



July 1, 2024
NOC-AE-24004046
10 CFR 50.73
STI: 35608947

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 2024-003-00
Condition Prohibited by Technical Specifications and Potential Loss of Safety Function
Due to Inoperable Low Head Safety Injection Pump

Pursuant to reporting requirements in 10 CFR 50.73(a)(2)(i)(B) and 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 2024-003-00 for a condition prohibited by Technical Specifications and 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) 972-4778.

A handwritten signature in black ink, appearing to read "Kimberly A. Harshaw".

Kimberly A. Harshaw
Executive Vice President and
Chief Nuclear Officer

Enclosure: Unit 1 LER 2024-003-00, Condition Prohibited by Technical Specifications and
Potential Loss of Safety Function Due to Inoperable Low Head Safety Injection Pump

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

ENCLOSURE

Unit 1 LER 2024-003-00

Condition Prohibited by Technical Specifications and Potential Loss of Safety Function
Due to Inoperable Low Head Safety Injection Pump



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/>)

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, Library, and Information Collections Branch (T-6 A10M), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by email to Infocollects.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. Facility Name South Texas Project Unit 1	<input checked="" type="checkbox"/> 050	2. Docket Number 00498	3. Page 1 OF 5
	<input type="checkbox"/> 052		

4. Title
Condition Prohibited by Technical Specifications and Potential Loss of Safety Function Due to Inoperable Low Head Safety Injection Pump

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	Docket Number
05	06	2024	2024	003	00	07	01	2024	N/A	<input type="checkbox"/> 050
									N/A	<input type="checkbox"/> 052

9. Operating Mode 1	10. Power Level 100%
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11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)

<input 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 checked="" 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
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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
B	BP	BKR	S125	Yes					

14. Supplemental Report Expected

<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)	15. Expected Submission Date	Month	Day	Year
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16. Abstract (Limit to 1326 spaces, i.e., approximately 13 single-spaced typewritten lines)
 On April 21, 2024, Low Head Safety Injection (LHSI) pump 1A failed to start from the Unit 1 Main Control Room during a valve operability test. An inspection of the 4.16kV breaker identified an unrestrained washer in the breaker cubicle that prevented the breaker from closing. It was determined that the unrestrained washer adversely impacted the seismic qualification of the breaker and there was no reasonable assurance that LHSI pump 1A breaker would have been able to perform its required safety-related function during a seismic event following breaker installation on April 4, 2023, until the washer was removed on April 21, 2024. This resulted in a condition prohibited by Technical Specification 3.5.2, actions "a" and "b". This also resulted in a condition that could have prevented fulfillment of a safety function of the Emergency Core Cooling System (ECCS) where less than the required number of ECCS trains were OPERABLE at various times from April 4, 2023, to April 21, 2024. The unrestrained washer was left in the breaker prior to shipping to STP and it was not identified by STPNOC during foreign material inspections during receipt and field installation activities. Planned corrective actions include re-inspecting remaining breakers, both in storage and installed in the field, purchased in the same lot.



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

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1. FACILITY NAME South Texas Project Unit 1	<input checked="" type="checkbox"/> 050	2. DOCKET NUMBER 00498	3. LER NUMBER		
	<input type="checkbox"/> 052		YEAR 2024	SEQUENTIAL NUMBER 003	REV NO. 00

NARRATIVE

1. Description of the Reportable Event

A. Reportable Event Classification

This event is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by Technical Specifications (TS) and 10 CFR 50.73(a)(2)(v)(D) as a condition that could have prevented fulfillment of a safety function.

TS 3.5.2 action statement "a" for an INOPERABLE Low Head Safety Injection (LHSI) pump allows continued operation for up to either 7 days if at least two High Head Safety Injection (HHSI) pumps, two LHSI pumps, associated Residual Heat Removal (RHR) heat exchangers, and required flow paths from the Refueling Water Storage Tank to the Reactor Coolant System (RCS) are OPERABLE. The LHSI pump must be returned to OPERABLE status after 7 days or apply the requirements of the Configuration Risk Management Program (CRMP). If neither action (i.e. pump restoration to OPERABLE or application of CRMP requirements) is completed, then the Unit must be in HOT STANDBY (Mode 3) within the next 6 hours and in HOT SHUTDOWN (Mode 4) within the following 6 hours.

