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**JUN 11 2001**

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Mail Station P1-137  
Washington, DC 20555

SUSQUEHANNA STEAM ELECTRIC STATION  
LICENSEE EVENT REPORT 50-388/2001-005-00  
PLA - 5327 FILE R41-2

Docket No. 50-388  
License No. NPF-22

Attached is Licensee Event Report 50-388/2001-005-00, which reports multiple test failures experienced during as-found actuation pressure surveillance testing of Main Steam Safety Relief Valves. This report is submitted as a condition prohibited by Technical Specifications in accordance with 10CFR50.73(a)(2)(i)(B) and guidance in NUREG-1022, Revision 2.

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

JE22

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@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 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.

**LICENSEE EVENT REPORT (LER)**

(See reverse for required number of digits/characters for each block)

<b>FACILITY NAME (1)</b> Susquehanna Steam Electric Station - Unit 2	<b>DOCKET NUMBER (2)</b> 05000388	<b>PAGE (3)</b> 1 OF 3
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**TITLE (4)**  
Multiple Test Failures of Main Steam Safety Relief Valves

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER	
04	12	2001	2001	005	00	06	11	2001	FACILITY NAME	DOCKET NUMBER 05000	
<b>OPERATING MODE (9)</b> 5											
<b>POWER LEVEL (10)</b> 0											
<b>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)</b>											
			20.2201(b)			20.2203(a)(3)(ii)			50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)
			20.2201(d)			20.2203(a)(4)			50.73(a)(2)(iii)		50.73(a)(2)(x)
			20.2203(a)(1)			50.36(c)(1)(i)(A)			50.73(a)(2)(iv)(A)		73.71(a)(4)
			20.2203(a)(2)(i)			50.36(c)(1)(ii)(A)			50.73(a)(2)(v)(A)		73.71(a)(5)
			20.2203(a)(2)(ii)			50.36(c)(2)			50.73(a)(2)(v)(B)		OTHER Specify in Abstract below or in NRC Form 366A
			20.2203(a)(2)(iii)			50.46(a)(3)(ii)			50.73(a)(2)(v)(C)		
			20.2203(a)(2)(iv)			50.73(a)(2)(i)(A)			50.73(a)(2)(v)(D)		
			20.2203(a)(2)(v)			X 50.73(a)(2)(i)(B)			50.73(a)(2)(vii)		
			20.2203(a)(2)(vi)			50.73(a)(2)(i)(C)			50.73(a)(2)(viii)(A)		
			20.2203(a)(3)(i)			50.73(a)(2)(ii)(A)			50.73(a)(2)(viii)(B)		

**LICENSEE CONTACT FOR THIS LER (12)**

<b>NAME</b> Gerard M. Machalick - Nuclear Licensing	<b>TELEPHONE NUMBER (Include Area Code)</b> 570 / 542-3861
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**COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)**

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

**SUPPLEMENTAL REPORT EXPECTED (14)**

<b>YES (If yes, complete EXPECTED SUBMISSION DATE).</b>	<b>X</b>	<b>NO</b>	<b>EXPECTED SUBMISSION DATE (15)</b>	<b>MONTH</b>	<b>DAY</b>	<b>YEAR</b>
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**ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)**

On April 12, 2001, with Unit 2 in Mode 5 (Refueling) at 0 percent Power, 6 of 8 Main Steam Safety Relief Valves failed their as-found actuation pressure test required by Technical Specification Surveillance Requirement 3.4.3.1. The acceptable band for as-found actuation pressure is +/-1% of the nameplate setpoint pressure. Four valves actuated below the acceptable band (-1.25%, -1.66%, -1.66% and -2.18%) and two valves actuated above the acceptable band (+1.16% and +1.53%). The cause of the event is expected drift of the valve actuation setpoints due to exposure to in-service operation. The Unit 2 reactor vessel did not reach a pressure that challenged the safety function of any of the valves and no valves opened inadvertently. All of the failed valves would have functioned below the reactor vessel design pressure and the vessel overpressurization analysis was valid for the as-found conditions. The safety significance of this event is low and the health and safety of the public was not compromised.

