



# PECO NUCLEAR

A Unit of PECO Energy

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10CFR50.73

May 30, 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 backup CREFAS subsystem was not always available during these events resulting in operation outside of the design basis.

Reference:	Docket Nos. 50-352 50-353
Report Number:	1-96-006
Revision Number:	03
Event Dates:	August 26, 1984 June 22, 1989 February 07, 1996 February 18, 1996 February 23, 1996 February 28, 1996
Report Date:	May 30, 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). This revision provides the description, cause, and corrective actions for an additional event that occurred on February 28, 1996 that was identified during the implementation of corrective actions for the original events. Changes are indicated by a revision bar in the left hand margin.

Very truly yours,

*James S. Kanter for RW Boyce*

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 (2) 05000 352			PAGE (3) 1 OF 14		
TITLE (4) Control Room Emergency Fresh Air System Inoperable Requiring Entry into Tech Spec 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 --	03	05	30	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, LGS								TELEPHONE NUMBER (Include Area Code) (610) 718-3400			
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)											
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	
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 15 single-spaced typewritten lines) (16)											
<p>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. It was determined that the MCR HVAC system was not within the design basis of the plant in that the standby MCR HVAC subsystem was not fully capable of automatically starting. Consequently, the CREFAS was not always capable of performing its safety function to mitigate an accident. Subsequent review of other support systems for CREFAS identified that the Control Structure Chilled Water System (CSCWS) was not appropriately factored into CREFAS operability. The event dates for these events are February 7, 18, 23, and 28, 1996. The actual consequences of these events were minimal since an accident or toxic chemical release did not occur. Startup testing did not verify simultaneous fan starting and station guidance did not adequately account for the interface between the MCR HVAC system, the CSCWS, and the CREFAS. Flow switches were adjusted, station guidance revised, and site staff training is being performed.</p>											

LICENSEE EVENT REPORT (LER)  
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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Limerick Generating Station, Unit 1	05000 - 352	96	-- 006 --	03	2 OF 14

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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 the normal and emergency Main Control Room (MCR) heating, ventilation, and air conditioning (HVAC) systems (EIIIS: 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.

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

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Limerick Generating Station, Unit 1	05000 - 352	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 14
		96	-- 006 --	03	

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

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 did 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).

As part of the corrective actions for these events, the equipment required to support the operability of the CREFAS was reviewed. An additional support system concern was identified during this review. It was recognized that the safety related Control Structure Chilled Water System (CSCWS) was required to support the continued operation of the MCR HVAC trains, and therefore, the CSCWS is needed to support the operability of the CREFAS. The CSCWS includes two independent trains and each train includes a chiller, a circulating pump, and cooling coils on the inlet to the MCR HVAC supply fan. The design of the MCR HVAC system includes an automatic trip of the running supply fan on high air temperature above 70 Degrees F. Without cooling provided by the associated loop of CSCWS, the MCR HVAC supply fan will trip on high temperature resulting in the inoperability of the associated train of CREFAS.

A review was then performed to determine if the trains of CSCWS were operable when required to support the operability of the associated train of CREFAS. It was discovered that the B CSCWS chiller had been out of service on February 28, 1996, when Unit 1 entered OPCIION 2, STARTUP, following the sixth Unit 1 refueling outage. TS Sections 3.7.2 and 3.0.4 prohibit entering OPCIION 2 without both trains of CREFAS operable. As a result, Unit 1 had operated in a condition prohibited by TS. Additionally, the review concluded that the maintenance for the CSCWS chillers required chillers to be out of



LICENSEE EVENT REPORT (LER)  
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FACILITY NAME (1)		DOCKET NUMBER (2)		LER NUMBER (6)			PAGE (3)
Limerick Generating Station, Unit 1		05000 - 352		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 14
				96	-- 006 --	03	

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

service for longer than seven (7) days which exceeds the allowed out of service time for a train of CREFAS per TS Section 3.7.2 ACTION a. As a result, Unit 1 and Unit 2 had operated in a condition prohibited by TS when the chiller was out of service for longer then seven (7) days.

