Nuclear Operating Company
South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

January 22, 2018
NOC-AE-18003546
10 CFR 50.73

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

South Texas Project
Unit 1
Docket No. STN 50-498
Licensee Event Report 2017-002-00
Unit 1 Condition Prohibited by Technical Specifications Due to
Inoperable Control Room Envelope Makeup Filtration System Heating Coil

Pursuant to 10 CFR 50.73(a)(2)(i)(B), STP Nuclear Operating Company hereby submits the attached South Texas Project Unit 1 Licensee Event Report 2017-002-00 for a condition prohibited by the plant Technical Specifications.

The event did not have an adverse effect on the health and safety of the public.

There are no commitments in this submittal.

If there are any questions, please contact Mr. Drew Richards at 361-972-7666 or me at 361-972-7344.

James Connolly
Site Vice President

amr/JC

Attachment: Unit 1 LER 2017-002-00, Unit 1 Condition Prohibited by Technical Specifications Due to Inoperable Control Room Envelope Makeup Filtration System Heating Coil

STI 34591589

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Attachment

Unit 1 LER 2017-002-00

Unit 1 Condition Prohibited by Technical Specifications Due to Inoperable Control Room Envelope Makeup Filtration System Heating Coil

NRC FORM 366 (04-2017) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
South Texas Unit 1	05000498	1 OF 5

4. TITLE

Unit 1 Condition Prohibited by Technical Specifications Due to Inoperable Control Room Envelope Makeup Filtration System Heating Coil

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
									N/A	05000
11	23	2017	17	- 002	- 0	1	22	2018	FACILITY NAME	DOCKET NUMBER
									N/A	05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
100	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
	☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
		☐ 50.73(a)(2)(i)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
Drew Richards	(361) 972-7666

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
D	VI	80	F132	N					

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO				

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

On November 23, 2017, a routine surveillance on the South Texas Unit 1 Train "C" Control Room Makeup and Cleanup Filtration System failed due to the Train "C" control room makeup filtration system heater de-energizing approximately two minutes after actuation. The makeup filtration system heater de-energized due to an improperly configured jumper on a circuit board associated with the Train "C" control room makeup filtration unit outlet low flow switch. The circuit board had been installed with the improperly configured jumper on September 27, 2017. The circuit board was properly configured and returned to service on November 24, 2017.

This resulted in the Train "C" Control Room Makeup and Cleanup Filtration System being inoperable for 58 days; the associated Technical Specification allowed outage time for this condition is 7 days. The cause of the event is the maintenance work instructions did not include steps to: (1) ensure that the circuit board jumper is in the correct position, and (2) conduct a post-maintenance test to ensure proper operation of the heaters. As a corrective action, the applicable maintenance work instructions will be revised to (1) ensure that the circuit board jumper is in the correct position, and (2) conduct a post-maintenance test to ensure proper operation of the heaters.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
South Texas Unit 1	05000-498	17	- 002	- 0

NARRATIVE

I. Description of Reportable Event

A. Reportable event classification

This event is reportable under §50.73(a)(2)(i)(B) as an operation or condition prohibited by the plant's Technical Specifications.

B. Plant operating conditions prior to event

Prior to the event on November 23, 2017, South Texas Unit 1 was operating in Mode 1 at 100 percent power.

C. Status of structures, systems, and components that were inoperable at the start of the event and that contributed to the event

Unbeknownst to the Control Room operators at the start of the event, the Train "C" Control Room Makeup and Cleanup Filtration System was inoperable due to a misconfigured jumper on the circuit board associated with the Train "C" control room makeup filtration unit outlet low flow switch. The switch provides an input to energize/de-energize the associated filtration unit heater.

D. Narrative summary of the event

NOTE: When known, approximate times for all major occurrences are provided below.

March 2, 2017

STP Nuclear Operating Company (STPNOC) issued a purchase order to Fluid Components International (FCI) for four circuit boards. The circuit boards are configured with a set of jumper pins that can be configured in either position J12 or J13. In the purchase order, the specified circuit board model indicated that all four circuit boards were to be procured with a standard option of "ENERGIZED AT FLOW OR WET", which corresponds to the J12 jumper position. The J13 position corresponds to the option of "ENERGIZED AT NO FLOW OR DRY."

April 1, 2017

STPNOC received the four circuit boards from FCI (Serial Numbers 624755, 624756, 624757, 624758).

May 30, 2017

The circuit board with serial number 624756 was installed in Unit 1 Train "B" Fuel Handling Building (FHB) exhaust.

June 1, 2017

A scheduled monthly surveillance on Unit 1 Train "B" FHB exhaust was performed. During the surveillance, the associated FHB exhaust heater function was tested by measuring heater coil current. Based on the successful completion of this surveillance, the jumper on the circuit board with serial number 624756 was configured in the correct J12 position. Note that the FHB exhaust air system is not governed by Technical Specifications but is required in the Technical Requirement Manual during the movement of fuel within the spent fuel pool or when conducting crane operation with loads over the spent fuel pool.

September 7, 2017

At 1036 hours, the quarterly surveillance was completed satisfactorily for Unit 1 Train "C" Control Room Makeup and Cleanup Filtration System.

September 27, 2017

The circuit board with serial number 624757 was installed in the Unit 1 Train "C" control room makeup filtration unit. Installation of the new circuit board was due to a planned periodic replacement and not because of a component failure. Following installation of the new circuit board, a post-maintenance test was performed to verify circuit board setpoints. However, a post-maintenance test to verify heater operability was not performed. The as-found configuration of the removed circuit board was configured with the jumper in the J12 position (correct position); the new circuit board was installed with the jumper in the J13 position (incorrect position).

