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PECO ENERGY

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10CFR 50.73

November 2, 1994
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 an event that resulted in a condition prohibited by Technical Specifications (TS) in that one Core Spray System (CSS) subsystem was inoperable and the required TS actions were not taken within the required time. This event occurred as a result of personnel error that incorrectly specified a fuse to be removed from the CSS subsystem automatic start logic.

Reference:	Docket No. 50-353
Report Number:	2-94-009
Revision Number:	00
Event Date:	August 29, 1994
Discovery Date:	October 3, 1994
Report Date:	November 2, 1994
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).

Very truly yours,

Robert W Boyce

DBN:cah

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

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NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

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

TITLE (4) A Core Spray Subsystem was inoperable and the Required Tech Spec Actions Not Taken When a Fuse Was Incorrectly Specified to be Removed by a Clearance

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 5 0 0 0
0 8	2 9	9 4	9 4	- 0 0 9	- 0 0	1 1	0 2	9 4		0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IN SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
1		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	0 9 8	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 (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)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
J. L. Kantner - Manager, Experience Assessment, LGS	6 1 0 7 1 8 - 3 4 0 0

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
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On 10/3/94, station personnel identified that the Unit 2 'A' Core Spray System (CSS) subsystem had been inadvertently rendered inoperable during planned maintenance on the D21 Emergency Diesel Generator (EDG). Between 8/29/94 and 9/6/94, an approved clearance incorrectly specified removal of a fuse from the D21 EDG breaker auxiliary control power circuit that would prevent the 'A' CSS subsystem from automatically starting. The Technical Specifications (TS) actions were not taken, resulting in a condition prohibited by TS. No transients occurred requiring the affected equipment to perform its design function. The cause of the incorrect clearance was a less than adequate review of the impact of the removal of the fuse by the clearance preparer and reviewer, both licensed operators. Additionally, a non-licensed Instrumentation and Controls work planner incorrectly recommended this fuse be removed. Clearances that would be used in the future for similar maintenance work are being revised to indicate the correct fuse. The recommended blocking contained in the work order library and all scheduled copies for similar work have been revised to ensure the correct blocking is specified. The expectation that recommended blocking is to be researched to ensure that accurate blocking is specified in the clearances will be reinforced to appropriate individuals.

Unit Conditions Prior to the Event:

Unit 2 was in Operational Condition 1 (Power Operation) at 98% full coastdown power.

Description of the Event:

On August 29, 1994 at 0445 hours, the Unit 2 D21 Emergency Diesel Generator (EDG, EIIS:EK) was removed from service and declared inoperable in preparation for scheduled preventive maintenance work involving the vendor recommended five (5) year overhaul. Operations personnel removed the D21 EDG from service in accordance with an approved clearance that included tagging out several switches, breakers and fuses. This clearance included removal of the fuse (EIIS:FU) in the D21 EDG breaker auxiliary control power circuit. On September 6, 1994, at 2145 hours, the clearance was removed including reinstallation of the fuse. The clearance had been applied for eight (8) days and seventeen (17) hours.

On October 2, 1994, the Unit 2 D23 EDG was removed from service and declared inoperable in preparation for scheduled preventive maintenance work also involving the five (5) year overhaul. The clearance used for the D23 EDG had been developed using the clearance written for the D21 EDG and also included removal of the corresponding fuse in the D23 EDG breaker auxiliary control power circuit. Operations personnel removed the fuse at 0311 hours on October 3, 1994.

Later on October 3, 1994, an Instrumentation and Controls (I&C) technician was reviewing the clearance and the associated equipment status in preparation of work on the D23 EDG. The technician questioned certain D23 status light indications that were not normally illuminated for the five (5) year overhaul clearances. Investigation by I&C technical support and Operations personnel determined that the fuse was the cause of the additional status light indications and that this fuse should not be removed for the intended work. The fuse was reinstalled and the clearance was revised by 1230 hours on October 3, 1994. The D23 fuse had been removed for approximately nine (9) hours.

A preliminary review of the D23 EDG electrical circuits indicated that the Unit 2 'C' Residual Heat Removal (RHR, EIIS:BO) pump motor and the 'C' Core Spray System (CSS, EIIS:BM) pump motor control circuits were inoperable. With the 2C CSS pump inoperable, the 2A CSS subsystem was also inoperable since the 2A CSS subsystem is comprised of the 'A' and 'C' CSS pumps. The 2C RHR subsystem and the 2A CSS subsystem were declared inoperable until the fuse was reinstalled.

A detailed analysis of the affect of removing the fuse from an EDG breaker auxiliary control power circuit was then performed by station Technical and Operations personnel. The analysis concluded that, in addition to the associated EDG being inoperable, the removed fuse rendered the instrumentation logic associated with the affected EDG inoperable. As a result, the corresponding divisional RHR pump motor breaker and the CSS pump motor breaker would not automatically close following a Loss of Coolant Accident (LOCA) initiation signal, regardless of offsite or onsite 4KV AC power availability. With the fuse removed, the most limiting Technical Specifications (TS) Limiting Condition for Operation (LCO) Action requirements are TS 3.3.3.b (Action 30), and TS 3.5.1.a.1. These TS actions require that with the CSS subsystem instrumentation inoperable to declare the CSS subsystem inoperable per TS Section 3.5.1. With one CSS subsystem inoperable, provided that at least two Low Pressure Coolant Injection (LPCI) subsystems are operable, the TS action is to restore the inoperable CSS subsystem to operable status within seven (7) days or be in at least hot shutdown within the next twelve (12) hours and in cold shutdown within the following twenty-four (24) hours. Operations personnel verified that all of the appropriate TS actions for the D23 EDG clearance were taken within the required times, with the fuse removed and re-installed.

