

## PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION  
 P. O. BOX A  
 SANATOGA, PENNSYLVANIA 19464  
 (215) 327-1200 EXT. 2000

J. DOERING, JR.  
 PLANT MANAGER  
 LIMERICK GENERATING STATION

February 6, 1991  
 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 - Unit 2

This LER reports a condition prohibited by Technical Specifications (TS) in that the required TS ACTION for an inoperable primary containment penetration conductor overcurrent protective device had not been performed within the specified time period due to a personnel error.

Reference:	Docket Nos. 50-353
Report Number:	2-91-001
Revision Number:	00
Event Date:	December 3, 1990
Discovery Date:	January 7, 1991
Report Date:	February 6, 1991
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)(i)(B).

Very truly yours,

JKP/cah

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

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Limerick Generating Station, Unit 2	DOCKET NUMBER (2) 0 5 0 0 0 3 5 3	PAGE (3) 1 OF 0 5
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TITLE (4) A condition prohibited by TSs due to an inoperable overcurrent protective device and the required TS ACTION was not performed within the required time period.

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)																																			
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<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;">OPERATING MODE (9) 1</td> <td colspan="11">THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)</td> </tr> <tr> <td rowspan="5">POWER LEVEL (10) 1 0 0</td> <td>20.402(b)</td> <td>20.405(c)</td> <td>50.73(a)(2)(iv)</td> <td>73.71(b)</td> </tr> <tr> <td>20.405(a)(1)(i)</td> <td>50.36(a)(1)</td> <td>50.73(a)(2)(v)</td> <td>73.71(c)</td> </tr> <tr> <td>20.405(a)(1)(ii)</td> <td>50.36(a)(2)</td> <td>50.73(a)(2)(vii)</td> <td rowspan="3">OTHER (Specify in Abstract below and in Text, NRC Form 366A)</td> </tr> <tr> <td>20.405(a)(1)(iii)</td> <td>X 50.73(a)(2)(i)</td> <td>50.73(a)(2)(viii)(A)</td> </tr> <tr> <td>20.405(a)(1)(iv)</td> <td>50.73(a)(2)(ii)</td> <td>50.73(a)(2)(viii)(B)</td> </tr> <tr> <td>20.405(a)(1)(v)</td> <td>50.73(a)(2)(iii)</td> <td>50.73(a)(2)(ix)</td> <td></td> </tr> </table>												OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)											POWER LEVEL (10) 1 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)	20.405(a)(1)(i)	50.36(a)(1)	50.73(a)(2)(v)	73.71(c)	20.405(a)(1)(ii)	50.36(a)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)	20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	20.405(a)(1)(iv)	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)(ix)	
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LICENSEE CONTACT FOR THIS LER (12)											
NAME G. J. Madsen, Regulatory Engineer, Limerick Generating Station										TELEPHONE NUMBER 2 1 5 3 2 7 - 1 2 0 0	

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
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO														

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

On January 7, 1991, Instrumentation & Controls (I&C) personnel identified a condition which was prohibited by Technical Specifications (TS). A Unit 2 Primary Containment penetration conductor overcurrent protective device was not calibrated to the TS (Section 3.8.4.1) required tolerance when it was installed as a replacement for a defective overcurrent protective device on December 3, 1990 and the required TS ACTIONS were not taken. The overcurrent protective device is an instantaneous magnetic circuit breaker (D234-R-E-10) that is aligned to the Unit 2 A2 drywell unit cooler fan and protects the electrical penetration in the primary containment wall. The replacement breaker for the A2 drywell unit cooler fan was incorrectly calibrated on December 3, 1990 in accordance with procedure PMQ-093-007, "Preventive Maintenance Procedure for Testing and Calibration of 480V Molded Case Circuit Breakers." This procedure did not differentiate between TS and non-TS required circuit breakers which have different allowable tolerances. In addition, maintenance personnel and operations personnel failed to perform the Surveillance Test (ST) which requires the operability of the circuit breaker. The PMQ-093-007 procedure will be revised to include a note specifying that ST procedure ST-8-093-320-1 or 2 shall be performed for the TS required circuit breakers. A review of the remaining PMQ procedures will be conducted to identify if any other similar problems exist. This event will be reviewed with the maintenance planners and operations personnel.

