



April 1, 2024
NOC-AE-24004026
10 CFR 50.73
STI: 35572977

ATTN: 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 2024-001-00
Two Steam Generator Power Operated Relief Valves (PORVs) Inoperable Resulting in a
Condition That Could Have Prevented Fulfillment of a Safety Function

Pursuant to reporting requirements in 10 CFR 50.73(a)(2)(v)(D), STP Nuclear Operating Company (STPNOC) hereby submits the attached South Texas Project Unit 1 Licensee Event Report 2024-001-00 for an event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident.

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 regarding this submittal, please contact Chris Warren at (361) 972-7293 or me at (361) 972-8945.

Jason R. Tomlinson
Site Vice President

Attachment: Unit 1 LER 2024-001-00, Two Steam Generator Power Operated Relief Valves (PORVs) Inoperable Resulting in a Condition That Could Have Prevented Fulfillment of a Safety Function

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

Attachment

Unit 1 LER 24-001-00

Two Steam Generator Power Operated Relief Valves (PORVs) Inoperable Resulting in
a Condition That Could Have Prevented Fulfillment of a Safety Function

**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/>)

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1. Facility Name
South Texas Unit 1☒ **050**
☐ **052****2. Docket Number**
00498**3. Page**
1 OF 5**4. Title**
Two Steam Generator Power Operated Relief Valves (PORVs) Inoperable Resulting in a Condition That Could Have Prevented Fulfillment of a Safety Function

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved		
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	<input type="checkbox"/> 050	Docket Number
01	23	2024	2024	- 001 -	00	04	01	2024	N/A	<input type="checkbox"/> 050	N/A
									Facility Name	<input type="checkbox"/> 052	Docket Number
									N/A		N/A

9. Operating Mode

3

10. Power Level

0

11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)

<input checked="" type="checkbox"/> 10 CFR Part 20	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 10 CFR Part 50	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 73.1200(a)
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 73.1200(b)
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	<input type="checkbox"/> 73.1200(c)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 73.1200(d)
<input type="checkbox"/> 20.2203(a)(2)(i)	<input checked="" type="checkbox"/> 10 CFR Part 21	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input checked="" type="checkbox"/> 10 CFR Part 73	<input type="checkbox"/> 73.1200(e)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 21.2(c)	<input type="checkbox"/> 50.69(g)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.77(a)(1)	<input type="checkbox"/> 73.1200(f)
<input type="checkbox"/> 20.2203(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(2)(i)	<input type="checkbox"/> 73.1200(g)
<input type="checkbox"/> 20.2203(a)(2)(iv)		<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(ii)	<input type="checkbox"/> 73.1200(h)
<input type="checkbox"/> 20.2203(a)(2)(v)		<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)		

☐ **OTHER** (Specify here, in abstract, or NRC 366A).**12. Licensee Contact for this LER****Licensee Contact**
Chris Warren, Licensing Engineer**Phone Number (Include area code)**
361-972-7293**13. Complete One Line for each Component Failure Described in this Report**

Cause	System	Component	Manufacturer	Reportable to IRIS	Cause	System	Component	Manufacturer	Reportable to IRIS
X	SB	FU	Gould S	Yes	B	SB	AMP	P095	Yes

14. Supplemental Report Expected☒ No ☐ Yes (If yes, complete 15. Expected Submission Date)**15. Expected Submission Date**

Month	Day	Year

16. Abstract (Limit to 1326 spaces, i.e., approximately 13 single-spaced typewritten lines)

On January 22, 2024, while in Mode 3, South Texas Project (STP) Unit 1 Steam Generator (S/G) 1A Power-Operated Relief Valve (PORV) was declared INOPERABLE. On January 23, 2024, while in Mode 3, STP Unit 1 S/G 1C PORV was declared INOPERABLE. This resulted in the inoperability of two of four S/G PORVs for approximately three hours until S/G 1A PORV was declared OPERABLE following corrective maintenance. In certain accident scenarios, the most limiting scenario being a Steam Generator Tube Rupture, more than two PORVs are needed to mitigate the consequences of an accident; therefore, this condition was determined to be reportable under 10 CFR 50.73(a)(2)(v)(D).

The S/G 1A PORV inoperability was caused by a blown fuse in the circuit that powers the servo amplifier board and the S/G 1C PORV inoperability was caused by a faulty servo amplifier board.

