

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8707210914 DOC. DATE: 87/07/17 NOTARIZED: NO DOCKET #  
 FACIL: 50-331 Duane Arnold Energy Center, Iowa Electric Light & Pow 05000331  
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 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 87-009-00: on 870527, emergency diesel generator B shut down when large pump started during simulated automatic actuation test. Caused by inadequate const acceptance procedure. Procedure revised. W/870717 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 4  
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
	PD3-1 LA	1 1	PD3-1 PD	1 1
	CAPPUCCI, A.	1 1		
INTERNAL:	ACRS MICHELSON	1 1	ACRS MOELLER	2 2
	AEOD/DOA	1 1	AEOD/DSP/NAS	1 1
	AEOD/DSP/ROAB	2 2	AEOD/DSP/TPAB	1 1
	DEDRO	1 1	NRR/DEST/ADE	1 0
	NRR/DEST/ADS	1 0	NRR/DEST/CEB	1 1
	NRR/DEST/ELB	1 1	NRR/DEST/ICSB	1 1
	NRR/DEST/MEB	1 1	NRR/DEST/MTB	1 1
	NRR/DEST/PSB	1 1	NRR/DEST/RSB	1 1
	NRR/DEST/SGB	1 1	NRR/DLPQ/HFB	1 1
	NRR/DLPQ/QAB	1 1	NRR/DOEA/EAB	1 1
	NRR/DREP/RAB	1 1	NRR/DREP/RPB	2 2
	NRR/PMAS/ILRB	1 1	NRR/PMAS/PTSB	1 1
	<u>REG FILE</u> 02	1 1	RES DEPY GI	1 1
	RES TELFORD, J	1 1	RES/DE/EIB	1 1
	RGNS FILE 01	1 1		
EXTERNAL:	EG&G GROH, M	5 5	H ST LOBBY WARD	1 1
	LPDR	1 1	NRC PDR	1 1
	NSIC HARRIS, J	1 1	NSIC MAYS, G	1 1

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) <b>Duane Arnold Energy Center (DAEC)</b>	DOCKET NUMBER (2) <b>0 5 0 0 0 3 3 1</b>	PAGE (3) <b>1 OF 0 3</b>
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TITLE (4)  
**Emergency Diesel Generator Trip Due to Incorrect Relay Setting**

EVENT DATE (5)			LER NUMBER (8)			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	27	8	7	0	0	7	17	None		0 5 0 0 0
0	5	27	8	7	0	0	7	17			0 5 0 0 0

OPERATING MODE (9) <b>N</b>	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)											
POWER LEVEL (10) <b>0 1 0 1 0</b>	20.402(b)			20.406(c)			50.73(a)(2)(iv)			73.71(b)		
	20.406(a)(1)(i)			50.38(c)(1)			<input checked="" type="checkbox"/> 50.73(a)(2)(v)			73.71(c)		
	20.406(a)(1)(ii)			50.38(c)(2)			50.73(a)(2)(vii)			OTHER (Specify in Abstract below and in Text, NRC Form 365A)		
	20.406(a)(1)(iii)			50.73(a)(2)(i)			50.73(a)(2)(viii)(A)					
	20.406(a)(1)(iv)			50.73(a)(2)(ii)			50.73(a)(2)(vii)(B)					
	20.406(a)(1)(v)			50.73(a)(2)(iii)			50.73(a)(2)(ix)					

LICENSEE CONTACT FOR THIS LER (12)									
NAME <b>Jeffrey C. Thorsteinson, Technical Support Supervisor</b>							TELEPHONE NUMBER <b>3 1 9 8 5 1 1 - 7 2 3 8</b>		
AREA CODE <b>3 1 9</b>									

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	
D	EIK	DGC	470	Y							

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)		
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)				<input checked="" type="checkbox"/> NO		
				MONTH	DAY	YEAR

ABSTRACT (Limit to 400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On May 27, 1987, with the reactor shutdown for refueling, the 'B' Emergency Diesel Generator ('B' EDG) automatically shut down when a large pump was started during performance of a simulated automatic actuation test. The intermediate cause was an incorrect setpoint on a newly installed phase differential overcurrent (PDO) relay. The root cause was an inadequate construction acceptance procedure, within which a test provided in the manufacturer's instruction manual adjusted the relay setpoint during testing but did not call for returning it to the design value. As corrective action, the procedure was modified and performed again such that the setpoints on the PDO relays for both EDGs were left at the correct value. The other EDG had not yet been tested. Subsequent research determined the EDGs would have been able to support required safeguard loads during the time the PDO relays had incorrect setpoints. Following a re-examination of it's reportability, this event is being reported pursuant to 10 CFR 50.73(a)(2)(v)(D).