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

Unit Conditions Prior to the Event:

Unit 2 Operating Condition was 1 (Power Operation) at 100% power level

Description of the Event:

On January 7, 1991 at approximately 1400 hours, Instrumentation & Control (I&C) personnel identified that a Unit 2 primary containment penetration conductor overcurrent protective device was not calibrated to the Technical Specifications (TS) (Section 3.8.4.1, "Electrical Equipment Protective Devices") required tolerance. The device was calibrated on December 3, 1990, and was installed as a replacement for a defective overcurrent protective device. The overcurrent protective device is an instantaneous magnetic circuit breaker (D234-R-E-10) (EIIS:BKR) for the Unit 2 A2 drywell unit cooler fan (EIIS:BK). This device protects the primary containment electrical penetration assembly and the associated electrical equipment in the primary containment from over current electrical faults which could cause damage to the assembly or equipment. The replacement breaker for the A2 drywell unit cooler fan was calibrated on December 3, 1990, in accordance with procedure PMQ-093-007, "Preventive Maintenance Procedure for Testing and Calibration of 480V Molded Case Circuit Breakers." This procedure specified a wider tolerance range for the instantaneous magnetic circuit breaker (+40%/-25% of the startup current) than the TS required tolerance (+20%/-20% of the startup current). As a result, one phase of the replacement breaker was set at a trip value which was greater than the 20% TS required tolerance. This procedure did not make any differentiation between the tolerance requirements for TS required circuit breakers and non-TS required circuit breakers. However this procedure was not intended for use on TS required equipment.

As a result, when maintenance personnel installed the new TS required circuit breaker on December 3, 1990, the setpoint was set at a value higher than the TS required setpoint. In addition, maintenance personnel did not satisfy the TS Surveillance Requirements (SR) of the circuit breaker in accordance with SR 4.8.4.1.a.2. The Surveillance Test (ST) Procedure, (ST-8-093-320-2, "480 VAC Primary Containment Penetration Overcurrent Protection Operability Test") for the breaker was not performed. The breaker was then turned over to operations personnel for the Operational Verification Form (OVF) test. On December 4, 1990 operations personnel tested the breaker by starting the associated A2 Drywell unit cooler fan. When the Unit Cooler Fan was started, it immediately tripped. The OVF was declared unsatisfactory by operations personnel and a new Maintenance Request Form (MRF) was initiated to investigate the cause of the fan trip. Operations personnel did not specify that procedure ST-8-093-320-2 needed to be performed on the newly installed circuit breaker at this time and therefore the incorrect tolerances on the circuit breaker were not identified. The circuit breaker for the A2 drywell unit cooler fan was not declared

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TEXT (If more space is required, use additional NRC Form 366A 2) (17)

inoperable at this time (December 4, 1990) and the associated ACTIONS required by TS section 3.8.4.1 for the circuit breaker were not implemented within the specified time period.

On January 7, 1991, while a Testing Branch technician was preparing to troubleshoot the cause of the fan trip, he discovered that the instantaneous breaker had been replaced without performing the ST procedure to verify the operability of the breaker. The technician contacted I&C personnel who notified operations shift supervision of the inoperable breaker. Upon discovery of the evolution of the above event, the required TS Action 3.8.4.1.a was initiated by operations personnel. Operations personnel then entered the TS Action for TS Section 3.8.4.1. The TS action required to be implemented was to restore the protective device to operable status or deenergize the circuit(s) within 72 hours or be in hot shutdown within the next 12 hours. The setpoint on the circuit breaker was adjusted to be within the TS required tolerance and the breaker was verified for operability following the performance of procedure ST-8-093-320-2. The circuit breaker was declared operable on January 10, 1991 at 0930 hours, 68 hours after it was declared inoperable.

On January 7, 1991, this event was determined to be reportable since the circuit breaker was not declared inoperable on December 3, 1990 by operations personnel and the associated action for TS Section 3.8.4.1 was not implemented within the required time period. The failure to perform the required TS Action resulted in a condition prohibited by TS and as a result, this report is being submitted in accordance with 10CFR50.73(a)(2)(i)(B).