TS 3.5.2 action statement "b" for less than two of the required Emergency Core Cooling System (ECCS) subsystems OPERABLE requires restoration of at least two ECCS subsystems to OPERABLE status within one hour or apply the requirements of CRMP. If neither action is completed, then the Unit must be in HOT STANDBY (Mode 3) within the next 6 hours and in HOT SHUTDOWN (Mode 4) within the following 6 hours.

In this event, the Unit operated from April 3, 2023 until April 21, 2024 with LHSI pump 1A INOPERABLE without entering TS 3.5.2 action statement "a" and TS 3.5.2 action statement "b" when a second train of ECCS was INOPERABLE for maintenance or surveillance testing. This exceeds the 7-day restoration time in action statement "a" and the 1-hour restoration time in action statement "b". The requirements of CRMP were not applied for either action statement.

The analyzed accidents in the STP Updated Final Safety Analysis Report (UFSAR) that rely on ECCS for reactor core cooling and criticality control assume one train of ECCS is unavailable during the accidents. During a design basis Loss of Cooling Accident (LOCA), one unaffected (i.e. OPERABLE) ECCS train delivers make-up water to the affected RCS train with the pipe break while the second unaffected ECCS train provides additional cooling capabilities to reactor core. There were several instances from April 3, 2023 until April 21, 2024 where less than the required number of ECCS trains were OPERABLE to mitigate the consequences of an accident.

B. Plant Operating Conditions Prior to Event

Prior to the event, Unit 1 was 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 time of discovery, there were no other structures, systems, or components that were INOPERABLE that contributed to the event.



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NARRATIVE

D. Narrative Summary of the Event

Timeline (Note: All times listed are Central Daylight Time)

03/23/2023 (1404): Train 'A' ECCS (includes LHSI pump 1A) declared INOPERABLE for the 'A' Train work window during the Unit 1 refueling outage.

04/02/2023: LHSI Pump 1A did not start. Breaker was re-racked and pump successfully started on the next attempt.

04/03/2023: Hand switch for LHSI Pump 1A was replaced. During the Post Maintenance Test (PMT), the first attempt to start the pump was unsuccessful. Electrical maintenance observed the breaker (did not perform any manipulations) when a 2nd attempt to start the pump was successful. The breaker was not cycled between pump start attempts.

04/03/2023 (1131): Train 'A' work window for Unit 1 refueling outage closed. LHSI pump 1A remains INOPERABLE and is a restraint to entering Mode 4 (Hot Standby).

04/04/2023: Replacement breaker for LHSI Pump 1A was installed with successful PMT. The breaker installed has the unrestrained washer.

04/04/2023 (2317): Operations declared LHSI pump 1A OPERABLE.

04/21/2024: During performance of Residual Heat Removal System Valve Operability Test, LHSI PUMP 1A failed to start. When hand switch was placed in the START position the green light momentarily flickered off and the red light never illuminated. The Train A LHSI, High Head Safety Injection (HHSI), Containment Spray System (CSS) pump cubicle and containment sump isolation valve cubicle cooler fans did not start. A brief thump was heard from the motor but no shaft rotation was observed. No protective devices appear to be actuated on SWGR E1A Cubicle 6.

04/22/2024: Electrical maintenance started performing breaker inspections and troubleshooting.

04/23/2024: Electrical maintenance continued troubleshooting activities. A loose wire for the hand switch red light tightened and the red bulb was replaced.

04/24/2024: Electrical maintenance identified the unrestrained washer on a support plate above the "A" phase vacuum interrupter. A picture is provided in the Attachment. The breaker was removed and a spare breaker was installed with a successful PMT.

