

PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION
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J. DOERING, JR.
 PLANT MANAGER
 LIMERICK GENERATING STATION

April 07, 1992
 Docket No. 50-352
 License No. NPF-39

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

SUBJECT: Licensee Event Report
Limerick Generating Station - Unit 1

This LER reports a condition prohibited by Technical Specifications (TS) due to equipment malfunction. Repair of an inverter necessitated deenergizing the inverter and entry into TS Section 3.0.3 because the 'D' Low Pressure Injection system, 'B' Core Spray Subsystem, and High Pressure Coolant Injection (HPCI) system could not be assured to meet TS response time requirements.

Reference:	Docket No. 50-352
Report Number:	1-92-002
Revision Number:	00
Event Date:	March 14, 1992
Report Date:	April 07, 1992
Facility:	Limerick Generating Station P.O. Box 2300, Sanatoga, PA 19464-0920

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

Very truly yours,

JLP:cah

cc: T. T. Martin, Administrator, Region I, USNRC
 T. J. Kenny, USNRC Senior Resident Inspector, LFS

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Limerick Generating Station, Unit 1 DOCKET NUMBER (2) 0 5 0 0 0 3 5 2 1 OF 0 3 PAGE (3)

TITLE (4) Condition prohibited by Technical Specifications resulted from repair of cooling fan for inverter that powers ECCS logic.

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 (9)		
03	14	92	92	002	00	04	07	92		0 5 0 0 0 0 0 0 0 0 0 0		

OPERATING MODE (9) 1

POWER LEVEL (10) 1 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 2. (Check one or more of the following) (11)

<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 20.405(a)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.73(a)(1)(i)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)
<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)	<input type="checkbox"/> 50.73(a)(2)(vi)	<input type="checkbox"/> OTHER (Specify in Remarks Section 4.10 of Form NRC Form 366)
<input type="checkbox"/> 20.405(a)(1)(iv)	<input checked="" type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(vii)(A)	
<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(vii)(B)	
<input type="checkbox"/> 20.405(a)(1)(vi)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME: G. J. Madsen, Regulatory Engineer, Limerick Generating Station

TELEPHONE NUMBER: 211 15 3 12 7 1 - 11 12 0 10

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
B15	BIO	INVERT	T214	YES					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If not, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)

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

On March 11, 1992, the cooling fan for the E21-K601D inverter was discovered to be inoperable. Repair of the inverter required its de-energization. Preliminary engineering review showed that the 'D' Low Pressure Coolant Injection system, the 'B' Core Spray Subsystem, and the High Pressure Coolant Injection system may not be able to meet response time requirements specified in Technical Specifications (TS) because of a time delay in the re-energization of the backup power supply to the E21-K601D inverter. A Regional Temporary Waiver of Compliance was requested and granted during a teleconference conducted on March 13, 1992, that involved a temporary extension of the time limit specified in TS Section 3.0.3 from 1 hour to 4 hours to allow time to repair the inverter before requiring a plant shutdown. The inverter repair was performed on March 14, 1992. The repair resulted in entering TS Section 3.0.3 because the TS ACTION for TS Section 3.5.1 could not be met. The actual consequences of this event was minimal because an accident condition did not occur during the time the inverter was under repair and because sufficient Emergency Core Cooling Systems were available. Discussions held with the inverter manufacturer confirmed that the E21-K601D inverter could fail at any time if operation continued without the cooling fan in service due to elevated equipment temperature and that the fan should be replaced. The cooling fan failed due to normal wear and preventive maintenance tasks are being developed to replace inverter cooling fans.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
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TEXT (if more space is required, use additional NRC Form 388A (1-117))

Unit Conditions Prior to the Event:

Unit 1 was in Operational Condition 1 (Power Operation) at 100% power level.

The 'A' Low Pressure Coolant Injection (LPCI) system (EISS:B0) was inoperable but available because of problems with its associated minimum flow valve. The residual heat removal function of this LPCI pump was unaffected by the minimum flow valve problem.