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 undervoltage testing of the Unit 1 D13 4kV safeguard bus. This 4kV bus provides safeguard power to the A train of the 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 the A supply and return fans attempted to restart, the fan motor breakers tripped off due to inadequate coordination in the starting of the A train supply and return fans. The A return fan started and tripped on low flow several times before the supply fan received a start signal. The A train return fan motor breaker tripped on thermal overload before the A train supply fan started. The supply fan also tripped on thermal overload after several attempts to automatically start without a return fan in operation. With the breaker thermal overload heaters tripped, the breaker remained tripped until the operators reset the breaker relay.

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 and supply fans started and tripped on thermal overload conditions just as the A train fans had

LICENSEE EVENT REPORT (LER)  
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FACILITY NAME (1)		DOCKET NUMBER (2)		LER NUMBER (6)			PAGE (3)
Limerick Generating Station, Unit 1		05000 - 352		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 OF 14
				96	-- 006 --	03	

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

done. 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 was in TS 3.0.3 for five (5) minutes. 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 safeguard 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 a thermal overload condition before the B supply fan started. The B supply fan then also tripped on a thermal overload condition. 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 operators recognized that for a short period of time both trains of the MCR HVAC were out of service and that Unit 2 was in TS 3.0.3 again for less than four (4) minutes. There were no TS actions required for Unit 1.

With the A train of the 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.

LICENSEE EVENT REPORT (LER)  
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FACILITY NAME (1)		DOCKET NUMBER (2)		LER NUMBER (6)			PAGE (3)
Limerick Generating Station, Unit 1		05000 - 352		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	6 OF 14
				96	-- 006 --	03	

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

Event 3

On February 16, 1996, the B CREFAS train was declared inoperable and the B train of the MCR HVAC was out of service due to planned maintenance on the associated DC electrical power bus. On February 18, 1996, under the direction of a licensed reactor operator, a non-licensed equipment operator adjusted the water flow of the CSCWS to the A MCR HVAC supply fan cooling coils. This action was taken to increase the temperature in the MCR. When the operator opened the cooling coil bypass valve, the temperature control valve did not respond quickly enough and the air temperature increased in the supply fan discharge duct. The air temperature reached the fan trip setpoint of 70 Degrees F. at 0744 hours and the A supply fan tripped per design. The A return fan then tripped on low flow. The operators restored the A supply and return fans to service by 0746 hours. With the A train of the MCR HVAC tripped and the B train of the MCR HVAC out of service for the DC electrical power bus work, both trains of CREFAS were inoperable. The operators recognized that Unit 2 was in TS Section 3.0.3 for two (2) minutes. Since Unit 1 was in the refuel mode with no core alterations being performed, there were no TS actions required for Unit 1.

When the A supply and return fans were returned to service the operators declared the A CREFAS train operable and TS Section 3.0.3 was exited. A maintenance work request was written for the temperature control valve.

Event 4

On February 23, 1996, operators were preparing for the performance of the D14 LOCA/LOOP test. At 0504 hours the operator secured the A train of the MCR HVAC train by placing the handswitches for the supply and return fans to the OFF position, and attempted to start the B train. The B supply fan tripped on a false high air temperature signal due to a malfunctioning temperature transmitter. The operator started the A supply and return fans but the A return fan tripped on a thermal overload condition due to a low setting on the thermal overload heater. The operator then attempted to start the B supply and return fans but the B return fan tripped on a thermal overload condition. With no MCR HVAC trains in service, Unit 2 entered TS Section 3.0.3. At 0523 hours, the operators were successful at restarting the A supply and return fans and Unit 2 exited TS 3.0.3. Since Unit 1 was in the refuel mode with no core



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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Limerick Generating Station, Unit 1	05000 - 352	96	-- 006 --	03	7 OF 14

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

alterations being performed, there were no TS actions required for Unit 1.

A maintenance work request was written to repair the temperature transmitter. On February 26, 1996, an Engineering Change Request was initiated to review the thermal overload heater settings.

Event 5

On February 23, 1996, during preparations for the D14 LOCA/LOOP, the operators successfully started the B MCR HVAC train with the A train off. The A train supply and return fan handswitches were placed in OFF (rather than in AUTO) because, 1) the flowswitch coordination problem did not affect the manual start capability of the associated train, and 2) a written station position considered a train of CREFAS to be operable with the MCR HVAC train fan handswitches in the OFF position provided that the train was available. During the D14 LOCA/LOOP test, the D14 4kV safeguard bus was de-energized and re-energized per the test. During the automatic restarting of the B MCR HVAC train, the B return fan tripped on a thermal overload condition at 1825 hours. The B supply fan then tripped on low flow. The operator immediately placed the A MCR HVAC train in service by taking the fan handswitches to RUN.