04/25/2024 (0341): Operations declared LHSI pump 1A OPERABLE.

E. Method of Discovery

The event was self-revealing when the LHSI pump 1A would not start on April 21, 2024. The unrestrained washer was identified in the breaker on April 24, 2024. The vendor provided confirmation the washer was present when the breaker was shipped to STP.



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NARRATIVE

II. Component Failures

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

The failed component in this event was the Train 'A' LHSI pump 1A breaker due to an unrestrained washer, which was foreign material, in the breaker. The presence of the washer adversely impacted the seismic qualification of the breaker, though the washer did not physically affect the functionality of the breaker until one year following installation. Based on a fault tree performed by Engineering, the most likely cause of the breaker's failure to close was due to either mechanical binding or a failure of the breaker's closed position latch, both of which could have been caused by the presence of the unrestrained washer. The circuit to energize LHSI pump 1A was not completed due to the washer preventing the breaker from fully closing.

B. Cause of Component Failure

Based on a fault tree performed by Engineering, the most likely cause of the breaker's failure to close was due to either mechanical binding or a failure of the breaker's closed position latch, both of which could have been caused by the presence of the unrestrained washer. Engineering was able to refute any contact, relay, charging springs, motor, and manufacturing flaws that could have caused the breaker to not perform its design functions.

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

Train 'A' Emergency Core Cooling System was INOPERABLE due to the inoperability of LHSI pump 1A.

D. Failed Component Information

System: Residual Heat Removal/Low Pressure Safety Injection System { BP }
Component: Breaker { BKR }
Manufacturer: Siemens { S125 }
Model: { 5HKR-250-1200-58 }

III. Analysis of Event

A. Safety System Responses that Occurred

No safety system responses occurred because of this event.

B. Duration of Safety System Inoperability

LHSI Pump 1A was INOPERABLE from 2317 on April 4, 2023, until 0341 on April 25, 2024, when LHSI Pump 1A was declared OPERABLE. This was a total 386 days and 24 minutes.

(04-02-2024)



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NARRATIVE

C. Safety Consequences and Implications

The increase in risk due to the inoperability of LHSI Pump 1A for the condition identified represents a very small change in risk. This assessment considered LHSI Train A unavailable during a seismic initiating event for 04/03/23 to 04/02/24, the time the breaker with the foreign material was installed until the last successful start of the LHSI Pump 1A, and the unavailability for LHSI Train A for all initiators for 04/02/24 to 04/25/24, the time of the last successful LHSI Pump 1A start until the pump was declared operable following corrective maintenance. This resulted in a total Incremental Core Damage Probability of 2.1872E-07 and a total Incremental Large Early Release Probability of 2.5568E-11. These results are within Region III for very small changes in risk per Regulatory Guide 1.174.

IV. Cause of the Event

The cause of the event was determined to be an error by the vendor when the washer was introduced into the breaker prior to shipping to STP. The purchase order for the component did have a requirement for the vendor to provide components free of foreign material. STP procurement and quality control personnel performed procedurally-required foreign material inspections during receipt activities and did not see the foreign material. STP Electrical Maintenance personnel performed another foreign material inspection prior to installation and did not see the foreign material.

V. Corrective Actions

Completed:

1. Condition Report (CR) Action 24-4015-8: Perform Extent of Condition review on all 4.16kV safety related breakers procured under Purchase Order 264203.

Planned:

1. CR Action 24-4015-18: Perform a foreign material inspection of breaker A2PKSG0E1A9, Serial Number #R-3009529574A-002.

2. CR Action 24-4015-19: Perform a foreign material inspection of breaker A2PKSG0E1A10, Serial Number #R-3009529574A-001.

VI. Previous Similar Events

No previous similar events that could have precluded this event were identified.

Attachment:

Picture of LHSI Pump 1A Breaker with As-Found Unrestrained Washer

Attachment

Picture of LHSI Pump 1A Breaker with As-Found Unrestrained Washer



Figure 1 - Image of Breaker with Unrestrained Washer