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

November 27, 2019
NOC-AE-19003697
STI: 34953007
10 CFR 50.73

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

South Texas Project
Unit 1
Docket No. STN 50-498
Licensee Event Report 2019-002-01
Unit 1 Condition Prohibited by Technical Specifications and Loss of Safety Function due to Inoperable Reactor Head Vent Throttle Valves

Enclosed is a supplement to Licensee Event Report (LER) 2019-002-00, "Unit 1 Condition Prohibited by Technical Specifications and Loss of Safety Function due to Inoperable Reactor Head Vent Throttle Valves," submitted to the NRC on September 30, 2019. This supplement updates the report to provide the cause of component failure and to provide planned corrective action. The updated information is denoted by revision bars located in the right-hand margin. This report is being submitted in accordance with the requirements 10 CFR 50.73.

There are no commitments in this submittal.

If there are any questions, please contact Nic Boehmisch at 361-972-8172 or me at 361-972-7888.

Michael A. Schaefer
Site Vice President

Attachment: Unit 1 LER 2019-002-01, Condition Prohibited by Technical Specifications and Loss of Safety Function due to Inoperable Reactor Head Vent Throttle Valves.

cc:

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
1600 E. Lamar Boulevard
Arlington, TX 76011-4511

NRC FORM 366 (04-2018)

U.S. NUCLEAR REGULATORY COMMISSION

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

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 Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@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 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	0500 0498	1 OF 5

4. Title

Condition Prohibited by Technical Specifications and Loss of Safety Function due to Inoperable Reactor Head Vent Throttle Valves.

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
07	30	2019	2019	– 002	– 01	11	27	2019	Facility Name N/A	Docket Number 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)
100	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 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)(ii)
	☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(iii)
		☐ 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)
Nic Boehmisch, Licensing Engineer	(361) 972-8172

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable To ICES		Cause	System	Component	Manufacturer	Reportable To ICES
B	AC	FSV	T020	Y						

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 14 single-spaced typewritten lines)

On December 31, 2018, South Texas Project (STP) Unit 1 reactor vessel head vent throttle valve (RHVTV) 'A' was declared INOPERABLE. On July 30, 2019, STP Unit 1 RHVTV 'B' was declared INOPERABLE. Technical Specifications requires one RHVTVs to be OPERABLE. With two INOPERABLE RHVTVs, entry into a 30-day Technical Specification shutdown ACTION statement is required. The RHVTVs could have been prevented from fulfilling a safety function needed to maintain the reactor in a safe shutdown condition; mitigating a possible condition of inadequate core cooling or impaired natural circulation. Operations did not recognize the loss of safety function and did not request a reportability review as required by station procedure.

On July 31, 2019, following additional investigation, STP Nuclear Operating Company determined that RHVTV 'B' had been INOPERABLE since June 24, 2019. Therefore, the RHVTV was INOPERABLE for longer than the Technical Specification 30-day shutdown ACTION statement, resulting in a condition prohibited by Technical Specifications. On August 1, 2019, RHVTV 'B' was declared OPERABLE. On August 15, 2019, RHVTV 'A' was declared OPERABLE. The event did not result in any offsite release of radioactivity or increase of offsite dose rates, and there were no personnel injuries or damage to any safety-related equipment associated with this event. Therefore, there was no adverse effect on the health and safety of the public.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
South Texas Unit 1	05000-498	2019	- 002	- 01

NARRATIVE

I. Description of Reportable Event

A. Reportable event classification

This event is reportable pursuant to 10 CFR 50.73(a)(2)(v)(A). A reactor head vent throttle valve (RHVTV) is required to fulfill a safety function by mitigating a possible condition of inadequate core cooling or impaired natural circulation resulting from the accumulation of non-condensable gases in the Reactor Coolant System. Unit 1 having both RHVTVs INOPERABLE could have prevented the fulfilment of the safety function needed to shutdown the reactor and maintain it in a safe shutdown condition.

