

**Richard L. Anderson**  
Vice President – Nuclear Operations

**PPL Susquehanna, LLC**  
769 Salem Boulevard  
Berwick, PA 18603  
Tel. 570.542.3883 Fax 570.542.1504  
randerson@pplweb.com



June 10, 2003

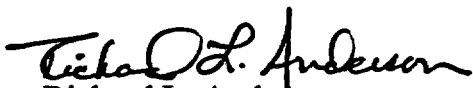
U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
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Washington, DC 20555

**SUSQUEHANNA STEAM ELECTRIC STATION  
LICENSEE EVENT REPORT 50-387/2003-002-00  
LICENSE NO. NPF-14  
PLA-5629**

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**Docket No. 50-387**

Attached is Licensee Event Report 50-387/2003-002-00. This event was determined to be reportable per 10 CFR 50.73(a)(2)(v)(C), an Event or Condition that Alone Could Prevent Fulfillment of a Safety Function, and 10 CFR 50.73(a)(2)(i)(B), a Condition Prohibited by the Technical Specifications. The 'B' Standby Gas Treatment train was inadvertently made inoperable from November 19, 2002 until April 16, 2003 due to incorrect control circuit wiring configuration for its inlet damper. The incorrect wiring condition was found during periodic surveillance testing. Additionally, the 'A' train was removed from service several times during that time period. The incorrect wiring condition has been corrected. This event resulted in no actual adverse consequences to the health and safety of the public. There are no commitments associated with this Licensee Event Report.

  
Richard L. Anderson  
Vice President – Nuclear Operations

Attachment

JE22

cc: Mr. H. J. Miller  
Regional Administrator  
U.S. Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, PA 19408

Mr. S. L. Hansell  
Sr. Resident Inspector  
U.S. Nuclear Regulatory Commission  
P.O. Box 35  
Berwick, PA 18603-0035

Mr. R. Osborne  
Allegheny Electric Cooperative  
P. O. Box 1266  
Harrisburg, PA 17108-1266

Mr. R. R. Janati  
Bureau of Radiation Protection  
Rachel Carson State Office Building  
P. O. Box 8469  
Harrisburg, PA 17105-8469

## 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 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to [bj1@nrc.gov](mailto:bj1@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 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 5

## 4. TITLE

Both Trains of Standby Gas Treatment Inoperable Due to Inadequate Maintenance and Inadequate Operability Testing

## 5. EVENT DATE

## 6. LER NUMBER

## 7. REPORT DATE

## 8. OTHER FACILITIES INVOLVED

MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
04	16	2003	2003	- 002	- 00	06	10	2003	Susq. SES - Unit 2	05000388
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING  
MODE

1

## 11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

10. POWER  
LEVEL

100

20.2201(b)

20.2203(a)(3)(ii)

50.73(a)(2)(ii)(B)

50.73(a)(2)(ix)(A)

20.2201(d)

20.2203(a)(4)

50.73(a)(2)(iii)

50.73(a)(2)(x)

20.2203(a)(1)

50.36(c)(1)(i)(A)

50.73(a)(2)(iv)(A)

73.71(a)(4)

20.2203(a)(2)(i)

50.36(c)(1)(ii)(A)

50.73(a)(2)(v)(A)

73.71(a)(5)

20.2203(a)(2)(ii)

50.36(c)(2)

50.73(a)(2)(v)(B)

OTHER

20.2203(a)(2)(iii)

50.46(a)(3)(ii)

x 50.73(a)(2)(v)(C)

Specify in Abstract below or in

20.2203(a)(2)(iv)

50.73(a)(2)(i)(A)

50.73(a)(2)(v)(D)

NRC Form 366A

20.2203(a)(2)(v)

x 50.73(a)(2)(i)(B)

50.73(a)(2)(vii)

20.2203(a)(2)(vi)

50.73(a)(2)(i)(C)

50.73(a)(2)(viii)(A)

20.2203(a)(3)(i)

50.73(a)(2)(ii)(A)

50.73(a)(2)(viii)(B)

