

UNITED STATES  
ATOMIC ENERGY COMMISSION  
DIRECTORATE OF REGULATORY OPERATIONS  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

TELEPHONE  
(312) 858-2660

A. RO Inspection Report No. 050-331/74-15

Transmittal Date : October 1, 1974

Distribution:  
RO Chief, FS&EB  
RO:HQ (5)  
DR Central Files  
Regulatory Standards (3)  
Licensing (13)  
RO Files

Distribution:  
RO Chief, FS&EB  
RO:HQ (4)  
L:D/D for Fuels & Materials  
DR Central Files  
RO Files

B. RO Inquiry Report No. \_\_\_\_\_

Transmittal Date : \_\_\_\_\_

Distribution:  
RO Chief, FS&EB  
RO:HQ (5)  
DR Central Files  
Regulatory Standards (3)  
Licensing (13)  
RO Files

Distribution:  
RO Chief, FS&EB  
RO:HQ  
DR Central Files  
RO Files

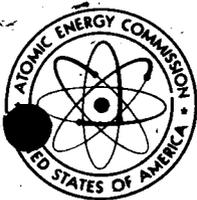
C. Incident Notification From: \_\_\_\_\_  
(Licensee & Docket No. (or License No.))

Transmittal Date : \_\_\_\_\_

Distribution:  
RO Chief, FS&EB  
RO:HQ (4)  
Licensing (4)  
DR Central Files  
RO Files

Distribution:  
RO Chief, FS&EB  
RO:HQ (4)  
L:D/D for Fuels & Materials  
DR Central Files  
RO Files

25



UNITED STATES  
ATOMIC ENERGY COMMISSION  
DIRECTORATE OF REGULATORY OPERATIONS  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

TELEPHONE  
(312) 858-2660

OCT 1 1974

Iowa Electric Light and Power Company  
ATTN: Mr. Charles W. Sandford  
Executive Vice President,  
Engineering  
Security Building  
P. O. Box 351  
Cedar Rapids, Iowa 52405

Docket No. 50-331

Gentlemen:

This refers to the inspection conducted by Mr. Feierabend of this office on August 27-29, 1974, of activities at Duane Arnold by AEC License No. DPR-40 and to the discussion of our findings with Messrs. Wallace, Hunt and others of your staff at the conclusion of the inspection.

A copy of our report of this inspection is enclosed and identifies the areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, interviews with plant personnel, and observations by the inspector.

During this inspection it was found that certain of your activities appear to be in violation of AEC requirements. The items and reference to the pertinent requirements are listed under Enforcement Action in the Summary of Findings Section of the enclosed inspection report. Prior to the conclusion of the inspection, the inspector determined that corrective action had been taken with respect to Item A and that measures have been taken to assure that similar, future violations will be avoided. Consequently, no reply to this item is required, and we have no further questions regarding this matter at this time.

With respect to Item B, the inspector verified that action was initiated to eliminate the deficiencies. Examination of the effectiveness of your surveillance test program will be included in future inspections, consequently, no reply to this item is required, and we have no further questions at this time.

In accordance with Section 2.790 of the AEC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the AEC's Public Document Room. If this report contains any information that you or your contractors believe to be proprietary, it is necessary that you make a written application to this office, within twenty days of your receipt of this letter, to withhold

OCT 1 1974

such information from public disclosure. Any such application must include a full statement of the reasons for which it is claimed that the information is proprietary, and should be prepared so the proprietary information identified in the application is contained in a separate part of the document. Unless we receive an application to withhold information or are otherwise contacted within the specified time period, the written material identified in this paragraph will be placed in the Public Document Room.

No reply to this letter is necessary; however, should you have any questions concerning this inspection, we will be glad to discuss them with you.

