

**AEC DISTRIBUTION FOR PART 50 DOCKET MATERIAL  
(TEMPORARY FORM)**

CONTROL NO: 8629

FILE:

<b>FROM:</b> Iowa Electric Light & Power Co Cedar Rapids, IA GG Hunt			<b>DATE OF DOC</b> 8-14-74		<b>DATE REC'D</b> 8-21-74		<b>LTR</b> X	<b>TWX</b>	<b>RFT</b>	<b>OTHER</b>	
<b>TO:</b> James G. Keppler			<b>ORIG</b> 1 signed		<b>CC</b>		<b>OTHER</b>		<b>SENT AEC PDR</b> XXX <b>SENT LOCAL PDR</b> XXX		
<b>CLASS</b>	<b>UNCLASS</b>	<b>PROP INFO</b>	<b>INPUT</b>		<b>NO CYS REC'D</b>		<b>DOCKET NO:</b>				
	XXX				1		50-331				
<b>DESCRIPTION:</b>  Ltr trans the following.....						<b>ENCLOSURES:</b>  Abnormal occurrence rpt #AO 50-331/74-27 of 8-4-74 re reactor coolant conductivity levels reportable.					
<b>PLANT NAME:</b> DUANE ARNOLD						(1 cy encl rec;d) FOR ACTION/INFORMATION 8-21-74 GMC					

**ACKNOWLEDGED  
DO NOT REMOVE**

BUTLER (L)	SCHWENCER (L)	ZIEMANN (L)	REGAN (E)
W/ CYS	W/ CYS	W/ CYS	W/ CYS
CLARK (L)	STOLZ (L)	DICKER (E)	LEAR
W/ CYS	W/ CYS	W/ CYS	W/7 CYS
DADE (L)	VASCALLO (L)	KNIGHTON (E)	
W/ CYS	W/ CYS	W/ CYS	W/ CYS
KNIEL (L)	PURPLE (L)	YOUNGBLOOD (E)	
W/ CYS	W/ CYS	W/ CYS	W/ CYS

**INTERNAL DISTRIBUTION**

<input checked="" type="checkbox"/> REG FILE <input checked="" type="checkbox"/> AEC PDR <input checked="" type="checkbox"/> OGC <input checked="" type="checkbox"/> MUNTZING/STAFF <input checked="" type="checkbox"/> CASE GIAMBUSSO BOYD MOORE (L)(LWR-2) DEYOUNG (L)(LWR-1) <input checked="" type="checkbox"/> SKOVHOLT (L) <input checked="" type="checkbox"/> GOLLER (L) P. COLLINS DENISE <input checked="" type="checkbox"/> REG OPR <input checked="" type="checkbox"/> FILE & REGION (3) <input checked="" type="checkbox"/> MORRIS <input checked="" type="checkbox"/> STEELE	<input checked="" type="checkbox"/> TECH REVIEW <input checked="" type="checkbox"/> HENDRIE <input checked="" type="checkbox"/> SCHROEDER <input checked="" type="checkbox"/> MACCARY <input checked="" type="checkbox"/> KNIGHT <input checked="" type="checkbox"/> PAWLICKI <input checked="" type="checkbox"/> SHAO <input checked="" type="checkbox"/> STELLO <input checked="" type="checkbox"/> HOUSTON <input checked="" type="checkbox"/> NOVAK <input checked="" type="checkbox"/> ROSS <input checked="" type="checkbox"/> IPPOLITO <input checked="" type="checkbox"/> TEDESCO <input checked="" type="checkbox"/> LONG <input checked="" type="checkbox"/> LAINAS <input checked="" type="checkbox"/> BENAROYA <input checked="" type="checkbox"/> VOLLMER	DENTON GRIMES GAMMILL KASTNER BALLARD SPANGLER ENVIRO MULLER DICKER KNIGHTON YOUNGBLOOD REGAN PROJECT MGR HARLESS	LIC ASST DIGGS (L) GEARIN (L) GOULBOURNE (L) KREUTZER (E) LEE (L) MAIGRET (L) REED (E) SERVICE (L) SHEPPARD (L) SLATER (E) SMITH (L) <input checked="" type="checkbox"/> TEETS (L) WILLIAMS (E) WILSON (L)	A/T IND BRAITMAN SALTZMAN B. HURT PLANS MCDONALD CHAPMAN DUBE w/input E. COUPE <input checked="" type="checkbox"/> D. THOMPSON (2) <input checked="" type="checkbox"/> KLECKER <input checked="" type="checkbox"/> EISENHUT
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**EXTERNAL DISTRIBUTION**

