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(TEMPORARY FORM)

CONTROL NO: 4244

FILE: 910

FROM: Iowa Electric Light & Power Cedar Rapids, Iowa G. G. Hunt		DATE OF DOC 5-5-74	DATE REC'D 5-13-74	LTR X	MEMO	RPT	OTHER
TO: James G. Keppler		ORIG 1	CC	OTHER	SENT AEC PDR <u>XXX</u> SENT LOCAL PDR <u>XXX</u>		
CLASS	UNCLASS XXX	PROP INFO	INPUT	NO CYS REC'D 1	DOCKET NO: 50-331		
DESCRIPTION:  Ltr trans the following.....  PLANT NAME: DUANE ARNOLD				ENCLOSURES:  Abnormal Occurrence Rpt #74-3 & 74-4 of 5-5-74 in which the reactor water conductivity levels exceeded Tech Specs  <b>DO NOT REMOVE ACKNOWLEDGED</b>  (1 cy encl rec'd)			

FOR ACTION/INFORMATION 5-14-74 GMC

✓ BUTLER(L)	SCHWENCER(L)	ZIEMANN(L)	REGAN(E)
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W/ Copies	W/ Copies	W/ Copies	W/ Copies
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INTERNAL DISTRIBUTION

✓ <u>REG FILE</u>	✓ <u>TECH REVIEW</u>	DENTON	LIC ASST	<u>A/T IND</u>
✓ AEC PDR	✓ HENDRIE	GRIMES		BRAITMAN
✓ OGC, ROOM P-506A	✓ SCHROEDER	GAMMILL	DIGGS (L)	SALTZMAN
✓ MUNTZING/STAFF	✓ MACCARY <i>lt</i>	KASTNER	GEARIN (L)	B. HURT
✓ CASE <i>lt</i>	✓ KNIGHT	BALLARD	GOULBOURNE (L)	<u>PLANS</u>
GIAMBUSSO	✓ PAWLICKI	SPANGLER	LEE (L)	MCDONALD
BOYD	✓ SHAO		✓ MAIGRET (L)	DUBE w/Input
MOORE (L) (BWR)	✓ STELLO <i>lt</i>	<u>ENVIRO</u>	REED (E)	<u>INFO</u>
✓ DEYOUNG (L) (PWR)	✓ HOUSTON	MULLER	SERVICE (L)	✓ C. MILES
SKOVHOLT (L)	✓ NOVAK	DICKER	SHEPPARD (L)	✓ KLECKER
GOLLER(L)	✓ ROSS	KNIGHTON	SLATER (E)	✓ EISENHUT
P. COLLINS	✓ IPPOLITO	YOUNGBLOOD	SMITH (L)	
DENISE	✓ TEDESCO <i>lt</i>	REGAN	TEETS (L)	
✓ REG OPR	✓ LONG	PROJECT LDR	WADE (E)	✓ <u>AOR FILE</u>
✓ FILE & REGION(3)	✓ LAINAS		WILLIAMS (E)	D. THOMPSON (2)
✓ MORRIS	✓ BENAROYA	HARLESS	WILSON (L)	
	✓ VOLLMER			

EXTERNAL DISTRIBUTION

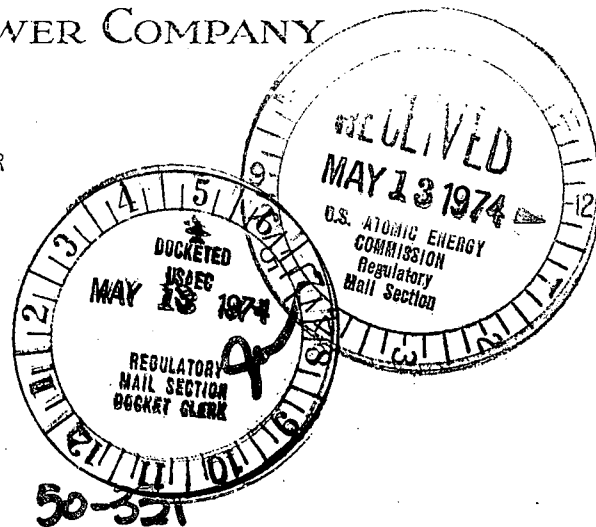
✓ 1 - LOCAL PDR CEDAR RAPIDS, IOWA	(1)(2)(10)-NATIONAL LAB'S	1-PDR-SAN/LA/NY
✓ 1 - TIC (ABERNATHY)	1-ASLBP (E/W Bldg, Rm 529)	1-GERALD LELLOUCHE
✓ 1 - NSIC (BUCHANAN)	1-W. PENNINGTON, Rm E-201 GT	BROOKHAVEN NAT. LAB
1 - ASLB	1-CONSULTANT'S	1-AGMED (Ruth Gussman)
✓ 1 - F. R. DAVIS (AEROJET NUCLEAR)	NEWMARK/BLUME/AGBABIAN	RM-B-127, GT.
✓ 16 - CYS ACRS <del>WOLDING</del>	1-GERALD ULRIKSON...ORNL	1-RD..MULLER..F-309 GT
Sent to Lic Asst Maigret 5-14-74	1-B & M SWINEBROAD, Rm E-201 GT	