This event is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B). Technical Specification 3.3.3.5 allows one required RHVTV to be INOPERABLE for 30 days while in Modes 1 through 3 before taking action to begin a reactor shutdown. However, both RHVTVs were determined to have been INOPERABLE longer than the allowed outage time without taking the required action. Consequently, Unit 1 was in a condition prohibited by Technical Specifications.

B. Plant operating conditions prior to event

Prior to the event on July 30, 2019, Unit 1 was operating in Mode 1 at 100% power.

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

At the start of the event, there were no other structures, systems, or components that were INOPERABLE that contributed to the event.

D. Background information

The reactor vessel head vent system (RVHVS) removes non-condensable gases or steam via remote manual operations from the control room. The system also provides a safety grade letdown path for safety grade cold shutdown. This system is designed to mitigate a possible condition of inadequate core cooling or impaired natural circulation resulting from the accumulation of non-condensable gases in the Reactor Coolant System. The RVHVS consists of single-active-failure-proof flow paths with redundant isolation valves. The active portion of the system consists of four isolation valves connected in two parallel paths to the head vent pipe, located near the center of the reactor vessel head. Downstream of the isolation valves are two solenoid-operated throttling valves in parallel, used to control the letdown flow rate. All of these valves are fail-closed, normally closed valves. The RHVTV position indication is provided in the control room and at the auxiliary shutdown panel through the plant computer Qualified Display Processing System (QDPS).

During MODES 1, 2, and 3 with one or more required channels of RHVTV INOPERABLE, Technical Specification 3.3.3.5 requires restoration of the INOPERABLE function to OPERABLE status within 30 days or to be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Only one RHVTV channel is required to be OPERABLE.

E. Narrative summary of the event

On December 31, 2018, at 20:39 reactor head vent throttle valve (RHVTV) 'A' unexpectedly auto transferred to the Auxiliary Shutdown Panel (ASP). Local investigation of the ASP showed indication for RHVTV 'A' in the Main Control Room position. Train 'A' reactor head vent path was subsequently declared INOPERABLE.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
South Texas Unit 1	05000-498	2019	- 002	- 01

NARRATIVE

E. Narrative summary of the event (continued)

A 10 CFR 21 Report Notification of a Defect with Target Rock Modulating Valve Positioner; Model 810000-X was received by STPNOC on March 7, 2019. Engineering performed a Plant Impact Evaluation of the report and concluded that the positioners for the RHVTV in Unit 1 were degraded and needed to be replaced at the next available opportunity.

On July 30, 2019, an Instrumentation and Control (I&C) Training instructor was demonstrating the plant data available on QDPS to a class. The instructor found the RHVTV 'B' position computer point reading bad data. Based on the instructor's knowledge of the system this indication was interpreted as a symptom of a blown fuse in the RHVTV 'B' control unit. The instructor immediately notified the control room. The control room declared the TRAIN 'B' reactor head vent path INOPERABLE. Operations failed to request a reportability review as required by procedure when two or more trains of a component or system are INOPERABLE.

Further evaluation by Engineering on July 31, 2019, discovered objective evidence that the fuses associated with RHVTV 'B' failed on or about June 24, 2019. Therefore, the condition existed longer than the associated 30-day Technical Specification action statement. The required shutdown Technical Specification ACTION requirements were not met.

RHVTV 'B' was declared OPERABLE on August 01, 2019. RHVTV 'A' was declared OPERABLE on August 15, 2019.

Timeline (Note: All times are Central Standard Time):

December 31, 2018 [2039]: RHVTV 'A' unexpectedly auto transfers to the Aux Shutdown Panel. The control room declares the valve INOPERABLE.

March 7, 2019 [1117]: 10 CFR PART 21 Report Notification of a Defect with Target Rock Modulating Valve Positioner Model 810000-X is received.

