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

SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 50-387/00-008-00
PLA - 5231 FILE R41-2

Docket No. 50-387
License No. NPF-14

Attached is Licensee Event Report 50-387/00-008-00. This report is being made pursuant to 10CFR50.73(a)(2)(i)(B), in that Susquehanna Unit 1 was in a condition prohibited by the Technical Specifications due to an inoperable Reactor Vessel Water Level Emergency Core Cooling System Actuation Switch.

Bryce L. Shriver
Vice President – Nuclear Site Operations

Attachment

cc: Mr. H. J. Miller
Regional Administrator
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

cc: Mr. S. L. Hansell
Sr. Resident Inspector
U.S. Nuclear Regulatory Commission
P. O. Box 35
Berwick, PA 18603-0035

IE22

NRC FORM 366 (6-1998)			U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001 <small>ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.</small>					
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)											
FACILITY NAME (1) Susquehanna Steam Electric Station - Unit 1						DOCKET NUMBER (2) 05000387		PAGE (3) 1 OF 4			
TITLE (4) Operation Prohibited By Technical Specifications Due To Inoperable Reactor Vessel Level Switch											
EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER	
07	15	00	00	-- 008	-- 00	08	24	00	FACILITY NAME	DOCKET NUMBER	
									05000		
									05000		
OPERATING MODE (9)		POWER LEVEL (10)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
1		100		20.2201(b)		20.2203(a)(2)(v)		X		50.73(a)(2)(i)	
				20.2203(a)(1)		20.2203(a)(3)(ii)				50.73(a)(2)(viii)	
				20.2203(a)(2)(i)		20.2203(a)(3)(ii)				50.73(a)(2)(x)	
				20.2203(a)(2)(ii)		20.2203(a)(4)				50.73(a)(2)(iii)	
				20.2203(a)(2)(iii)		50.36(c)(1)				73.71	
				20.2203(a)(2)(iv)		50.36(c)(2)				50.73(a)(2)(iv)	
								50.73(a)(2)(v)		OTHER	
								50.73(a)(2)(vii)		Specify in Abstract below or in NRC Form 366A	
LICENSEE CONTACT FOR THIS LER (12)											
NAME Joseph J. Meter – Senior Engineer, Licensing								TELEPHONE NUMBER (Include Area Code) 570 / 542-1873			
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)											
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	
X	I	LIS	B080	Y							
SUPPLEMENTAL REPORT EXPECTED (14)						EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR	
X YES (If yes, complete EXPECTED SUBMISSION DATE).						NO		02	15	01	
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16) <p>On July 15, 2000, at 0400 hours with Unit 1 in Mode 1 at 100% power, Reactor Vessel Water Level Emergency Core Cooling System Actuation Switch LIS-B21-1N031A was found with moisture inside its faceplate and determined to be operable. On July 17, 2000 two of the micro-switches within LIS-B21-1N031A that provide input to the High Pressure Coolant Injection (HPCI) and the Reactor Core Isolation Cooling (RCIC) were found outside of Technical Specification allowable values. LIS-B21-1N031A was replaced and returned to operable on July 18, 2000 at 0545 hours. On July 26, 2000, after an in-depth investigation, a follow-up engineering evaluation determined that LIS-B21-1N031A had been inoperable from July 15, 2000 at 0400 hours until July 17, 2000 at 2115 hours without the applicable Technical Specification action statements met. The micro-switch failures are due to a minor external water leak into the instrument housing, which developed at the high pressure process connection following recent replacement of LIS-B21-1N031A. All similar in-service instruments were verified to be free from moisture. The cause for non-compliance with required LCO actions is that actions beyond Operations initial investigation were not immediately pursued. Applicable Operations personnel will review the event and the actions to be taken for similar instrument problems and other equipment problems. This event will be reviewed with applicable Instrumentation and Control personnel discussing the moisture induced micro-switch failures and potential impacts from defective process connections. The instrument will be shipped to a vendor for failure analysis. There was no compromise to the health and safety of the public due to this event since redundant instrumentation was operable.</p>											

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

EVENT DESCRIPTION

On July 15, 2000, at 0400 hours, with Unit 1 in Mode 1 (Power Operation) at 100 % power, a Nuclear Plant Operator (non-licensed) performing rounds observed condensation forming on the inside of the glass faceplate of Reactor Vessel Water Level Emergency Core Cooling System Actuation Switch LIS-B21-1N031A. This Instrument has an analog display and contains four separate micro-switches that provide inputs to the Primary Containment Isolation System (PCIS; EISS Code: JM) isolation logic, Core Spray (CS; EISS Code: BM) initiation logic, Residual Heat Removal Low Pressure Coolant Injection (RHR LPCI; EISS Code: BO) initiation logic, Automatic Depressurization System (ADS; EISS Code: B) initiation logic, High Pressure Coolant Injection (HPCI; EISS Code: BJ) initiation logic and Reactor Core Isolation Cooling (RCIC; EISS Code BN) initiation logic. Control Room Senior Reactor Operators (licensed) performed an initial operability determination of the observed condition and concluded that LIS-B21-1N031A was operable since the analog display was reading consistent with other similar reactor vessel level instruments. A work authorization was initiated to investigate the condition. Additionally, in accordance with the station's operability determination program, Operations personnel initiated a follow-up operability determination request to Engineering personnel to evaluate the condition.

