

AEC DISTRIBUTION FOR PART 50 DOCKET MATERIAL
(TEMPORARY FORM)

CONTROL NO: 6114

FILE: *PJA*

FROM: Iowa Electric Light and Power Company Cedar Rapids, Iowa G. G. Hunt		DATE OF DOC 6-21-74	DATE REC'D 6-29-74	LTR X	TWX	RPT	OTHER
TO: Mr. Keppler		ORIG 1 signed	CC	OTHER	SENT AEC PDR X		
					SENT LOCAL PDR X		
CLASS	UNCLASS XXXXX	PROP INFO	INPUT	NO CYS REC'D 1	DOCKET NO: 50-331		

DESCRIPTION:
Ltr trans the following:

PLANT NAME: Duane Arnold

ENCLOSURES:
Abnormal Occurrence No. DPR 49/74-11, on 6-11-74, in which it was observed that HPCI outboard steam supply isolation valve MOV 2239 was indicating the closed position.

ACKNOWLEDGED
Do Not Remove

(1 cy rec'd)

FOR ACTION/INFORMATION 7-5-74 AB

- | | | | |
|------------|---------------|----------------|-----------|
| BUTLER (L) | SCHWENCER (L) | ZIEMANN (L) | REGAN (E) |
| W/ CYS | W/ CYS | W/ CYS | W/ CYS |
| CLARK (L) | STOLZ (L) | DICKER (E) | G. LEAR |
| W/ CYS | W/ CYS | W/ CYS | W/ 7 CYS |
| W/ CYS | VASSALLO (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"/> TECH REVIEW | DENTON | LIC ASST | A/T IND |
| <input checked="" type="checkbox"/> AEC PDR | <input checked="" type="checkbox"/> HENDRIE | GRIMES | DIGGS (L) | BRAITMAN |
| <input checked="" type="checkbox"/> OGC | <input checked="" type="checkbox"/> SCHROEDER | GAMMILL | GEARIN (L) | SALTZMAN |
| <input checked="" type="checkbox"/> MUNTZING/STAFF | <input checked="" type="checkbox"/> MACCARY | KASTNER | GOULBOURNE (L) | B. HURT |
| <input checked="" type="checkbox"/> CASE | <input checked="" type="checkbox"/> KNIGHT | BALLARD | KREUTZER (E) | |
| GIAMBUSSO | <input checked="" type="checkbox"/> PAWLICKI | SPANGLER | LEE (L) | <u>PLANS</u> |
| BOYD | <input checked="" type="checkbox"/> SHAO | | MAIGRET (L) | MCDONALD |
| MOORE (L)(LWR-2) | <input checked="" type="checkbox"/> STELLO | <u>ENVIRO</u> | REED (E) | CHAPMAN |
| DEYOUNG (L)(LWR-1) | <input checked="" type="checkbox"/> HOUSTON | MULLER | SERVICE (L) | DUBE w/input |
| SKOVHOLT (L) | <input checked="" type="checkbox"/> NOVAK | DICKER | SHEPPARD (L) | E. COUPE |
| GOLLER (L) | <input checked="" type="checkbox"/> ROSS | KNIGHTON | SLATER (E) | |
| P. COLLINS | <input checked="" type="checkbox"/> IPPOLITO | YOUNGBLOOD | SMITH (L) | <input checked="" type="checkbox"/> D. THOMPSON (2) |
| DENISE | <input checked="" type="checkbox"/> TEDESCO | REGAN | TEETS (L) | <input checked="" type="checkbox"/> KLECKER |
| <input checked="" type="checkbox"/> REG OPR | <input checked="" type="checkbox"/> LONG | PROJECT MGR | WILLIAMS (E) | <input checked="" type="checkbox"/> EISENHUT |
| <input checked="" type="checkbox"/> FILE & REGION (3) | <input checked="" type="checkbox"/> LAINAS | | WILSON (L) | |
| <input checked="" type="checkbox"/> MORRIS | <input checked="" type="checkbox"/> BENAROYA | HARLESS | | |
| <input checked="" type="checkbox"/> STEELE | <input checked="" type="checkbox"/> VOLLMER | | | |

