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ACCESSION NBR:9010170065 DOC.DATE: 90/10/10 NOTARIZED: NO DOCKET #
FACIL:50-331 Duane Arnold Energy Center, Iowa Electric Light & Pow 05000331

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RECIP.NAME	RECIPIENT AFFILIATION

SUBJECT: LER 90-014-00:on 900910,high pressure reactor scram following MSR high level turbine trip.W/901010 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 4
TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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Iowa Electric Light and Power Company

October 10, 1990
DAEC-90-0853

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 #90-014

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 9-10-90

Rick L. Hannen
Plant Superintendent - Nuclear

RLH/RMM/sjo

cc: Director of Nuclear Reactor Regulation
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File A-118a

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IE01

NRC Form 366A (6-89) | U.S. NUCLEAR REGULATORY COMMISSION | APPROVED OMB NO. 3150-0104 | EXPIRES: 4/30/92

LICENSEE EVENT REPORT (LER)

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): High Pressure Reactor Scram Following MSR High Level Turbine Trip

EVENT DATE (5) MONTH	DAY	YEAR	LER NUMBER (6) YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	REPORT DATE (7) MONTH	DAY	YEAR	OTHER FACILITIES INVOLVED (8) FACILITY NAMES	DOCKET NUMBER(S)
0 9	1 0	9 0	9 0	0 1 4	0 0	1 0	1 0	9 0	None	0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9): N

POWER LEVEL (10): 0 2 7

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

☐ 20.402(b)	☐ 20.405(c)	☒ 50.73(a)(2)(iv)	☐ 73.71(b)
☐ 20.405(a)(1)(i)	☐ 50.36(c)(1)	☐ 50.73(a)(2)(v)	☐ 73.71(c)
☐ 20.405(a)(1)(ii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(vii)	☐ OTHER (Specify in Abstract below and in Text, NRC Form 366A)
☐ 20.405(a)(1)(iii)	☐ 50.73(a)(2)(i)	☐ 50.73(a)(2)(viii)(A)	
☐ 20.405(a)(1)(iv)	☐ 50.73(a)(2)(ii)	☐ 50.73(a)(2)(viii)(B)	
☐ 20.405(a)(1)(v)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER AREA CODE
Ronald M. McGee, Technical Support Specialist	3 1 9 8 5 1 - 7 6 0 2

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
☐ YES (If yes, complete EXPECTED SUBMISSION DATE)	☒ NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On September 10, 1990 with the reactor at approximately 27% power, a turbine trip occurred as a result of a sensed high level in a Moisture Separator Reheater. Reactor steam production at the time of the turbine trip was slightly in excess of the bypass valve capacity, resulting in a rising reactor pressure, and a reactor scram approximately one minute later.

Plant response to the conditions present occurred appropriately. Primary Containment Isolation Groups 2-5 responded in accordance with design when reactor water level decreased as a result of void reduction in response to the reactor scram.

The root cause of the event was valve misalignment following maintenance. The corrective actions included an immediate valve lineup verification and enhancements to the valve lineup procedure.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6) YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	PAGE (3)
Duane Arnold Energy Center	0 5 0 0 0 3 3 1	9 0	- 014 -	00	2 OF 3

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

I. DESCRIPTION OF EVENT:

On September 10, 1990 at 21:56:43 with the reactor at approximately 27% power, a Turbine Trip occurred as a result of a sensed high level in a Moisture Separator Reheater (MSR). Turbine bypass valves opened in response to the rising main steam pressure. A direct scram from the Turbine Trip was not required as this input to the Reactor Protection System (RPS) is bypassed at reactor powers less than 30%. Reactor pressure increased at a rate of approximately 100 psi/minute due to steam production in excess of the Turbine bypass capacity. This resulted in a high pressure Reactor Scram at 21:57:47. Reactor pressure was promptly restored to normal with bypass valves as reactor power decreased in response to the scram. Reactor level was controlled between 199 and 163 inches (above TAF) with normal feedwater. Primary Containment Isolation System (PCIS) Groups 2-5 responded in accordance with design when reactor level decreased to less than 170 inches as a result of void reduction in response to the reactor scram. No other safety systems actuated in response to the event.

II. CAUSE OF EVENT

Following calibration of the MSR Level instrument, a manual isolation to the instrument could not be reopened due to a worn stem - handwheel connection. The valve was replaced prior to startup from the current refueling outage, but left in the nearly closed position. Post Maintenance operability testing was deferred until after startup in order to have pressure available at the valve to check for leakage. The testing did not include a valve lineup check as it was assumed that this valve would be included in the Pre-Startup valve lineup.

It was subsequently determined that the Pre-Startup valve lineups did not include this non-safety related instrument's isolations.

Following reactor startup, the level sensing chamber slowly filled with condensing steam and eventually obtained a sensed high level causing a direct Turbine Trip.

The cause of the scram is a non-single failure tolerant design of the Turbine Trip logic. The intermediate cause was a sensed high MSR level caused by an erroneous indication. The root cause was instrument sensing line valve misalignment following maintenance.

III. ANALYSIS OF EVENT

Turbine trips at low and high power are analyzed events with no adverse safety consequences. All automatic actions occurred as expected. Operator actions were appropriate and promptly restored the plant to a stable condition.

NRC Form 366A (6-89) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO.3150-0104

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

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6) YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	PAGE (3)
Duane Arnold Energy Center	0 5 0 0 0 3 3 1	9 0	014	00	3 OF 3

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

IV. CORRECTIVE ACTIONS

The MSR level instrument valve lineup was corrected. All other Turbine Trip instrument valve lineups were verified to be correct.

The MSR level instrument performance was verified to be satisfactory.

The non-nuclear instrument valve lineup has been expanded to include all identified Turbine Trip instrumentation.

Additional resources have been allocated for the Scram Frequency Reduction program.

Supplemental valve lineup categories will be created to minimize the probability of Reactor Scram events due to instrument valve mispositioning. This will be accomplished by 5/31/91.

A verification of instrument isolations to ensure inclusion in valve lineups will be completed by 12/31/91.

V. ADDITIONAL INFORMATION

A. There were no failed components in this event.

B. No previous Licensee Event Reports concerning High Pressure Reactor Scrams or Turbine Trips due to valve mispositioning were located.

C. Applicable EIIS System Codes

1. Reactor Protection system - JD
2. Containment Isolation Control System - JM
3. Main/Reheat Steam System - SB
4. Main Turbine System - TA