

ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8903020553 DOC.DATE: 89/02/17 NOTARIZED: NO DOCKET #
 FACIL:50-331 Duane Arnold Energy Center, Iowa Electric Light & Pow 05000331
 AUTH.NAME AUTHOR AFFILIATION
 MCGILL,D.L. Iowa Electric Light & Power Co.
 HANNEN,R.L. Iowa Electric Light & Power Co.
 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 89-001-00:on 890118,manual scram due to loss of EHC oil.
 W/8 ltr.

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

NOTES:

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	HALL,J.R.	1 1		
INTERNAL:	ACRS MICHELSON	1 1	ACRS MOELLER	2 2
	ACRS WYLIE	1 1	AEOD/DOA	1 1
	AEOD/DSP/TPAB	1 1	AEOD/ROAB/DSP	2 2
	ARM/DCTS/DAB	1 1	DEDRO	1 1
	NRR/DEST/ADE 8H	1 1	NRR/DEST/ADS 7E	1 0
	NRR/DEST/CEB 8H	1 1	NRR/DEST/ESB 8D	1 1
	NRR/DEST/ICSB 7	1 1	NRR/DEST/MEB 9H	1 1
	NRR/DEST/MTB 9H	1 1	NRR/DEST/PSB 8D	1 1
	NRR/DEST/RSB 8E	1 1	NRR/DEST/SGB 8D	1 1
	NRR/DLPQ/HFB 10	1 1	NRR/DLPQ/QAB 10	1 1
	NRR/DOEA/EAB 11	1 1	NRR/DREP/RAB 10	1 1
	NRR/DREP/RPB 10	2 2	NRR/DRIS/SIB 9A	1 1
	NUDOCS-ABSTRACT	1 1	REG FILE 02	1 1
	RES/DSIR/EIB	1 1	RES/DSR/PRAB	1 1
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EXTERNAL:	EG&G WILLIAMS,S	4 4	FORD BLDG HOY,A	1 1
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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)

Duane Arnold Energy Center (DAEC)

DOCKET NUMBER (2)

0 5 0 0 0 3 3 1 1 OF 0 3

PAGE (3)

TITLE (4)

Manual Scram Due to Loss of EHC Oil

EVENT DATE (5)

MONTH DAY YEAR

0 1 1 8 8 9

LER NUMBER (6)

YEAR SEQUENTIAL NUMBER

0 0 1

REPORT DATE (7)

MONTH DAY YEAR

0 0 0 2 1 7 8 9

OTHER FACILITIES INVOLVED (8)

FACILITY NAMES

None

DOCKET NUMBER(S)

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))

20.402(b)

20.408(e)

XX

60.73(a)(2)(iv)

73.71(b)

POWER LEVEL (10)

1 0 0

20.408(a)(1)(i)

60.36(c)(1)

60.73(a)(2)(iv)

73.71(c)

20.408(a)(1)(ii)

60.36(c)(2)

60.73(a)(2)(vii)

OTHER (Specify in Abstract below and in Text NRC Form 366A)

20.408(a)(1)(iii)

60.73(a)(2)(i)

60.73(a)(2)(viii)(A)

20.408(a)(1)(iv)

60.73(a)(2)(ii)

60.73(a)(2)(viii)(B)

20.408(a)(1)(v)

60.73(a)(2)(iii)

60.73(a)(2)(ix)

NAME

LICENSEE CONTACT FOR THIS LER (12)

Dave L. McGill, Technical Support Specialist

TELEPHONE NUMBER

AREA CODE

3 1 9 8 5 1 - 7 3 0 9

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

CAUSE	SYSTEM	COMPONENT	MANUFAC TURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFAC TURER	REPORTABLE TO NRC
B	TIG	P/SIP		No					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)

X NO

EXPECTED SUBMISSION DATE (15)

MONTH DAY YEAR

ABSTRACT (Limit to 1400 spaces - approximately fifteen single-space typewritten lines) (16)

On January 18, 1989 at 0337 hours an Electro Hydraulic Control (EHC) Reservoir low level alarm was received in the control room. The Auxiliary Operator was sent to investigate the low level alarm. The EHC Reservoir was low and there was a leak on a high pressure supply line to the Turbine Control Valve #3 (CV-3) which could not be isolated. Control Room personnel began lowering reactor power by reducing recirculation flow and inserting control rods. With reactor power at 41% and EHC Reservoir level decreasing, the reactor was manually scrammed at 0352 hours.

There were no component or system failures other than the leak in the EHC piping. The leak was in a flexible hose installed during the cycle 9/10 refueling outage. This hose was removed and examined for cracks using a liquid penetrant inspection. A 1/2" circumferential crack in the tubing was identified. A representative of the hose manufacturer was consulted and all of the flexible high pressure EHC tubing that was installed during the cycle 9/10 refueling was replaced.

