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DEC 16 2019

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

10 CFR 50.73

SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 50-387(388)/2018-005-01
UNIT 1 LICENSE NO. NPF-14
UNIT 2 LICENSE NO. NPF-22
PLA-7750

Docket No. 50-387
50-388

Attached is a supplement to Licensee Event Report (LER) 50-387(388)/2018-005-00 that reported two related events involving drifting of Reactor Pressure Steam Dome – Low permissive switches (Microswitch 2). These events, one at Unit 1 and one at Unit 2, were determined to be reportable as a condition prohibited by Technical Specifications in accordance with 10 CFR 50.73(a)(2)(i)(B), a common cause inoperability of independent trains or channels in accordance with 10 CFR 50.73(a)(2)(vii), a condition that could have prevented fulfillment of a safety function in accordance with 10 CFR 50.73(a)(2)(v)(D), and a single cause that could have prevented fulfillment of safety functions of trains or channels in different systems in accordance with 10 CFR 50.73(a)(2)(ix)(A).

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

This letter contains no new regulatory commitments.

A handwritten signature in black ink, appearing to read "K. Cimorelli", written over a horizontal line.

K. Cimorelli

Attachment: LER 50-387(388)/2018-005-01

Copy: NRC Region I
Ms. S. Goetz, NRC Project Manager
Ms. L. H. Micewski, NRC Sr. Resident Inspector
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
<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 Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. Facility Name Susquehanna Steam Electric Station Unit 1	2. Docket Number 05000387	3. Page 1 OF 4
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4. Title Condition Prohibited by Technical Specifications Due to Drift of Reactor Pressure Switches

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	Docket Number
06	05	2018	2018	- 005	- 01	12	16	2019	Susquehanna Steam Electric Station Unit 2	05000388
									Facility Name	Docket Number
										05000

9. Operating Mode 1	11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)			
	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(ix)(A)
10. Power Level 100	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(ii)
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input checked="" type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(iii)
<input type="checkbox"/> 50.73(a)(2)(i)(C)				<input type="checkbox"/> Other (Specify in Abstract below or in NRC Form 366A)

12. Licensee Contact for this LER

Licensee Contact C. E. Manges, Jr., Senior Engineer – Nuclear Regulatory Affairs	Telephone Number (Include Area Code) (570) 542-3089
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13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable To ICES	Cause	System	Component	Manufacturer	Reportable To ICES
B	JE	PS	GE/Cameron	Y					

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

Month	Day	Year

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On June 5, 2018, the Unit 1 "B" Reactor Steam Dome Pressure – Low permissive pressure switch, Microswitch 2 (SW2) was found outside of the Technical Specification (TS) 3.3.5.1 allowable value during testing. Subsequently, on June 6, 2018, the Unit 2 "C" Reactor Steam Dome Pressure – Low permissive pressure switch, SW2, was found outside of the TS 3.3.5.1 allowable value during testing. Both drifted outside of the lower allowable value which is intended to ensure that the Emergency Core Cooling System (ECCS) injection prevents the fuel peak cladding temperature from exceeding the limits of 10 CFR 50.46.

Based on the information available, the condition existed for longer than allowed by Units 1 and 2, TS 3.3.5.1 and TS 3.5.1. As such, this is a condition prohibited by TS and is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B). This is also considered a common cause inoperability of independent trains or channels (10 CFR 50.73(a)(2)(vii)), a condition that could have prevented fulfillment of a safety function (10 CFR 50.73(a)(2)(v)(D)), and a single cause that could have prevented fulfillment of safety functions of trains or channels in different systems (10 CFR 50.73(a)(2)(ix)(A)).

The direct cause was determined to be instrument setpoint drift resulting from an over-ranged condition and the effects of the movement assembly on the torque tube. Interim compensatory actions include performing calibration using the quarterly calibration procedures every 45 days on Unit 1 and every 30 days on Unit 2. Final corrective actions will include installing Cameron-Barton 288A instruments that have been modified to remove the over-range condition and the movement assembly/associated linkages that were determined to be affecting instrument drift.

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
<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 Information Services Branch (T-2 F43), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
Susquehanna Steam Electric Station Unit 1	05000-387	YEAR	SEQUENTIAL NUMBER	REV NO.
		2018	- 005	- 01

NARRATIVE**CONDITIONS PRIOR TO EVENT**

Unit 1 – Mode 1, approximately 100 percent Rated Thermal Power

Unit 2 – Mode 1, approximately 100 percent Rated Thermal Power


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

EVENT DESCRIPTION

Susquehanna Steam Electric Station (SSES) had been utilizing International Telephone and Telegraph (ITT)-Barton 288A pressure switches in the Reactor Steam Dome Pressure – Low channels [EIS System/Component Identifier: JE/PS] that provide the injection permissive for the Core Spray system [EIS System Identifier: BM] (Technical Specification (TS) 3.3.5.1, Function 1d) and the Low Pressure Coolant Injection system (LPCI) [EIS System Identifier: BO] (TS 3.3.5.1, Function 2d). Each pressure switch has two microswitches, low (SW1) and high (SW2). All eight obsolete ITT-Barton 288A pressure switches were replaced with General Electric (GE) recommended Cameron-Barton 288A pressure switches between September 6, 2017 and November 15, 2017 to address drift issues. The Cameron-Barton 288A pressure switches were bench tested prior to installation and calibration checked at the time of installation. Subsequent calibration checks were performed at more frequent intervals than the quarterly TS required calibrations.