During normal rounds on the evening of March 11, 1992, an operator noted that the E21-K601D inverter (EISS:INVT) was running hotter than expected. Subsequent investigation identified that the cooling fan (EISS:FAN) for the E21-K601D inverter was inoperable. This inverter converts Division 4 DC power to AC power to supply power to control circuits and initiation logic of various Emergency Core Cooling Systems (ECCS). Should the E21-K601D inverter fail, backup power is supplied automatically by Division 4 safeguard AC power. The repair was expected to take 2-4 hours to complete during which time the inverter would be de-energized and Division 4 safeguard AC power would supply the loads of the E21-K601D inverter which includes the initiation logic for the HPCI system, 'D' LPCI system, and 'B' Core Spray Subsystem (CSS). Preliminary engineering review showed that the 'D' LPCI system, 'B' CSS, and HPCI system may not be able to meet response time requirements specified in TS because of a time delay in re-energization of the backup AC power supply associated with the starting and loading of the D14 Emergency Diesel Generator (EDG, EISS:EK) following a Loss of Coolant Accident (LOCA) signal. This time delay would result in a 3 second delay of the initiation of the 'D' LPCI system and 'B' CSS and could result in an increase of the HPCI system response time of up to 13 seconds. Accordingly, the 'D' LPCI system, 'B' CSS, and HPCI system would be rendered inoperable, TS Section 3.5.1 ACTION c.1 could not be satisfied, and TS Section 3.0.3 would be entered. A Regional Temporary Waiver of Compliance was requested and approved during a teleconference conducted on March 13, 1992, at 1930 hours, that involved a temporary extension of the time limit specified in TS Section 3.0.3 from 1 to 4 hours to allow time to repair the inverter before requiring a plant shutdown.

Description of the Event:

At 0248 hours on March 14, 1992, the E21-K601D inverter was removed from service after all conditions for the Regional Temporary Waiver of Compliance were satisfied. The 'D' LPCI system, 'B' CSS, and the HPCI system were declared inoperable because they could not be assured to meet TS Surveillance Requirements (TSSR) 4.3.3.3 and TS Section 3.0.3 was entered. The cooling fan was replaced and the inverter was re-energized at 0453 hours. Following administrative completion of the work order, the 'D' LPCI system, 'B' CSS, and the HPCI system were declared operable and TS Section 3.0.3 was exited at 0536 hours. This LER is being submitted in accordance with the requirements of 10CFR50.73(a)(2)(i)(B) since this event resulted in a condition prohibited by TS.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REGION NUMBER			
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TEXT IF MORE SPACE IS REQUIRED, USE ADDITIONAL NRC Form 866A (11)

Analysis of the Event:

The actual consequences of this event was minimal in that an accident condition did not occur during the time that the 'A' and 'D' LPCI systems, the 'B' CSS, and the HPCI system were inoperable. If an accident had occurred during the E21-K601D inverter cooling fan repair, sufficient ECCS were available to maintain safe shutdown of the reactor and mitigate the consequences of an accident as analyzed in the Limerick Generating Station Updated Final Safety Analysis Report, Section 6.3, and a General Electric Company analysis documented in NEDO-24708, "Additional Information Required for NRC Staff Generic Report on Boiling Water Reactors." Additionally, the response time of the 'D' LPCI system, 'B' CSS, and the HPCI system would be only slightly impacted as a result of the time delay in the initiation logic re-energization. These systems would have supplied full flow at rated pressures in response to the LOCA. Though not part of the ECCS, the Reactor Core Isolation Cooling system (EII:BN), Feedwater system (EII:SJ), Condensate system (EII:SD), and all safety relief valves (EII:RV) were operable.

Cause of the Event:

Discussions held with the inverter manufacturer on March 13, 1992, confirmed that the E21-K601D inverter could fail at any time if operation continued without the cooling fan in service due to elevated equipment temperature and that the fan should be replaced. De-energization of the E21-K601D inverter to perform the cooling fan repair resulted in a condition where the 'D' LPCI system, 'B' CSS, and the HPCI system could not be assured of meeting TSSR 4.3.3.3. The inverter cooling fan failure was assessed to be the result of normal wear.

Corrective Actions:

The cooling fan for the E21-K601D inverter was replaced on March 14, 1992. Other inverters were inspected to ensure their operation was at expected equipment temperatures. Preventive Maintenance tasks are being developed to replace the cooling fans on a schedule of approximately 3 to 5 years. In addition, a review of the Technical Specifications requirements associated with ECCS is being performed to determine if any changes or clarifications are required if an associated inverter that powers ECCS logic is removed from service.

Previous Similar Occurrences:

None

Tracking Codes: B15 - Failure due to normal wear