



Commonwealth Edison
Dresden Nuclear Power Station
R.R. #1
Morris, Illinois 60450
Telephone 815/942-2920

May 8, 1991

EDE LTR #91-282

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Attached please find Licensee Event Report #89-027-1. This revised report provides an update concerning corrective actions taken concerning this event. The event described in this report is a postulated loss of Low Pressure Coolant Injection (LPCI) motor control centers resulting from a unique and extremely remote Diesel Generator (DG) voltage regulator failure during a design basis Loss of Coolant Accident (LOCA), concurrent with a Loss of Offsite Power, due to an original construction design deficiency. This concern was originally identified at the Northern States Power Monticello facility. Review of this event with the Corporate Nuclear Licensing staff resulted in it being classified as a voluntary LER due to its generic applicability.

E. D. Eenigenburg
Station Manager
Dresden Nuclear Power Station

EDE/ade

Enclosure

cc: A. Bert Davis, Regional Administrator, NRC Region III
File/NRC
File/Numerical

(ZDVR/208)

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LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1) Dresden Nuclear Power Station, Unit 2
 Docket Number (2) 0 15 10 10 10 12 13 17
 Page (3) 1 of 0 4

Title (4) Postulated LPCI Swing Bus Loss Resulting From Diesel Generator Voltage Regulator Failure Due to Design 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 Names		Docket Number(s)		
10	12	89	89	0217	01	11	10	89	Dresden Unit 3		0 15 10 10 10 12 14 19		
										N/A		0 15 10 10 10 11 11	

OPERATING MODE (9) N
 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)
 20.402(b) 20.405(a)(1)(i) 20.405(a)(1)(ii) 20.405(a)(1)(iii) 20.405(a)(1)(iv) 20.405(a)(1)(v)
 20.405(c) 50.36(c)(1) 50.36(c)(2) 50.73(a)(2)(i) 50.73(a)(2)(ii) 50.73(a)(2)(iii)
 50.73(a)(2)(iv) 50.73(a)(2)(v) 50.73(a)(2)(vii) 50.73(a)(2)(viii)(A) 50.73(a)(2)(viii)(B) 50.73(a)(2)(x)
 73.71(b) 73.71(c) X Other (Specify in Abstract below and in Text) Voluntary

LICENSEE CONTACT FOR THIS LER (12)
 Name: Ismael Rivera, Jr., Technical Staff System Engineer Ext. 2549
 TELEPHONE NUMBER: AREA CODE 8 1 5 9 4 2 1 - 2 19 12 10

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)
 Expected Submission Date (15) _____
 Yes (If yes, complete EXPECTED SUBMISSION DATE) X NO

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

On October 12, 1989 with Unit 2 and Unit 3 in the run mode near full rated core thermal power, it was determined that a postulated failure of the Diesel Generator (DG) voltage regulators during a design basis Loss of Coolant Accident (LOCA), concurrent with a Loss of Offsite Power (LOOP), could render Low Pressure Coolant Injection (LPCI) System Motor Control Centers (MCCs) 29-7/28-7 (Unit 2) or 39-7/38-7 (Unit 3) incapable of performing their intended function. It is postulated that during the LOCA/LOOP, an output voltage regulator failure occurs following the start and initial loading of the Unit DG. The postulated regulator failure is such that the voltage is maintained below that required to carry the LPCI MCC loads, but greater than the voltage required to initiate the automatic low voltage MCC transfer logic. This then results in the loss of the LPCI subsystem and the Division II Core Spray system. The root cause of this event has been attributed to an original construction design deficiency. The safety significance of this postulated failure is minimal because this sequence of events is unique and extremely remote. Corrective action included development of an Operator response procedure, Operator training, and initiation of design reviews. This concern had not been previously identified at the Dresden facility. This event is being reported as a voluntary LER due to its generic applicability.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [XX]

This is postulated to result in loss of the LPCI subsystem. Additionally, it is postulated that the degraded MCC 29-7/28-7 (39-7/38-7) voltage causes degraded voltage on the associated DG-backed 4 KV bus 24-1 (34-1) feeding the MCCs. This is postulated to result in loss of the Division II Core Spray system. Consequently, only the Division I Core Spray system would be available to provide low pressure Emergency Core Cooling System (ECCS) injection.