EXTERNAL DISTRIBUTION

- | | | |
|---|-------------------------------|-------------------------|
| <input checked="" type="checkbox"/> 1 - LOCAL PDR Cedar Rapids, Iowa | (1)(2)(10)-NATIONAL LABS | 1-PDR-SAN/LA/NY |
| <input checked="" type="checkbox"/> 1 - TIC (ABERNATHY) | 1-ASLBP(E/W Bldg, Rm 529) | 1-BROOKHAVEN NAT LAB |
| <input checked="" type="checkbox"/> 1 - NSIC (BUCHANAN) | 1-W. PENNINGTON, Rm E-201 GT | 1-G. ULRIKSON, ORNL |
| 1 - ASLB | 1-B&M SWINEBROAD, Rm E-201 GT | 1-AGMED (RUTH GUSSMAN) |
| 1 - P. R. DAVIS | 1-CONSULTANTS | Rm B-127 GT |
| <input checked="" type="checkbox"/> 16 - ACRS SENT TO LIC ASST S. TEETS | NEWMARK/BLUME/AGBABIAN | 1-RD. MUELLER, Rm F-309 |

IOWA ELECTRIC LIGHT AND POWER COMPANY

General Office

CEDAR RAPIDS, IOWA
DUANE ARNOLD ENERGY CENTER
PALO, IOWA

June 21, 1974

DAEC - 74 - 231

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

50-331



SUBJECT: Abnormal Occurrence No. DPR 49/74-11
FILE: A-118a

Dear Mr. Keppler:

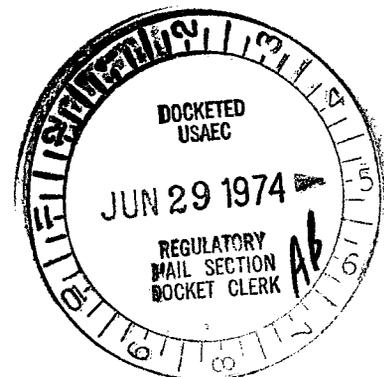
In accordance with Appendix A to Operating License DPR-49, Technical Specifications and Bases for Duane Arnold Energy Center, please find enclosed a written report on the subject occurrence.

Yours very truly,

G. G. Hunt, Chief Engineer
Duane Arnold Energy Center

Encl.
GAE/GGH/pd

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



JUN 24 1974

6114

IOWA ELECTRIC LIGHT AND POWER COMPANY

General Office

CEDAR RAPIDS, IOWA

Subject: Abnormal Occurrence
Report Number: DPR 49/74-11
Reprot Date: June 21, 1974
Occurrence Date: June 11, 1974
Facility: Duane Arnold Energy Center, Unit NO. 1, Palo, Iowa

Identification of Occurrence

Occurrence involving a piping hanger support and seismic restraints on the HPCI steam supply piping in accordance with Section 1.4.d of Appendix A to Operating License DPR-49, Technical Specifications and Bases.

Conditions Prior to Occurrence

The reactor was in a steady-state power condition (30% thermal) at rated pressure and temperature. The reactor mode switch was in the "run" position.

Description of Occurrence

The following items summarize the events prior to and during the subject occurrence:

June 11, 1974

- 1423 hours During a routine inspection of the control panel, it was observed that HPCI outboard steam supply isolation valve, MOV 2239, was indicating the closed position. Operations personnel observed that a HPCI auto isolation alarm signal was not present and opened MOV 2239. "HPCI Room Fire" annunciator was received in the control room with a simultaneous electric fire pump auto start. Fire Protection System actuation was caused by a steam leak when the HPCI steam supply line drain pot level switch was dislodged from its condensate chamber.
- 1425 hours Outboard and inboard HPCI steam supply isolation valves MOV 2239 and 2238 were closed by placing the control switches in the closed positions.
- 1510 hours HPCI Fire Protection System was secured with the manual isolation valve.
- 1715 hours Visual inspection indicated that a pipe hanger and several seismic restraints had been affected and the HPCI System was confirmed to be inoperable. The Chief Engineer and General Production Manager were notified of the occurrence.

June 12, 1974

1035 hours USAEC Region III Reactor Inspector, C. Feierabend notified of Abnormal Occurrence DPR 49/74-11 involving pipe hangers and restraints on hangers and restraints on HPCI steam supply piping.

Designation of Apparent Cause of Occurrence

The single apparent cause of the occurrence was a hydrostatic shock caused by a slug of water, created by steam condensation, moving down the HPCI steam supply line when HPCI outboard steam supply isolation valve (MOV2239) was opened. MOV2239 is a normally open seal-in type valve. Investigation as to how and when MOV2239 went to the closed position is continuing.

Analysis of Occurrence

The following items of equipment were affected as a result of the occurrence:

1. Insulation at pipe flexure locations.
2. The second pipe hanger outside the steam tunnel in the torus compartment.
3. Three seismic snubbers.
4. A local rack mounted pressure indicator (PI2208).
5. A HPCI steam supply line drain pot level instrument (LS2214).