**LICENSEE EVENT REPORT (LER)**

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Susquehanna Steam Electric Station - Unit 2	05000388	2001	-- 005	-- 00	2 OF 3

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

**EVENT DESCRIPTION**

On April 12, 2001, with Unit 2 in Mode 5 (Refueling) at 0 percent Power, 6 of 8 Main Steam Safety Relief Valves (SRV; EIS Code: SB) failed their as-found actuation pressure test required by Technical Specification (TS) Surveillance Requirement 3.4.3.1. The acceptable band for as-found actuation pressure is +/-1% of the nameplate setpoint pressure. Four valves actuated below the acceptable band (-1.25%, -1.66%, -1.66% and -2.18%) and two valves actuated above the acceptable band (+1.16% and +1.53%). The valves that failed the as-found actuation pressure testing have been replaced with refurbished valves that have been certified to safety actuation setpoints within TS acceptance criteria. Corrective action that remains to be completed is to obtain a license amendment to revise the TS acceptance band for as-found actuation pressure of the safety relief valves to +/-3% of setpoint.

**CAUSE OF EVENT**

The cause of the event is expected drift of the valve actuation setpoints due to exposure to in-service operation. The as-found actuation pressure test experience at Susquehanna is consistent with industry experience for this type of valve, with normal maintenance activities.

The valves used at Susquehanna were originally purchased to ASME Boiler and Pressure Vessel Code, Section III, Nuclear Vessels, July 1971. The design setpoint tolerance was +/-1% for construction, based on Article NB-7000, ASME III, Summer 1971. The original TS requirements were based on this design code. ANSI/ASME OM-1-1981, Requirements for Inservice Performance Testing of Nuclear Power Plant Pressure Relief Devices, Section 1.3.3.1.5, subsequently set the criteria for failure of an as-found safety relief valve test as less than +3% of design setpoint. The valves used at Susquehanna have never consistently met the TS requirement of +/-1% during as found testing after in-service operation, but have consistently actuated within 3% of setpoint.

The inability of the type of valve used at Susquehanna to meet the as-found +/-1% of design setpoint requirement has been recognized by the nuclear industry. In response, the BWR Owners Group sponsored an initiative to revise the existing TS requirements to +/-3%, and General Electric submitted Topical Report NEDC-31753P to the NRC on this subject. The NRC approved this Technical Evaluation by SER, and several other licensees have implemented an TS acceptance band of +/-3%.

**ANALYSIS / SAFETY SIGNIFICANCE**

Technical Specification 3.4.3 requires that 12 of 16 Main Steam SRVs be operable while the unit is in Mode 1, 2 or 3. TS Surveillance Requirement 3.4.3.1 requires the as-found actuation pressure of an SRV to be within 1% of the nameplate setpoint pressure. Eight of the sixteen SRVs were removed for surveillance testing, and six of those eight failed to meet the TS required 1% acceptance band for as-found actuation pressure. This event is reportable per 10CFR50.73(a)(2)(i)(B) as a condition prohibited by Technical Specifications, based on the example of multiple test failures in NUREG-1022, Revision 2.

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Susquehanna Steam Electric Station - Unit 2	05000388	2001	-- 005	-- 00	3 OF 3

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

The Unit 2 reactor vessel did not reach a pressure that challenged the safety function of any of the SRVs and no valves opened inadvertently. All of the failed SRVs would have functioned below the reactor vessel design pressure and the vessel overpressurization analysis was valid for the as-found conditions. Historically, Susquehanna SRVs have consistently tested to within 3% of setpoint after in-service operation. The range of +/-3% of setpoint pressure has been approved by the NRC in General Electric Topical Report NEDC-31753P and has been implemented in the Technical Specifications of several other licensees.

Based on the above analysis, the safety significance of this event is low and the health and safety of the public was not compromised.

In accordance with the guidelines provided in NUREG-1022, Revision 2, the required submission date for this report is June 11, 2001.

**CORRECTIVE ACTIONS**

The valves that failed the as-found actuation pressure testing have been replaced with refurbished valves that have been certified to safety actuation setpoints within TS acceptance criteria. All valves that were tested were replaced with valves that have been completely refurbished. Industry experience shows that valves of this type exhibit better setpoint accuracy following complete and thorough valve refurbishment, compared to test results after normal valve maintenance. The refurbishment was accomplished when implementing a design change to improve the seating performance of the valves.

Corrective action that remains to be completed is:

- Replace remaining valves with extensively refurbished valves to improve valve performance.
- Obtain a license amendment to revise the TS acceptance band for as-found actuation pressure of the safety relief valves to +/-3% of setpoint.

**ADDITIONAL INFORMATION**

Past Similar Events: LER 50-387/00-007-00, Multiple Test Failures of Main Steam Relief Valves

Failed Component: None