Sincerely yours,

James G. Keppler  
Regional Director

Enclosure:  
RO Inspection Rpt No. 050-331/74-15

bcc: RO Chief, FS&EB  
RO:HQ (4)  
Licensing (4)  
DR Central Files  
RO Files  
PDR  
Local PDR  
NSIC  
TIC  
OGC, Beth, P-506A

U. S. ATOMIC ENERGY COMMISSION  
DIRECTORATE OF REGULATORY OPERATIONS

REGION III

Report of Operations Inspection

RO Inspection Report No. 050-331/74-15

Licensee: Iowa Electric Light and Power Company  
Security Building  
P. O. Box 351  
Cedar Rapids, Iowa

Duane Arnold Energy Center  
Palo, Iowa

License No. DPR-49  
Category: B

Type of Licensee: BWR, 538 Mwe

Type of Inspection: Special Announced

Date of Inspection: August 27 - 29, 1974

Dates of Previous Inspection: August 1 - 2, 1974 (Operations)

Principal Inspector:

*C. D. Feierabend*  
C. D. Feierabend

9/27/74  
(Date)

Accompanying Inspector: None

Other Accompanying Personnel: None

Reviewed By:

*RC Knop*  
R. C. Knop, Senior Inspector  
Projects, Unit 1  
Operations Branch

9/27/74  
(Date)

## SUMMARY OF FINDINGS

### Enforcement Action

The following Category II violation was reported by the licensee. The licensee took action specified to comply with the Technical Specifications.

- A. Technical Specification 3.5.D.2 states that, "From and after the date the HPCI subsystem is made or found to be inoperable for any reason, continued reactor operation is permissible only during the succeeding seven days unless such subsystem is sooner made operable, providing that during such seven days all active components of the ADS subsystem, the RCIC system, the LPCI subsystem and both core spray subsystems are operable."

Contrary to the above, on May 30, 1974, the licensee determined that one ADS valve had been inoperable due to improper valve alignment during the time that the HPCI was inoperable. (Paragraph 3.a)

The following Category II violation was identified by the inspector in the course of the inspection.

- B. Technical Specification 3.6.C.2 states in part that, "Both the sump and air sampling systems shall be operable during reactor power operation".

Technical Specification 4.6.C.1 states, "Reactor coolant system leakage shall be checked by the sump and air sampling system and recorded at least once per day".

Contrary to the above, on August 29, 1974, the inspector observed that the air sampling system had not been made operable, therefore, the daily surveillance checks had not been made. (Paragraph 5)

### Licensee Action on Previously Identified Enforcement Matters

None included in the scope of this inspection.

### Unusual Occurrences

- A. A failure of a circuit breaker to close occurred during loss of off-site power test. (Paragraph 3.b)

- B. Pipe hanger and restraint damage occurred on the HPCI steam line during startup testing. (Paragraph 3.c)
- C. Unexplained control rod drift occurred on July 2 and July 16, 1974. (Paragraph 3.d)
- D. A short circuit in a limit switch caused the HPCI system to be inoperable because it prevented the injection valve from opening. (Paragraph 3.e)
- E. The primary coolant leakage into primary containment exceeded 5 gpm on July 20, 1974 and August 21, 1974. (Paragraph 3.f)

Other Significant Findings

A. Current Findings

Startup testing at the 100% plateau was in progress.

B. Unresolved Items

Unexplained Control Rod Drift. (Paragraph 3.d)

C. Status of Previously Reported Unresolved Items

1. Operability of HPCI System (RO:III Inspection Report No. 050-331/74-13)

The Startup test program has demonstrated system operability and capability to perform its function. Some additional testing will be performed to verify continued reliability. (Paragraph 2.b)

Management Interview

A management interview was conducted with Messrs. Wallace, Hunt and members of the licensee's staff at the conclusion of the inspection on August 29, 1974.

A. Operator Contract Negotiations

The licensee stated that the union negotiating committee had recommended approval of a contract, that a vote by the union members was scheduled for August 30, and that licensee management was confident that the contract would be signed before the present contract expired on August 31. The inspector stated that he had discussed the licensee's plans with regard to possible work stoppage and requested that RO:III be notified in the event that the contract was not approved as scheduled. The licensee agreed to notify the inspector concerning the results of the meeting, and did notify the inspector by telephone on August 31, 1974, that negotiations were successful and a new contract had been signed.

B. Rerouting of Reactor Water Cleanup System Piping (RWCU)

The inspector stated that he had reviewed the documentation for the modification to reroute a portion of the RWCU system and had found no deficiencies. (Paragraph 4)

C. Operator Retraining

The inspector stated that he had observed that the licensee had started the classroom lecture series portion of the operator requalification program in accordance with the authorization<sup>1/</sup> received to delay the lectures until September 1, 1974.

