REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8003240493 DOC.DATE: 80/03/18 NOTARIZED: NO DOCKET #
FACIL:50-331 Duane Arnold Energy Center, Iowa Electric Light & Pow 05000331
AUTH.NAME AUTHOR AFFILIATION
TOOKER,D.W. Iowa Electric Light & Power Co.
RECIP.NAME RECIPIENT AFFILIATION
Region 3, Chicago, Office of the Director

SUBJECT: LER 80-009/01T-0:on 800304,during refueling outage insp of HPCI pump,section of split ring found lodged in impeller. Split ring piece found to be from HPCI booster pump 1P-216. Caused by improper split ring retention device.

DISTRIBUTION CODE: A002S COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 1+3
TITLE: Incident Reports

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
ACTION:	05 BC ORB# 3	4	4			
INTERNAL:	01 REG FILE	1	1	02 NRC PDR	1	1
	09 I&E	2	2	11 MPA	3	3
	14 TA/EDO	1	1	15 NOVAK/KNIEL	1	1
	16 EEB	1	1	17 AD FOR ENGR	1	1
	18 PLANT SYS BR	1	1	19 I&C SYS BR	1	1
	20 AD PLANT SYS	1	1	22 REAC SAFT BR	1	1
	23 ENGR BR	1	1	24 KREGER	1	1
	25 PWR SYS BR	1	1	26 AD/SITE ANAL	1	1
	27 OPERA LIC BR	1	1	28 ACDENT ANLYS	1	1
	29 AUX SYS BR	1	1	AD/ORP-DOR	1	1
	AEOD	1	1	DOUG MAY-TERA	1	1
	HANAUER,S.	1	1	IRELAND,R.	3	3
	JORDAN,E./IE	1	1			
EXTERNAL:	03 LPDR	1	1	04 NSIC	1	1
	29 ACRS	16	16			

69

TOTAL NUMBER OF COPIES REQUIRED: LTTR 52 ENCL 52

NRC FORM 366 (7-77)

U. S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT

CONTROL BLOCK: | | | | | | | (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

0 1	I A D A C 1 (2)	0 0 - 0 0 0 0 0 - 0 0 (3)	4 1 1 1 1 (4)	(5)
7 8	9 LICENSEE CODE 14	15 LICENSE NUMBER 25	26 LICENSE TYPE 30	57 CAT 58

CON'T

0 1	REPORT SOURCE L (6)	0 5 0 0 0 3 3 1 (7)	0 3 0 4 8 0 (8)	0 3 1 8 8 0 (9)
7 8	60	61 DOCKET NUMBER 68	69 EVENT DATE 74	75 REPORT DATE 80

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 During a refueling outage inspection of the main HPCI pump, a section of

0 3 a split ring was found lodged in the impeller. Inspection revealed

0 4 the split ring piece was from the HPCI booster pump 1P-216. The remainder

0 5 of the split ring was not located. This split ring is used to position

0 6 the 1P-216 impeller. The loss of the split ring could have caused damage

0 7 to the pump thus rendering the HPCI system inoperable. Reference T.S.

0 8 3.5.D.1. No similar event reports have been submitted.

	SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
0 9	S F (11)	B (12)	B (13)	P U M P X X (14)	B (15)	Z (16)

(17) LER/RO REPORT NUMBER	EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
	8 0	—	0 0 9	/	0 1	T	—	0

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
A (18)	F (19)	Z (20)	Z (21)	0 0 0 0	Y (23)	N (24)	N (25)	B 5 8 0 (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 Improper split ring retention device. The shaft sleeve spacer was affix

1 1 ed to the shaft by blunt end setscrews. These will be replaced with dog

1 2 point setscrews which extend 1/16 inch into holes drilled in the shaft.

1 3 Radiographs of the downstream piping have failed to locate the missing

1 4 split ring piece. Investigation and analysis continuing.