March 11, 2019: System engineering performs a Plant Impact Evaluation of 10 CFR PART 21 report and concludes the positioners for the RHVTVs in Unit 1 are degraded.

July 30, 2019 [1521]: I&C Training instructor discovers RHVTV 'B' control unit has a blown fuse. The control room declares the valve INOPERABLE.

July 31, 2019 [1459]: Engineering determined that RHVTV 'B' failed on or about June 24, 2019, exceeding the associated 30-day Technical Specification action statement allowed outage time.

August 01, 2019: RHVTV 'B' was declared OPERABLE.

August 15, 2019: RHVTV 'A' was declared OPERABLE.

F. Method of discovery

This event was discovered by an I&C Training instructor during a classroom demonstration.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
South Texas Unit 1	05000-498	2019	- 002	- 01

NARRATIVE

II. Component failures

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

Fuse failures in the control units resulted in the RHVTVs losing power and becoming INOPERABLE.

B. Cause of component failure

Based on vendor discussions, it is likely that voltage transients have resulted in the power fuses clearing. The controllers have voltage transient protection circuitry, which clears the fuse when the controller protection circuitry is actuated. The protection can be actuated by fast transients such as those caused when adjacent circuitry is actuated. The time frame for these actuations is only during the peaks of the transient. This protection circuitry has made the controller more sensitive to fast voltage transients than the previous design. Replacing the power fuse with a higher rated fuse will eliminate the impact by moving the fuse clearing time curve beyond the operation of the transient protection curve of the controller.

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

No additional systems were affected by the RVHVS failure.

D. Failed component information

Reactor Core System { AC }
Valve, Solenoid, Flow { FSV }
Manufacturer: Target Rock { T020 }
Model: { 79AB-003 }

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

The RVHVS was INOPERABLE for a period of 38 days from the QDPS indication on 06/24/2019 until RHVTV 'B' was declared OPERABLE on 08/01/2019.

C. Safety consequences and implications

Multiple trains of safety systems provide the primary means of accomplishing the functions supported by the RVHVS. Failure of the RVHVS does not cause an initiating event or fail other risk significant systems. In addition to this, the RVHVS would not be used for several hours following an event, providing ample time for recovery of other mitigation systems. The failure of the RVHVS for 38 days has a negligible impact on plant Core Damage Frequency (CDF) and Large Early Release Frequency (LERF).

The event did not result in any offsite release of radioactivity or increase of offsite dose rates, and there were no personnel injuries or damage to any other safety-related equipment associated with this event.

Therefore, there was no adverse effect on the health and safety of the public.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
South Texas Unit 1	05000-498	2019	- 002	- 01

NARRATIVE

IV. Cause of the event

The Apparent Cause of the condition prohibited by technical specifications was determined to be:

1. Operations did not recognize that Unit 1 had lost a safety function with both valves INOPERABLE.

The cause of the loss of safety function was determined to be:

1. A fuse in the control unit of the required valve failed resulting in a loss of safety function.

V. Corrective actions

Completed:

1. Failed fuses were replaced in both trains of RHVTV, restoring each to OPERABLE status and restoring the safety function.

Planned:

2. Update the "Safety Function Checklist" for RHVTV to include in the notes to check QDPS to ensure the valve position indication is valid and if both valves are simultaneously INOPERABLE then this a loss of a safety function and is reportable per 10CFR50.72(3)(v).
3. Create a computer alarm for RHVTV position indications that will notify when position indication is invalid, indicative of blown fuses.
4. Replace the power fuse for each RHVTV's controller with a higher rated fuse.

VI. Previous similar events

The review of external OE did not identify any opportunities to identify this event prior to its occurrence.

The review of internal OE identified the following similar condition:

1. LER 2018-001-01: Condition Prohibited by Technical Specifications That Could Have Prevented the Fulfillment of a Safety Function Due to Two Inoperable Extended Range Monitors. (Condition Report 18-3967)