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JUL 09 2012

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 50-388/2012-001-00
UNIT 2 LICENSE NO. NPF-22
PLA-6882 **Docket No 50-388**

Attached is Licensee Event Report (LER) 50-388/2012-001-00 submitted for the Susquehanna Unit 2 event in which two Control Room Floor Cooling Systems were inoperable. The duration of the event was approximately fifteen minutes and resulted in a condition that could have prevented the fulfillment of a safety function. This event is being reported in accordance with 10 CFR 50.73(a)(2)(v)(D).

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.

J. M. Helsel

Attachment: LER 50-388/2012-001-00

Copy: NRC Region I
Mr. P. W. Finney, NRC Sr. Resident Inspector
Mr. R. R. Janati, DEP/BRP
Ms. C. J. Sanders, NRC Project Manager

NRC FORM 366 (10-2010) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES:10/31/2013

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.

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Susquehanna Steam Electric Station Unit 2	05000388	1 OF 3

4. TITLE

Two Control Room Floor Cooling Systems Inoperable

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 05000
05	11	2012	2012	- 001	- 00	07	09	2012	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE

1

10. POWER LEVEL

100%

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

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☒ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMER *(Include Area Code)*
D. L. Filchner, Senior Engineer - Nuclear Regulatory Affairs	(610) 774-7819

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

14. SUPPLEMENTAL REPORT EXPECTED

☒ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☐ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR
10	19	2012

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

On 5/11/12 at 1603 hours, Unit 2 entered LCO 3.0.3 due to two control room floor cooling systems being inoperable. 0V117A Control Room Floor Cooling Unit fan's discharge damper failed earlier during the same day at 0523 hours, rendering the associated 0V117A fan inoperable. The redundant 'B' train fans and associated Control Structure Chiller automatically started as a result of a fan low flow interlock. The control switch for the 'A' train logic was left in 'Start' and the control switch for the 'B' train logic was left in 'Auto' as directed by the alarm response procedure. During application of a clearance order for repair of the failed 0V117A fan damper, the 'A' control room cooling fan switch was placed in 'Stop' position. This resulted in an automatic start of the 'A' Control Structure Chiller and all the associated 'A' fans except for the control room cooling fan, and a shutdown of the 'B' train fans and chiller. This condition caused the loss of both control room cooling fans and LCO 3.7.3 "Control Room Emergency Outside Air Supply (CREOAS) System," Condition E; LCO 3.7.4 "Control Room Floor Cooling System," Condition D; LCO 3.0.3; and TRO 3.7.9 "Control Structure HVAC," were entered at 16: 03 hours. The control room operators immediately recognized the loss of cooling and took manual action to restart the 'B' train. LCO 3.0.3 was exited at 16:18 hours without a reactor power reduction. This event is reportable as a loss of entire safety function under 10CFR50.73(a)(2)(v)(D).

The direct cause of this event was that the fan failure and the subsequent removal from service for repair, combined with the alignment of control switches for the equipment that auto started was not considered in the Alarm Response for Control Room Cooling fan failure or Off Normal Procedure for Loss of Control Structure Chilled Water. Operators were not procedurally directed to place the running equipment in a lead configuration. This resulted in knowledge based decisions that culminated in the loss of both Control Room cooling fans and resulted in the Unit 2 entering LCO 3.0.3.

Immediate corrective actions were taken to modify alarm response procedures.

Susquehanna Unit 1 was in Mode 5 at the time of the event and therefore unaffected because the associated Unit 1 Technical Specifications were not applicable.

The root cause, safety significance, and corrective actions will be provided in a supplement to this LER upon completion of the Root Cause Evaluation.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Susquehanna Steam Electric Station Unit 2	05000388	2012	- 001	- 00	2 OF 3

NARRATIVE

CONDITION PRIOR TO THE EVENT

Unit 2 – Mode 1, 100 percent Rated Thermal Power

EVENT DESCRIPTION AND TIMELINE

A chronological timeline or sequence of events leading up to and immediately following the event follows:

On 05/11/2012 at 0523 hours - control room personnel noted a change in Control Room HVAC background noise and found the 0V117A Control Room Floor Cooling Unit fan's discharge damper (HD-07831A) closed. Subsequently the 'A' train of CS HVAC (chiller and fans) shutdown on "0V117A low flow." Control Room personnel entered off normal procedure ON-030-001 "Loss of Control Structure Chilled Water." The 'B' train of CS HVAC (chiller and fans) automatically started following the shutdown of the 'A' train of CS HVAC.