On February 27, 1996, it was realized that the Limerick Generating Station Updated Final Safety Analysis Report (UFSAR) specified that the MCR HVAC system was to be capable of starting automatically and that the MCR HVAC system should be considered a support system required for the operability of the CREFAS. This includes the capability to automatically start following the loss of the running MCR HVAC supply and/or return fans (due to equipment failure or loss of power). With a MCR HVAC fan's handswitch in the OFF position, the associated train was not capable of starting automatically, and the associated CREFAS train should be declared inoperable. Additionally, it was discovered that the automatic fan start was tested with a loss of a single fan at a time and was not tested for a simultaneous trip of the supply and return fans (as would occur with a loss of power). The NRC was then notified that the plant had been operated in a condition outside of the design basis and in a condition not covered by testing procedures.

As a result of the revised station position regarding the operability of the CREFAS subsystem with a MCR HVAC fan handswitch in the OFF



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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				YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Limerick Generating Station, Unit 1		05000 - 352		96	-- 006 --	03	8 OF 14

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

position, the event on February 23, 1996, was considered to be another entry into TS Section 3.0.3 when the B MCR HVAC train tripped.

Unit 1 Start Up

On February 27, 1996, the setpoints for the MCR HVAC fan motor flow switches and thermal overload heaters were adjusted and testing showed that the MCR HVAC trains were capable of automatically starting as a back up to the running train. A review of the safety related HVAC systems was performed to determine if a similar fan flow switch coordination problem existed. The review identified that the Auxiliary Equipment Room (AER) HVAC system was susceptible to the same problem. A review of the flow switch settings revealed that the supply and return fan start up coordination problem should not exist. Additionally, the review concluded that the AER HVAC system is not required to be capable of starting automatically to support the operability of any TS equipment. With the potentially generic issues resolved and both trains of the CREFAS and the supporting MCR HVAC trains operable, Unit 1 entered OPCIION 2 and started up from the refueling outage at 0211 hours on February 28, 1996.

Event 6

Later on February 27, and several times on February 28, 1996, the B MCR HVAC supply fan spuriously started with the A train in service. Troubleshooting was being performed to determine if a flow switch was malfunctioning. A technician was checking the flow switch that trips the A MCR HVAC supply fan on low flow when a spurious trip signal occurred and tripped the A supply fan at 1858 hours on February 28, 1996. The B supply fan started but the operators secured the fan because the B CSCWS chiller was out of service. With the B CSCWS chiller out of service, the B supply fan would eventually trip on high air temperature. The A supply fan low flow trip signal was jumpered out and the A supply and return fans were restarted at 1943 hours.

With no MCR HVAC train in service, both trains of CREFAS were inoperable. As a result, Unit 2 had entered TS Section 3.0.3. Since Unit 1 had entered OPCIION 2 on February 28, 1996, at 0211 hours, Unit 1 had also entered TS Section 3.0.3. Both units were in TS Section 3.0.3 for forty-five (45) minutes. Both units exited TS Section 3.0.3 at 1943 hours when the A supply and return fans were restarted.

LICENSEE EVENT REPORT (LER)  
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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Limerick Generating Station, Unit 1	05000 - 352	96	-- 006 --	03	9 OF 14

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

To avoid future spurious automatic starts of the B supply fan, the B CSCWS chiller was restored and the B supply and return fans were placed in run with the A fans in auto.

Event 7

With the realization that the MCR HVAC trains need to be capable of starting automatically and the flow switch coordination prevented this capability, it was recognized that Unit 1 and Unit 2 had been operating outside of the design bases since issuance of the operating licenses (i.e., August 26, 1984 for Unit 1 and June 22, 1989 for Unit 2). Additionally, with the standby train of the MCR HVAC not capable of automatically starting, one train of CREFAS was inoperable. This condition also existed since issuance of the operating licenses resulting in operation prohibited by TS Section 3.7.2.

