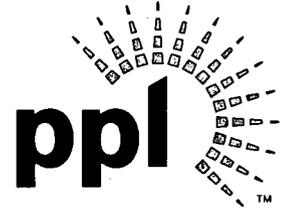


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**MAR 28 2011**

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Mail Stop OP1-17  
Washington, DC 20555

**SUSQUEHANNA STEAM ELECTRIC STATION  
LICENSEE EVENT REPORT 50-387/2011-002-00  
LICENSE NO. NPF-14  
PLA-6703**

**Docket No 50-387**

Attached is Licensee Event Report (LER) 50-387/2011-002-00. This event was determined to be a System Actuation and reportable under 10 CFR 50.73(a)(2)(iv) in that Unit 1 was manually scrammed due to an unisolable extraction steam leak. All systems functioned as required.

There were no actual consequences to the health and safety of the public as a result of this event.

No regulatory commitments are associated with this LER.

  
T. S. Rausch

Attachment

Copy: NRC Region I  
Mr. P. W. Finney, NRC Sr. Resident Inspector  
Mr. R. R. Janati, DEP/BRP  
Mr. B. K. Vaidya, NRC Project Manager

*JE22  
NRC*

# LICENSEE EVENT REPORT (LER)

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

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to [infocollects.resources@nrc.gov](mailto:infocollects.resources@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

<b>1. FACILITY NAME</b> Susquehanna Steam Electric Station Unit 1	<b>2. DOCKET NUMBER</b> 05000387	<b>3. PAGE</b> 1 OF 4
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**4. TITLE**  
Unit 1 Manual Scram due to Unisolable Extraction Steam System Leak

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
01	25	2011	2011	- 002 -	00	03	28	2011	FACILITY NAME	DOCKET NUMBER
										05000
										05000

<b>9. OPERATING MODE</b>  1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§:</b> (Check all that apply)			
<b>10. POWER LEVEL</b>  65%	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

**12. LICENSEE CONTACT FOR THIS LER**

Name Cornelius T. Coddington, Senior Engineer - Nuclear Regulatory Affairs	Telephone Number (Include Area Code) (610) 774-4019
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**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
A	SZ	V	A585	N					

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

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

On January 25, 2011, Susquehanna Steam Electric Station Unit 1 reactor was manually scrambled due to an unisolable extraction steam system leak in the 1C Feedwater Heater Bay area (EIS: SJ). Reactor power was lowered from 98.4% to 65% prior to the scram. Non-safety-related electrical equipment exposed to the condensing steam began malfunctioning. Attempts to isolate the source of the leakage were unsuccessful. Based on continued indications of an unisolable steam leak, the decision was made to shut down the unit. The mode switch was placed in shutdown. All rods inserted. Reactor water level lowered to minus 31 inches causing a Level 3 (plus 13 inches) isolation. The Reactor Core Isolation Cooling System (RCIC) (EIS: BN) automatically initiated on a minus 30 inch level signal and was manually secured after water level was restored. Reactor water level was maintained at the normal operating band using feedwater. No steam relief valves opened. All safety systems (RPS and PCIS) operated as expected. The direct cause of the unisolable leak was the loss of a bleeder trip valve cover plug. Corrective actions were to replace and seal weld the cover plug on the affected valve and to seal weld the cover plugs on 12 other valves of similar design on Unit 1. Work orders are being developed to seal weld the remaining valve cover plugs on the valves of similar design.

This event is being reported in accordance with 10 CFR 50.73(a)(2)(iv)(A) due to the manual scram and the Reactor Protection System initiation.

There were no actual adverse consequences to the fuel, any safety-related plant equipment, or to the health and safety of the public as a result of this event since the dose consequences from the additional leakage would not have exceeded regulatory limits.

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

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Susquehanna Steam Electric Station Unit 1	05000387	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
		2011	- 002 -	00	

**NARRATIVE**

EVENT DESCRIPTION

On January 25, 2011, Susquehanna Steam Electric Station Unit 1 reactor was manually scrammed due to an unisolable extraction steam system leak in the 1C Feedwater Heater Bay area. Reactor power was lowered from 98.4% to 65% prior to the scram. Non-safety-related electrical equipment exposed to the condensing steam began malfunctioning. Attempts to isolate the source of the leakage were unsuccessful. Based on continued indications of an unisolable steam leak, the decision was made to shut down the unit. The mode switch was placed in shutdown. All rods inserted. Reactor water level lowered to minus 31 inches causing a Level 3 (plus 13 inches) isolation. The Reactor Core Isolation Cooling System (RCIC) automatically initiated on a minus 30 inch level signal and was manually secured after water level was restored. Reactor water level was maintained at the normal operating band using feedwater. No steam relief valves opened. All safety systems (RPS and PCIS) operated as expected.

