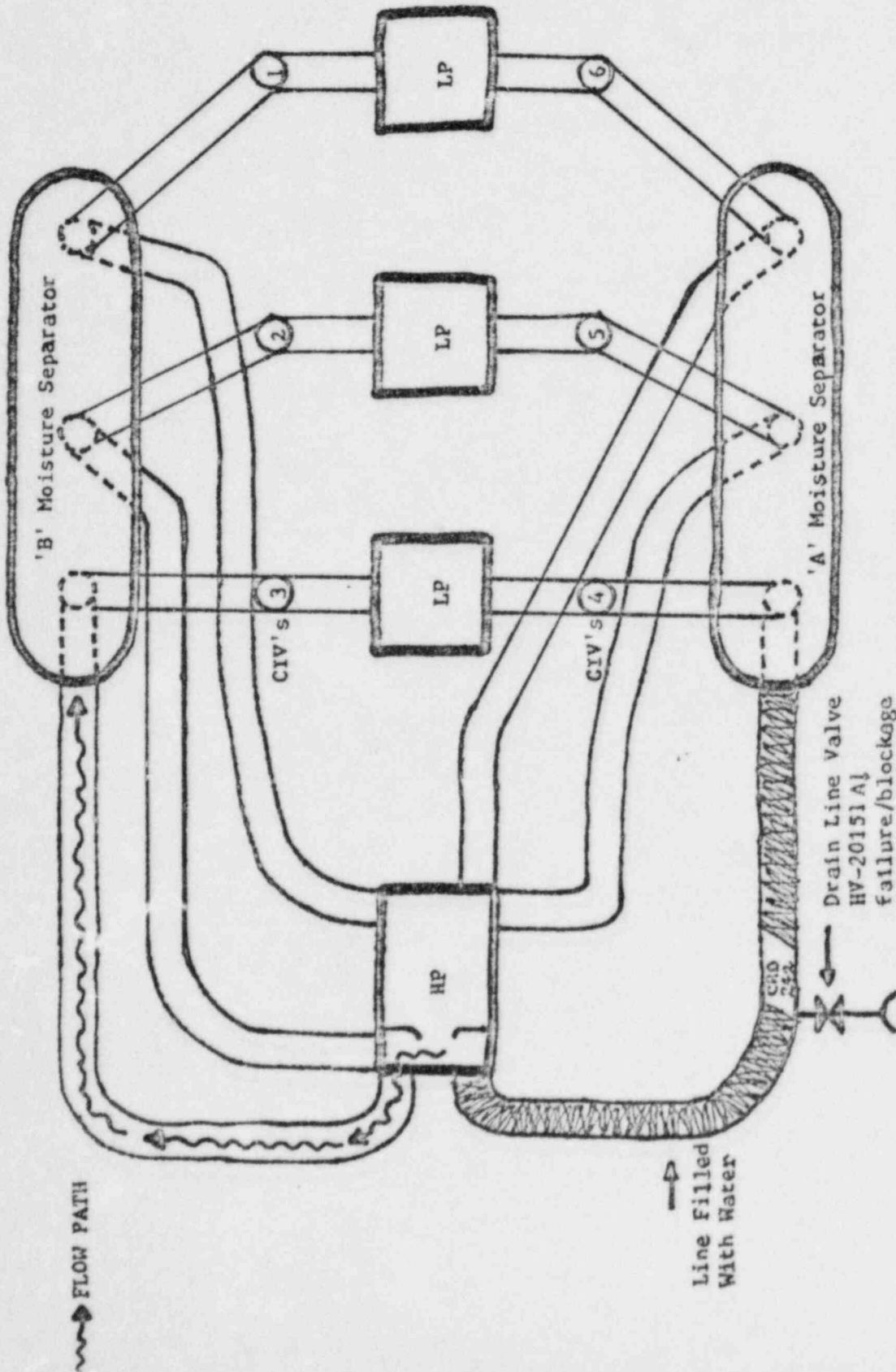
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The crossaround piping was drained and the drain valve operator (Limitorque SMB-000) was successfully reworked. A test procedure (which required the installation of special monitoring instrumentation) verified a drain path from each of the six (6) crossaround lines prior to performing additional CIV testing, which was performed at 5% power increments from 20% to 50%. No scrams occurred during this testing. As plant conditions permit, the manways on the remaining five (5) crossaround lines will be removed and a cleanliness inspection will be performed. A procedure change is under evaluation that would verify the crossaround lines' drain paths prior to rolling the turbine. A semi-annual visual inspection of the drain valves (to be scheduled as plant conditions permit) will be performed to evaluate their operability.

All system responses were conservative and per design. A review of high pressure turbine vibration and temperature data concluded that water passing through the turbine belly did not cause high vibration or temperature changes. Unit 1 was not affected by this event and there were no adverse impacts to public health and safety.





Pennsylvania Power & Light Company

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September 25, 1984

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SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 84-017-00
ER 100450 FILE 841-23
PLA-2322

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

Attached is Licensee Event Report 84-017-00. This event was determined reportable per 10CFR50.73(a)(2)(v), in that there were two unanticipated Reactor Protection System actuations which resulted in reactor scrams.

H.W. Keiser
Superintendent of Plant-Susquehanna

LAK/pjg

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