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June 06, 2023

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

10 CFR 50.73

**SUSQUEHANNA STEAM ELECTRIC STATION  
LICENSEE EVENT REPORT 50-387/2023-002-00  
UNIT 1 LICENSE NO. NPF-14  
PLA-8075**

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**Docket No. 50-387**

Attached is Licensee Event Report (LER) 50-387/2023-002-00. The LER reports an event involving the inoperability of the High Pressure Coolant Injection (HPCI) System due to the HPCI Turbine Stop Valve failing to stroke fully closed as designed. The condition is being reported in accordance with 10 CFR 50.73(a)(2)(v)(D) as an event or condition that could have prevented fulfillment of a safety function.

There were no actual consequences to the health and safety of the public as a result of this event.

This letter contains no new or revised regulatory commitments.

A handwritten signature in black ink, appearing to read "Derek Jones". The signature is stylized with a large, sweeping loop at the beginning.

*Derek Jones Acting SVP for E. Casulli*

E. Casulli

Attachment: LER 50-387/2023-002-00

Copy: NRC Region I  
Mr. C. Highley, NRC Senior Resident Inspector  
Ms. A. Klett, NRC Project Manager  
Mr. M. Shields, PA DEP/BRP



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  
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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 e-mail to [Infocollects.Resource@nrc.gov](mailto: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; email: [oir\\_submission@omb.eop.gov](mailto:oir_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  
Susquehanna Steam Electric Station (SSES) Unit 1

050      2. Docket Number 00387      3. Page 1 OF 3  
 052

4. Title Unplanned Inoperability of the High Pressure Coolant Injection (HPCI) System due Failure of the HPCI Turbine Stop Valve to Fully Close, Most Likely Due to Internal Corrosion and Mechanical Binding of the Valve Hydraulic Drive

| 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                | <input type="checkbox"/> 050 | Docket Number |
| 04            | 07  | 2023 | 2023          | - 002 -           | 00      | 06             | 06  | 2023 | Facility Name                | <input type="checkbox"/> 052 | Docket Number |

9. Operating Mode 1      10. Power Level 100

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

| 10 CFR Part 20                              | <input type="checkbox"/> 20.2203(a)(2)(vi) | 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)   | <b>10 CFR Part 21</b>                      | <input type="checkbox"/> 50.46(a)(3)(ii)    | <input type="checkbox"/> 50.73(a)(2)(v)(A)            | <b>10 CFR Part 73</b>                         | <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: Katie Brown – Nuclear Regulatory Affairs      Phone Number (Include Area Code): 570-542-3407

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     | BJ     | SHV       | S075         | Y                  |       |        |           |              |                    |

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 April 07, 2023, at approximately 20:52, during performance of the weekly Unit 1 High Pressure Coolant Injection (HPCI) Lube Oil System Functional Test, the HPCI Turbine Stop Valve failed to stroke fully closed as designed. Upon discovery of the condition, Operations entered Unit 1 Technical Specification (TS) 3.5.1, "ECCS [Emergency Core Cooling Systems]-Operating," Condition D for HPCI System inoperable. Operations exited TS 3.5.1, Condition D on April 08, 2023, at approximately 15:54 following valve cleaning and lubrication and satisfactory post maintenance testing.

The cause of the HPCI Turbine Stop Valve failing to fully close was most likely internal corrosion and mechanical binding of the valve hydraulic drive mechanism caused by condensation from a steam leak past the HPCI Turbine Steam Supply Valve seat accumulating on the HPCI Turbine Stop Valve and dripping onto the hydraulic operating cylinder. The failure of HPCI Turbine Stop Valve as a result of the steam leak past the HPCI Turbine Steam Supply Valve seat was a previously unrecognized failure mode in the station's assessment of the steam leak, and therefore was not properly mitigated. Key corrective actions include repair of the HPCI Turbine Stop Valve and hydraulic operating cylinder and replacement of the HPCI Turbine Steam Supply Valve. In the interim, condition monitoring will be informed by weekly inspection of the HPCI Turbine Stop Valve.

This event was reported by Event Notification 56458 in accordance with 10 CFR 50.72(b)(3)(v)(D). The condition is also being reported in accordance with 10 CFR 50.73(a)(2)(v)(D) as an event or condition that could have prevented fulfillment of a safety function. There were no actual consequences to the health and safety of the public as a result of this event.