Completed corrective actions include corrective maintenance to replace a blown fuse to restore S/G 1A PORV to OPERABLE status on January 23, 2024, and corrective maintenance to replace the faulty servo amplifier board to restore S/G 1C PORV to OPERABLE status on January 24, 2024.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

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1. FACILITY NAME South Texas Unit 1	<input checked="" type="checkbox"/> 050	2. DOCKET NUMBER 05000498	3. LER NUMBER		
	<input type="checkbox"/> 052		YEAR 24	SEQUENTIAL NUMBER 001	REV NO. 00

NARRATIVE**I. Description of Reportable Event****A. Reportable Event Classification**

This event is reportable pursuant to 10CFR50.73(a)(2)(v)(D) as an event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident.

The South Texas Project (STP) accident analysis for a Steam Generator Tube Rupture (SGTR) with a coincident Loss of Offsite Power or failure of the turbine bypass system assumes three intact Steam Generator (S/G) PORVs are available for heat removal from the Reactor Coolant System (RCS). During this accident scenario, the intact S/G PORVs open to release steam into the atmosphere, reducing RCS temperature and pressure with the intent of minimizing the loss of RCS coolant through the ruptured S/G tube (break flow) into the affected S/G. Under the assumed conditions, Total Equivalent Dose Exposure (TEDE) to the Main Control Room (MCR) and offsite are below the limits in 10 CFR 50.67 and Regulatory Guide (Reg Guide) 1.183.

With only two of four S/G PORVs operable from 1902 to 2234 on January 23, 2024, under the worse-case accident scenario in Mode 3, a single S/G with an operable PORV (assuming one of the S/Gs with an operable PORV experienced a SGTR) may have not been able to meet all safety function requirements in the event of the accident, possibly resulting in TEDE to the MCR and offsite exceeding 10 CFR 50.67 and Reg Guide 1.183 limits.

The event date for this LER is considered to be January 23, 2024, which is the date that S/G PORVs 1A and 1C were inoperable. However, the event was not discovered to be reportable until an Engineering evaluation was completed on February 1, 2024. Therefore, the report date for this event is April 1, 2024 (60 days from the date of discovery).

B. Plant Operating Conditions Prior to Event

At the time of the event, STP Unit 1 was at 0% power in Mode 3.

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 were INOPERABLE that contributed to the event.

D. Narrative Summary of the Event

Timeline (Note: All times are Central Standard Time)

01/22/24 (1025) - Operations declared Unit 1 Steam Generator PORV 1A INOPERABLE and Non-Functional due to failure to operate in AUTO or MANUAL. Entered Technical Specification (TS) 3.7.1.6 Action a: With one less than the required atmospheric steam relief valves OPERABLE, restored the required atmospheric steam relief valves to OPERABLE status within 7 days or apply the Configuration Risk Management Program (CRMP); or be in at least HOT STANDBY within the next 6 hours and place the required RCS / Residual Heat Removal (RHR) loops in operation for decay heat removal. Reactor trip breakers are open and loops "B", "C", and "D" are in operation with the steam generators as a heat sink.



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NARRATIVE

01/22/24 (1135) - Operations closed MS-0021 S/G 1A Main Steam Outlet PORV Isolation Valve

01/22/24 (2236) - Entered TS 3.6.1.1 for unlocking and opening Main Steam Above Seat Drain Isolation Valves MS-0544 and MS-0546.

01/22/24 (2331) - Main Steam Above Seat Drain Isolations MS-0544 and MS-0546 are closed following draining. Exited TS 3.6.1.1

01/23/24 (1305) - Commenced 0PGP03-MS-0001, Main Steam System Valve Operability Test, for Work Authorization Number 701742 - post maintenance operability test for S/G 1A PORV.

01/23/24 (1902) - Operations declared Unit 1 Steam Generator PORV 1C INOPERABLE and Non-Functional due to failure to operate in MANUAL. Entered TS 3.7.1.6 Action b: With two less than the required atmospheric steam relief valves OPERABLE, within 72 hours restored at least three atmospheric relief valves to OPERABLE status or apply the CRMP or be in at least HOT STANDBY within the next 6 hours or in HOT SHUTDOWN with the following 6 hours and place the required RCS/RHR loops in operation for decay heat removal.

01/23/24 (2019) - Entered TS 3.6.1.1 for unlocking and opening Main Steam Above Seat Drain Isolation valve MS-0543.

01/23/24 (2027) - MS-0055 S/G 1C Main Steam Outlet PORV isolation valve closed.

