



PECO NUCLEAR

A UNIT OF PECO ENERGY

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

10CFR50.73

March 8, 1996
Docket Nos. 50-352
50-353
License Nos. NPF-39
NPF-85

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

SUBJECT: Licensee Event Report
Limerick Generating Station - Units 1 and 2

This LER reports multiple instances of the loss of the safety function of the Control Room Emergency Fresh Air System (CREFAS) resulting in operating conditions prohibited by Technical Specifications. In addition, the automatic start feature of the back up CREFAS subsystem was not available prior to these events resulting in operation outside of the design basis.

Reference:	Docket Nos. 50-352 50-353
Report Number:	1-96-006
Revision Number:	00
Event Dates:	February 07, 1996
Report Date:	March 8, 1996
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)(i)(B) and 10CFR50.73(a)(2)(ii)(B).

Very truly yours,

Robert W. Boyce, Plant Manager

DBN:cah

cc: T. T. Martin, Administrator Region I, USNRC
N. S. Perry, USNRC Senior Resident Inspector, LGS

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LICENSEE EVENT REPORT (LER)

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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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

FACILITY NAME (1) Limerick Generating Station, Unit 1		DOCKET NUMBER (?) 05000 352	PAGE (3) 1 OF 6
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TITLE (4) Control Room Emergency Fresh Air System Inoperable Requiring Entry into TS 3.0.3 As a Result of Flow Switch Coordination Deficiency.

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	
02	07	96	96	-- 006 --	00	03	08	96	Limerick, Unit 2	05000353	
									FACILITY NAME	DOCKET NUMBER	
										05000	

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10)	0	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)			
		20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)			
		20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER			
		20.405(a)(1)(iii)		X 50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text. NRC Form 366A)			
		20.405(a)(1)(iv)		X 50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)					
20.405(a)(1)(v)				50.73(a)(2)(iii)		50.73(a)(2)(x)					

LICENSEE CONTACT FOR THIS LER (12)

NAME J. L. Kantner - Manager Experience Assessment	TELEPHONE NUMBER (Include Area Code) (610) 718-3400
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X	YES (If yes, complete EXPECTED SUBMISSION DATE)		NO		04	15	96

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

During the performance of the 6th Unit 1 refueling outage in 02/96, both trains of the normal Main Control Room (MCR) ventilation (HVAC) system concurrently tripped off several times resulting in loss of the flow path needed to support the operability of the Control Room Emergency Fresh Air System (CREFAS). As a result, Units 1 and 2 entered a condition prohibited by Technical Specifications (TS) Section 3.7.2 for CREFAS. Also the MCR HVAC system was not within the design basis of the plant. The standby MCR HVAC subsystem was not fully capable of automatically starting in the event of a failure of the running subsystem due to a coordination problem in the starting of the supply and return fans. When both subsystems of the MCR HVAC system were out of service and not capable of automatically starting, the CREFAS was not capable of performing its safety function to mitigate an accident. The event date for the first two events reported in this LER is 02/07/96. The actual consequences of these events were minimal since an accident or toxic chemical release did not occur. A cross disciplinary team is performing a root cause investigation of these events. The causes and corrective actions identified by this review will be provided in a revision.

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TEXT CONTINUATION

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

Conditions Prior To The Event

Unit 1 was in Operational Condition (OPCON) 5 (Refuel) prior to the first event. Various refueling outage activities were accomplished during the outage including surveillance testing and minor maintenance on the power supplies and logic associated with the A and B trains of normal and emergency Main Control Room (MCR) heating, ventilation, and air conditioning (HVAC) systems (EIS: VI). Unit 1 started up from the refueling outage at 0221 hours on February 28, 1996.

Unit 2 was in OPCON 1 (Run) prior to and throughout the events described in this report.

Description of the Event

During the performance of the sixth Unit 1 refueling outage in February 1996, both trains of the normal MCR HVAC system concurrently tripped off several times resulting in loss of the flow path needed to support the operability of the Control Room Emergency Fresh Air System (CREFAS). As a result, Unit 1 and Unit 2 entered a condition prohibited by Technical Specifications (TS) Section 3.7.2 for CREFAS. This TS Section does not contain an action statement for the loss of both trains of CREFAS while in OPCONS 1 (RUN), 2 (Startup), or 3 (Hot Shutdown) and therefore the affected unit entered TS Section 3.0.3. TS Section 3.0.3 requires the initiation of a plant shutdown within one hour. Each time the operators were able to quickly restore one of the MCR HVAC trains, thereby restoring one train of CREFAS to an operable status and the unit exited TS Section 3.0.3. A plant shutdown was not initiated as a result of any of these events since one of the trains was restored within one hour following each event.

During the investigation into the events, station personnel determined that the MCR HVAC system was not within the design basis of the plant. The MCR HVAC subsystem that was aligned in the standby mode was not capable of automatically starting in the event of a failure of the running subsystem due to a coordination problem in the starting of the supply and return fans.

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The Limerick Generating Station Updated Final Safety Analysis Report (UFSAR) states that the active components of the safety related MCR HVAC system are designed to meet the single failure criteria. The MCR HVAC system provides the flowpath and recirculation of air through the MCR and provides a flow path for this air to be filtered by the CREFAS filters in the event of an accident involving a radioactive release. Without the automatic start capability of the standby MCR HVAC subsystem, the CREFAS would not be fully capable of mitigating the consequences of an accident with a failure of the other train of CREFAS or a support system or component. Although not discussed in the UFSAR, the MCR operators do have the capability to manually start a MCR HVAC train in such an event.