D. Abnormal Occurrences

The inspector stated that he had examined several abnormal occurrences, including review of operating logs, abnormal occurrence reports and evaluations by licensee management. The inspector stated that, for all occurrences that had violated limiting conditions for operation, he had verified that the actions taken were appropriate and that no response would be required. (Paragraph 3)

E. Violation of Technical Specifications

The inspector stated that the inspection identified violation of Technical Specifications 3.6.C.2 and 4.6.C.1, which require that both reactor coolant leakage monitoring systems be operable and checked daily.

The licensee stated that the air sampling system had been considered a part of the nitrogen system for controlling oxygen content (inerting) and so had not been scheduled for testing until completion of the startup test program.

The licensee stated that action had been initiated to make the system operable and that surveillance would be performed in accordance with the Technical Specification. (Paragraph 5)

1/ Letter L, OLB to IELP dated May 17, 1974.

## REPORT DETAILS

### 1. Persons Contacted

#### Iowa Electric Light and Power Company (IELP)

J. Wallace, General Production Manager  
G. Hunt, DAEC Chief, Engineer  
E. Hammond, Assistant Chief Engineer  
B. York, Operations Supervisor  
M. Kappl, Assistant Operations Supervisor  
C. Vondra, Shift Supervising Engineer  
R. Zook, Shift Supervising Engineer  
D. Moen, Reactor & Plant Performance Engineer  
R. Rinderman, Quality Supervisor  
R. Hannen, Test Engineer  
D. Wilson, Results Engineer  
O. Schellberg, Results Engineer  
P. Ward, Nuclear Design Engineer  
H. Rehauser, Project Engineer Supervisor

#### General Electric Company (GE)

J. Miller, Site Manager  
K. Burke, TD&A Engineer

### 2. Startup Testing

#### a. STI-22 Pressure Regulator

The licensee performed tests of response to pressure transients during startup testing at the 25%, 50% and 75% test plateaus. In all cases the test results met the basic acceptance criteria that the delay ratio be less than 1.0 for each process variable for oscillatory responses. This was also true for response time and for control by the backup regulatory after simulated failures of the primary controlling regulator.

All primary parameters met the desired criteria ratio of  $< 0.25$ , however, some secondary parameters may require additional fine tuning, which will be completed at 100% power. The test results were reviewed and approved in accordance with the licensee's startup test program.

#### b. STI-15 HPCI Testing

The inspector reviewed the data and licensee evaluations for several tests of the HPCI system. Early tests of the system had produced marginal results. Modifications were made to the control system to improve response to initiation signal.

Several occurrences resulting from HPCI testing, were reportable as Abnormal Occurrences. (Paragraph 3). Review of each of these occurrences and the corrective actions applied indicated that the test program was effective in identifying and resolving design and/or procedural problem areas.

Demonstrations of system performance, including injection into the reactor vessel after a schedule turbine trip from 100% power, verified ability of the system to respond and perform its function within the allowable time criteria.

The licensee considers the system to be operable, however, two areas require additional testing. These are repeatability of the time for the steam stop valve to start opening and the magnitude of the  $\Delta P$  signal for one of the high flow switches that provides isolation of the steam line in case of a steam break.

c. STI-27 Turbine Stop Valve Trip

The inspector received the test data and the licensee evaluation of the turbine trip from 95% rated power with 100% core flow. The test successfully demonstrated that the system response was as predicated and all test criteria were met. As in other transient tests, the plant computer did not provide much data for analysis, and it tripped off a few minutes after the test was initiated.

3. Abnormal Occurrences

The inspector reviewed the following Abnormal Occurrence Reports (AOR's) to verify that the reports accurately described the occurrences, that licensees corrective actions were adequate and that the occurrences were evaluated in accordance with Technical Specification requirements.

a. AOR No. DPR-49/74-7, dated June 7, 1974 - Inoperable ADS Valves

The cause of the occurrence was attributed to error in verifying system lineup, partially due to inadequacies in drawings, checklists, and procedures. The occurrence was a violation of Limiting Condition for Operation and was reported in accordance with Technical Specifications requirements. Licensee actions were found to be adequate.

b. AOR No. DPR-49/74-10, dated June 19, 1974 - Failure of Motor Control Center Bus to Energize During Loss of Power Testing

The failure did not violate Limiting Condition of Operation. The cause of the occurrence and corrective actions were accurately described. Review of plant records verified that the design change and a change to the operating procedure had been completed in accordance

with the licensee's quality assurance program.

