

Iowa Electric Light and Power Company

May 29, 1992  
NG-92-2545

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-19  
Licensee Event Report #92-008

Gentlemen:

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

Very truly yours,



David L. Wilson  
Plant Superintendent - Nuclear

DLW/JP/eah

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

NRC Resident Inspector - DAEC

150023

Handwritten initials and date: JES 2/1

## LICENSEE EVENT REPORT (LER)

EXPIRES 4-30-92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50 MINS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-330) U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104) OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1):

Duane Arnold Energy Center

DOCKET NUMBER (2):

0 5 0 0 0 3 3 1

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TITLE (4): Hydrogen Induced Cracking Causes Fracture of  
Emergency Service Water Pump Bolts

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	4	0	2	9	2	9	2	0	0	8	None	0 5 0 0 0
0	5	2	9	9	2	0	5	2	9	9	2	0 5 0 0 0

OPERATING MODE (9):

N

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)

POWER LEVEL (10): 0 0 0	20 402(b)	20 406(c)	50 734(i)(2)(H)	73 716(i)
	20 406(i)(1)(i)	50 361(i)(1)	50 734(i)(2)(i)	73 716(i)
	20 406(i)(1)(ii)	50 361(i)(2)	50 734(i)(2)(iv)	<input checked="" type="checkbox"/> OTHER (Specify - Abstract below and a Text NRC Form 308A)
	20 406(i)(1)(iii)	50 734(i)(2)(ii)	50 734(i)(2)(v)(A)	
	20 406(i)(1)(iv)	50 734(i)(2)(iii)	50 734(i)(2)(v)(B)	
20 406(i)(1)(v)	50 734(i)(2)(iv)	50 734(i)(2)(i)		

LICENSEE CONTACT FOR THIS LER (12):

NAME

Joseph P. Ickes, Technical Support Specialist

TELEPHONE NUMBER

AREA CODE

3 1 9 8 5 1 - 7 6 4 8

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

CAUSE	SYSTEM	COMPONENT	MANUFAC TURE	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFAC TURE	REPORTABLE TO NRC
B	B	1 P	T	1 5 2	Yes				

SUPPLEMENTAL REPORT EXPECTED (14)

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

ABSTRACT (16) (If yes, complete) (If no, complete) (If yes, complete) (If no, complete)

On April 2, 1992, while preparing a new Emergency Service Water pump for installation, two bowl retaining bolts broke when subjected to less than required torque requirements. The bolts were replaced and sent off site for testing to determine the cause of the failures. The failures were found to be caused by delayed Hydrogen Induced Cracking due to an anomaly in the heat treatment process. This event had no effect on the safe operation of the plant. It is not a reportable event and is submitted for information only.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

EXPIRES 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 50.8 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-580) U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  Duane Arnold Energy Center	DOCKET NUMBER (2)  05000331	LER NUMBER (3)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		92	- 008	- 00	2	OF	3

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

## I. DESCRIPTION OF EVENT:

On April 2, 1992, with the reactor shut down for a refuel outage, a new Emergency Service Water (ESW) pump, supplied by Johnston Pump, was being prepared for installation. During this process, a previously tightened bowl retaining bolt, was observed to be loose. The bolt broke when an attempt was made to tighten it per the approved vendor procedure. The decision was then made to replace all the bowl bolts. While removing the bolts already installed, a second bolt broke. The bolts affected were 5/8"-11NC x 1 1/2" long, grade SA193-B6 (410 Stainless Steel) and were manufactured by Texas Bolt Company from their heat number 8641707. A non-conformance report was issued and subsequent evaluation completed. It has been determined that this event is not reportable under 10CFR20, 10CFR21 or 10CFR50.72/73. This report is submitted for information only.

## II. CAUSE OF EVENT:

A metallurgical laboratory, Packer Engineering, was contracted to perform testing that would determine the cause of the bolt failures. The two broken bolts and five additional bolts that were removed from the pump were analyzed. These bolts were all of the same grade, but were of two different heats. The heat containing the broken bolts generally exhibited higher hardness and hydrogen content, although there was considerable variation of hardness found in this heat. This combined with the as found fracture surface character indicated that delayed Hydrogen Induced Cracking (HIC) had occurred. When compared with the heat containing the unbroken bolts, and their generally lower hardness and hydrogen content, it is apparent that the failure mechanism was introduced during the heat treatment process.

## III. ANALYSIS OF EVENT:

This event had no effect on the safe operation of the plant. The broken bolts are considered to be an isolated failure within the particular heat. An engineering evaluation has concluded that additional bolt failures would be unlikely due to the wide range of hardness found in the sample, and the remaining bolting would have been sufficient to ensure continued operability of the pump. Therefore, a significant safety concern does not exist.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

EXPIRES 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530) U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (0150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

DUCKET NUMBER (2)

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PAGE (3)

Duane Arnold Energy Center

05000331

YEAR

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TEXT (If more space is required, use additional NRC Form 208A's) (17)

## IV. CORRECTIVE ACTIONS:

Texas Bolt is not on the Iowa Electric Light & Power (IELP) Nuclear Approved Vendor List and IELP has not procured bolting from them.

All Texas Bolt, grade SA193-B6 bolting on the new ESW pump, has been replaced with grade SA193-B7 (4140 Carbon Steel) bolting from IELP stock. The bolting from the old pump was examined and found to be intact and not manufactured by Texas Bolt. In addition, a review of the records for the River Water Supply (RWS) pumps, Residual Heat Removal Service Water (RHRSW) pumps and the remaining ESW pump, indicated the bolting used was not provided by Texas Bolt.

Johnston Pump has been notified and has subsequently notified Texas Bolt. The Duane Arnold Energy Center Part 21 Committee has determined this event is not reportable based on the engineering analysis conclusion.

## V. ADDITIONAL COMMENTS:

## A. Previous Similar Events

A review of the LER database since 1974, did not identify any similar events.

## B. EIS System and Component Codes

System: BI

Component: P