<input checked="" type="checkbox"/> 1 - LOCAL PDR CEDAR RAPIDS, IA <input checked="" type="checkbox"/> 1 - TIC (ABERNATHY) <input checked="" type="checkbox"/> 1 - NSIC (BUCHANAN) 1 - ASLB <input checked="" type="checkbox"/> 1 - P. R. DAVIS <input checked="" type="checkbox"/> 5 - ACRS SENT TO LIC ASST TEETS 8-21-74	(1)(2)(10)-NATIONAL LABS 1-ASLBP(E/W Bldg, Rm 529) 1-W. PENNINGTON, Rm E-201 GT 1-B&M SWINEBROAD, Rm E-201 GT 1-CONSULTANTS NEWMARK/BLUME/AGBABIAN	1-PDR-SAN/LA/NY 1-BROOKHAVEN NAT LAB 1-G. ULRIKSON, ORNL 1-AGMED (RUTH GUSMAN) Rm B-127 GT 1-RD..MUELLER, Rm F-300 GT
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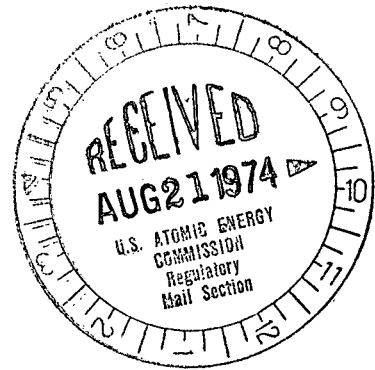
LB

# IOWA ELECTRIC LIGHT AND POWER COMPANY

*General Office*

CEDAR RAPIDS, IOWA  
DUANE ARNOLD ENERGY CENTER  
PALO, IOWA  
AUGUST 14, 1974  
DAEC - 74 - 287

## REGULATORY DOCKET FILE COPY



Mr. James G. Keppler, Regional Director  
Directorate of Regulatory Operations  
U. S. Atomic Energy Commission  
Region III  
799 Roosevelt Road  
Glen Ellyn, Illinois 60137

SUBJECT: Abnormal Occurrence No. 50-331/74-27  
FILE: A-118a

Dear Mr. Keppler:

In accordance with Appendix A, Operating License DPR-49, Technical Specifications and Bases for Duane Arnold Energy Center, please find enclosed a written report on the subject abnormal occurrence. Mr. C. Feierabend, of your office, was notified of the occurrence on August 5, 1974, at 1435 hours.

Very truly yours,

A handwritten signature in dark ink, appearing to read "G. G. Hunt".

G. G. Hunt  
Chief Engineer  
Duane Arnold Energy Center

GAE:GGH:bh  
Enclosure

CC: John O'Leary  
C. W. Sandford  
J. A. Wallace  
E. L. Hammond  
B. R. York  
D. L. Wilson  
O. C. Schellberg  
L. D. Root  
H. W. Rehrauer-Chairman, Safety Committee  
J. R. Newman  
G. A. Engle  
B. L. Hopkins



8629

AUG 16 1974

# IOWA ELECTRIC LIGHT AND POWER COMPANY

General Office  
CEDAR RAPIDS, IOWA

SUBJECT: Abnormal Occurrence  
REPORT NUMBER: AO 50-331/74-27  
REPORT DATE: August 14, 1974  
OCCURRENCE DATE: August 4, 1974  
FACILITY: Duane Arnold Energy Center, Unit No. 1, Palo, Iowa

## Identification of Occurrence

Reactor coolant conductivity levels reportable in accordance with Appendix A, Operating License DPR-49, Specification 1.0.4.b.

## Conditions Prior to Occurrence

Routine power ascension operation. Reactor was at 65% power at time of occurrence.