- c. AOR No. DPR-49/74-11, dated June 21, 1974 - Pipe Hanger and Restraint Damage from Water Hammer, HPCI Steam Line

The failure did not violate Limiting Conditions for Operations. Review of plant records verified that corrective actions included modification of the valve controls and the plant operating procedures in accordance with the licensee's administrative control and quality assurance procedures.

- d. AOR Nos. A050-331/74-14, dated July 12, 1974 and DPR-49/74-20, dated July 26, 1974 - Excessive Control Rod Drift

There was no violation of Limiting Condition for Operations. The inspector reviewed logs and discussed these occurrences with operators and supervisory personnel. The actions taken and the continuing investigations described in the report appear appropriate. The licensee has verbally committed that if either of the control rods or any other control rod experiences an abnormal drift, the reactor will be shut down for full investigation and resolution of the problem. This item is considered unresolved pending final resolution.

- e. AOR Nos. A050-331/74-15, dated July 16, 1974, and A050-331/74-17, dated July 19, 1974 - Failure of Limit Switch Prevented HPCI Injection Valve from Opening

These occurrences did not violate Limiting Conditions for Operation. Review of the records and discussion with operating personnel indicated that the system had been checked and determined to be operable on July 6, as described, but that the system would not have performed as intended, because of the short circuit in the limit switch discovered on July 14, 1974. The licensee declared the system inoperable and performed the appropriate surveillance tests on backup systems in accordance with the Technical Specification requirements.

- f. AOR No. 50-331/74-24, dated July 30, 1974 and No. 50-331/74-31, - Unidentified Leakage of Reactor Coolant in Drywell Exceeded Limiting Condition for Operation

Examination of these occurrences verified that the licensee placed the reactor in a cold shutdown condition in accordance with Technical Specification requirements. Repairs and retesting was performed as described in the AOR. Discussions with operating personnel, observation of the monitoring instrumentation and comparison with Technical Specification requirements identified a deficiency in surveillance of unidentified leakage. (Paragraph 5)

4. Rerouting Reactor Cleanup Line

The inspector examined a design change that had been accomplished to

correct the condition described in a letter<sup>2/</sup> to RO:III. The design change was completed in accordance with the licensee's quality assurance program for operation. The proposed change was reviewed and approved in accordance with 10 CFR 50.59. Plant records reviewed included drawings, procedures, records for core drilling and sealing the secondary containment walls, hydrostatic tests, electrical system loop and functional tests, records for changes in pipe hangers, drawings revisions, welder qualifications and NDT records. No deficiencies were noted.

5. Reactor Coolant Leakage

The inspector examined the licensee's provisions for monitoring and recording reactor coolant leakage into primary containment.

a. Sump Pump System

All quantitative measurements of leakage are monitored by sump pump operation. The daily leakage rates, (both identified and unidentified) are computed from the integrated flows from the equipment sump and floor drain sump pumps respectively. Alarms that would indicate high leakage are provided by timers that monitor sump pump running time, for excessive pumping, and time between pumping cycles. The integrators and alarms circuits were operable.

b. Air Sampling System

Observation of the air sampling instrumentation and discussions with cognizant plant personnel indicated that this system had not been calibrated nor preoperationally tested, hence no daily surveillance checks had been made. This was in violation of Technical Specifications 3.6.C.2 and 4.6.C.1.

Although plant management personnel were aware of the Technical Specification requirement, they had mistakenly interpreted that the air sampling system was not required before commercial operation. This was because the instrumentation is installed together with the nitrogen system for inerting, which is not required<sup>3/</sup> until after completion of the startup test program.

The licensee took immediate action to begin calibration and testing to place the air sampling system in operation.

<sup>2/</sup> IELP Letter, Subject: Section of Pipe Outside of Secondary Containment dated July 26, 1974

<sup>3/</sup> Technical Specification 3.7.A.5.