

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Limerick Generating Station - Unit 1										DOCKET NUMBER (2) 0 5 0 0 0 3 5 2					PAGE (3) 1 OF 0 4					
TITLE (4) Reactor Scrams on Reactor Low Water Level																				
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 NAMES				DOCKET NUMBER(S)					
0 1	0 2	8 6	8 6	-	0 0 1	-	0 0	0 1	3 1	8 6					0 5 0 0 0 0 0 0					
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)																	
3			20.402(b)					20.406(c)					X 80.73(a)(2)(iv)					73.71(a)		
POWER LEVEL (10)			20.406(a)(1)(i)					80.38(a)(1)					80.73(a)(2)(v)					73.71(a)		
0 0 1 0			20.406(a)(1)(ii)					80.38(a)(2)					80.73(a)(2)(vi)					OTHER (Specify in Abstract below and in Text, NRC Form 366A)		
			20.406(a)(1)(iii)					80.73(a)(2)(i)					80.73(a)(2)(viii)(A)							
			20.406(a)(1)(iv)					80.73(a)(2)(ii)					80.73(a)(2)(viii)(B)							
			20.406(a)(1)(v)					80.73(a)(2)(iii)					80.73(a)(2)(ix)							
			20.406(a)(1)(vi)					80.73(a)(2)(iv)					80.73(a)(2)(x)							
NAME										TELEPHONE NUMBER										
John C. Nagle, Senior Engineer, Licensing Section										AREA CODE 2 1 5 8 4 1 - 5 1 8 4										
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																				
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC										
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)			MONTH	DAY	YEAR					
YES (If yes, complete EXPECTED SUBMISSION DATE)										X NO										

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single space typewritten lines) (16)

Abstract: 86-001

On January 2, 1986 at 2318 hours and January 3 at 0046 hours with Unit 1 in the hot shutdown mode and reactor power at zero percent, two low water level reactor scram signals occurred. The scrams resulted from a discrepancy between the Wide range and Narrow range reactor level indications. During recovery from a planned turbine trip from 100 percent rated reactor power, the High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) systems were being used to control reactor pressure and level. The HPCI/RCIC panel operator placed the RCIC system in and out of service based on Wide range level instrumentation. The Reactor Protection System (RPS) logic uses the Narrow range level instrumentation. As the reactor pressure and temperature decreased, the density of water in the reference legs of the instruments increased. The length of the Wide range instrument's reference leg water column is greater than the Narrow range column. The combination of increased water density and substantial difference between reference leg water column lengths caused the discrepancy between the Wide and Narrow range level indications. When the Wide range instrumentation indicated level to be above 20 inches, the Narrow range instrumentation value (12.5 inches - low level scram setpoint) caused the RPS to generate a scram signal.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED ONS NO. 3188-0104
EXPIRES 02/1/86

FACILITY NAME (1) Limerick Generating Station Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 5 2 8 6 - 0 1 0 1 - 0 1 0	LER NUMBER (3)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			

TEXT (If more space is required, use additional NRC Form 266A (17))

Unit Conditions Prior to the Event:

Mode 3 (Hot Shutdown)
Reactor Power 0%
Power Ascension Testing in Progress

Description of the Event:

On January 2, 1986 at 2318 hours and at 0046 hours on January 3, low water level scram signals occurred. During recovery from a planned turbine trip from 100 percent rated reactor power, the High Pressure Coolant Injection (HPCI) system was placed in service to maintain reactor pressure. The Reactor Core Isolation Cooling (RCIC) system was intermittently placed in service to control reactor vessel level and pressure. A licensed Reactor Operator was dedicated to the operation of the HPCI and RCIC systems while another licensed Reactor Operator was stationed at the Reactor Console.