After replacement, drift issues have continued. Only SW2 was found drifted outside of the TS allowable values. A detailed timeline of events is as follows:

- September 20, 2017 - the obsolete ITT-Barton 288A pressure switch for Unit 2 PIS-B21-2N021C was replaced with a GE recommended Cameron-Barton 288A pressure switch.
- October 9, 2017 - the obsolete ITT-Barton 288A pressure switch for Unit 2 PIS-B21-2N021D was replaced with a GE recommended Cameron-Barton 288A pressure switch.
- November 15, 2017 - the obsolete ITT-Barton 288A pressure switch for Unit 1 PIS-B21-1N021B was replaced with a GE recommended Cameron-Barton 288A pressure switch.
- December 5, 2017 – Unit 2 PIS-B21-2N021C and Unit 2 PIS-B21-2N021D were found outside of the TS 3.3.5.1 allowable value during the calibration check. Both drifted outside of the upper allowable value which is intended to ensure that the reactor dome pressure has fallen to a value below the Core Spray and RHR/LPCI maximum design pressures to preclude over-pressurization of the low pressure systems prior to low pressure injection initiation. Unit 2 PIS-B21-2N021C exceeded the TS 3.3.5.1 allowable value by 1.3 psi. Unit 2 PIS-B21-2N021D exceeded the TS 3.3.5.1 allowable value by 2.8 psi. Both switches were adjusted to within the TS allowable value. These conditions were initially reported in LER 50-388/2017-010-00 on February 2, 2018.

NRC FORM 366A (04-2018)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB: NO. 3150-0104	EXPIRES: 03/31/2020
 LICENSEE EVENT REPORT (LER) CONTINUATION SHEET		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 Information Services Branch (T-2 F43), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov , and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.	
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Susquehanna Steam Electric Station Unit 1	05000-387	YEAR	SEQUENTIAL NUMBER	REV NO.
		2018	- 005	- 01

- June 5, 2018 - Unit 1 PIS-B21-1N021B was found outside of the TS 3.3.5.1 allowable value during testing. The switch drifted outside of the lower allowable value which is intended to ensure that the ECCS injection prevents the fuel peak cladding temperature from exceeding the limits of 10 CFR 50.46. PIS-B21-1N021B exceeded the TS 3.3.5.1 allowable value by 2.7 psi. The switch was adjusted to within the TS allowable value. This switch had been previously tested on December 7, 2017 and March 6, 2018 with acceptable results.
- June 6, 2018 - Unit 2 PIS-B21-2N021C was found outside of the TS 3.3.5.1 allowable value during testing. The switch drifted outside of the lower allowable value which is intended to ensure that the ECCS injection prevents the fuel peak cladding temperature from exceeding the limits of 10 CFR 50.46. PIS-B21-2N021C exceeded the TS allowable value by 1.5 psi. The switch was adjusted to within the TS allowable value. This switch had been previously tested on October 20, 2017 with acceptable results. The switch drifted outside of the upper TS 3.3.5.1 allowable value limit on December 5, 2017. This switch was subsequently tested on January 4, 2018, February 8, 2018, March 7, 2018, and May 3, 2018 with acceptable results.

Based on the information available, the condition existed for longer than allowed by Units 1 and 2, TS 3.3.5.1 and TS 3.5.1. As such, this is a condition prohibited by Technical Specifications and is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B). In addition, SSES believes that redundant channels were inoperable at the same time impacting both Core Spray and LPCI functions; therefore, this is also considered a common cause inoperability of independent trains or channels (10 CFR 50.73(a)(2)(vii)), a condition that could have prevented fulfillment of a safety function (10 CFR 50.73(a)(2)(v)(D)), and a single cause that could have prevented fulfillment of safety functions of trains or channels in different systems (10 CFR 50.73(a)(2)(ix)(A)).

CAUSE OF EVENT

The direct cause was determined to be instrument setpoint drift resulting from an over-ranged condition and the effects of the movement assembly on the torque tube.

ANALYSIS/SAFETY SIGNIFICANCE

Analysis of the condition determined a minimal impact (0.5°F) on peak cladding temperature (PCT) for a limiting break resulting in a new PCT of 1848.5°F, which is well below the 2200°F acceptance criteria. Analysis also determined that there was no impact on the small break LOCA PCT. Based on this evaluation, this event will not be counted as a safety system functional failure for the NRC performance indicator based on the engineering analysis that shows there was no loss of ability to fulfill the safety function.

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CORRECTIVE ACTIONS

Interim compensatory actions include performing calibration using the quarterly calibration procedures every 45 days on Unit 1 and every 30 days on Unit 2.

Final corrective actions will include installing Cameron-Barton 288A instruments that have been modified to remove the over-range condition and the movement assembly/associated linkages that were determined to be affecting instrument drift.

COMPONENT FAILURE INFORMATION

The switches that drifted are Cameron-Barton 288A pressure indicating switches manufactured by Cameron.

PREVIOUS SIMILAR EVENTS

LER 50-388(387)/2015-001-01, "Condition Prohibited by Technical Specifications Due to Drift of Reactor Pressure Steam Dome-Low Switches", dated February 10, 2016.

LER 50-388/2017-010-00, "Condition Prohibited by Technical Specifications Due to Drift of Reactor Pressure Switches", dated February 2, 2018.