	FACILITY STATUS	% POWER	OTHER STATUS (30)	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION (32)
1 5	H (28)	0 0 0 (29)	NA	C (31)	Refueling OUtage Inspection

	ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)
1 6	Z (33)	Z (34)	NA	NA

PERSONNEL EXPOSURES

	NUMBER	TYPE	DESCRIPTION (39)
1 7	0 0 0 (37)	Z (38)	NA

PERSONNEL INJURIES

	NUMBER	DESCRIPTION (41)
1 8	0 0 0 (40)	NA

LOSS OF OR DAMAGE TO FACILITY (43)

	TYPE	DESCRIPTION
1 9	Z (42)	NA

8003240493

PUBLICITY

	ISSUED	DESCRIPTION (45)	NRC USE ONLY
2 0	N (44)	NA	

NAME OF PREPARER D. W. Tooker PHONE: 319-851-5611

GPO 917-926

DUANE ARNOLD ENERGY CENTER

Iowa Electric Light and Power Company

LICENSEE EVENT REPORT-Supplemental Data

Docket No. 050-0331

Licensee Event Report Date: 3-18-80

Reportable Occurrence No: 80-009

Event Description

At 0800 hours on March 4, 1980 while performing a refueling outage inspection of the main HPCI pump, a section of split ring was found lodged in the impeller. The HPCI booster pump was disassembled and it was found that both halves of one of the split rings which position the booster pump impeller were missing. The split ring and shaft sleeve spacer are used to position the booster pump impeller. The shaft sleeve spacer (which in turn held the split ring in place) was affixed to the pump shaft with blunt end set screws. The set screws had worked out of the shaft sleeve spacer allowing the shaft sleeve spacer to expand on the pump shaft. The fluid pressure during previous HPCI booster pump operation caused the shaft sleeve spacer to move along the pump shaft uncovering, and thus freeing, the split ring. One half of the split ring was found lodged in the impeller of the main HPCI pump and the other half is assumed to be in the pump discharge piping. The missing half of the split ring is a 1/4 inch by 1/4 inch square, semicircular (3-inch inside diameter) ASTM A-276 Type 410 H.T. piece of steel. The split ring/shaft sleeve spacer retainer failure created the potential for the booster pump impeller to thrust and damage itself which would have made the HPCI system inoperable. Reference Technical Specification paragraph 3.5.D.1. The HPCI booster pump, 1P-216, is a Byron Jackson 10 x 10 x 14½, single stage, Type DVS, centrifugal pump. No similar event reports have been submitted.

Cause Description

Improper split ring/shaft sleeve spacer retention device. Thermal expansion allowed the set screws to back out of the shaft sleeve spacer and the shaft sleeve spacer to expand on the HPCI booster pump shaft. The booster pump design is such that the fluid pressure tended to push the shaft sleeve spacer along the pump shaft away from the split ring. Thus the split ring was uncovered and free to move.

Corrective Action

The blunt end set screws used to affix the shaft sleeve spacer to the pump shaft will be replaced with dog point set screws which extend 1/16 inch into holes drilled in the pump shaft. This design change will account for the thermal expansion of the shaft sleeve spacer and prevent recurrence of this event. Also review of other Byron Jackson pumps at

DUANE ARNOLD ENERGY CENTER

Iowa Electric Light and Power Company

LICENSEE EVENT REPORT-Supplemental Data

Docket No. 050-0331

Licensee Event Report Date: 3-18-80

Reportable Occurrence No: 80-009

Corrective Action Continued

DAEC indicates that the shaft sleeve spacer is heat shrunk to the pump shaft and that the pump designs are such that the fluid pressure tends to push the shaft sleeve spacer over the split ring. Thus it was concluded that this event is not likely to occur in other Byron Jackson pumps at DAEC.

Efforts to locate the missing section of the HPCI booster pump split ring by radiography have been unsuccessful. Investigation and analysis by NSSS vendor is continuing.