LCO 3.7.3, LCO 3.7.4, TRO 3.7.9, and TRO 3.8.6 were entered for 'A' Control Room Cooling Inoperable due to failed fan discharge damper HD-07831A. A Condition Report was generated to document the issue and support repairs.

On 05/11/2012 at 1603 hours - during application of the clearance order for the damper repair work, when the fan hand switch HS-07831A was placed in "Stop," the low flow alarm logic fault for 0V117A was bypassed. As a result, the 0K112A Control Structure Chiller started and fans 0V113A & 0V115A started because 0P162A, the chilled water loop pump control switch, had been left in the "Start" position from the previous trip while the loss of the 0V117A was still being investigated. Since the 'B' Chiller controls were left in 'AUTO,' the 'B' train of CS HVAC (chiller and fans) shutdown when the 'A' system re-started.

Off Normal Procedure ON-030-001 "Loss of Control Structure Chilled Water" was entered when Control Room Floor Cooling Unit Fan hand switch HS-07831A was placed to "Stop" to support repairs. This condition caused a loss of both Control Room Fans 0V117A and 0V117B. LCO 3.7.3, LCO 3.7.4, and subsequently LCO 3.0.3 were entered due to the loss of 0V117A and 0V117B.

On 05/11/2012 at 1612 hours - the 'B' train of CS HVAC (chiller and fans) was started in accordance with the operating procedures to restore Control Room Cooling.

On 05/11/2012 at 1615 hours - the 'A' Control Structure Chiller 0K112A was placed in standby.

At 1618 hours LCO 3.0.3 was exited.

On 05/11/2012 at 2127 hours - an ENS notification (47919) was made to the NRC in accordance with 10 CFR 50.72(b)(3)(v) & (vi) for an event that could have prevented the fulfillment of a safety function. As such, this event is being submitted in accordance with 10CFR50.73(a)(2)(v)(D) as a loss of entire safety function.

CAUSE OF THE EVENT

The direct cause was that the fan failure and the subsequent need to take it out of service for repair, combined with the alignment of control switches for the equipment that auto started was not considered in the Alarm Response for Control Room Cooling fan failure or Off Normal Procedure for Loss of Control Structure Chilled Water. Operators were not directed procedurally to place the running equipment in a lead configuration; this resulted in knowledge based decisions that culminated in the loss of both Control Room cooling fans and resulted in the Unit 2 entering LCO 3.0.3. Procedures were deficient to ensure a successful outcome.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Susquehanna Steam Electric Station Unit 2	05000388	2012	--001-	- 00	3 OF 3

Control room personnel did not anticipate that placement of the 0V117A Control Room Floor Cooling Unit Fan hand switch to 'Stop' would cause the 'B' train of CS HVAC (chiller and fans) to shutdown. A step in the operating procedure OP-030-001 "Control Structure Chilled Water System" to align the chiller that auto started as the lead, (in service) chiller, was not required by procedure to be completed prior to placing the 0V117A Control Room Floor Cooling Unit Fan hand switch to 'Stop' for repairs. Additionally, the sequence of blocking applied by the Clearance Order did not take the chiller control logic into account.

Upon completion of the root cause evaluation for this event, the root cause will be provided in a supplement to this LER.

ANALYSIS/SAFETY SIGNIFICANCE

Actual Consequences:

There are no actual safety consequences as a result of this event due to its short duration.

Potential Consequences:

The Control Room Floor Cooling System is capable of removing sensible and latent heat loads from the control room, including consideration of equipment heat loads and personnel occupancy requirements to ensure equipment operability. The system is designed for 30 day continuous occupancy and the control room cooling fans are also needed for pressure control of the habitability envelope. A loss of the Control Room Floor Cooling System for an extended period has the potential to affect these requirements.

Upon completion of the root cause evaluation, the actual safety significance and any potential consequences will be included in a supplement to this LER.

CORRECTIVE ACTIONS

An immediate corrective action was to revise alarm response procedures to include direction to place the running control structure chiller to a "start" configuration when it is decided to maintain that configuration.

Additional corrective actions determined during completion of the root cause evaluation will be included in a supplement to this LER.

PREVIOUS SIMILAR EVENTS

The following LER's were recently submitted related to Control Structure Cooling issues:

- LER 387/2012-01-00, "Both Control Structure Chillers Inoperable" identified a condition that could have prevented the fulfillment of a safety function associated with the CS Chillers.
- LER 387/2012-002-00, "B Control Structure Chiller Inoperable Concurrent with "A" Emergency Diesel Generator Out of Service" identified a condition that could have prevented the fulfillment of a safety function associated with the CS Chillers.