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U.S. NUCLEAR REGULATORY COMMISSION

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DOCKET NUMBER: 50-331

FILE NUMBER: INCIDENT REPORT

TO: MR J G KEPPLER

FROM: IOWA ELEC LIGHT & POWER CO
CEDAR RAPIDS, IOWA
g g hunt

DATE OF DOCUMENT: 6-10-76

DATE RECEIVED: 6-14-76

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DESCRIPTION
LTR TRANS THE FOLLOWING.....

ENCLOSURE
LICENSEE EVENT REPORT (RO 76-37) 50-331/
ON 6-1-76 RE MCPR REACHED 1.759 AND ONE
REACHED 1.689 BOTH EXCEEDING TECH SPEC....

DO NOT REMOVE

ACKNOWLEDGED

PLANT NAME: DUANE ARNOLD

1PG 4ENCL

NOTE: IF PERSONNEL EXPOSURE IS INVOLVED
SEND DIRECTLY TO KREGER/J. COLLINS

SAFETY	FOR ACTION/INFORMATION	ENVIRO 6-15-76 RB
X BRANCH CHIEF:	G. LEAR	
W/3 CYS FOR ACTION		
X LIC. ASST:	C. PARRISH	
W/ CYS		
ACRS CYS HOLDING/SENT TO LA		

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CONTROL NUMBER: 6042

IOWA ELECTRIC LIGHT AND POWER COMPANY

DUANE ARNOLD ENERGY CENTER
P. O. Box 351
Cedar Rapids, Iowa 52406

June 10, 1976
DAEC -76 -189

Mr. James G. Keppler, Director
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission - Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Subject: Licensee Event Report No. 76-37
(30 day)

File: A-118a

Dear Mr. Keppler:

In accordance with Appendix A to Operating License DPR-49, Technical Specifications and Bases for Duane Arnold Energy Center and Regulatory Guide 10.1, please find attached a copy of the subject Licensee Event Report. (Total of 3 copies transmitted)

Very truly yours,

G. G. Hunt ECH

G. G. Hunt
Chief Engineer
Duane Arnold Energy Center

Docket 50-331
attachment
GGH/DLW/mg

cc: (Director, Office of Inspection and Enforcement)(30)
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Director, Management Information and Program Control (3)
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

6042

LICENSEE EVENT REPORT

CONTROL BLOCK: [ ] (1–6)

(PLEASE PRINT ALL REQUIRED INFORMATION)

	LICENSEE NAME	LICENSE NUMBER	LICENSE TYPE	EVENT TYPE
01	IADAC1	00-00000-00	41111	03
(7–8)	(9–14)	(15–25)	(26–30)	(31–32)

	CATEGORY	REPORT TYPE	REPORT SOURCE	DOCKET NUMBER	EVENT DATE	REPORT DATE
01 CONT		L	L	050-0331	061017	061076
(7–8)	(57–58)	(59)	(60)	(61–68)	(69–74)	(75–80)

EVENT DESCRIPTION

02 During control rod withdrawals, two MCPR violations occurred. First
03 one, MCPR reached 1.759 (limit 1.761); second one, MCPR reached 1.689
04 (limit 1.717). Group 42 rods inserted one notch in both cases to re-
05 turn MCPR within limits. (RO 76-37).
06

	SYSTEM CODE	CAUSE CODE	COMPONENT CODE	PRIME COMPONENT SUPPLIER	COMPONENT MANUFACTURER	VIOLATION
07	RC	D	ZZZZZZ	Z	Z999	Y
(7–8)	(9–10)	(11)	(12–17)	(43)	(44–47)	(48)

CAUSE DESCRIPTION

08 Nonequilibrium xenon condition existed during the rod withdrawal
09 periods. Reactor Engineering will investigate optimum startup
10 conditions to be available in future.

	FACILITY STATUS	% POWER	OTHER STATUS	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION
11	F	048	NA	B	Normal Shift Surveillance
(7–8)	(9)	(10–12)	(13–44)	(45)	(46–80)

	FORM OF ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY	LOCATION OF RELEASE
12	Z	Z	NA	NA
(7–8)	(9)	(10)	(11–44)	(45–80)

PERSONNEL EXPOSURES

	NUMBER	TYPE	DESCRIPTION
13	000	Z	NA
(7–8)	(9–11)	(12)	(13–80)

PERSONNEL INJURIES

	NUMBER	DESCRIPTION
14	000	NA
(7–8)	(9–11)	(12–80)

OFFSITE CONSEQUENCES

15 NA

LOSS OR DAMAGE TO FACILITY

	TYPE	DESCRIPTION
16	Z	NA
(7–8)	(9)	(10–80)

PUBLICITY

17 NA

ADDITIONAL FACTORS

18

19

NAME: Ellery L. Hammond PHONE: 319-851-5611

Iowa Electric light and power company

DUANE ARNOLD ENERGY CENTER
PALO, IOWA

June 9, 1976

MCPR Violation Report for 6/1/76

File: J-40b

On May 31, 1976 and June 1, 1976 control rod withdrawals per IPOI Appendix I, Table II.G.3-1 for the A-2 rod sequence were being made to maneuver to a higher load line prior to increasing power using recirc flow. A summary of the operation early on June 1 is contained in Table 1.