01/23/24 (2040) - Main Steam Above Seat Drain Isolation for MS-0543 locked closed following draining. Exited TS 3.6.1.1.

01/23/24 (2234) - Operations declared Steam Generator PORV 1A OPERABLE and Functional following maintenance, ECO release, and satisfactory performance of 0PSP03-MS-0001. Exited TS 3.7.1.6 Action b and TS 3.3.5.1 Action 1 for Steam Generator PORV 1A.

E. Method of Discovery

The inoperability of two S/G PORVs was self-revealing as it was discovered when S/G 1A PORV could not be operated in AUTO or MANUAL and S/G 1C PORV could not be operated in MANUAL.

II. Component Failures

A. Failure Mode, Mechanism, and Effects of Failed Components

The failed components in this event were a blown fuse in Circuit 17 in distribution panel 3E241EDP1201 for S/G 1A PORV and a faulty servo amplifier board for S/G 1C PORV.

The fuse in Circuit 17 in distribution panel 3E241EDP1201 provides over-current protection to the servo amplifier board. The failed fuse resulted in servo amplifier circuit voltage measured at 59V instead of the 120V needed to power the servo amplifier board, resulting in the inability to operate S/G 1A PORV.



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NARRATIVE

A. Failure Mode, Mechanism, and Effects of Failed Components (continued)

Engineering and Maintenance performed troubleshooting of the S/G 1C PORV servo amplifier board and measured $>2.50E+8$ Ohms for the A/B solenoids and feedback potentiometer leads to ground, which are not abnormal measurements. Based on voltage measurements and LED indicators and lack of indications of water intrusion, Engineering concluded that an intermittent condition existed within the servo amplifier board that caused the fuse to inconsistently blow during troubleshooting and it was determined the board needed to be replaced.

B. Cause of Component Failure

STP was unable to determine the cause of the fuse failure for S/G 1A PORV. There were no additional indications of over-current in the circuit or distribution panel that affected other components and no other components required replacement.

An intermittent condition with the servo amplifier board for S/G 1C PORV was identified through Engineering and Maintenance troubleshooting that caused the fuse on the servo amplifier board to inconsistently blow under normal electrical load. A specific cause for the servo amplifier board intermittent issues causing the fuse to blow could not be identified.

C. Systems or Secondary Functions That Were Affected by Failure of Components with Multiple Functions

No other systems or secondary functions were affected in this event.

D. Failed Component Information

System: Main Steam System { SB }
Component: Fuse { FU }
Manufacturer: { Gould Shawmut }
Model: { A60X10-1 }

System: Main Steam System { SB }
Component: Servo Amplifier { AMP }
Manufacturer: Paul-Munroe Hydraulics/Enertech { P095 }
Model: { PD88085-202 }

II. Analysis of Event

A. Safety System Responses that Occurred

No safety system responses occurred because of this event.

B. Duration of Safety System Inoperability

S/G 1A and 1C PORVs were INOPERABLE from 1902 on January 23, 2024, to 2234 on January 23, 2024, when S/G 1A PORV was declared OPERABLE. This was a total of 3 hours and 32 minutes.



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South Texas Unit 1		05000498	24	- 001	- 00

NARRATIVE

C. Safety Consequences and Implications

STP analyzed the Incremental Core Damage Probability and Incremental Large Early Release Probability for this event and concluded they are well below the non-risk significant threshold as defined by STP's Configuration Risk Management Program. This event was determined to be of very low safety significance based on the analysis performed.

The event did not result in any offsite release of radioactivity or increase in offsite dose rates. 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.

IV. Cause of the Event

The cause of the event was determined to be a blown fuse in Circuit 17 for panel DP1201 for S/G 1A PORV and an intermittent condition with S/G 1C PORV servo amplifier board that caused the fuse on the board to blow under normal electrical load.

V. Corrective Actions

Completed:

1. Corrective maintenance to replace a blown fuse in Circuit 17 for panel DP1201 for S/G 1A PORV.
2. Corrective maintenance to replace a blown fuse and the servo amplifier board for S/G 1C PORV.

Planned:

No additional corrective actions are planned.

VI. Previous Similar Events

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

A review of STP Condition Report Work Orders for all S/G PORVs did not identify any previous occurrences discussed in this LER within the last six years that would have helped identify any generic or underlying root causes that contributed to this event. The most recent servo amplifier board failure was in 2017 but was due to water intrusion into the component.