CAUSE OF THE EVENT

The direct cause of the unisolable steam leak was the loss of a bleeder trip valve cover plug via steam-induced thread erosion due to inadequate thread engagement and improper application of thread sealant. The inadequate thread engagement and improper application of thread sealant were due to neither the work instructions nor employee knowledge/experience being sufficient to ensure a correctly assembled threaded pipe fitting. In addition several causal factors were identified:

- The cover plug hole may have been used as a rigging attachment point which compromised the pipe joint integrity.
- Procedures for addressing identified plant deficiencies were not followed.
- Guidance on assembly of threaded pipe fittings generic applications was not provided.

ANALYSIS/SAFETY SIGNIFICANCE

This event is being reported in accordance with 10 CFR 50.73(a)(2)(iv)(A) due to the manual scram and the Reactor Protection System initiation.

Actual Consequences

Safety systems (RPS and PCIS) actuated as a result of the event and operated as designed. There were no impacts to safety-related equipment due to the steam leak. Some damage was sustained to the balance of plant (BOP) equipment. The BOP equipment is not credited in any accident mitigating analysis. While loss of BOP equipment can result in an initiating event, the loss did not adversely impact risk. No changes are required to the calculation of frequency of an initiating event as a result of this occurrence. Overall risk did not increase and there was no impact to the health and safety of the public.

Potential Consequences:

A manual scram is included in a larger grouping of non-isolation initiating events in the station Probabilistic Risk Assessment model. The initiating event frequency for non-isolation events is based on industry and Susquehanna operational data. A substantiated increase in the initiating event frequency would lead to an increase in baseline Core Damage Frequency (CDF). Therefore, the potential consequence of event recurrence would be to increase the initiating event frequency for non-isolation events in the station PRA model, leading to an increase in baseline CDF.

## LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

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**NARRATIVE**CORRECTIVE ACTIONS

The following corrective actions have been completed:

- Valves in both units with a plugged pressure boundary penetration similar to BTV10245C have been identified.
- The bleeder trip valve cover plug for BTV10245C was replaced and seal welded in-place.
- The cover plugs for 12 other bleeder trip valves in Unit 1 were seal welded in-place.
- The Crane, Hoist and Rigging Program was revised in 2003 after the last major overhaul of the valves to include a pre-lift checklist, which includes an inspection of attachment points.
- Standards, expectations and importance of procedure use and adherence were discussed during the March 2011 All Hands meetings.
- Reviewed the procedure use and adherence performance gap as part of a separate evaluation of station procedure use and adherence.

The following corrective actions are planned:

- Seal weld the Unit 2 valves with a plugged pressure boundary penetration.
- Seal weld the remaining Unit 1 valves with a plugged pressure boundary penetration.
- Revise controlled planning procedure which describes assembly and acceptance criteria for threaded pipe assemblies. The procedure will also include critical information on application and limitations of thread sealant.
- Review Lessons Learned fact sheet with appropriate groups as an interim measure.
- Evaluate knowledge gap via performance analysis in the Maintenance Curriculum Committee. Knowledge gap issue has been entered into the Corrective Action Program.
- Implement corrective actions from the procedure use and adherence evaluation as follows:
  - Revise plant procedure to incorporate additional management expectations on procedure ownership, procedure quality, and use of Knowledge Based Decision Making.
  - Develop and implement a Dynamic Learning Activity for station personnel to demonstrate how procedure use and compliance expectations are to be met.
  - Create coaching card with enhanced criteria for what is to be observed regarding procedure use and adherence when performing direct and paired observations by supervisors and managers.

No regulatory commitments are associated with this report.

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

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Susquehanna Steam Electric Station Unit 1	05000387	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 4
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**NARRATIVE**

ADDITIONAL INFORMATION

Failed Component Information:

Component: BTV10245C; 16 inch Bleeder Trip (Check) Valve

Manufacturer: Atwood & Morrill Co.

Previous Similar Events:

- LER 2010-003-01, Docket No. 387/License No. NPF-14
- LER 1993-009-00, Docket No. 388/License No. NPF-22