**LB**

# IOWA ELECTRIC LIGHT AND POWER COMPANY

*General Office*

CEDAR RAPIDS, IOWA  
DUANE ARNOLD ENERGY CENTER  
PALO, IOWA  
MAY 5, 1974  
DAEC - 74 - 173



Mr. James G. Keppler  
Regional Director  
Directorate of Regulatory Operations, USAEC  
Region III  
799 Roosevelt Road  
Glen Ellyn, Illinois 60137

SUBJECT: Abnormal Occurrences No. DPR-49.74-3 and  
DPR-49/74-4  
FILE: A-118a  
A-110

Dear Mr. Keppler:

In accordance with Appendix A to Operating License DPR-49, Technical Specifications and Bases for Duane Arnold Energy Center, please find enclosed a preliminary written report on the subject abnormal occurrences. Since the subject occurrences are of the same nature, involve the same analyses, and have the same corrective actions, the reports have been combined into one document. Mr. D. Boyd of your office indicated this method of reporting would be acceptable.

Please note that investigation and analysis of the occurrences has not yet been completed. Therefore, this report is intended to be only preliminary in nature. A final report will be submitted as soon as possible. We will keep your office advised on the status of the final report.

Yours very truly,

G. G. Hunt  
Chief Engineer  
Duane Arnold Energy Center

DLW/GGH/bh

CC: ✓ John O'Leary, Washington, D. C.  
C. W. Sandford  
J. A. Wallace  
E. L. Hammond  
B. R. York  
D. L. Wilson  
H. W. Rehrauer, Chairman, Safety Committee

4244

REGULATORY DOCKET FILE COPY

# IOWA ELECTRIC LIGHT AND POWER COMPANY

*General Office*  
CEDAR RAPIDS, IOWA

Subject: Abnormal Occurrences(Preliminary Report)  
Report Number: DPR-49/74-3 and DPR-49/74-4  
Report Date: May 5, 1974  
Occurrence Dates: April 26, 1974 and April 28, 1974, respectively  
Facility: Duane Arnold Energy Center, Unit No. 1, Palo, Iowa

## Identification of Occurrences

Reactor water conductivity levels in violation of a limiting condition for operation as established in the Duane Arnold Energy Center Technical Specifications, Section 3.6.B.2.a.

## Conditions Prior to Occurrences

DPR-49/74-3

1. Routine Startup Operation - nuclear heat was being used to raise reactor water temperature to 212°F. in preparation for Phase Four Startup Activities.
2. Reactor Vessel vented to atmosphere and reactor water temperature at inlet to Reactor Water Cleanup System 135°F.
3. Reactor Critical, thermal power <1%.

DPR-49/74-4

1. Nuclear heat (neutron flux) was being used to break down Reactor Water Cleanup System resins in the reactor water.
2. Reactor Vessel vented to atmosphere and reactor water temperature at inlet to Reactor Water Cleanup System, 150°F.
3. Reactor Critical, thermal power <1%.

Description of Occurrence

DPR-49/74-3

April 26, 1974

1. 1300 hours, Control Room Operators observed increasing reactor water conductivity.
2. 1320, Reactor water conductivity exceeded Tech. Spec. limit of 5 micro mhos/cm. (Beginning of DPR 49/74-3).
3. 1335, Operations requested reactor water sample analysis for conductivity pH, and chlorides.
4. 1420, Chemistry group implemented continuous monitoring of reactor water conductivity and pH at Reactor Water Cleanup Sample Station. Readings were to be logged at 1/2 hour intervals.
5. 1430, Shift Supervisor log entry indicates reactor water conductivity of 24 micro mhos/cm, reactor water temperature of 195°F. and a chemistry report that chlorides are within specifications.
6. 1620, Operations Supervisor directed that power and temperature be held constant (195°F.) and clean-up to continue until conductivity within Tech. Spec. limits.
7. 1700, Reactor water conductivity peaked at 33 micro mhos/cm and decreasing.
8. 1810, D. Boyd, Region III Reactor Inspector, notified of Abnormal Occurrence, DPR-49/74-3.
9. 1822, Assistant Chief Engineer ordered commencement of orderly shutdown.
10. Control rod insertion began.
11. 2103, All Control rods fully inserted.
12. 2112, Reactor mode switch placed in shutdown.
13. 2400, Reactor water conductivity approximately 22 micro mhos/cm.