Operator error has been designated as a contributing factor in the occurrence since proper methods were not followed for warming the HPCI steam supply line when returning the outboard isolation valve to its normally open position. The proper procedure would have been to first close the inboard (throttle) isolation valve and then open the outboard (seal-in) valve. The inboard (throttle) valve could then have been used to gradually release steam to supply line.

A review of plant Operating Procedures indicated that the procedures did not adequately cover the situation for opening the outboard isolation valve with the inboard valve full open. These procedures have been revised as stated in the corrective action section of this report.

There was no release of radioactive materials to the environment as a result of this occurrence and there was no hazard to the health and safety of the public.

Corrective Action

Following the occurrence, a comprehensive program was established to restore the HPCI System to an operational status. This program included a detailed inspection of HPCI Steam Supply piping including pipe hangers and seismic restraints, an inspection of the HPCI Turbine, an inspection of all associated instrumentation, and testing to verify integrity and operability of the HPCI System.

The following items summarize the activities involved in the inspection of HPCI Steam Supply piping, pipe hangers and seismic restraints, and the HPCI Turbine. Corrective actions are indicated where appropriate:

1. HPCI Steam Supply Piping - The extent of piping movement during the transient was assessed by observing the extent of insulation and pipe support damage. Based on these measurements, a stress analysis was performed to identify those portions of the system in which the stresses potentially could have exceeded the material yield stress. Those portions were then given a full volumetric inspection utilizing ultrasonic techniques. Also, selected areas were surface tested using magnetic particle, and liquid dye penetrant techniques. As a result of this inspection, it was determined that the piping met the requirements of ANSI B31.7-1969 (Paragraph 1-724.1.1) with the exception of three linear abnormalities. These anomalies were removed, final surface examined by the magnetic particle method, checked for minimum wall thickness and found to be acceptable in accordance with ANSI B31.7-1969 (Paragraph 1-724.1.6).

The pipe diameter in the HPCI room and two locations in the torus area were checked for ovality and no significant differences in the diameter were found.

All flanges in the affected portions of the HPCI steam supply piping, with the exception of the connection to the HPCI Turbine, were dismantled and their bolts and gaskets replaced. The bolts in the flanged condition to the HPCI Turbine were examined ultrasonically and found to be unaffected.

Temporary insulation was installed on selected portions of the piping where insulation was removed for inspection.

2. HPCI Turbine - A representative of the turbine manufacturer was called on site to assist in the examination of the HPCI Turbine for potential damage. An initial visual examination had indicated no evidence of damage to or movement of the turbine. The following items summarize the major items of the inspection, which confirmed there was no damage to the Turbine:
 - a. Turbine bearings examined.
 - b. Pedestal dye-penetrant checked.
 - c. Insulation examined for indications of turbine movement.
 - d. Insulation removed from the flange area between the steam chest and stop valve for examination of flange.
 - e. Inlet pipe was disconnected from the turbine to check for pipe stress.
 - f. Coupling alignment and shaft runout were checked prior to and after disconnecting the inlet pipe.
 - g. Dowel pins were inspected.

The inspection of all associated instrumentation indicated that the only instruments affected were a pressure indicator (PI 2208) on a local rack and a level switch (LS2214) on the steam line drain pot. Both instruments were replaced.

Operability of the HPCI System was verified by surveillance testing and the conduct of that portion of the HPCI Startup Test Instruction which demonstrates auto initiation and design flows at rated pressure.

In order to prevent recurrence of the subject occurrence, a design change was made to remove the seal-in feature of the outboard HPCI steam supply isolation valve on opening. This will provide a throttle capacity on the outboard valve and provide an additional capability for warming the HPCI steam supply piping.

Additionally, Operating Procedures were revised to emphasize the requirements for warming the HPCI steam supply piping. A review of the Operating Procedures for the RCIC system is also in progress to ensure they contain the same requirements.

The training of Operating personnel concerning the occurrence has been completed. All operating personnel have been apprised of the circumstances surrounding the subject occurrence and actions required to prevent a like occurrence in the future.

Conclusion

Prior to declaring the HPCI System operable on June 18, 1974, the DAEC Operations Committee conducted a comprehensive review of the occurrence and actions performed to restore the system to an operable status. The Committee concluded that the occurrence did not present a hazard to the health and safety of the public. The contents of this report were review and approved by the Operations Committee on June 21, 1974.



G. G. Hunt
Chief Engineer
Duane Arnold Energy Center

DLW/GGH/bh