PECO NUCLEAR
A UNIT OF PECO ENERGY

PECO Energy Company
PO Box 2300
Sanatoga, PA 19464-0920

10CFR50.73

September 22, 2000
Docket No.50-353
License No. NPF-85

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

SUBJECT: Licensee Event Report
Limerick Generating Station (LGS) - Unit 2

This LER concerns the failure of the outboard suppression pool suction for High Pressure Coolant Injection System(HPCI) to open on the first attempt during its surveillance test. The HPCI system was declared inoperable because of inability of the HPCI system to take suction from the suppression pool (TS 3.5.1.c).

Reference:	Docket No. 50-353
Report Number:	2-00-003
Revision Number:	00
Event Date:	August 29, 2000
Report Date:	September 22, 2000
Facility:	Limerick Generating Station P.O. Box 2300, Sanatoga, PA. 19464-2300

This LER is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(v).

Very truly yours,

Robert C. Braun, Plant Manager-LGS
lwh
cc: H. J. Miller, Administrator Region I, USNRC
A. L. Burritt, USNRC Senior Resident Inspector, LGS

IE22

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION
(6-1998)

LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001
Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the 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. If 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.

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
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TITLE (4)
Failure of Suppression Pool Suction Valve Resulting in HPCI Inoperability

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
										05000
08	29	2000	2000	-- 003 --	00	09	22	2000	FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)	100%		20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)
			20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
			20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER
			20.2203(a)(2)(iii)		50.36(c)(1)	X	50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
K. W. Gallogly, Manager - Experience Assessment	(610) 718-3400

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									

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
☐ YES (If yes, complete EXPECTED SUBMISSION DATE).	☒ NO					

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On August 29, 2000 at 03:15 hours, the outboard suppression pool suction valve for the High Pressure Coolant Injection (HPCI) System failed to open on the first attempt during its surveillance test. The HPCI System was declared inoperable because of the inability of the suppression pool suction valve to take suction from the suppression pool (TS 3.5.1.c). This limit seated butterfly valve was subsequently closed, retested and stroked successfully within the acceptable time requirements. High pressure injection capability was available through the HPCI system from the Condensate Storage Tank.

The cause of the valve inoperability was due to the valve operator spring pack being out of tolerance combined with a recent change to the torque switch setting. The spring pack for this valve was replaced with a calibrated spring pack. Other limit seated valves were reviewed, and valve setup criteria notes for these valves were developed. The motor operated valve (MOV) specification will be revised for limit seated valves to test the spring pack when torque values or spring packs are changed.

This report is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(v)(D).

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Limerick Generating Station Unit 2	05000 -353	2000	-- 003 --	00	2 OF 3

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

Unit Conditions Prior to the Event

Unit 2 was in Operational Condition (OPCON) 1(Power Operation) operating at a nominal 100% power level at the time of event. There were no structures, systems or components out of service which contributed to the event.

Description of the Event

At 03:15 hours on August 29, 2000, while performing the "HPCI Valve Test" surveillance (ST-6-055-220-2), the HPCI [EIIS:BJ] outboard suppression pool suction valve (HV-055-2F041) failed to stroke in the open direction. The valve did move slightly to indicate dual indication. The valve was taken to the closed position as indicated by full closed indication in the main control room. The valve was then retested and stroked successfully within the acceptable time requirements. High Pressure Coolant Injection (HPCI), which is a single train system was considered inoperable. Core Spray [EIIS:BM], Low Pressure Coolant Injection (LPCI) [EIIS:BO], Automatic Depressurization System (ADS) and Reactor Core Isolation Cooling (RCIC) [EIIS:BN] systems were all operable.
At 06:37 hours on August 29, 2000 a 4 hour notification was made to the NRC in accordance with 10CFR50.72(b)(1)(iii)(d) for inoperability of the HPCI system.
At 11:45 hours the report was amended to indicate that HV-055-2F041 was not a primary containment isolation valve (PCIV).
After the valve did not stroke, the as-found VOTES testing showed valve performance was acceptable and had expected running and seating loads.

On June 19, 2000, the torque switch setting for this valve was reduced based on Limitorque generic spring pack settings to allow the torque switch to trip on a valve malfunction prior to exceeding a valve structural limit. This valve satisfactorily completed its post mainenance VOTES test.

The original setting was adequate for valve performance for many years, and the valve would have performed properly even with the out of tolerance spring pack prior to this adjustment. The generic spring pack curve showed that the revised setting would develop sufficient torque to open the valve under design conditions. However, with the out of tolerance spring pack, torque values with the revised settings were marginal. As the valve (after being closed for months) came off its seat, the unseating bypass switch opened (during the hammer blow) and the torque switch opened. At that instant, the torque required to open the valve further was higher than the torque switch setting, and the valve movement stopped. On the second attempt, the valve came off its seat more quickly, and the unseating bypass switch opened (after the hammer blow). The torque required to continue opening was less than the torque switch setting, and the valve continued to full stroke open.

The HPCI suction valve is limit seated and does not torque into the seat. Therefore, the function of the torque switch cannot be tested in place during valve diagnostic testing.

Limit seated valves at Limerick have been reviewed, and no other limit seated valves have had their torque switch settings changed.

The HPCI system is normally aligned to the Condensate Storage Tank (CST)[EIIS:KA]. Transfer to the suppression pool is accomplished by opening the limit seated butterfly valve (HV-055-2F041) and the primary containment isolation valve (PCIV)[HV-055-2F042] on receipt of a low water level signal from the CST or a high water level signal in the suppression pool.

Analysis of the Event

There were no actual consequences associated with inoperability of the HPCI system since there was no demand for HPCI during the event.
The potential consequences of the event were minimal. During the event Core Spray, LPCI , RCIC and ADS were all considered operable. Because the CST flow path was available, the HPCI system remained available to inject water to the vessel. At low level in the CST, switchover to the suppression pool would not have occurred with HV-055-2F041 failing to open. However, the operator would then manually open the valve from the control room and provide suction from the suppression pool. In the event that HV-055-2F041 could not be manually opened from the control room, an operator could have been dispatched to open the valve locally.

A review of the event from a probability/risk analysis perspective shows that the most risk significant event affected by a HPCI suction valve failure is a Station Blackout. Procedural direction has the operator run HPCI from the suppression pool until it heats up and then swaps to the CST for cooler water. Events where suppression pool cooling is available are less sensitive to HPCI suction source.

Cause of the Event

The cause of the event was an out of tolerance valve spring pack combined with a lowered torque switch setting. This condition decreased the setup margin for the torque switch to overcome the hammer blow event.

Corrective Actions Completed

The spring pack was replaced on HV-055-2F041 with a calibrated spring pack, and the valve was tested satisfactory.

Valve setup criteria notes have been developed for all limit seated valves at Limerick to ensure that specific valve spring pack test data is used for torque switch adjustments or spring pack replacements.

Corrective Actions Planned

The motor operated valve specification will be revised to ensure spring pack testing or other justification is provided for torque switch settings for limit seated valves when either a torque switch setting is changed, or the spring pack is changed. This will be accomplished by December 31, 2000.

Previous Similar Occurrences

None