April 27, 1974

14. 0454 hours, "B" RHR Loop placed in shutdown cooling mode to increase reactor water temperature with pump heat. (Reactor water temperature approximately 148°F.).
15. 1505, "A" RHR Loop placed in shutdown cooling mode to increase reactor water temperature with pump heat. (Reactor water temperature approximately 157°F.).
16. 1530, Reactor water conductivity below Tech. Spec. limitations of 5 micro mho per/cm. (End of DPR 49/74-3)

17. 1825, Reactor water temperature approximately 175°F.
18. 2021, RHR Loops "A" and "B" secured from shutdown cooling mode.
19. 2116, Reactor Mode Switch placed in "Startup" in preparation for heatup in accordance with instructions from the Assistant Chief Engineer and the Operations Supervisor. After each rod pull in the approach to criticality, reactor water conductivity is to be observed for five (5) minutes before pulling more rods. If at any time 4.5 micro mhos/cm reactor water conductivity is reached, rod motion is to stop, allowing Reactor Water Cleanup System to reduce conductivity.
20. 2136, Commenced rod pull for criticality.

DPR-49/74-4

April 28, 1974

21. 0155 hours, Reactor critical, reactor water temperature 160°F.
22. 0800, Reactor water conductivity exceeded Tech. Spec. limit of 5 micro mhos/cm. (Beginning of DPR-49/74-4)
23. 0845, Reactor water conductivity peaked at 7.8 micro mhos/cm.
24. 0916, Orderly reactor shutdown began. Reactor water conductivity began decreasing.
25. 1005, All control rods fully inserted.
26. 1012, Reactor Mode Switch placed in shutdown.
27. 1019, RHR Loop "B" placed in shutdown cooling mode in order to maintain reactor water temperature with pump heat.
28. 1023, RHR Loop "A" placed in shutdown cooling mode in order to maintain reactor water temperature with pump heat.
29. 1230, Reactor water conductivity below Tech. Spec. limits of 5 micro mhos/cm. (End of DPR 49/74-4).

April 29, 1974

30. 0756, USAEC Region 5 Coordinating Office notified concerning DPR-49/74-4.

Designation of Apparent Cause of Occurrences

The apparent cause of both occurrences was the breakdown of reactor water cleanup system resins in the reactor water resulting from exposure to neutron flux.

Resins were introduced to the reactor water during the conduct of Preoperational Test No. 58.1 - Nuclear Steam Supply Shutoff system on April 3, 1974. (See Unusual Event Report No. DPR 49/74-UE-1). During this test, the Reactor Water Cleanup System discharge valve to radwaste was open while the filter-demineralizers were in a "hold" mode of operation. It is believed the filter-demineralizer tanks may have partially drained allowing resins to drop off the septums. When the Reactor Water Cleanup System was restored to normal operations resins could have passed through the septums and into the reactor vessel.

A review of Reactor Water Cleanup System filter-demineralizer precoat operations is continuing to determine if they are adequate. Results of that review will be included in the final report of these abnormal occurrences.

#### Analysis of Occurrences

Investigation of the abnormal occurrences and resulting analyses have not been completed and will be included in the final report.

#### Corrective Action

The following items summarize actions undertaken to control reactor water conductivity and prevent repetition of the occurrences:

##### April 29, 1974

Filter demineralizer and resin vendors arrived on site to provide technical assistance.

##### April 30, 1974

Special testing of the reactor water cleanup filter demineralizer units was undertaken to ascertain if the use of solka-floc would reduce the traces of resins in the effluent of the units (the filter septums in current use are designed not to require the use of solka-floc).

Results of the testing will be included in the final report of these occurrences.

##### May 1, 1974

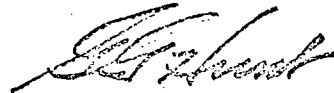
Actions were initiated to prepare the condensate-system filter-demineralizers for large volume cleanup of the reactor water. A procedure was prepared to provide for the following flow paths:

1. Removal of approximately 200 gpm of reactor water from the reactor vessel through the reactor water cleanup system bypass piping and discharge to the main condenser hot well.
2. Flow to the reactor vessel was to be through the condensate-feedwater system. The feedwater regulating valves would maintain reactor vessel level and flow to the condenser.

May 2, 1974

Cleanup of reactor water using the condensate-feedwater system commenced at 0200 hours.

Investigation and analysis of the occurrences had not been completed at the time this report was prepared. A final report will be submitted after these actions have been completed.



G. G. Hunt  
Chief Engineer  
Duane Arnold Energy Center

DLW/GGH/bh