Event 8

On February 28, 1996 at 0131 hours, the B CSCWS chiller was removed from service and the motor breaker removed to investigate a spurious breaker alarm. The B chiller is required to support the availability of the B train of MCR HVAC and the operability of the B train of CREFAS. The operators did not declare the B train of CREFAS inoperable since at that time the chiller was not known to be a support system for the CREFAS. At 0211 hours on February 28, 1996, Unit 2 entered OPCON 2 with the B train of CREFAS inoperable. This was an operation prohibited by TS Sections 3.7.2 and 3.0.4 which require both trains of CREFAS to be operable prior to entering OPCON 2. It was decided to restore the B chiller to service when the A MCR HVAC supply fan tripped at 1858 hours. The B chiller was returned to service at 1928 hours on February 28, 1996, before Unit 1 entered OPCON 1.

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

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Limerick Generating Station, Unit 1	05000 - 352	96	-- 006 --	03	10 OF 14

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

the MCR or in locations within the Control Structure. 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

The primary causes of these events are:

- 1) The startup testing of the MCR HVAC system did not verify that the standby MCR HVAC train was fully capable of automatically starting on failure of the operating train. As a result, the coordination problem with the flow switches and the undersized thermal overload heaters was not discovered and corrected prior to startup.
- 2) A written station position did not consider single failure criteria and incorrectly concluded that a train of MCR HVAC did not need to be capable of automatically starting. The station position considered that the availability of a supply and return fan was adequate to support the operability of the CREFAS, irrespective of the AC power supply. The startup testing actually performed supported this conclusion. The UFSAR also did not clearly state that the MCR HVAC system was needed for the operability of the CREFAS. This established an incorrect understanding of the MCR HVAC system and its relationship to the CREFAS on the part of the station staff. Furthermore, since the support function of the MCR HVAC system was not understood, the support function of the CSCWS was also not tied to the operability of the CREFAS. As a result, CREFAS operability and TS actions were not considered during decisions to work on or test the MCR HVAC system or the CSCWS.

A brief discussion of the cause(s) for each event is provided below:

## Event 1:

This event occurred because the MCR HVAC flow switches were not properly coordinated to allow the simultaneous start of a MCR HVAC supply and return fan and the thermal overload heaters were undersized.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Limerick Generating Station, Unit 1	05000 - 352	96	-- 006 --	03	11 OF 14

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

## Event 2:

This event also occurred due to the flow switch and thermal overload heater equipment problems. Additionally, the station staff did not recognize the full impact of the lack of the standby start capability due to the incorrect understanding created by the startup test and the station position. Corrective actions to resolve the flow switch and thermal overload heater concerns were not fully completed since the impact on the operability of the CREFAS was not recognized. Conscious decisions were made regarding the ability of the MCR HVAC system to provide a flow path for the CREFAS and that immediate corrective actions were considered sufficient to maintain the CREFAS operable.

## Event 3:

This event occurred as a result of; 1) a lack of procedural guidance for operating the CSCWS cooling coil bypass valve, 2) a design deficiency in the adequacy of the temperature control subsystem, 3) an inadequate knowledge of the MCR HVAC trip functions on the part of the operators, 4) an incorrect understanding of the relationship between the MCR HVAC system and the CREFAS. If the operators or the operations shift supervision knew that manipulation of the bypass valve could result in a trip of the MCR HVAC train and that the remaining train of CREFAS would be affected, the task would not have been performed.

## Event 4:

This event occurred as a result of a failed temperature transmitter as well as the same causes for event 2.

## Event 5:

This event occurred as a result of the same causes as event 2.

## Event 6:

This event occurred as a result of: 1) a defective flow switch that prompted troubleshooting of the flow switches, 2) a failure of the flow switch during connection of a test recorder, and 3) a less than adequate assessment of the potential impact of the troubleshooting on the MCR HVAC system, the CREFAS and the CSCWS. If the technicians,



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Limerick Generating Station, Unit 1	05000 - 352	96	-- 006 --	03	12 OF 14

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

the technicians supervision, or the operations shift supervision knew that the troubleshooting could result in a trip of the MCR HVAC train and that the remaining train of CREFAS would be affected, the task would not have been performed.

## Event 7:

This condition occurred as a result of the inadequate startup testing of the MCR HVAC system and a less than adequate review of the support function of the MCR HVAC system on the part of the station staff prior to startup. As a result, the coordination problem with the flow switches and the undersized thermal overload heaters was not discovered and corrected prior to startup.