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FACILITY NAME (1)  Duane Arnold Energy Center (DAEC)	DOCKET NUMBER (2)  0   5   0   0   0   3   3   1	LER NUMBER (8)			PAGE (3)	
		YEAR 8   7	SEQUENTIAL NUMBER -   0   0   8	REVISION NUMBER -   0   0	OF	

TEXT (If more space is required, use additional NRC Form 388A's) (17)

On May 27, 1987, the 'B' Emergency Diesel Generator ('B' EDG, EK-DG-1G21, EIIS System Code EK) automatically shut down during the performance of a simulated automatic actuation test for Loss of Coolant Accident-Loss of Offsite Power (LOOP/LOCA). The reactor was shutdown for a refueling outage at the time of the test. The test is typically performed at the end of such an outage in order to fully verify operation of safety equipment under LOOP/LOCA conditions. The intermediate cause of the trip was an incorrect setpoint on a newly installed phase differential overcurrent (PDO) relay (BBC Brown Boveri, Inc., Type ITE-87M, EIIS Component Code EK-87-187/DG2).

The intermediate cause of the trip was the loading of the 700 hp 'B' Core Spray (EIIS System Code BM) pump motor (BM-P-211B). The starting of this large motor produced a bus transient of sufficient magnitude to cause the phase differential overcurrent relay to trip the EDG. The relay was incorrectly left at its most sensitive setting during construction acceptance testing. The simulated automatic actuation test includes the entire sequence of loading that an EDG would be required to perform for a Loss of Coolant Accident. The reactor safeguard systems required for fuel moving had already been loaded on the EDG and did not trip the EDG.

The root cause of the trip was an inadequate construction acceptance procedure. The procedure required performance of an acceptance test provided within the manufacturer's instruction manual. This acceptance test adjusted the setpoint of the relay as part of the test, but contained no provision for returning the setpoint to its original value. The setpoint was not adjusted and returned to the value specified in the design documents as part of the remaining construction acceptance procedure. An inspection of the 'A' EDG noted that the setpoint of its newly installed phase differential overcurrent relay was also incorrect due to this problem. The 'A' EDG had not yet been tested for the simulated automatic actuation.

As corrective actions, the construction acceptance procedure was modified such that the setpoints on both 'A' and 'B' EDG phase differential overcurrent relays were adjusted and left at the level specified in the design documents. The procedure was then performed again. The unique nature of this incident does not appear to warrant further corrective action or programmatic changes. The manufacturer of the relays is being informed of this incident. To further eliminate the possibility of spurious trips, a surge current protector was installed in each of the relays. This device is basically an inductor which acts to impede the surge currents that can affect the electronics of the relay.

The phase differential overcurrent relays act to protect the EDG from a phase-to-phase or phase-to-ground fault. The phase differential overcurrent relays originally installed in the EDG's were later found to be not recommended for seismic applications. In response to this, the original relays were removed from the control circuit and an effort initiated to find a suitable replacement. The replacements discussed in this report were installed in the current refueling outage in March and April (into the EDG 'A' and 'B' circuitry, respectively).

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (8)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Duane Arnold Energy Center (DAEC)	09999331	877	000089	0000	0023 OF 0033

(If more space is required, use additional NRC Form 388A's) (17)

The two EDG's are designed to provide power to reactor safeguard loads in the event of a loss of offsite power. During the period in which the new relays were installed the EDG's were required to be operable to support the Standby Gas Treatment System (SGTS, EIS System Code BH) and the Standby Filter Unit (SFU, EIS System Code VI) during fuel movement. When the SGTS and the SFU were required to be operable, the large motors on the essential bus were not capable of automatically loading onto the EDG's. The EDG's would have been able to support the reactor safeguards system loads that were required at the time as demonstrated by the test on May 27, 1987. Therefore, there was no potential for an effect on the health and safety of the public.

A review of past events at the DAEC indicates that we have not experienced problems with the EDG simulated automatic actuation test. This event was initially considered non-reportable, as the EDG's would have supported the required safety functions during the period the phase differential overcurrent relays were set incorrectly. At the request of the site Resident Inspector, the reportability of this event was re-examined. This report is being submitted pursuant to 10 CFR 50.73 (a)(2)(v)(D) as an event which, "regardless of the plant mode or power level, and regardless of the significance of the structure, system, or component that initiated the event" resulted in an event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident.

Iowa Electric Light and Power Company

July 17, 1987  
DAEC-87-0770

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

Subject: Duane Arnold Energy Center  
Docket No. 50-331  
Op. License DPR-49  
Licensee Event Report No. 87-009

Gentlemen:

In accordance with 10 CFR 50.73 please find attached a copy of the subject Licensee Event Report.

Very truly yours,



7/17/87

Rick L. Hannen  
Plant Superintendent - Nuclear

RLH/JCT/go

Attachment - LER 87-009

cc: Mr. A. Bert Davis  
Regional Administrator  
Region III  
U. S. Nuclear Regulatory Commission  
799 Roosevelt Road  
Glen Ellyn, IL 60137

NRC Resident Inspector - DAEC

File A-118a

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