The HPCI/RCIC panel operator monitored a Wide range level recorder because the Reactor Operator could not dedicate himself solely to relaying Narrow range level readings due to other responsibilities. The HPCI/RCIC panel operator was aware of a discrepancy between the Wide and Narrow range level instrumentation and therefore maintained reactor level above 20 inches on the Wide range level recorder. The Reactor Protection System (RPS) logic utilized the Narrow range level indication of 12.5 inches (low level scram setpoint) and generated a scram signal at 2318 hours. The scram was reset and operation of the HPCI and RCIC systems was continued to control reactor vessel pressure and level. The Wide range level indication was now maintained above 25 inches; however, at 0046 hours, a second low water level scram signal occurred.

The EIIS code for the affected system, Reactor Protection System (RPS), is JC.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0184

EXPIRES 8/31/86

FACILITY NAME (1) Limerick Generating Station Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 5 2	LER NUMBER (6)			PAGE (3)	
		YEAR 8 6	SEQUENTIAL NUMBER 0 0 1	REVISION NUMBER 0 0		0 3 OF 0 4

TEXT (if more space is required, use additional NRC Form 366a) (17)

Consequences of the Event:

All control rods were in the full-in position prior to these events. The reactor had been shutdown since 2054 hours. The RPS and Nuclear Steam Supply Shutoff System (NSSSS) operated as designed during the reactor water level transient. The HPCI and RCIC system were in service and reactor water level was restored. All other safety systems responded properly. The adverse consequences resulting from this event were minimal.

Cause of the Event:

The cause for the two low water level reactor scram signals was a discrepancy between the Wide range and Narrow range reactor level indications. The Wide range is -150 to 60 inches and the Narrow range is 0 to 60 inches. The Wide and Narrow range level instruments are calibrated for saturated water conditions at rated pressure of 1000 psig. As the reactor pressure and temperature decreased, the density of water in the reference legs of the instruments increased. The length of the Wide range instrument's reference leg water column is greater than the Narrow range column. The combination of increased water density and substantial difference between reference leg water column lengths caused the discrepancy between the Wide and Narrow range level indications.

Although the operators had noticed the discrepant readings, a second scram occurred because the discrepancy between the two ranges of reactor level indication had increased as the reactor pressure decreased.

Corrective Actions:

Communication between the Reactor Operator and the HPCI/RCIC panel operator was enhanced by verbally relaying the Narrow range level indications. When reactor pressure had decreased to a sufficient level, the condensate pumps were used to maintain reactor level and RCIC was secured. Operators continued to control reactor pressure using HPCI.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMS NO 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1) Limerick Generating Station Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 5 2 8 6 -	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		0 0 1	0 0 1	0 0 1	0 0 4	OF	0 4

TEXT (if more space is required, use additional NRC Form 266a (1/7))

Actions Taken to Prevent Recurrence:

Engineering has been assigned the task to investigate the feasibility and merits of design changes that would minimize scram signals when operating under these conditions.

Previous Similar Occurrences:

Limerick LERs 85-083 and 85-073 reported low level reactor scrams, but the causes of the events are not similar.

PHILADELPHIA ELECTRIC COMPANY

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January 31, 1986

Docket No. 50-352

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Washington, DC 20555

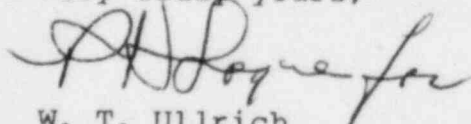
SUBJECT: Licensee Event Report
Limerick Generating Station - Unit 1

This LER concerns two reactor scrams on low level which resulted from a discrepancy between Wide range and Narrow range reactor water level indications.

Reference:	Docket No. 50-352
Report Number:	86-001
Revision Number:	00
Event Date:	January 2, 1986
Report Date:	January 31, 1986
Facility:	Limerick Generating Station P.O. Box A, Sanatoga, PA 19464

This LER is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(iv).

Very truly yours,



W. T. Ullrich
Superintendent
Nuclear Generation Division

cc: Dr. Thomas E. Murley, Administrator, Region I, USNRC
E. M. Kelly, Senior Resident Site Inspector
See Service List

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