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
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|   |   |                                  |               |                              |               |
|---|---|----------------------------------|---------------|------------------------------|---------------|
| 1. FACILITY NAME<br><br>Susquehanna Steam Electric Station (SSES)<br>Unit 1 | <input checked="" type="checkbox"/> 050 | 2. DOCKET NUMBER<br><br>05000387 | 3. LER NUMBER |                              |               |
|   | <input type="checkbox"/> 052            |                                  | YEAR<br>2023  | SEQUENTIAL NUMBER<br>- 002 - | REV NO.<br>00 |

**NARRATIVE**

**CONDITIONS PRIOR TO EVENT**

Unit 1 – Mode 1, approximately 100 percent Rated Thermal Power (RTP)  
Unit 2 – Mode 5, zero percent RTP

There were no structures, systems, or components that were inoperable at the start of the event and contributed to the event.

**EVENT DESCRIPTION**

On April 07, 2023, at approximately 20:52, during performance of the weekly Unit 1 High Pressure Coolant Injection (HPCI) [EIS System Code: BJ] Lube Oil System Functional Test, the HPCI Turbine Stop Valve [EIS Component Code: SHV] failed to stroke fully closed as designed. Upon discovery of the condition, Operations entered Unit 1 Technical Specification (TS) 3.5.1, "ECCS [Emergency Core Cooling Systems]-Operating," Condition D for HPCI System inoperable. Operations exited TS 3.5.1, Condition D on April 08, 2023, at approximately 15:54 following valve cleaning and lubrication and satisfactory post maintenance testing.

This event was reported by Event Notification 56458 in accordance with 10 CFR 50.72(b)(3)(v)(D). The condition is also being reported in accordance with 10 CFR 50.73(a)(2)(v)(D) as an event or condition that could have prevented fulfillment of a safety function.

**CAUSE OF EVENT**

The cause of the HPCI Turbine Stop Valve failing to fully close was most likely internal corrosion and mechanical binding of the valve hydraulic drive mechanism caused by condensation from a steam leak past the HPCI Turbine Steam Supply Valve [EIS Component Code: V] seat accumulating on the HPCI Turbine Stop Valve and dripping onto the hydraulic operating cylinder. The failure of HPCI Turbine Stop Valve as a result of the steam leak past the HPCI Turbine Steam Supply Valve seat was a previously unrecognized failure mode in the station's assessment of the steam leak, and therefore was not properly mitigated.

**ANALYSIS/SAFETY SIGNIFICANCE**

The condition described herein rendered the Unit 1 HPCI System inoperable. HPCI and Automatic Depressurization System (ADS) are independent high pressure ECCS. With HPCI rendered inoperable, the high pressure ECCS function would be fulfilled by ADS. During the period that HPCI was inoperable, both divisions of ADS were operable and available to fulfill the high pressure ECCS function. Since the high pressure ECCS function was maintained, the condition did not represent a safety system functional failure. Accordingly, this event will not be counted as a safety system functional failure in the Reactor Oversight Process Performance Indicators. There were no actual consequences to the health and safety of the public as a result of this event.



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|   | <input type="checkbox"/> 052            |                                  | YEAR<br>2023  | SEQUENTIAL NUMBER<br>- 002 - | REV NO.<br>00 |

**NARRATIVE**

**CORRECTIVE ACTIONS**

Key corrective actions include repair of the HPCI Turbine Stop Valve and hydraulic operating cylinder and replacement of the HPCI Turbine Steam Supply Valve. In the interim, condition monitoring will be informed by weekly inspection of the HPCI Turbine Stop Valve. Additionally, risks associated with the steam leak past the HPCI Turbine Steam Supply Valve seat will be re-assessed to ensure bridging and elimination strategies are developed for all associated failure modes.

**COMPONENT FAILURE INFORMATION**

Component Name - HPCI Turbine Stop Valve  
Component Identification - FV15612  
Manufacturer – Schuttle and Koerting Co.  
Valve Type – Inverted, Oil-Operated, Semi-Balanced Globe-Type Stop Valve

**PREVIOUS OCCURRENCES**

None.