8903020553 890217
PDR ADOCK 05000331
S PDC

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER(6)			PAGE(3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Duane Arnold Energy Center	05000331	89	001	00	2	OF	3

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

I. DESCRIPTION OF EVENT:

On January 18, 1989 the plant was operating at 100% power. At 0337 hours an Electro Hydraulic Control (EHC) (EIIS System Code TG) reservoir low level alarm was received in the control room and the Auxiliary Operator was sent to investigate the alarm. The Auxiliary Operator reported that EHC reservoir level was low and that there was a leak on a high pressure supply line to CV-3 (EIIS Component Function Identifier FCV) (one of four control valves for the high pressure turbine, (EIIS Component Function Identifier TRB)) which could not be isolated. At 0342 hours control room personnel began reducing reactor power with recirculation flow (EIIS System Code AD) to limit the effect of the transient. At 0346 hours control room personnel began inserting control rods (EIIS System Code AA) to further reduce reactor power. At 0352 hours reactor power had been reduced to 41% and the reactor was manually scrammed.

II. CAUSE OF EVENT:

After discussions with the representative of the tubing manufacturer it was determined that the tubing failed as a result of the stresses placed on it during operation. The piping configuration at DAEC involved a multi-planar installation with additional stresses imposed by thermal movement of the steam lines. The manufacturer's manual indicates, and its representative confirmed, that the flexible tubing was designed to accomodate stresses in a single plane (or balanced stresses in multiple planes), not unbalanced torsional stresses that can be associated with multi-planar installations.

The root cause of the EHC failure is a cognitive error by failing to assess adequately the tubing application.

III. ANALYSIS OF EVENT:

The magnitude of the transient was minimized by the timely and appropriate response of control room personnel who located the EHC leak, identified its size, and prepared the plant for the impending scram. Power was lowered to 41% by reducing recirculation flow and inserting control rods. Pressure control was assured through steam line drains (EIIS System Code TF) prior to the scram. These actions permitted control of reactor pressure without relief valve actuation. After the manual scram, reactor water level was maintained between 156" and 219". Group Isolations II-V (EIIS System Code JM) were received as expected with no equipment problems. The leak was stopped by securing pumps in the EHC system.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

FACILITY NAME (1) Duane Arnold Energy Center	DOCKET NUMBER (2) 05000331	LER NUMBER(6)			PAGE(3)		
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		89	- 001	- 00	3	OF	3

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

If the EHC system leak had resulted in loss of EHC system pressure, reactor pressure control after the scram would have been accomplished through the use of the High Pressure Coolant Injection (HPCI) (EIIS System Code BJ), Reactor Core Isolation Cooling (RCIC) (EIIS System Code BN), sequential lifting of relief valves, and steam line drains.

The tubing had been installed during the cycle 9/10 refueling outage in November 1988. The tubing was a flexible metal hose manufactured by Flexonics Incorporated. It replaced hard tubing that was prone to leakage at threaded fittings. The damaged piece of flexible tubing was examined by a vendor representative and it was determined that the failure was due to a misapplication of this tubing. The installation applied stresses in several planes. The magnitude of the combined stresses failed the tubing.

IV. CORRECTIVE ACTIONS:

The damaged piece of flexible tubing was removed and inspected with liquid penetrant. This inspection revealed that a crack started at the edge of the heat affected zone of a resistance weld and continued circumferentially for approximately 1/2". After discussion with the vendor representative on Friday, January 20, the cause of the failure was determined to be a misapplication due to inadequate design consideration by utility employees of all the stresses affecting the subject installation. Corrective action included the replacement of all high pressure flexible connections (43 installations) installed during the Cycle 9/10 refueling outage with a flexible connection capable of withstanding all imposed stresses. Additionally, two low pressure connections were replaced during the shutdown. The remainder of the low pressure lines will be replaced prior to startup from the cycle 10/11 refueling outage.

We have reviewed the root cause cognitive error and determined it was an isolated incident and not representative of a general lack of thoroughness by our personnel.

V. ADDITIONAL INFORMATION:

There are other installations at the DAEC with flexible tubing made by a different manufacturer. These installations are in the Nitrogen Supply System (EIIS System Code LK) and the Diesel Generator Air Starting System (EIIS System Code LC). These installations will be reviewed by Engineering.

Iowa Electric Light and Power Company

February 17, 1989

DAEC-89-0151

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

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License DPR-49
Licensee Event Report #89-001

Gentlemen:

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

Very truly yours,

 2-17-89

Rick L. Hannen
Plant Superintendent - Nuclear

RLH/DLM/go

cc: Director of Nuclear Reactor Regulation
Document Control Desk
U.S. Nuclear Regulatory Commission
Mail Station P1-137
Washington, D. C. 20555

NRC Resident Inspector - DAEC

File A-118a

