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MAR 02 2011

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

**SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 50-387/2011-001-00
LICENSE NOS. NPF-14 and NPF-22
PLA-6696**

**Docket Nos. 50-387
and 50-388**

Attached is Licensee Event Report (LER) 50-387/2011-001-00. This event was determined to be reportable under 10 CFR 50.73(a)(2)(ii)(B) as an unanalyzed condition in that a single point vulnerability associated with the steam leak detection system (SLD) might not be able to accommodate a sudden complete failure of the non-safety related Reactor Building (RB) HVAC heating system temperature controls during cold weather conditions without causing an isolation of HPCI, RCIC, and the main steam lines (MSIVs).

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.

Sincerely,

A handwritten signature in blue ink, appearing to read "Timothy S. Rausch", is written over a circular stamp or seal.

T. S. Rausch

Attachment

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

NRC FORM 366 (9-2007)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB: NO. 3150-0104	EXPIRES: 08/31/2010
<h2 style="margin: 0;">LICENSEE EVENT REPORT (LER)</h2> <p style="margin: 0;">(See reverse for required number of digits/characters for each block)</p>		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 Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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 3
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4. TITLE
Single Point Vulnerability with the Potential to Cause Isolations

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	03	2011	2011	- 001 -	00	03	02	2011	Susquehanna Steam Electric Station Unit 2	05000388
									FACILITY NAME	DOCKET NUMBER
										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 98%	<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 checked="" 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 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	Telephone Number (Include Area Code)
C. E. Manges, Jr., Senior Engineer - Nuclear Regulatory Affairs	(570) 542-3089

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

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

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

On January 3, 2011, PPL Susquehanna, LLC (PPL) identified a single point vulnerability associated with the steam leak detection system (SLD) for Unit 1 and Unit 2. Specifically, PPL determined that the design and setpoint selection for the SLD Delta Temperature function might not be able to accommodate a sudden complete failure of the non-safety related Reactor Building (RB) HVAC heating system temperature controls during cold weather conditions without causing an isolation of high pressure injection systems (HPIC and RCIC) and main steam lines (MSIVs). This design deficiency had existed since original plant design.

This event is being reported in accordance with 10 CFR 50.73(a)(2)(ii)(B) as an unanalyzed condition.

The cause of the event was a less than adequate single failure analysis that did not provide sufficient detail to identify the vulnerability.

There were no actual adverse consequences. With regard to potential significance, incorporation of the postulated isolation events into the risk model resulted in very small changes to the CDF and LERF. Based on this information, the potential safety impact of the reported event was insignificant.

A corrective action to eliminate the isolation function of the SLD delta T instrumentation has been implemented. In addition, a Failure Modes and Effects Analysis (FMEA) will be performed on all non-Q support systems that could cause an isolation of ECCS systems or all the MSIVs. This proposed action will address the extent of cause.

**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 3
		2011	- 001 -	00	

NARRATIVE

EVENT DESCRIPTION

On January 3, 2011, PPL Susquehanna, LLC (PPL) identified a single point vulnerability associated with the steam leak detection system (SLD) (EIS Code IJ) for Unit 1 and Unit 2. Specifically, PPL determined that the design and setpoint selection for the SLD Delta Temperature function might not be able to accommodate a sudden complete failure of the non-safety related Reactor Building (RB) HVAC heating system temperature controls (EIS Code VA) during cold weather conditions without causing an isolation of HPCI (EIS Code BJ), RCIC (EIS Code BN) and main steam lines (EIS Code SB). This design deficiency had existed since original plant design. Additional details concerning the SLD system and the associated single point vulnerability are provided below.

System Description:

The SLD delta T instrumentation consists of a temperature element that measures HVAC inlet air temperature and a temperature element that measures room temperature. The HVAC inlet air temperature is subtracted from the room temperature to obtain a delta T. The HPCI room, RCIC room, and steam tunnel contain separate instruments and each system is isolated by their respective instrument strings when the measured delta T reaches the isolation setpoint. A pre-isolation alarm is also received when the pre-isolation alarm setpoint is reached.

