REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8706150125 DOC. DATE: 87/06/05 NOTARIZED: NO DOCKET #
FACIL: 50-331 Duane Arnold Energy Center, Iowa Electric Light & Pow 05000331
AUTH. NAME AUTHOR AFFILIATION
BLAIR, D. P. Iowa Electric Light & Power Co.
MINECK Iowa Electric Light & Power Co.
RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 87-013-00: on 870508 & 09, w/all fuel removed from vessel, full reactor protection sys trips received. Caused by inadequate pre-work review of current sys status & faulty relay. Personnel counseled & relay replaced. W/870605 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	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES 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/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
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	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	REG FILE 02	1	1
	RES DEPY GI	1	1	RGN3 FILE 01	1	1
EXTERNAL:	EG&G GROH, M	5	5	H ST LOBBY WARD	1	1
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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)
Duane Arnold Energy Center (DAEC)	0 5 0 0 0 3 3 1	1 OF 0 3

TITLE (4)
Reactor Protection System Trips

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 8	8 7	8 7	— 0 1 3	—	0 0	0 6	0 5	8 7	None	0 5 0 0 0
											0 5 0 0 0

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 0 0	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
		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)	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
Douglas P. Blair	AREA CODE 3 1 9 8 5 1 - 7 2 0 4

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
X	J C	R L Y	G 0 8 0	YES					

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 May 8 and 9, 1987, with all fuel removed from the vessel, two full Reactor Protection System (RPS) trips were received. An intermediate cause of each event is too few inputs to the Average Power Range Monitoring (APRM) Subsystem.

On May 8, 1987, a full RPS trip occurred when Motor Control Center 1B42 was de-energized for preplanned maintenance. Power was lost to the 'B' RPS logic as expected (resulting in a 'B' RPS trip). However, due to other preplanned maintenance on the Local Power Range Monitoring System (LPRM), too few inputs were available to APRM C and an APRM INOP trip occurred in the 'A' RPS. As a corrective action, 1B42 was re-energized and the full RPS trip was reset. The root cause of the event was inadequate pre-work review of the current system status.

On May 9, 1987, a full RPS trip occurred when the 'A' RPS Motor Generator (MG) Set tripped due to a faulty relay and too few inputs were available to APRM D because of LPRM maintenance. As a corrective action, the relay was replaced on May 12, 1987. The root cause of the relay failure is unknown.

In both events the control rod drive hydraulic control units were electrically disabled and no control rod motion occurred. There was no affect on the health and safety of the public. These events are being reported pursuant to 10 CFR 50.73(a)(2)(iv).

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NRC Form 366
(9 83)

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
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Duane Arnold Energy Center (DAEC)	0 5 0 0 0 3 3 1	8 7	— 0 1 3	— 0 0	0 2 OF 0 3

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

On May 8 and 9, 1987, with all fuel removed from the vessel, two full Reactor Protection System trips were received. Although the root cause of each event is different, an intermediate cause of each event is too few inputs to the Average Power Range Monitoring Subsystem (APRM).

At 1217 hours on May 8, 1987, a full Reactor Protection System (RPS, EIIS System Code JC) trip was received due to too few inputs to Average Power Range Monitor (APRM, EIIS Code IG) C. The Control Rod Drive (CRD, EIIS System Code AA) hydraulic control units were electrically disarmed and no control rod motion occurred. The full RPS trip was reset at 1247 on the same day.

This full RPS trip was received when Motor Control Center (MCC) 1B42 was de-energized for preplanned maintenance. When 1B42 was de-energized, the power was lost to the 'B' RPS Logic System as expected. The anticipated consequence of this action was a 'B' RPS trip. The 'B' RPS system also powers one-half of the Local Power Range Monitor (LPRM, EIIS System Code IG) inputs to the 'C' APRM. Due to other preplanned maintenance on the LPRM System, too few inputs were available to APRM 'C' and an APRM INOP trip occurred in the 'A' RPS. This trip completed the logic for a full RPS trip. As a corrective action, 1B42 was re-energized following completion of the maintenance to restore power to the 'B' RPS logic. This action allowed the full RPS trip to be reset.