At 0431 hours and 0630 hours CPRRAT for 8 x 8 fuel assemblies exceeded 1.00 indicating a violation of the Tech Spec Minimum Critical Power Ratio limit. In both instances action was taken within 15 minutes to return MCPR within limits. Both violations were in limits again within 1 hour of the first indications of the violations.

While a non-equilibrium Xenon condition (low Xenon inventory) was tending to decrease the value of CPR during the period of the violations, two calculational problems existed at the same time.

Due to an oversight, General Electric did not communicate to Iowa Electric the fact that the fuel loading for cycle 2 is mirror symmetric. From startup in the A-2 sequence until 1059 hours on June 1, the process computer core limits calculations were using rotational symmetry. In this instance the rotational symmetry mode produced overly conservative limits. The result of switching from rotational to mirror symmetry is shown in Table 1. The difference between the two modes is of the same order of magnitude as the amount by which the MCPR limit was exceeded.

An examination of the number of base critical codes that accompanied the calculation of the violations shows that at 0431 hours 7 base crit's were present. At 0630 hours 15 base crit's were present. Numerous examples of base critical codes affecting the core limits calculation in a conservative direction can be sited to argue that the MCPR violations were actually the product of overly conservative calculations due to the existance of several base critical codes at the time of the calculation.

Either of the above calculation problems could have led to erroneously low MCPR's resulting in apparent violations. It is very probable that the combination of the two problems caused erroneously low MCPR's. Unfortunately, the requirement of Tech Spec for prompt action to bring MCPR within limits precludes the use of detailed study and recalculation to determine the real source of the problem at the time it occurs. Investigation of the problem at a later time usually provides inconclusive results.

Thus, in the absence of concrete proof to the contrary, the MCPR violations of June 1 were due to a low Xenon concentration condition. A nearer equilibrium Xenon condition would have supported the rod pattern without a MCPR violation. To prevent a recurrence of this problem, studies should be performed to determine optimum startup strategy.

Kurt M. Haas
Reactor Engineer
Duane Arnold Energy Center

REVIEWED BY: Ellery L Hammond DATE: 6/10/76
Chairman, Operations Committee

KMH/mg

cc: Mr. E. Hammond
Mr. B. York
Mr. W. Nodean

TABLE 1

TIME	8x8 CPRRAT	MCPR	REQUIRED MCPR	POWER MWT	FLOW Mlb/hr	BASE CRIT's	SYMMETRY MODE	CONTROL ROD MOVEMENTS
0130	0.969	1.829	1.773	760	18.43	1	Rotational	
0330	0.995	1.772	1.763	802	19.24	6	"	Group 42 @ 12
0431	1.001	1.759	1.761	807	19.39	7	"	
0515	0.984	1.793	1.764	784	19.11	3	"	Group 42 @ 10
0531	0.976	1.805	1.763	783	19.24	3	"	
0555	0.972	1.776	1.727	839	21.96	6	"	
0630	1.017	1.689	1.717	894	22.69	15	"	Group 42 @ 12
0654	0.987	1.739	1.717	868	22.74	10	"	Group 42 @ 10
0730	0.987	1.733	1.710	878	23.25	11	"	
0830	0.995	1.708	1.699	898	24.07	10	"	
0906	0.967	1.757	1.699	874	24.07	5	"	Group 42 @ 8
0932	0.962	1.766	1.699	871	24.06	4	"	
1030	0.964	1.763	1.700	867	24.00	8	"	
1059	0.951	1.788	1.699	866	24.06	5	Mirror	

D. Lanham

IOWA ELECTRIC LIGHT AND POWER COMPANY

DUANE ARNOLD ENERGY CENTER
P. O. Box 351
Cedar Rapids, Iowa 52406

June 10, 1976
DAEC -76 -189

50-331

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799 Roosevelt Road
Glen Ellyn, Illinois 60137

Subject: Licensee Event Report No. 76-37
(30 day)

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Very truly yours,

G. G. Hunt ECH

G. G. Hunt
Chief Engineer
Duane Arnold Energy Center

Docket 50-331

attachment

GGH/DLW/mg

cc: Director, Office of Inspection and Enforcement (30)
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Director, Management Information and Program Control (3)
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17 NA

ADDITIONAL FACTORS

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NAME: Ellery L. Hammond PHONE: 319-851-5611

GPO 881-667

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