



Iowa Electric Light and Power Company

January 8, 1991  
DAEC-91-0017

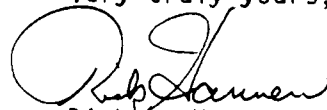
Mr. A. Bert Davis  
Regional Administrator  
Region III  
U. S. Nuclear Regulatory Commission  
799 Roosevelt Road  
Glen Ellyn, IL 60137

Subject: Duane Arnold Energy Center  
Docket No: 50-331  
Op. License DPR-49  
Licensee Event Report #90-022

Gentlemen:

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

Very truly yours,

  
Rick L. Hannen  
Plant Superintendent - Nuclear

RLH/BKS/pwj

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

Dr. William R. Jacobs, Jr.  
GDS Associates, Inc.  
Suite 720  
1850 Parkway Place  
Marietta, GA 30068-8237

File A-118a

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Duane Arnold Energy Center • 3277 DAEC Road • Palo, Iowa 52324 • 319/851-7611

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**LICENSEE EVENT REPORT (LER)**

EXPIRES 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 30.0 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 (3150-0104) OFFICE OF MANAGEMENT AND BUDGET WASHINGTON, DC 20503

FACILITY NAME (1)		DOCKET NUMBER (2)	PAGE (3)
Duane Arnold Energy Center		0 5 0 0 0 3 3 1	1 OF 0 3

TITLE (4) Primary Containment Isolation System Group IV Isolation Due to Water Void in Residual Heat Removal System Suction Line

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)									
1	2	10	9	0	9	0	0	2	2	0	0	0	1	0	8	9	1	None	0 5 0 0 0

OPERATING MODE (8)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)																				
POWER LEVEL (10)	10	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 20.406(a)(1)(iii)	<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 20.406(c)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 50.73(a)(2)(ix)	<input type="checkbox"/> 73.71(b)	<input type="checkbox"/> 73.71(c)	OTHER (Specify in Abstract below and in Text NRC Form 366A)

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER
NAME	Brian K. Smith, Technical Support Specialist	AREA CODE: 3 1 9 8 5 1 - 7 4 5 6

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)			<input checked="" type="checkbox"/> NO			

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (18)

Procedure improvements have been made to the Residual Heat Removal System (RHR) Operating Instruction that includes steps that require filling the RHR suction line with Condensate Service Water prior to initiating Shutdown Cooling. This action was taken due to an unexpected Primary Containment Isolation System (PCIS) Group IV isolation of RHR on December 10, 1990 while the plant was shutdown. In that event, actions were taken to flush the RHR suction line prior to initiating Shutdown Cooling. The RHR Outboard Isolation valve auto-closed when the RHR Inboard Isolation valve was taken to open. Event investigation determined that part of the RHR suction line had drained. When the RHR Inboard Isolation valve was opened, water flowed from the Reactor Vessel into the RHR suction line. This caused a momentary pressure surge and resulted in a PCIS Group IV isolation; however, there was no adverse effect on the RHR System or the plant.

**LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION**

EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 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 (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503

FACILITY NAME (1)  Duane Arnold Energy Center	DOCKET NUMBER (2)  05000331	LER NUMBER(6)			PAGE(3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

**I. DESCRIPTION OF EVENT:**

On December 10, 1990, the plant was shutdown with reactor pressure at approximately 50 psig. Operations personnel were preparing to flush the Residual Heat Removal System (RHR, EIIS System Code BO) suction line prior to initiating Shutdown Cooling. The RHR Outboard Suction Line Isolation Valve (EIIS Component Code 20) had been opened. When the RHR Inboard Suction Line Isolation Valve (EIIS Component Code 20) was opened, the Outboard Isolation Valve auto-closed due to a sensed Primary Containment Isolation System (PCIS, EIIS System Code JM) Group IV logic actuation. This Engineered Safety Feature actuates when reactor pressure off the 'B' Reactor Recirculation System (EIIS System Code AD) loop is sensed greater than 135 psig. The isolation protects the RHR System piping from overpressure. Reactor pressure prior to and after the event indicated approximately 50 psig; no changes were observed or recorded. Coincident with the isolation, Control Room alarms indicated that a momentary pressure surge had occurred in the RHR System. This surge had been sensed in the 'B' Reactor Recirculation loop, downstream of the Outboard Isolation Valve, and downstream of the RHR Pumps. Operations personnel also noted an approximate 10" decrease in Reactor Vessel water level; however, level remained within the normal range.

**II. CAUSE OF EVENT**

Investigation into the unexpected PCIS Group IV isolation verified the auto-closure of the Outboard Isolation Valve was due to a sensed high reactor pressure. Prior to initiating the Shutdown Cooling mode of the RHR System, the suction line must be flushed to minimize thermal shock. This is accomplished by creating a flow-path from the Reactor Vessel through RHR to the Radwaste System (EIIS System Code WD).

Investigation of the event determined that part of the RHR System suction line was empty (void of water). With the Outboard Isolation Valve open, opening the Inboard Isolation Valve provided a flow path for Reactor Vessel water to fill the void (causing the observed decrease in Reactor Vessel level). Post-event analysis of computer data determined that approximately 800 gallons of water had flowed into the suction line in approximately 5 seconds and resulted in the sudden, momentary surge in pressure.

The cause for the void of water in the RHR System suction line was investigated. It was determined that downstream RHR System leakage had allowed the suction line to drain, causing the void. (Note: During the recent refueling outage, two in-line Condensate Service System (EIIS System Code KA) manual valves (EIIS Component Code SHV) that connect to the RHR System suction line were replaced due to identified leakage into the RHR System. This in-leakage had provided a continuous supply of water into the suction line.)

**LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION**

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FACILITY NAME (1)  Duane Arnold Energy Center	DOCKET NUMBER (2)  0   5   0   0   0   3   3   1	LER NUMBER(6)			PAGE(3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		9 0	- 022	- 00	3	OF	3

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

The PCIS Group IV isolation of the RHR System was initiated by a pressure surge caused by the flow of water from the Reactor Vessel into the void in the RHR System suction line.

**III. ANALYSIS OF EVENT**

The plant was shutdown when the event occurred. The sensed pressure surge resulted in the automatic PCIS Group IV isolation of the RHR System Outboard Suction Line Isolation Valve as required. The isolation of the RHR System had no adverse effect on the plant. A visual inspection of RHR System piping was performed with no abnormalities identified.

**IV. CORRECTIVE ACTIONS**

Operations personnel immediately verified appropriate plant response. Actions were taken to restore Reactor Vessel level and reset the PCIS Group IV actuation logic. Subsequently, the RHR System was unisolated, the flush completed, and the RHR System placed in the Shutdown Cooling mode.

Following determination of the event cause, the procedure was revised to include steps that require filling of the RHR System suction line via the Condensate Service System prior to performing the flush. This will preclude recurrence of this event.

An additional corrective action to provide Control Room indication of RHR suction line pressure has been initiated. This action will be completed as part of the Detailed Control Room Design Review modification, Phase IV, currently identified in the Integrated Plan.

The event will be discussed in Operations Department training to ensure that all Operations personnel are made aware of the event and the changes to the procedure.

**V. ADDITIONAL INFORMATION:**

This event is being reported in accordance with 10CFR50.73 (a)(2)(iv).