## Description of Occurrence

On August 4, 1974, at 1408 hours, condensate demineralizer 1T-13E was placed in service. Operator was gradually opening CV-1719E (Demineralizer discharge isolation) when a high differential pressure alarm was received from PDIS 1731E, which senses differential pressure across the resin trap. Operator immediately closed CV-1719E.

The following is a chronological list of events related to the occurrence.

8-4-74	1408 hours	Commenced placing 1T-13E in service
	1410 hours	Condensate Demineralizer System trouble
	1414 hours	Steam line high radiation. Control Room conductivity recorder indicates conductivity in excess of Tech. Spec. limits.
	1440 hours	Sample sink temporary process instrument indicated pH 3.9
	1530 hours	Analytical sample analysis conductivity 54 micro mho/cm and pH 3.9
	1554 hours	Commenced reducing reactor power
	1628 hours	Manual Reactor Scram
	1800 hours	pH 3.9 Conductivity 44 $\mu$ mho/cm
	1835 hours	Added 200 grams of trisodium phosphate (TSP)
	1849 hours	Added 200 grams TSP
	1858 hours	Added 200 grams TSP
	1900 hours	pH 4.52 Conductivity 21 $\mu$ mho/cm

	1907 hours	Added 200 grams of TSP
	1925 hours	Added 200 grams of TSP
		pH 4.8 Conductivity 18 $\mu$ mho/cm
	1945 hours	pH 5.7 Conductivity 15 $\mu$ mho/cm
	2020 hours	pH 5.25 Conductivity 15 $\mu$ mho/cm
	2200 hours	pH 5.32 Conductivity 13 $\mu$ mho/cm
	2300 hours	pH 5.36 Conductivity 11.5 $\mu$ mho/cm
	2400 hours	pH 5.43 Conductivity 10.25 $\mu$ mho/cm
8-5-74	0100 hours	pH 5.5 Conductivity 8.6 $\mu$ mho/cm
	0200 hours	pH 5.59 Conductivity 7.5 $\mu$ mho/cm
	0300 hours	pH 5.62 Conductivity 6.4 $\mu$ mho/cm
	0400 hours	pH 5.68 Conductivity 5.4 $\mu$ mho/cm
	0430 hours	Within Technical Specification limit.

#### Description of Apparent Cause of Occurrence

The apparent cause of the occurrence was carry-over of resin from demineralizer 1T-13E. The release of resin was due to an air pocket formed in the dome of the demineralizer which caused a flow imbalance and disturbed the precoat resin cake.

#### Analysis of Occurrence

The maximum values attained during this occurrence were a pH of 3.9 and conductivity of 54 micro mho/cm. This was due to breakdown of the resin released into the vessel.

This conclusion is supported by information contained in a Rhom and Haas bulletin Amber-Hi-Lites, No. 139 as follows, "When exposed to radiation, ion exchange resins are subject to degradation conditions that are not encountered by ion exchange resins under normal conditions in water treatment. High energy radiation, particularly gamma and X-ray radiation, will directly degrade many organic compounds, including all types of ion exchange resins. In addition, gamma radiation causes water to undergo radiolysis, resulting in formation of hydrogen peroxide which in turn will cause all ion exchange resins to degrade." The Rohm and Haas report goes on to explain that such degradation of cation ion exchange resin will be evidenced by the formation of sulfuric acid. The formation of sulfuric acid will cause a reduction in solution pH and an increase in conductivity due to the presence of ionic material.


#### Corrective Action

When the high differential pressure alarm and steam line radiation alarms were received, power ascension was ceased to evaluate the plant condition. A plant shutdown was commenced soon after the first analysis confirmed the pH and conductivity levels were out of Technical Specification limits. A manual reactor scram was initiated to shorten the time of reactor coolant temperature greater than 212°F.. Trisodium phosphate additions were made to lower the conductivity and raise the pH levels.

Administrative controls are being implemented to incorporate into the Operating Instructions an additional check which will assist in verifying proper venting when a demineralizer is being refilled.

Conclusion

On August 13, 1974, the DAEC Operations Committee reviewed and approved this report. The Committee concluded that the occurrence did not present a hazard to the health and safety of the public.

A handwritten signature in dark ink, appearing to read "G. G. Hunt", is positioned above the typed name.

G. G. Hunt  
Chief Engineer  
Duane Arnold Energy Center

GAE:GGH:bh