The SLD delta T instrumentation is dependent on proper operation of the Zone I and II RB HVAC heater temperature controller (TC-17589 or TC-27589) during cold weather operation. The Zone I and II RB HVAC heaters are controlled by a single temperature controller (TC17589 for Unit 1, TC27589 for Unit 2) which sends a signal to multiple heater step controllers.

Single Point Vulnerability:

Failure of the temperature controller (TC-17589 or TC-27589) could cause the heaters to turn off. This would cause a decrease in RB HVAC Supply temperature and result in a increase in measured SLD delta T during cold weather. This could have potentially caused an isolation of the MSIVs, HPCI, and RCIC within a short period of time.

Relevant Historical Information:

In 2005, INPO identified a weakness in identifying single point vulnerabilities. In 2006, engineering performed a single point vulnerability analysis for Criticality 1A components. Criticality 1A components are those whose failure alone results in a complete loss of power generation. Since the temperature controllers are Criticality 3 components, they were not evaluated. Criticality 3 components are those whose failure, when combined with another component failure, results in the complete or partial loss of electrical output, in the loss of a safety system function, or the loss of IPE defense-in-depth. In 2007, the engineering staff received training on Failure Modes and Effects analysis.

Previous Occurrences:

One of the root causes of the scram reported in LER 50-387/2006-004 was ineffective failure mode analysis for new modifications. One of the correct condition/prevent recurrence actions was to provide training on different failure modes and effects analyses. The training was focused on performing single failure analysis on new modifications. The SLD issue is a latent, pre-existing single failure issue. A corrective action to perform an FMEA on all non-Q support systems that could cause an isolation of ECCS systems or all the MSIVs is intended to address the latent issues for the more risk significant ECCS systems and loss of the normal heat sink.

**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 3
		2011	--001--	00	

NARRATIVE

CAUSE OF THE EVENT

The cause of the event was a less than adequate single failure analysis performed during the original plant design. The original single failure analysis was consistent with the level of detail of other non-Q system single failure analyses performed at that time. Training on Failure Modes and Effects analysis was provided to Engineering staff in 2007. This training provided expectations as to the level of detail of a failure modes and effects analysis for non-Q systems. Using the guidance from this training, the single point vulnerability was discovered during the preparation of 50.59 determinations for the engineering change to remove the isolation function. In the strict sense of the definition, this represents a deficiency of the previous analysis even though it was consistent with PPL and industry expectations for non-Q systems at that time.

ANALYSIS/SAFETY SIGNIFICANCE

Actual Consequences:

There were no actual consequences from this event. The postulated event was that a postulated failure of the RB HVAC heater controller could cause the SLD delta T instrumentation to isolate the MSIVs, HPCI, and RCIC if outside air temperatures were low enough (less than approximately 10°F). The heater failure never occurred, therefore the potential isolations did not occur and no transient was experienced. The SLD delta T isolations have been removed from the plant; therefore, the potential issue has been resolved.

Potential Consequences:

The postulated event was that a failure of the RB HVAC heater controller could cause the SLD delta T instrumentation to isolate the MSIVs, HPCI, and RCIC if outside air temperatures were low enough (less than approximately 10°F). For a system isolation to occur, the heater controller had to fail and concurrently the outside air temperature had to be below approximately 10°F. Outside air temperatures of less than approximately 10°F have been reported eleven times in the last two years. Incorporation of these new isolation events into the risk model resulted in very small changes to the CDF and LERF. Based on this information, the potential safety impact of the reported event was insignificant. The SLD delta T isolation functions have been removed from the plant; therefore the potential issue has been resolved.

CORRECTIVE ACTIONS

The following corrective action has been completed:

- A modification to eliminate the isolation function of the Steam Leak Detection delta T instrumentation was implemented.

The following corrective action is planned:

- Perform a Failure Modes and Effects Analysis (FMEA) on all non-Q support systems that could cause an isolation of ECCS systems or all the MSIVs.

No regulatory commitments are associated with this report.