



June 30, 2023

Docket No. 50-443
L-2023-085a
10 CFR 50.73

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

Re: Seabrook Station
Docket No. 50-443
Reportable Event: 2023-003-00
Date of Event: May 6, 2023

Reactor Protection System Manual Actuation due to failed Silicon Controlled Rectifiers

The attached Licensee Event Report 2023-003 is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event. If you have any questions, please contact Mr. Kenneth Mack, Fleet Licensing Manager, at 561-904-3635.

Respectfully,

A handwritten signature in black ink, appearing to read "D Strand".

Dianne Strand General Manager, Regulatory Affairs

Attachment

cc: Seabrook Station NRC Senior Resident Inspector
Seabrook Station NRC Project Manager



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 Infocollections.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; email: oira_submission@omb.eop.gov. 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 Seabrook Station | <input checked="" type="checkbox"/> 050 | 2. Docket Number 00443 | 3. Page 1 OF 3 |
| | <input type="checkbox"/> 052 | | |

4. Title
Reactor Protection System Manual Actuation due to failed Silicon Controlled Rectifiers

| 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 |
| 05 | 06 | 2023 | 2023 | 003 | 00 | 06 | 30 | 2023 | NA | Docket Number |
| | | | | | | | | | Facility Name | <input type="checkbox"/> 052 |
| | | | | | | | | | NA | Docket Number |

| | |
|------------------------|------------------------|
| 9. Operating Mode 3 | 10. Power Level 000 |
|------------------------|------------------------|

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 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 checked="" 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 type="checkbox"/> 10 CFR Part 21 | <input type="checkbox"/> 50.46(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(v)(A) | <input 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 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 Jarrett Mack | Phone Number (Include area code) 561-304-6263 |
|----------------------------------|--|

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 | AA | SCR | W120 | Y | | | | | |

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 |
|--|--|------------------------------|-------|-----|------|

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

On May 6, 2023, at 15:52 with Seabrook Unit 1 in Mode 3 at 0 percent power at normal operating temperature and pressure, while performing Digital Rod Position Indication (DRPI) system surveillance testing, Shutdown Bank E stopped withdrawing. In response, the Reactor Trip Breakers were manually opened, initiating a valid actuation of the Reactor Protection System. Subsequently, at 22:53 of the same day, while performing DRPI system surveillance testing, Shutdown Bank C stopped inserting. In response, the Reactor Trip Breakers were manually opened, initiating another valid actuation. The cause was found to be failed Silicon Controlled Rectifiers associated with coil lifts. Action has been taken to send these cards to Corporate Procurement Engineering and Dedication (CPED) for a root cause determination. Both events were reported pursuant to 10 CFR 50.72(b)(3)(iv)(A) as events that resulted in valid actuation of the RPS. The RPS responded as designed during both events and both events are being reported pursuant to 10 CFR 50.73(a)(2)(iv)(A) as events that resulted in manual actuation of the RPS. No other Structure, Systems, or Components (SSCs) contributed to these events. Neither event adversely impacted the health and safety of the public.



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

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|--------------------------------------|---|---------------------------|---------------|--------------------------|---------------|
| 1. FACILITY NAME Seabrook Station | <input checked="" type="checkbox"/> 050 | 2. DOCKET NUMBER 00443 | 3. LER NUMBER | | |
| | <input type="checkbox"/> 052 | | YEAR 2023 | SEQUENTIAL NUMBER 003 | REV NO. 00 |

NARRATIVE

Description

On May 6, 2023, at 15:52 with Seabrook Unit 1 in Mode 3 at 0 percent power at normal operating temperature and pressure, while performing DRPI operability testing, Shutdown Bank E stopped withdrawing at 114 steps. A Rod Control Urgent Failure Alarm was activated because rods could not step manually or automatically resulting in the inability to incrementally control rod insertion. In response, operators responded as expected and the Reactor Trip Breakers (RTB) [EIS: BKR] were manually opened, initiating a valid actuation of the Reactor Protection System (RPS)[EIS: JD]. At 22:53 on May 6, 2023, while performing DRPI system surveillance testing, Shutdown Bank C stopped inserting at 143 steps and another Rod Control Urgent Failure Alarm was activated. In response, the RTBs were manually opened, initiating a second valid RPS actuation that day. There were no SSCs that were inoperable at the beginning of this event that contributed to the event. For both DPRI system test failures, immediate troubleshooting involved systematic testing of various circuit cards in the shutdown bank C, D, E (SCDE)[EIS:AA] cabinet and monitoring the rod lift signals.

Cause of the Event

The cause of the Rod Control Urgent Alarm preventing manual and automatic rod motion was identified through troubleshooting as failed Silicon Controlled Rectifiers (SCR)[EIS: SCR] associated with lift coils. The SCRs were manufactured by Westinghouse and actions are in place to determine the root cause of the failure (see corrective actions).

Analysis of the Event

This licensee event report is being provided pursuant to 10 CFR 50.73(a)(2)(iv)(A) as events that resulted in manual actuation of a system listed 10 CFR 50.73(a)(2)(iv)(B). The RPS, including a reactor scram or reactor trip, is listed in 10 CFR 50.73(a) (2)(iv)(B)(1) as an event subject to the reporting requirements of 10 CFR 50.73(a)(2)(iv)(A). The events did not result in a Safety System Functional Failure.

Safety Significance

There were no safety consequences resulting from these events. During each event, the affected Shutdown Bank was capable of being tripped to the fully inserted position. Thereby, the events had no impact on the health and safety of the public. In addition, there were no other Structures, Systems, or Components (SSCs) that contributed to the events.

Corrective Actions

1. Complete circuit card forensics at CPED.
2. Review preventative maintenance strategy to ensure periodic checks/replacements are aligned with original equipment manufacturer. Implement any deficient preventative maintenance found. Determine if SCR and capacitor periodic replacements are required.
3. Revise maintenance rule functional failure (MRFF) if necessary to evaluate performance failures based on troubleshooting results.



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| | <input type="checkbox"/> 052 | | YEAR 2023 | SEQUENTIAL NUMBER 003 | REV NO. 00 |

NARRATIVE

Similar Events

A review of reportable events dating back 10 years, did not identify any previous events or conditions that involved the same underlying cause as this event.