As immediate corrective action, a memo was written and issued to licensed shift Operations personnel describing this problem. Subsequently, on October 13, 1989, Dresden General Abnormal Procedure (DGA-5), Degraded Voltage on MCC 29-7/28-7 (39-7/38-7) Due to a Failure of the Unit 2(3) Diesel Generator Voltage Regulator During a LOCA/LOOP Event, was written and approved to inform and instruct the Operators in appropriate steps to mitigate this scenario. Also, training was provided on DGA-5 for Operations personnel.

Subsequently, two additional concerns were raised about degraded voltage conditions that could affect the MCC 29-7/28-7 (39-7/38-7) bus equipment operability. They are overvoltage and underfrequency of bus voltage. A revision to the procedure was written and approved on October 17, 1989 to incorporate and mitigate the consequences of these additional concerns.

No equipment was declared inoperable nor was there any actual component failure during this event.

C. APPARENT CAUSE OF EVENT:

Review of this event concluded that this issue did not meet the reporting requirements of 10CFR 50.73(a)(2)(ii) or 10CFR 50.72(b)(1)(ii) because it did not result in an unanalyzed condition that significantly compromised plant safety, due to the unique and extremely remote nature of this postulated scenario. Additionally, this type of failure mechanism was not included in the original design basis. However, it was determined that it should be reported as a voluntary LER due to its generic applicability. A courtesy NRC Emergency Notification System call was completed at 1504 hours on October 12, 1989. The root cause of this event has been attributed to an original construction design deficiency.

D. SAFETY ANALYSIS OF EVENT:

The sequence of events postulated is unique and extremely remote. First, a design basis LOCA must occur; second, a LOOP must occur; and third, the DG output must degrade to a point where equipment function is affected, but the voltage must remain above the trip point for the LPCI MCC 29-7/28-7 (39-7/38-7) automatic transfer circuit. To be of concern, this degradation must occur after the DG is powering the emergency bus. The degradation must also occur before the LPCI injection valve has opened. This time window is less than 40 seconds for the bounding case. The probability of these events occurring individually over the life of the plant is low, and the probability of them occurring simultaneously, within the short time window necessary for DG degradation to be of concern, is conservatively judged to be extremely low (upper bound of 1.2 E-8/year to 3 E-8/year).

Surveillances are performed in accordance with Technical Specification 4.9.D.1 to assure DG operability. Surveillance on the DG auto start and load, including the LPCI MCC 29-7/28-7 (39-7/38-7) transfer, are performed each refueling outage in accordance with Technical Specification 4.9.D.4.

The DGs are also monitored continuously during operation. Significant degradation in the DG output voltage or frequency during accident conditions would result in a Control Room alarm to alert the Operator. In addition, bus undervoltage (approximately 70%) is alarmed separately in the Control Room.

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TEXT Energy Industry Identification System (EIS) codes are identified in the text as [XX]

DGA-5 has been written and implemented to provide the Operators with symptoms by which to recognize the failure of LPCI MCCs 29-7/28-7 (39-7/38-7) to transfer when required. Immediate and subsequent Operator actions to diagnose the condition and effect a transfer from the degraded power source are provided in these procedures.

E. CORRECTIVE ACTIONS:

The immediate corrective action was to issue a memo to licensed shift Operations personnel describing this concern. Subsequently, procedure DGA-5, Degraded Voltage on MCC 29-7/28-7 (39-7/38-7) Due to a Failure of the Unit 2(3) Diesel Generator Voltage Regulator During a LOCA/LOOP Event, was written, approved, and then revised to inform and instruct the Operators in the appropriate steps to mitigate this postulated event (237-200-89-15401).

In addition, an engineering study was performed concerning a modification to correct this design deficiency. The possibilities evaluated included additional protective relays or powering the involved MCCs via an Uninterruptible Power Supply (UPS). Under Modification 12-2(3)-89-053, Under/Over Voltage and Under/Over Frequency Relays were subsequently installed on the LPCI MCCs 29-7/28-7 (39-7/38-7). Unit 3 was completed on January 22, 1990 and Unit 2 was completed on November 7, 1990.

F. PREVIOUS EVENTS:

This issue developed from an INPO Operating Experience notification concerning a similar concern at the Northern States Power Monticello facility. This concern had not been previously identified at the Dresden site.

G. COMPONENT FAILURE DATA:

As this event did not involve actual component failure, this Section is not applicable.