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August 26, 2024

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

10 CFR 50.73

SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 50-387/2023-004-01
UNIT 1 LICENSE NO. NPF-14
PLA-8139

Docket No. 50-387

Attached is Licensee Event Report (LER) 50-387/2023-004-01. The LER supplement reports an event involving a manual scram due to degrading main condenser vacuum. This event is being reported in accordance with 10 CFR 50.73(a)(2)(iv)(A) as an event that resulted in a manual actuation of the Reactor Protection System (including a reactor scram).

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.

E. Casulli

Attachment: LER 50-387/2023-004-01

Copy: NRC Region I
Ms. J. England, 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 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. 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 Unit 1	<input checked="" type="checkbox"/> 050	2. Docket Number 00387	3. Page 1 OF 3
	<input type="checkbox"/> 052		

4. Title
Manual Reactor Scram Due to Degraded Main Condenser Vacuum

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
11	10	2023	2023	004	01	08	26	2024	Facility Name	<input type="checkbox"/> 050
									Facility Name	<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 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 Brad Yarzebinski - Nuclear Regulatory Affairs Engineer	Phone Number (Include area code) 570-542-2839
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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
X	TF	DRN	GE	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
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16. Abstract (Limit to 1326 spaces, i.e., approximately 13 single-spaced typewritten lines)

On November 10, 2023, at approximately 01:18, Susquehanna Steam Electric Station Unit 1 reactor was manually scrammed due to degrading Main Condenser vacuum caused by a failed turbine bearing waste water and oil (slop) drain. The event was reported by Event Notification 56846 in accordance with 10 CFR 50.72(b)(2)(iv)(B) and 10 CFR 50.72(b)(3)(iv)(A). This event is also reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A) as an event that resulted in a manual actuation of the Reactor Protection System (including a reactor scram).

Failure of the slop drain was caused by vibration/cyclic fatigue-induced failure of the socket weld on the 1.5" pipe to the 3" x 1.5" pipe reducer inside the Main Condenser. Key corrective action included plugging and welding the failed slop drain and reducing the length of the resulting pipe stub.

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**

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1. FACILITY NAME Susquehanna Steam Electric Station Unit 1	<input checked="" type="checkbox"/> 050	2. DOCKET NUMBER 00387	3. LER NUMBER		
	<input type="checkbox"/> 052		YEAR 2023	SEQUENTIAL NUMBER 004	REV NO. 01

NARRATIVE

CONDITIONS PRIOR TO EVENT

Unit 1 - Mode 1, approximately 100% Rated Thermal Power (RTP)
Unit 2 - Mode 1, approximately 100% RTP

Vacuum rapidly degraded on the Susquehanna Steam Electric Station (SSES) Unit 1 Main Condenser, which resulted in the need for a manual reactor scram.

EVENT DESCRIPTION

On November 10, 2023, SSES Unit 1 was manually scrammed due to degraded Main Condenser [EIS System Code/Component Code: SG/COND] vacuum caused by a failed turbine bearing waste water and oil (slop) drain [EIS System Code/Component Code: TF/DRN]. The following is a timeline of significant events associated with the scram:

November 10, 2023, at approximately 01:06 - Unit 1 Main Condenser vacuum was rapidly degrading along with indication of high offgas flow. A Recirculation Limiter 2 runback was inserted to lower reactor power. Main Condenser vacuum continued to degrade following the reduction in reactor power to approximately 70%.

November 10, 2023, at approximately 01:18 - A manual scram was inserted when Main Condenser vacuum reached 6 inches of mercury absolute. Plant response to the scram was per design, Reactor Protection System (RPS) [EIS System Code: JC] channels all tripped and maintained the scram signal for the required 10 second period. Reactor Water Level lowered to -25" following the scram. Reactor Water Level 3 (+13 inch) containment isolation system signals were received and went to completion. The feedwater system [EIS System Code: SJ] remained in service as the primary Reactor Pressure Vessel (EIS System Code/Component Code: AC/RPV) water level control system. There were no Emergency Diesel Generator [EIS System Code/Component Code: EK/DG] starts or Safety Relief Valve [EIS System Code/Component Code: SB/RV] actuations during the event.

The event was reported by Event Notification 56846 in accordance with 10 CFR 50.72(b)(2)(iv)(B) and 10 CFR 50.72(b)(3)(iv)(A). This event is also reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A) as an event that resulted in a manual actuation of the RPS (including a reactor scram).

CAUSE OF EVENT

Failure of the slop drain was caused by vibration/cyclic fatigue-induced failure of the socket weld on the 1.5" pipe to the 3" x 1.5" pipe reducer inside the Main Condenser. This failure was due to the original slop drain capping and piping removal modification in 2002 not being performed in accordance with the associated engineering change. In addition to the slop drain piping, pipe supports that were intended to support the remaining piping were erroneously removed. This allowed a remaining vertically suspended 1.5" diameter pipe stub of approximately 40 inches to vibrate, which eventually caused the weld failure.

ANALYSIS/SAFETY SIGNIFICANCE

The actual consequences from the drain leaking air into the Unit 1 Main Condenser were degraded Unit 1 Main Condenser vacuum, a forced down power, and subsequent manual scram.

Without prompt operator action, an automatic scram would have been initiated. Additionally, High Pressure Coolant Injection (EIS System Code: BJ) System and Reactor Core Isolation Cooling (EIS System Code: BN) System could have initiated which would require initiating support systems as well as adding additional heat to the suppression pool. This would have necessitated using the Residual Heat Removal (EIS System Code: BJ) System in Suppression Pool Cooling mode to transfer the suppression pool heat to the spray pond.



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NARRATIVE

Based on the results of a risk significance evaluation, this event is classified as having "very low" safety significance. It should also be noted that this manual scram was uncomplicated, did not require Emergency Core Cooling System initiation, and Main Steam Isolation Valves remained open (i.e. the main condenser remained available as the primary heat sink).

The condition described herein did not result in 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.

CORRECTIVE ACTIONS

Following the scram, a gasketed plate and plug assembly was installed at the failed slop drain, allowing Unit 1 to resume normal operation until permanent repairs could be made. This temporary engineering change was also preemptively performed on other Unit 1 slop drain piping stubs prior to resuming normal operation.

During the 2024 refueling and inspection outage, the failed slop drain piping was plugged and welded, and the length of the remaining 3" diameter pipe stub reduced. As part of the extent of condition, the temporary engineering change described above may be installed on the remaining affected slop drains until permanent repairs are complete.

COMPONENT FAILURE INFORMATION

Component Identification - Weld at 3" to 1.5" reducer
Component Name - Waste Water and Oil Drain piping
Component Part Number - N/A
Manufacturer - General Electric (GE)

PREVIOUS OCCURRENCES

None.