## 12. LICENSEE CONTACT FOR THIS LER

## NAME

Joseph J. Meter - Nuclear Regulatory Affairs

## TELEPHONE NUMBER (Include Area Code)

570 / 542-1873

## 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	BH	CDMP	I206	Y					

## 14. SUPPLEMENTAL REPORT EXPECTED

YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR

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

At 22:35 on April 16, 2003 with Unit 1 in Mode 1 at 100% power and Unit 2 in Mode 4 at 0% power, a Secondary Containment Surveillance Test revealed that the 'B' train of the Standby Gas Treatment System (SGTS) inlet damper was inoperable. Electrical Maintenance personnel discovered that the control circuit wires external to the damper actuator had their polarities reversed. Although the polarity reversal had existed since 1998, the damper became inoperable during actuator replacement work performed in November of 2002. Additionally, it was determined that the 'A' train of SGTS was removed from service several times while the 'B' train of SGTS was inoperable. The wiring error was corrected and the 'B' train of SGTS was returned to operable status at 14:15 on April 17, 2003. A root cause analysis was performed for the event and three root causes were found. The procedure used to replace the damper actuator was not explicit enough with respect to control circuit wiring configuration. Work Management personnel did not specify the correct operability testing for the actuator replacement on the work order release in 2002 and Operations release and close out of the work order did not detect the omission. A contributing factor to the work order release errors is that station procedures and computerized workflow steps for the operability testing process contain inconsistencies. The procedures for actuator maintenance and operability testing will be revised to correct these deficiencies. This event is reportable as a Condition Prohibited by the Technical Specifications per 10 CFR 50.73(a)(2)(i)(B) and as an Event or Condition That Alone Could Prevent Fulfillment of a Safety Function per 10 CFR 50.73(a)(2)(v)(C) for Unit 1 and Unit 2. There were no actual consequences to the health and safety of the public as a result of this event since neither of the SGTS trains were required to actuate during the time they were inoperable.

# LICENSEE EVENT REPORT (LER)

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Susquehanna Steam Electric Station - Unit 1	05000387				2 of 5

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

## EVENT DESCRIPTION

At 22:35 on April 16, 2003 with Unit 1 in Mode 1 at 100% power and Unit 2 in Mode 4 at 0% power, a 24-month Secondary Containment Drawdown and In-leakage Surveillance Test revealed that the 'B' train of the Standby Gas Treatment system (SGTS) inlet damper PDD07554B would not modulate to its open position. That condition rendered the 'B' SGTS train (EIS Code: BH) inoperable. Electrical Maintenance personnel (utility, non-licensed) investigated the condition and discovered that the control circuit wiring configuration external to the damper actuator was incorrect. The external wires from the controller to the damper actuator were terminated with their polarities reversed. During the investigation it was determined that the incorrect configuration had existed since January 21, 1998 and resulted in the damper becoming inoperable during subsequent actuator replacement work performed on November 19, 2002. The error in the wiring configuration was promptly corrected and the 'B' SGTS train was returned to operable status at 14:15 on April 17, 2003. Additionally, it was determined that the 'A' SGTS train was removed from service for maintenance and testing activities from February 10, 2003 through February 12, 2003, from February 24, 2003 through February 25, 2003, on April 11, 2003 and again on April 12, 2003. Therefore, during the time periods in which the 'A' train was removed from service, both the 'A' and 'B' trains were inoperable.

## CAUSE OF EVENT

A root cause analysis of the event was performed and three primary (root) causes were identified. The maintenance procedure used to replace the damper actuator was not explicit enough with respect to control circuit wiring configuration. Work Management personnel did not specify the correct operability testing for the actuator replacement on the work order release form in 2002. Lastly, Operations personnel that released and closed out the work order release form did not detect the omission.

On January 21, 1998 Electrical Maintenance personnel (utility, non-licensed) replaced the damper actuator for PDDM07554B with a rebuilt actuator using maintenance procedure MT-GE-030 as part of its five-year Equipment Qualification (EQ) program. The replaced damper actuator failed to stroke during subsequent post maintenance operability testing. An investigation at that time revealed that the control circuit-wiring configuration internal to the damper actuator was incorrect. The wires from the actuator force coil were soldered in-place to the internal side of the termination block with their polarities reversed. Since the actuator force coil is one of the subcomponents replaced during the five-year actuator rebuild, MT-GE-030 acknowledged that there may be a need to reverse the force coil wires once the actuator is installed and tested. However, MT-GE-030 did not discuss changing the configuration of the external wires from the controller to the termination block since their configuration is shown on plant electrical drawings. To remedy the January 21, 1998 problem, Electrical Maintenance personnel incorrectly interpreted the instructions in MT-GE-030 and reversed the wires from the controller to the external side of damper actuator termination block instead of re-soldering the internal force coil wires to their correct polarity. Operability testing was then re-performed and the damper functioned correctly. A review of that event revealed that the cause for the procedure misinterpretation was MT-GE-030 did not make a sufficient distinction in the terminology used to describe the wires that are internal to the actuator (force coil wires) and those wires that are external to the actuator.

