

# LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Susquehanna Steam Electric Station - Unit 2	DOCKET NUMBER (2) 05000388	PAGE (3) 1 OF 3
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TITLE (4)  
Reactor SCRAM - Moisture Separator High Level

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 NAME	DOCKET NUMBER
06	29	98	98	-- 009	-- ,00	07	29	98		05000
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)								
POWER LEVEL (10)	55	20.2201(b)			20.2203(a)(2)(v)			50.73(a)(2)(i)		50.73(a)(2)(viii)
		20.2203(a)(1)			20.2203(a)(3)(i)			50.73(a)(2)(ii)		50.73(a)(2)(x)
		20.2203(a)(2)(i)			20.2203(a)(3)(ii)			50.73(a)(2)(iii)		73.71
		20.2203(a)(2)(ii)			20.2203(a)(4)			<input checked="" type="checkbox"/> 50.73(a)(2)(iv)		OTHER
		20.2203(a)(2)(iii)			50.36(c)(1)			50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
		20.2203(a)(2)(iv)			50.36(c)(2)			50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME Stephen J. Ellis - Nuclear Licensing Engineer	TELEPHONE NUMBER (Include Area Code) (717) 542-3537
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

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

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On June 29, 1998 at 0319 hours, with Unit 2 in Condition 1 (power operation) at 55% power, the "A" Moisture Separator experienced a drain tank high level condition. This condition initiated a turbine trip, which in turn resulted in a reactor SCRAM. The most likely cause of the Moisture Separator high level is believed to be the accumulation of water in one or more of the cross-around pipes between the High Pressure Turbine and the Moisture Separator. As power was being increased, system dynamics were such that the accumulated water was swept into the Moisture Separator.

This event was determined to be reportable to the Commission per 10CFR 50.73(a)(2)(IV) as a result of actuation of the Reactor Protection System (RPS). The plant response to this event was as expected. There were no Emergency Core Cooling System (ECCS) initiations or injections, no emergency diesel generator starts, and no Main Steam Relieve Valve lifts. All equipment important to safety was available throughout the event. As such, there were no safety consequences or compromises to public health and safety. The safety and welfare of the public was not compromised. Corrective actions include: procedural changes to add assurance that water is removed from the cross-around piping; monitoring temperature of piping drains to assure flow; and the performance of an independent study to review issues associated with this event.

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**LICENSEE EVENT REPORT (LER)**  
**TEXT CONTINUATION**

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

**EVENT DESCRIPTION**

On June 29, 1998 at 0319, with Unit 2 in Condition 1 (Power Operation) at 55% power, the "A" Moisture Separator (EIS Code: S) drain tank high level alarm was received, shortly followed by a Main Turbine Trip (EIS Code: TA) and a Reactor SCRAM. The unit was in a power ascension at time of the event. The unit responded as expected to the SCRAM. There were no Emergency Core Cooling System (ECCS) initiations or injections associated with this event.

**CAUSE OF THE EVENT**

The investigation of this event reviewed the operation of the Moisture Separator instrumentation. There were no significant instrumentation anomalies identified. The high level indication was observed on four independent instrument loops. It has been concluded that the Main Turbine trip was initiated from a real high Moisture Separator water level.

It is believed that water had accumulated in the cross-around piping. The cross-around piping carries steam from the high pressure turbine exhaust to the inlet of the Moisture Separators. They are equipped with low point drains to control water buildup, especially during startup power ascension. The drain valves are opened following Main Turbine shell warming, and remain open until approximately 15% power. The valves are again opened for a 15 minute period at 30% power, and then re-closed. As part of this investigation, compliance with the procedural requirement was reviewed. There were no sign-offs for the valve opening at 15% power, but there was a sign-off for the valves opening and reclosing at 30%. The investigation concluded, following review of the applicable procedures and interviews with the Operators (licensed) on duty at the time, that the subject drain valves were cycled in accordance with the operating procedures, and that no human performance error contributed to this event.

Having considered the above, the investigation team concluded that the most likely cause for the Moisture Separator High Level, was that one or more of the cross-around pipes was filled with water. The size, length and configuration of these pipes is such that more than enough water could have accumulated in the low point to exceed the capacity of the Moisture Separator drain tanks even considering the fifteen minute draining period performed at 30% power. As power was being increased, the steam velocity in this piping became sufficient to sweep the collected water into the Moisture Separator, causing the high level, Main Turbine trip and Reactor SCRAM.

**REPORTABILITY/ANALYSIS**

This event was reported to the Commission within four hours as required by 10CFR50.72(b)(2)(ii). This report is being written per 10CFR50.73(a)(2)(IV), in that the Reactor Protection System (RPS) (EIS Code:JC) was activated, constituting an Emergency Safeguard Feature (ESF) actuation. As previously noted, the plant responded to the Main Turbine trip and subsequent Reactor SCRAM as expected. There were no ECCS initiations or injections, no emergency diesel generator starts, and no Safety Relief Valve (SRV) lifts following the Reactor SCRAM. All required safety-related equipment was available throughout the event. Based on the above, there were no safety consequences or compromises to public health and safety as a result of this event..

Per the guidance of NUREG 1022, the submittal date for this report was determined to be 7/29/98.

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

**CORRECTIVE ACTIONS**

The following corrective actions have been completed:

- Changes to the General Operating (GO) procedure have been made to provide added insurance that water is removed from the cross-around pipes.
- The temperature of the cross-around piping drain line was monitored during the subsequent startup. The objective was to verify that there is flow through all six cross-around pipe drains, which the monitoring verified.

Also, an independent study of the circumstances and technical issues associated with this event will be performed.

**ADDITIONAL INFORMATION**

Past Similar Events:

- Docket No. 50-388 LER 84-017-00
- Docket No. 50-388 LER 84-021-01, 00

Failed Components: None



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