Later on October 3, 1994, it was determined that the D23 EDG clearance was based on the D21 EDG clearance implemented in August 1994. It was then recognized that the D21 EDG clearance had been applied for longer then the time limits of the TS Section 3.5.1.a.1 action requirement and the TS actions were not taken within the required time. As a result, a condition prohibited by TS had occurred. Therefore, this report is being submitted in accordance with the requirements of 10CFR50.73(a)(2)(i)(B).

Analysis:

The actual and potential consequences of this event were minimal and there was no release of radioactive material as a result of this event. No transients occurred requiring the affected equipment to perform its design function while the fuse was removed.

The affect of the removed fuse was limited to the equipment powered from the 4KV AC safeguard power bus associated with the EDG that was removed from service for scheduled preventive maintenance. The Limerick Generating Station (LGS) design for each unit includes four (4) independent 4KV AC safeguard power buses each with 2 offsite power sources, an EDG, a 100% capacity LPCI pump, a 50% capacity CSS pump, and a 4KV load center. The LGS accident analysis includes the total loss of a 4KV AC safeguard power bus and associated loads. The remaining three (3) divisions of AC power and safety related loads assure the ability to achieve and maintain safe shutdown in the event

of accident. Therefore, the affect of the removed fuse is bounded by the existing analysis in the LGS Updated Final Safety Analysis Report (UFSAR).

The overall affect of the removed fuse was the loss of the automatic functions of the involved 4KV AC safeguard bus resulting in the inoperability of the associated EDG, LPCI subsystem and CSS subsystem. Manual operation of the offsite feeder breakers and the 4KV loads was still available. There were no other EDGs or Emergency Core Cooling Systems inoperable when the fuse was removed for the D21 and D23 EDGs. A review of the clearances for the other EDGs verified that the clearance error was limited to the D21 and D23 EDGs.

The removal of the fuse caused the following specific affects on the associated division equipment.

- The 4KV, 480V, and 120V loads would not have load shed following a LOCA initiation signal.
- The shunt trip breakers of the non-essential loads fed from the 4KV safeguards bus would not have functioned.
- The EDG trip bypass circuitry would not have activated. The trip bypass is designed to remove non-essential EDG electrical trip functions following a LOCA initiation signal.
- The 4KV load center breaker would not have reclosed if tripped.
- The 4KV bus feeder breaker and EDG output breaker automatic transfer would not have occurred if one or both offsite AC power sources became unavailable.
- The automatic sequencing of the emergency loads on to the 4KV bus would not have occurred if a LOCA initiation signal had occur.

Cause of the Event:

The cause of the incorrect clearance was a less than adequate review of the impact of the removal of the fuse by the clearance preparer and reviewer. The preparer is a licensed reactor operator and the reviewer is a licensed senior reactor operator. Additionally, a non-licensed I&C planner incorrectly recommended this fuse be removed during the work planning process. The clearance preparer and reviewer were misled by the planner's suggested blocking and assumed that the planner had performed the necessary reviews to determine the necessary blocking.

In the preparation of the work for the D21 EDG, the I&C planner provided recommended blocking in the work order including removal of

the fuse. The planner misinterpreted the drawings and wrote the wrong fuse in the work order. The clearance writer used the recommended blocking information in the development of the clearance for the D21 EDG work. Neither the clearance preparer nor the reviewer performed an adequate review to determine the impact of removing the fuse. Per the Clearance and Tagging Manual, the clearance preparer and reviewer are responsible for ensuring each clearance is accurate and appropriate including verification that the clearance does not compromise the operability of other required equipment. Since the planner provided the suggested blocking, the clearance preparer and reviewer concluded that a detailed technical review was unnecessary.

In the case of the clearance for the D23 EDG work, the clearance preparer used the D21 EDG clearance as a basis for the development of the D23 EDG clearance and also specified the removal of the fuse. The error in the D23 EDG was not discovered by the clearance preparer or reviewer.

Corrective Actions:

The individuals involved in the preparation and review of the D21 and D23 EDG clearances have been counseled on the expectation to perform the necessary research in order to fully understand the effect of the clearance. The other individuals who are or could be involved in clearance writing activities will be informed of the event and the corrective actions. The expectation that recommended blocking is to be researched to ensure that accurate blocking is specified in the clearances will be reinforced to these individuals. These actions are ongoing and will be fully completed by April 30, 1995.

The recommended blocking contained in the work order library and in all scheduled copies of the five (5) year overhaul preventive maintenance work orders for all eight (8) LGS EDGs has been revised to ensure the correct blocking is specified for the future EDG five (5) year overhauls.

The clearance for the D23 EDG was revised on October 3, 1994 to reflect the correct fuses for removal. The clearance/work order used for the D21 EDG work will be annotated prior to generation of the next five (5) year EDG overhaul clearance to indicate that the flawed D21 clearance is not to be used in developing future clearances.

A review of future recommended blocking in a sampling of scheduled work orders will be performed to determine if further actions are warranted. This review will be completed by November 30, 1994.

Previous Similar Occurrences:

None