Event 8

This event occurred as a result of an incorrect understanding of the relationship between the MCR HVAC system, the CSCWS, and the CREFAS. The root causes for this event are closely tied to the causes for Events 2, 3, 5, and 7 discussed above.

Corrective Actions

Below is a description of the corrective actions taken or planned with the associated event listed at the end of the action.

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. (Events 1, 2, 4, and 7)

The UFSAR section describing the MCR HVAC system and the CREFAS will be reviewed and revised as necessary to increase the clarity of the information. (Events All)

The written station position regarding the MCR HVAC system was deleted and the appropriate station personnel, including the licensed operators, were informed that the position was deleted. The operators were informed that a train of MCR HVAC is a support subsystem required for the corresponding train of CREFAS to be considered operable. (Events 2, 3, 4, 5, 6, and 7)

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Limerick Generating Station, Unit 1	05000 - 352	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	13 OF 14
		96	-- 006 --	03	

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

Similar written station positions will be reviewed for accuracy and revised as necessary. (Events 2, 3, 4, 5, 6, and 7)

The appropriate station personnel will be informed of the correct relationship between the MCR HVAC system and the CREFAS and other aspects of the operation and trip functions of the MCR HVAC system and the CREFAS. (Events All)

The procedure for operating the CSCWS cooling water bypass valve will be reviewed and revised as necessary to provide steps for manual operation of the temperature control function. (Event 3)

An evaluation is being performed to consider replacing the high temperature trip of the MCR HVAC supply fan with an alarm. (Events 3 and 4)

The defective temperature transmitter on the B MCR HVAC supply fan was replaced on February 23, 1996. This failure is considered to be a random failure and no additional actions are planned. (Event 4)

The defective flow element for the automatic start function of the B MCR HVAC supply fan was replaced on April 3, 1996. This failure is considered to be a random failure and no additional actions are planned. (Event 6)

The defective flow switch for the A MCR HVAC supply fan was replaced on February 29, 1996, and will be evaluated for the failure mechanism. This failure is considered to be an isolated failure and no additional actions are planned. (Event 6)

A review of the HVAC systems was performed and determined that only the AER HVAC system could have a similar fan coordination problem and the appropriate corrective actions were taken. This concern had no impact on the operability of TS equipment. (Events 1, 2, 4, 5, and 7)

The CREFAS support equipment, the startup testing, and current testing requirements will be reviewed to ensure the appropriate equipment is identified and appropriate testing was and is being performed. This will include a review of the CREFAS support systems to ensure that these systems are being properly maintained to support the operability of the CREFAS. A supplement to this report will be provided if additional support system concerns are identified

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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 (MNB 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)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Limerick Generating Station, Unit 1	05000 - 352	96	-- 006 --	03	14 OF 14

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

resulting in the inoperability of the CREFAS. (Events 1, 2, 4, 5, 6, and 7)

A review of other thermal overload heater setpoints is being performed. (Events 1, 2, 4, 5 and 7)

A revision to the UFSAR was evaluated and approved to allow for operator actions under specific conditions in considering the operability of the CREFAS system. This evaluation utilized the guidance of NRC Generic Letter 91-18, Information Regarding NRC Inspection Manual on Operability. (Events 5 and 7)

A memo was issued to the Licensed Operators informing them that the CSCWS chillers are required to be operable to support the operability of the CREFAS. A separate memo will be issued to the appropriate station personnel informing them that the trains of the CSCWS are required to be operable when the associated train of CREFAS is required to be operable per TS Section 3.7.2. (Event 8)

The appropriate station procedures will be reviewed, and revised as necessary, to ensure the ties between the CSCWS, the MCR HVAC system, and the CREFAS are considered. (Event 8)

The scheduling for maintenance of the CSCWS will be reviewed to include the allowed out of service time limitations of TS Section 3.7.2. A review of the program that implements the Maintenance Rule will be performed to ensure the support systems for the CREFAS are appropriately considered. (Event 8)

The appropriate training programs will be reviewed, and revised as necessary, to address the ties between the CSCWS, the MCR HVAC system, and the CREFAS. (Event 8)

A review of the support functions that the CSCWS provides to other safety related systems is being performed to ensure the appropriate TS ACTIONS are considered when the CSCWS is not operable. A supplement to this report will be provided if additional support system concerns are identified resulting in the inoperability of other TS systems. (Event 8)

Previous Similar Occurrences

None