On July 17, 2000, at 2115 hours, the applicable Limiting Condition for Operation (LCO) action statements were entered to implement the work authorization. Instrumentation and Controls (I&C) personnel (non-licensed) performed an as-found calibration of LIS-B21-1N031A while Engineering personnel observed. The micro-switches associated with the HPCI initiation logic and RCIC initiation logic, switch 2A and 2B respectively, were found outside Technical Specification allowable values. The remaining micro-switches were found outside desired tolerance, but within Technical Specification allowable values. I&C personnel replaced LIS-B21-1N031A, performed a leak test and a satisfactory post replacement calibration of all four switches. The instrument was returned to operable status at 0545 hours on July 18, 2000.

After an in-depth investigation of the internals of the removed instrument, on July 26, 2000, Engineering personnel (non-licensed) performing the follow-up operability determination concluded that the switch failures were due to moisture intrusion. As a result, there was a direct correlation to the condensation observed on the instrument faceplate on July 15, 2000 and the failure of the two micro-switches on July 17, 2000. Therefore, the LCO action statements to place the inoperable channel in the tripped condition within 24 hours were not met for LCO 3.3.5.1 and LCO 3.3.5.2. The subsequent LCO action statements required for not placing the channels in the tripped condition were also not met. LCO action statements for LCO 3.5.1 and LCO 3.5.3 required the unit to be in Mode 3 (Hot Shutdown) within the next 12 hours.

CAUSE OF EVENT

A visual inspection of the failed instrument by I&C and Engineering personnel did not identify any gross failure of the bellows assembly. It is suspected that a minor external water leak at the high-pressure process connection migrated between the surfaces of the housing and the differential pressure unit and through a mounting bolthole. The exact cause of the process connection leak is not definitively known at this time. The leak is believed to be due to a defective process connection and it developed sometime

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after LIS-B21-1N031A was replaced on 5/2/2000 during a Unit 1 refueling and inspection outage. The moisture build-up within the instrument over time then caused the micro-switches to drift out of calibration. The instrument will be shipped to a vendor for analysis of the failure.

The cause for the non-compliance with the required LCO action statements is that actions beyond Operations initial investigation were not immediately pursued. With the benefit of the results of a more immediate calibration of the instrument, the corrective actions could have been completed within the LCO action statement time limits. The failure mode of the Barton manufactured instrument was not apparent to Operations personnel at the time of initial observation of moisture inside the instrument faceplate. That is, the analog display was reading consistent with other similar reactor vessel level instruments and the affects of moisture on the micro-switches were not evident. Therefore, an immediate calibration of the instrument was not requested.

REPORTABILITY/ANALYSIS

This event was determined to be reportable per 10CFR50.73(a)(2)(i)(B), as a condition prohibited by the plant's Technical Specifications. LIS-B21-1N031A was inoperable from 0400 hours on July 15, 2000, until 2115 hours on July 17, 2000, for a total of 65 hours and 15 minutes without entering the applicable LCO action statements. The applicable LCO action statements for LCO 3.3.5.1, LCO 3.3.5.2, LCO 3.5.1 and LCO 3.5.3 required the unit to be in Mode 3 (Hot Shutdown) within 36 hours.

With the Division 1 instrument channel LIS-B21-1N031A inoperable, there was no compromise to the health and safety of the public. The other Division 1 instrument channel LIS-B21-1N031C, as well as both of the Division 2 instrument channels, LIS-B21-1N031B and LIS-B21-1N031D, remained operable during this event and would have functioned as needed for initiation of HPCI and / or RCIC in response to an actual Reactor Pressure Vessel (RPV) Low-Low Level 2.

In accordance with the guidelines provided in NUREG-1022, Revision 1 section 2.11 and 5.1.1, the required submission date for this report is August 25, 2000. The in-depth evaluation that was needed to determine that the event was reportable was completed on July 26, 2000 after the removed instrument was investigated.

CORRECTIVE ACTIONS

Corrective actions that have been completed are:

- LIS-B21-1N031A was replaced, leak tested and successfully recalibrated.
- The remaining Reactor Vessel Water Level Emergency Core Cooling System Actuation Switches on Unit 1 and Unit 2 were verified to be free from moisture.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

Corrective actions to be completed are:

- Training will be given to applicable Operations personnel describing this event and the actions to be taken:
 - Specifically, when observable moisture is detected inside Barton instruments.
 - Generally, when there is any anomalous observation or condition of plant equipment, Technical Specification action times should be considered when determining timeliness of any necessary follow-up investigations.
- This event will be reviewed with the applicable I&C personnel discussing the moisture induced micro-switch failures and potential impacts from defective process connections.
- The removed instrument will be shipped to a vendor for failure analysis.
- This LER will be updated accordingly.

ADDITIONAL INFORMATION

Past Similar Events: LER 93-012-00, Docket No. 387/License No. NPF-14 – Failure of Emergency Core Cooling System for Reactor Pressure Switch Required Entry into Technical Specification 3.0.3

LER 93-004-00, Docket No. 388/License No. NPF-22 – Operability Testing Following Instrument Leak Repair Required Entry Into LCO 3.0.3

Failed Component: LIS-B21-1N031A

Manufacturer: Barton

Model: 288A