Analysis of the Event:

The drywell unit cooler system contains eight unit coolers and each unit cooler contains two redundant fans. The purpose of the Drywell Unit Cooler System is to remove heat from the drywell and to provide for hydrogen mixing following a Loss of Coolant Accident (LOCA). During normal power operation, one fan in each unit cooler is normally operating in conjunction with the drywell chilled water system to remove heat from the drywell with the second fan in standby. The standby fan starts automatically upon loss of the lead fan, as sensed by a low air flow element located in the discharge duct. The redundant A1 Drywell Unit Cooler fan was placed in service during the time period that the A2 Drywell Unit Cooler fan was aligned to the out of calibration instantaneous magnetic circuit breaker. The A1 fan would have been available for hydrogen mixing in the event of LOCA. Furthermore, if the A2 fan with the out of calibration breaker had been placed in service and an electrical fault had occurred, the thermal magnetic circuit breaker, which is in series with the A2 instantaneous magnetic breaker, would have tripped in time to protect the penetration assembly. Therefore, the penetration would have remained unaffected and containment integrity would have been maintained.



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Cause of the Event:

Various causes were identified that contributed to this event. These causes are listed in the order of occurrence:

1. The PMQ calibration procedure did not make any differentiation between TS required circuit breakers and non-TS required circuit breakers. The PMQ-093-007 procedure was deficient in that it did not include a note specifying that ST-8-093-320-2 be performed to verify the operability of the TS required circuit breakers.
2. The MRF planner did not include performance of the Surveillance Test (ST) in the plan to replace the new instantaneous magnetic circuit breaker. The MRF planner was unaware of the ST and the TS requirements and therefore did not include the ST procedure in the plan.
3. Shift Supervision incorrectly assumed that the cause of the breaker trip was due to a unit cooler fan problem, and not a breaker problem. As a result, only the drywell unit cooler fan was declared inoperable.
4. The Shift Technical Assistant (STA) reviewing the work performed on December 3, 1990, incorrectly determined that the breaker had been satisfactorily calibrated under the PMQ procedure. The testing requirements for this circuit breaker would normally consist of a bench calibration and a functional test of the affected plant equipment. Since the work described on the Maintenance Request Form was a breaker calibration, the STA only specified a functional test of the unit cooler fan. He did not consider any further testing to be necessary. Since procedure ST-8-093-320-2 consists of performing a bench calibration, which is similar to the testing performed, it is possible that the STA would not have specified this additional testing even if he had referred to the ST.

Corrective Actions:

The following corrective actions are being implemented to prevent recurrence:

1. The PMQ-093-007 procedure will be revised to include a note specifying that procedure ST-8-093-320-1 or 2 shall be performed for the TS required circuit breakers. Furthermore, procedure PMQ-093-004, "Preventive Maintenance Procedure for the 480 VAC Magnetic Starters" will also be revised to specify performance of ST-8-093-320-1 or 2 for the TS listed circuit breakers. These procedures are expected to be revised by March 11, 1991.
2. Additional information will be added to the PM base line database to identify that the appropriate ST procedures need to be performed on the TS

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containment penetration breakers. The PM baseline information is utilized by the MRF planner when identifying the scope of work associated with circuit breaker maintenance. This task is expected to be completed by March 11, 1991.

3. A review of the remaining Electrical PMQ and ST procedures will be conducted to identify any similar conditions. If any other problems are identified, the procedures will be revised accordingly. This review is expected to be completed by March 11, 1991.
4. This event will be reviewed with the maintenance organization. The T.S. requirements for electrical equipment will also be discussed. This action is expected to be completed by February 20, 1991.
5. An on-shift training memo was written to the STAs concerning this event. This memo includes the requirements to perform the Technical Specifications Surveillance Requirement under the appropriate ST, and to verify primary containment penetration overcurrent protective device operability.
6. A Training Needs Analysis Form has been issued to incorporate a discussion of this event and its causes in continuing Licensed Operator training.

Previous Similar Occurrences:

None

Tracking Codes: A09 - Failure to properly interpret information/results.  
001 - Incorrect procedure.