At 1445 hours, Unit 1 Train "C" Control Room Makeup and Cleanup Filtration System was declared Operable following planned maintenance.

November 23, 2017

At 0940 hours, the scheduled quarterly surveillance on Unit 1 Train "C" Control Room Makeup and Cleanup Filtration System was commenced (Unit 1 was in Mode 1 at 100% power).

At 1544 hours, a manual actuation of the Unit 1 Train "C" control room emergency ventilation system was initiated per surveillance procedure.

At 1545 hours, Unit 1 Train "C" Control Room Makeup and Cleanup Filtration System associated heater de-energized. The train was declared inoperable and Technical Specification 3.7.7 Action a was entered:

a. With one Control Room Makeup and Cleanup Filtration System inoperable for reasons other than condition b or condition e, within 7 days restore the inoperable system to OPERABLE status, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

November 24, 2017

At 1202 hours, after corrective maintenance was performed, the quarterly surveillance on Unit 1 Train "C" Control Room Makeup and Cleanup Filtration System was re-performed. The jumper configuration for the installed circuit board with serial number 624757 was corrected in the field and the circuit board was returned to service.

At 2305 hours, following successful surveillance test performance, Unit 1 Train "C" Control Room Makeup and Cleanup Filtration System declared Operable.

Time unknown: The circuit board with serial number 624758, which was never installed in the plant, was verified to have the jumper in the correct J12 position.

December 14, 2017

The circuit board with serial number 624755 was inspected and the jumper was found to be misconfigured (i.e., jumper was in the J13 position). The circuit board was located in the warehouse and had never been installed in the plant. A "discrepant hold" was placed on the circuit board with serial number 624755 to ensure that the card is not installed in the plant until the jumper is properly configured.

January 10, 2018

The circuit board with serial number 624755 was reconfigured to place the jumper in the correct configuration and the "discrepant hold" was removed.

E. Method of discovery

The event was discovered when the scheduled quarterly surveillance on Train "C" Control Room Makeup and Cleanup Filtration System failed on November 23, 2017.

II. Component failures

A. Failure mode, mechanism, and effects of failed component

The affected circuit board did not fail but was improperly configured. The system is designed to de-energize the heaters based on low air flow. As a result of the misconfigured jumper, the system operated in the opposite manner (i.e., the heaters energized during low flow conditions). The heaters are required to maintain desired makeup filtration effectiveness because without the heater energized, the humid ambient air would saturate the filters with moisture and reduce the filter efficiency from approximately 90% to approximately 30%.

B. Cause of component failure

The cause of the component failure was due to an improperly configured circuit board jumper. The jumper changed the output of the circuit board such that the associated heaters were energized (versus de-energized) at system low flow conditions.

C. Systems of secondary functions that were affected by failure of components with multiple functions

The affected circuit board does not provide any secondary functions nor does it provide inputs to other systems.

D. Failed component information (Energy Industry Identification System (EIIS) designators provided in {brackets})

Control Room HVAC System (Control Building/Control Complex Environmental Control System) {VI}
Flow Switch {80}
Fluid Components International {F132}

III. Analysis of the event

A. Safety system responses that occurred

No safety systems were required to respond as a result of this event.

B. Duration of safety system inoperability

Unit 1 Train "C" Control Room Makeup and Cleanup Filtration System was inoperable for a period of 58 days, 10 hours, 20 minutes from 1445 hours on September 27, 2017 until 2305 hours on November 24, 2017.

C. Safety consequences and implications

When STPNOC reanalyzed the UFSAR Chapter 15 Accident Analyses for Alternate Source Term, Control Room makeup filtration was not credited in any accident analyses. Only recirculation filtration was credited in the design bases calculations. Therefore, reduced makeup filtration effectiveness, due to loss of heater function in a makeup train heater, would have no effect on the plant design basis assumptions.

Control Room makeup filtration is only credited for use as a compensatory action if tracer gas testing fails the inleakage measurement limit. The presence of uncredited makeup filtration would provide margin until the measured inleakage problem is resolved. During the time period of this event, no tracer gas testing was performed in Unit 1, so makeup filtration was not credited as a compensatory measure while the Train "C" Control Room Makeup and Cleanup Filtration System was inoperable.

In the STP PRA model, the system function of the Control Room Makeup and Cleanup Filtration System is to provide outside air for cooling of plant equipment located in the Control Room Envelope. The heaters in the makeup filtration portion of the system are not modeled in the STP PRA model and have no impact on core damage frequency or large early release frequency. The heaters would become important after a core damage event followed by a radiological release to provide clean air to the Control Room Envelope for habitability; however, this is beyond the scope of the STP PRA model, which is a Levels I and II PRA model.

From a Technical Specification perspective, during the time period of this event, the other two trains of the Control Room Makeup and Cleanup Filtration System were Operable and capable of performing their required functions. Note that the Control Room Makeup and Cleanup Filtration System trains are 50% capacity trains (i.e., two trains are required to meet the design bases function).

IV. Cause of the event

The cause of the event is the applicable maintenance work instructions did not include steps to: (1) ensure that the circuit board jumper is in the correct position, and (2) conduct a post-maintenance test to ensure proper operation of the heaters.

V. Corrective actions

The applicable maintenance work instructions will be revised to (1) ensure that the circuit board jumper is in the correct position, and (2) conduct a post-maintenance test to ensure proper operation of the heaters.

VI. Previous similar events

An operating experience review was conducted to find similar events regarding improperly configured jumpers. One event in the past ten years was discovered (reference STP Condition Report 09-16821). This event did not result in an LER because the incorrectly installed jumper was discovered prior to the component being placed into service. No changes to written instructions were made as a result of this event.