Additionally, it was determined that the automatic start feature of the MCR HVAC had never been fully tested resulting in a condition not covered by procedures. The preoperational testing did verify that a trip of a single MCR HVAC fan did result in an automatic start of the corresponding fan in the other train.

On February 27, 1996, at 1029 hours, the NRC was notified of this condition per the requirements of 10CFR50.72(b)(1)(B) and 10CFR50.72(b)(1)(C).

This report is being submitted in accordance with the requirements of 10CFR50.73(a)(2)(i)(B) and 10CFR50.73(a)(2)(ii)(B). These events are being reported in the same report since the events involve the same result, the events were the result of common causes, the events occurred over a short period of time, and the events are being investigated collectively by a cross disciplinary team.

Below is a brief description of each of the events.

Event 1

On February 7, 1996, station personnel were performing under voltage testing of the Unit 1 D13 4kV safeguards bus. This 4kV bus provides safeguard power to the A train of MCR HVAC and the A CREFAS subsystem. The A train of the MCR HVAC supply and return fans were in operation prior to the test. A supply fan and a return fan are required to be in service to provide a complete flow path through the MCR. At 0210 hours, the bus was de-energized and then automatically re-energized from the second offsite AC source per the test. When

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the A supply and return fans attempted to restart, the fan motor breaker thermal overload heaters tripped shutting down the fans.

The B train supply and return fans are each automatically started on a low flow condition by separate flow switches located in the discharge of the corresponding fan in the A train (i.e., a trip of the A train supply fan will result in a start of the B train supply fan). Due to inadequate coordination in the starting of the B train supply and return fans, the B return fan started and tripped on low flow several times before the supply fan received a start signal. The B train return fan motor breaker tripped on thermals before the B train supply fan started. The supply fan also tripped on thermals after several attempts to automatically start without a return fan in operation. At this point, both trains of the MCR HVAC system were out of service and there was no flowpath through the MCR for the CREFAS.

The operators reset the thermal overload heater trips and restarted the A train supply and return fans at 0215 hours. The operators recognized that with no MCR HVAC subsystem in service, both trains of the CREFAS were inoperable and that Unit 2 had been in TS 3.0.3. Since Unit 1 was in the refuel mode with no core alterations being performed, there were no TS actions required for Unit 1.

An investigation concluded that the flow switches may need recalibration and maintenance work requests were initiated for the switches. With the A supply fan and the A return fan in service the CREFAS was declared operable and the undervoltage test was completed.

Event 2

Later on February 7, 1996, the D13 LOCA/LOOP testing was being performed. At 1349 hours, the D13 bus was de-energized to prepare for a monitored Emergency Diesel Generator (EDG) start and LOCA/LOOP loading sequence per the test. With a low flow condition in the A supply and A return fan discharge ducts the B supply and return fans received a start signal. However, the B return fan started and tripped on thermals before the B supply fan started. The B return fan then also tripped on thermals. The D13 4kV safeguards bus was re-energized as part of the LOCA/LOOP testing but not before the B trains fans had tripped off. With power restored to the D13 bus, the A supply and return fans automatically restarted at 1353 hours. The

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operators recognized that for a short period of time both trains of the MCR HVAC were out of service and that Unit 2 had entered TS 3.0.3 again. There were no TS actions required for Unit 1.

With the A MCR HVAC back in service, the operators considered both trains of CREFAS operable. The calibration of the flow switches was again believed to be the cause of the tripping of the B train fans and that the A and B trains of CREFAS were operable with the A train of the MCR HVAC system in service.

During the refueling outage additional events involving the loss of the MCR HVAC system occurred. These events will be discussed in detail in a supplement to this report. The supplementary information on each event will be provided within thirty days of the event.

Analysis of the Event

The actual consequences of these events were minimal since an accident or toxic chemical release did not occur requiring the CREFAS to perform its safety function. Potential consequences include the loss of the CREFAS safety function if a condition existed requiring a MCR isolation and CREFAS initiation with a concurrent single active failure. The consequences of this type of transient would have been mitigated by the ability of the MCR operators to restore operation of a CREFAS train and the support systems (e.g., MCR HVAC) either within the MCR or in locations within the CE. Additionally, with no MCR HVAC fans running, there is no addition of toxic gas or radioactive gases or particulates from the outside areas into the MCR thereby limiting the exposure of the operators.

Cause of the Event

A cross disciplinary team is performing a root cause investigation of these events. The causes of these events as identified by this investigation will be provided in a supplement to this LER by April 15, 1996.

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Corrective Actions

On February 27, 1996, the flow switch and the thermal overload heater setpoints were adjusted and testing showed that the MCR HVAC trains were capable of automatically starting as a back up to the running train. These actions were accomplished prior to the restart of Unit 1 following the refueling outage.

The corrective actions for these events as identified by the investigation will be provided in a supplement to this LER by April 15, 1996.

Previous Similar Occurrences

The assessment of previous similar occurrences will be included in the investigation of these events. The results of this assessment will be provided in a supplement to this LER by April 15, 1996.