The APRM subsystem has six (6) channels, each of which averages input signals from a number of LPRM's (80 total). APRM channels A, C, and E are associated with the 'A' Reactor Protection trip system; APRM channels B, D and F are associated with the 'B' Reactor Protection trip system. APRM channels E and F average output signals from 20 LPRM's each. APRM channels A and B average outputs from 20 shared LPRM's and APRM channels C and D share and average outputs from the remaining 20 LPRM's. APRM's A, B, C, and D required a minimum of nine (9) LPRM Inputs. APRM's E and F require a minimum of thirteen (13) LPRM inputs. An APRM INOP trip occurs when less than the minimum required LPRM's are available.

Another intermediate cause of the RPS trip on May 8, 1987 was a procedural deficiency. Operating Instruction (OI) No. 304.2, 4160V/480V Essential Electrical Distribution System, does not contain information to alert personnel to the possibility of a full RPS trip if too few inputs are available to the APRMs due to MCC switching operations or maintenance on the LPRM System. As a corrective action, OI 304.2 will be revised to include this information. The root cause of the event was inadequate pre-work review of the current system status prior to de-energizing 1B42. Operations and maintenance personnel were reminded to thoroughly review the current system status while planning or conducting maintenance.

At 1806 hours on May 9, 1987, a full Reactor Protection System (RPS) trip occurred due to too few inputs to Average Power Range Monitor (APRM) D. The control rod drive hydraulic control units were electrically disarmed and no control rod motion occurred. The RPS trip was reset at 1810 hours the same day.

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Duane Arnold Energy Center (DAEC)	0 5 0 0 0 3 3 1	8 7	— 0 1 3	— 0 0	0 3 OF 0 3

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

This full RPS trip occurred when the 'A' RPS Motor Generator (MG) Set tripped due to a failed General Electric CR120A type relay (JC-RLY-C71-6-1K). The root cause of the failure is unknown. The 'A' RPS system supplies power to one-half of the inputs to APRM D. A full RPS trip occurred because other preplanned maintenance on the LPRM system had resulted in too few inputs being available to APRM D. The APRM INOP trip on the 'B' RPS combined with the 'A' RPS MG Set trip completed the logic for a full RPS trip.

As an immediate corrective action, the 'A' RPS System was aligned with its alternate power supply and the RPS trip was reset. The failed relay was replaced on May 12, 1987. The 'A' RPS System power was transferred from the alternate supply to the 'A' RPS MG Set on May 26, 1987.

A search of the LER database revealed two events that were similar in nature to those identified in this report. In January, 1984 a reactor scram occurred due to too few LPRM inputs on APRM's A and B. The cause of the event was an LPRM power supply failure (see LER 84-008). The root cause of the power supply failure could not be determined. In July, 1985, two full RPS trips occurred when MCC 1B42 tripped open while being loaded. The 'B' RPS System lost power as expected. However, APRM E momentarily spiked upscale completing the logic for a full RPS trip in one event, and two few APRM inputs completed the full RPS trip logic in the other event. The cause of both events was an unattached trip coil on a breaker feeding 1B42. (See LER 85-024).

In the events on May 8 and 9, 1987, the RPS responded per design. The vessel was defueled and the control rod drive hydraulic control units were electrically disarmed. As a result, no control rod motion occurred. There was no affect on the safe operation of the plant, nor was there any affect on the health and safety of the public. These events are being reported pursuant to 10 CFR 50.73(a)(2)(iv).

Iowa Electric Light and Power Company

June 5, 1987
DAEC-87-0691

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. 87-013

Gentlemen:

In accordance with 10 CFR 50.73 and 10 CFR 21 please find attached a copy of the subject Licensee Event Report.

Very truly yours,

Daniel L. Mineck
Plant Superintendent - Nuclear

DLM/DPB/go

Attachment - LER 87-013

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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