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

## CAUSE OF EVENT (continued)

On November 19, 2002 Electrical Maintenance personnel (utility, non-licensed) again replaced the damper actuator for PDDM07554B with a rebuilt actuator as part of its five-year EQ program using maintenance procedure MT-GE-030. The force coil wires for that rebuilt actuator were soldered to the internal side of the termination block with correct polarity. Procedure MT-GE-030 directed Electrical Maintenance personnel to document the as-found location of the external wires from the controller to the termination block prior to removing the old actuator. Once the rebuilt actuator was installed, the procedure directed them to terminate the external wires at their as-found location. The damper stroked in-place with the control wires (external) determined when Electrical Maintenance personnel used a simulated control signal. However, when the control wires (external) were terminated with reverse polarity at the terminal block, damper PDDM07554B would not have functioned on an actual signal from the system controller. In addition, the operability testing specified for the work did not reveal that the actuator was incorrectly wired. The 'B' Standby Gas Treatment train was subsequently returned to an operable status.

At PPL Susquehanna, LLC components and systems are released for work using a Release Work Order (RLWO) which is prepared by a Work Week Manager (utility, non-licensed) and reviewed by Unit Supervisor (utility, licensed). That document lists the operability testing that is required to return the component or system to an operable status. When all work and operability testing is completed, the RLWO is closed by a Unit Supervisor (utility, licensed) to ensure that the released equipment is operable. The operability testing stated on the RLWO used for the actuator replacement on November 19, 2002 was not adequate to detect the incorrect wiring configuration. The Work Week Manager omitted the necessary testing requirement and the error went undetected by the two Unit Supervisors involved. A review of those errors revealed that operability testing process roles and responsibilities are discussed in several levels of station procedures and computerized work flow steps but there are inconsistencies between them. For example, the RLWO computerized work flow steps provide an entry for operability testing but it is not required to be filled in. If the entry is left blank by the Work Week Manager, the computerized process does not require the Unit Supervisor to concur that "none" is the correct operability testing to be performed.

## ANALYSIS / SAFETY SIGNIFICANCE

This event is reportable as a Condition Prohibited by the Technical Specifications per 10 CFR 50.73(a)(2)(i)(B) and as an Event or Condition That Alone Could Prevent Fulfillment of a Safety Function per 10 CFR 50.73(a)(2)(v)(C). The 'B' train of SGTS was inoperable greater than the seven days allowed by Technical Specification 3.6.4.3 Condition A and the 'A' train of SGTS was removed from service on several occasions while the 'B' train was inoperable. Although Unit 2 was shut down for a refueling outage at the time of the discovery, the conditions apply to both Unit 1 and Unit 2 since Unit 2 was in Mode 1 prior to its shutdown on March 8, 2003.

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

**ANALYSIS / SAFETY SIGNIFICANCE** (continued)

The SGTS is designed to accomplish the following safety related objectives:

- a) Exhaust sufficient filtered air from the Reactor Building (EIS Code: NG) to maintain a negative pressure of about 0.25 inches water gauge in the affected volumes following secondary containment isolation for a spent fuel handling accident in the refueling floor area and for a loss of coolant accident.
- b) Filter the exhausted air to remove radioactive particulates and both radioactive and non-radioactive forms of iodine to limit the offsite dose to the guidelines of 10 CFR100.

There were no actual consequences to the health and safety of the public as a result of this event since neither train of SGTS were required to actuate during the time they were inoperable. During those periods when both trains of SGTS were inoperable there were no spent fuel moves taking place. However, the SGTS would not have been able to fulfill the above objectives during those times if a LOCA would have occurred. During the remaining periods from November 19, 2002 until April 16, 2003 (when only the 'B' train was inoperable,) the 'A' train was operable and would have been capable of meeting the above safety related objectives.

In accordance with guidance in NUREG-1022, Revision 2, the due date for this report is June 16, 2003.

**CORRECTIVE ACTIONS**

The corrective actions that have been completed are:

- The error in the wiring configuration was corrected and the 'B' SGTS train was returned to operable status.
- It was confirmed that the 'A' SGTS train was not affected by wiring configuration problems via proper system testing.

The key corrective actions to be completed are:

- Revise the maintenance procedures that remove, rebuild and replace the subject damper actuators to provide sufficient distinction in the terminology used to describe the wires that are internal to the actuator (force coil wires) and those wires that are external to the actuator.
- Revise operability testing process procedures and computerized workflow steps guides to eliminate the inconsistencies.

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

### CORRECTIVE ACTIONS (continued)

- Revise RLWO computerized workflow steps to require an entry for operability testing even if the testing required is "none".
- Provide training to Unit Supervisor personnel on the requirement to evaluate component and system operability testing during RLWO release and close out.

### ADDITIONAL INFORMATION

Past Similar Events: None

Failed Component : 'B' SGTS train Inlet Damper PDD07554B

Manufacturer: ITT

Model: NH93