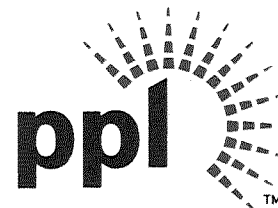


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FEB 0 1 2012

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

**SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 50-387/2011-002-01
LICENSE NO. NPF-14
PLA-6804**

Docket No 50-387

Attached is supplemental Licensee Event Report (LER) 50-387/2011-002-01. This supplement is being submitted because PPL Susquehanna, LLC (PPL) determined that the original investigation of this reportable event did not comprehensively address the organizational, programmatic, and safety culture contributors to the event and, as a result, established a root cause investigation team to supplement the original root cause evaluation. This supplement reflects the results of the additional evaluation.

The original LER 50-387/2011-002-00 was submitted to the Nuclear Regulatory Commission (NRC) on March 28, 2011.

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.

A handwritten signature in black ink, appearing to read "F. A. Kearney", is written over a rectangular box. Below the signature, the name "F. A. Kearney" is printed in a standard font.

F. A. Kearney

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

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, 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.

1. FACILITY NAME Susquehanna Steam Electric Station Unit 1	2. DOCKET NUMBER 05000387	3. PAGE 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 -	01	02	01	2012	FACILITY NAME	05000
									FACILITY NAME	05000

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: <i>(Check all that apply)</i>			
10. POWER LEVEL 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					

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	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 (EIIS: 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) (EIIS: 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. The two root causes were 1.) Less than adequate (LTA) management oversight of the work activity and work planning process and 2.) Deficient work instruction and task assignment for the Bleeder Trip Valve (BTV) repair task. Corrective actions were to replace and seal weld the cover plug on the affected valve and to seal weld the cover plugs on other valves of similar design. Other key corrective actions included planning procedure changes related to threaded pipe assemblies, evaluation and training of maintenance foremen, implementation of a more risk informed screening process, procedure changes and an enhanced coaching card on procedure use and adherence, and management observations using the revised coaching card.

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 -	01	

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

PPL completed a root cause investigation shortly after the event occurred. This root cause evaluation determined 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 for generic applications was not provided.

PPL subsequently determined that the original investigation did not comprehensively address the organizational, programmatic, and safety culture contributors to the event and established a root cause investigation team to supplement the original root cause evaluation. The root causes identified by the supplemental root cause evaluation include:

- Less than adequate management oversight of the work activity and work planning process resulted in degraded standards applied to preparation and performance of the BTV repair.
- Deficient work instruction and task assignment for the BTV repair task, due to less than adequate understanding of maintenance "skill of the craft" capabilities by the work planning organization, resulted in inadequate corrective maintenance and subsequent unisolable leak.

A contributing factor identified in the root cause evaluation was as follows:

- Less than adequate risk informed screening of the initial BTV leak action request resulted in the failure to perform an effective evaluation of the BTV leak and establish follow-up monitoring to minimize the risk consequences of a continued leak.

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.

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	3 OF 4
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NARRATIVEPotential 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.

CORRECTIVE ACTIONS

The following are key corrective actions that have been completed:

1. The bleeder trip valve cover plug for BTV10245C was replaced and seal welded in-place.
2. Valves in both units with a plugged pressure boundary penetration similar to BTV10245C have been identified and seal welded.
3. 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.
4. Standards, expectations and importance of procedure use and adherence were discussed during the March 2011 All Hands meetings.
5. A general directive for threaded pipe assemblies was created to describe acceptance criteria and provide guidance on use of thread sealant.
6. The event was reviewed in the Maintenance Curriculum Committee for gaps in maintenance fundamentals and resulting actions were entered into the Corrective Action Program.
7. A training needs analysis for generic plug repair was completed with no required interventions identified to improve work instruction for generic plug repair.
8. The procedure use and adherence performance gaps were reviewed as part of a separate evaluation of station procedure use and adherence.
9. Evaluation/training of maintenance and field services foremen was completed to address management oversight and standards for conduct of maintenance
10. Benchmarking was performed to develop a list of "skill of the craft" activities
11. Corrective action program procedures have been revised to make the screening process more risk informed and to include risk as a function of both probability and consequence for station operation as well as other conditions adverse to quality
12. Procedures were revised to ensure Management Review Committee oversight of the action request classification process
13. Procedure on standards and expectations for procedure use was revised to incorporate additional management expectations on procedure ownership, procedure quality, and use of Knowledge Based Decision Making.
14. A coaching card was created with enhanced criteria for what is to be observed regarding procedure use and adherence when performing direct and paired observations by supervisors and managers.
15. A program to periodically look for and identify leaks in areas not normally accessible due to environment and during plant operation has been developed.
16. Develop a Work Instruction for generic plug repair with appropriate considerations for sealant, cleaning the threads, FME, and thread engagement

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

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NARRATIVE

The following are key corrective actions that are ongoing or planned:

1. Perform a focused self assessment of the work control process for work package preparation and close-out
2. Conduct targeted observations by planning supervision to address management oversight and to reinforce expectations
3. Perform an evaluation of a sample of (risk significant) pending work packages to verify that they meet critical quality criteria and provide coaching and accountability to planning and maintenance staff to change behaviors and improve performance based on the results of the evaluation
4. Develop procedures or detailed work instructions for activities that were not maintained on the "skill of the craft" list based on benchmarking (excluding activities that have no risk significance outside the power block)

No regulatory commitments are associated with this report.

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