

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. 050-331/74-11

Transmittal Date : April 22, 1974

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DR Central Files
Regulatory Standards (3)
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B. RO Inquiry Report No. _____

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C. Incident Notification From: _____

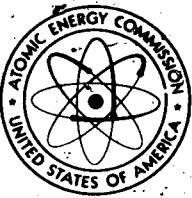
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APR 22 1974

Iowa Electric Light and Power Company
ATTN: Mr. Charles W. Sandford
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 Messrs. D. C. Boyd and J. R. Fishbaugher of this office on March 23, 1974, of activities at the Duane Arnold Energy Center authorized by AEC Operating License No. DPR-49 and to the discussion of our findings with Messrs. Sandford, 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 inspectors.

During this inspection, it was found that certain of your activities appear to be in violation of AEC requirements. The item 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 inspectors determined that corrective action had been taken with respect to these violations and that measures have been taken to assure that a similar, future violation will be avoided. Consequently, no reply to this letter is required, and we have no further questions regarding these matters 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 such information from public disclosure. Any such application must include a full statement of the reasons for which it is claimed that the information

Iowa Electric Light and Power
Company

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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.

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. 050-331/74-11

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

U. S. ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS

REGION III

Report of Test and Startup

RO Inspection Report No. 050-331/74-11

Licensee: Iowa Electric Light and Power Company
Security Building
P. O. Box 351
Cedar Rapids, Iowa 52405

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: March 23, 1974

Dates of Previous Inspection: March 21 and 22, 1974 (Construction)

Principal Inspector:

D. C. Boyd

4-22-74
(Date)

Accompanying Inspector: J. R. Fishbauger

D. C. Boyd for

4-22-74
(Date)

Other Accompanying Personnel: None

Reviewed By: D. M. Hunnicutt, Chief
Reactor Testing and Startup Branch

D. C. Boyd for

4-22-74
(Date)

SUMMARY OF FINDINGS

Enforcement Action

The following Category II violation was reported by the licensee:

Contrary to Technical Specification Surveillance Requirement 4.9.B, daily response checks of the fuel loading chambers were not performed during a period when they were required to be operable. (Paragraph 6)

Licensee Action on Previously Identified Enforcement Matters

All previously identified enforcement matters have been satisfactorily resolved.

Design Changes: Not applicable.

Unusual Occurrences

No unusual occurrences were identified as a result of this inspection.

Other Significant Findings

A. Current Findings

Status Report

1. Operating License DPR-49 was issued on February 22, 1974.
2. Fuel loading began on February 27, 1974, and was completed on March 16, 1974.
3. Initial criticality was achieved at 6:25 p.m. on March 23, 1974.

B. Status of Previously Reported Unresolved Items

None.

Management Interview

Persons Contacted:

Iowa Electric Light and Power (IELP)
Duane Arnold Energy Center (DAEC)

C. Sandford, Executive Vice President, IELP
J. Wallace, Production Manager, IELP
G. Hunt, Chief Engineer, DAEC
E. Hammond, Assistant Chief Engineer, DAEC
G. Cook, Quality Assurance Manager, IELP
R. York, Operating Supervisor, DAEC
H. Rehrauer, Project Engineering Supervisor, IELP
D. Wilson, Results Engineer, DAEC

Directorate of Regulatory Operations, Region III

D. C. Boyd, Principal Inspector
J. R. Fishbauger, Reactor Inspector

Subjects Discussed:

The inspector stated that there were two primary objectives for this special inspection. The first objective was to determine the licensee's readiness to proceed with the initial criticality. The second objective was to observe the licensee's performance in attaining initial criticality.

Paragraphs 1 through 4 identify the regulatory findings to establish the licensee's readiness for initial criticality. Paragraphs 5.a through 5.d describe the observations made by the inspector of the licensee's performance of the initial criticality.

REPORT DETAILS

Persons Contacted

Iowa Electric Light and Power Company (IELP) Duane Arnold Energy Center (DAEC)

C. Sandford, Executive Vice President, IELP
J. A. Wallace, General Production Manager, IELP
G. G. Hunt, DAEC Chief Engineer, DAEC
E. L. Hammond, Assistant Chief Engineer and Chairman,
DAEC Operations Committee
B. York, Operations Supervisor, DAEC
R. Graybeal, Radiation Protection Engineer, DAEC
H. Rehrauer, Nuclear Group Leader and Chairman,
Safety Committee, IELP
G. Cook, Manager, Quality Assurance, IELP
J. Ward, Nuclear Group Leader, IELP
D. Moen, Reactor and Plant Performance Engineer, DAEC
J. Weeda, Nuclear Results Engineer, DAEC
J. Gebert, Electrical Maintenance Supervisor, DAEC
R. Rinderman, Quality Supervisor, DAEC

General Electric Company

J. H. M. Miller, Site Manager
J. L. Nickle, Startup Supervisor

Bechtel

D. Vander Meer, Startup Supervisor
W. Balodis, Startup Supervisor

1. Core Loading Verification

The inspector reviewed the master fuel loading procedure which indicates that the core loading was double checked through the use of tag boards in the control room and on the refueling floor, to assure that the loading was performed in a predetermined sequence. The inspector observed portions of a position by position video tape of the full core which established that: the individual fuel elements were in the proper core position; were properly oriented in that core position; and were properly seated. This video tape also established that the four operational sources were correctly positioned.

2. Neutron Monitoring System

The inspector reviewed the master planning checklist for Start-Up Instruction No. 4, Full Core Shutdown Margin, to establish that the SRM's and IRM's were located in-vessel and connected to the non-coincidence mode to scram on high neutron level.

The inspector reviewed the SRM and IRM calibration records and observed that the SRM's were responding to the operational sources (all four units were reading above the required minimum of 3 cps).

3. Control Rod Operability

The inspector reviewed the master fuel loading procedure to verify that the required control rod testing had been accomplished prior to, during, and following the core loading operation. This review included the verification that the Rod Worth Minimizer System and the Rod Sequence Control System were operable.

4. Licensee Evaluations and Approvals

The inspector verified that the proper management review and approvals had been obtained for the following:

- a. Start-Up Instruction No. 4, Full Core Shutdown Margin.
- b. Start-Up Instruction No. 6, SRM Performance and Control Rod Sequence.
- c. Start-Up Instruction No. 10, IRM Performance.
- d. Start-Up Instruction No. 34, Vibration Measurements.

The inspector raised a question regarding the capability of the Rod Sequence Control System (RSCS) to provide its intended purpose since STI No. 4 called for a deviation from the hard wired control rod sequence. The licensee verified that they had performed the functional testing required by the Technical Specifications to establish that the system was operable, and stated that in their judgment, the proposed test did not violate the intent of this system. The inspector reviewed the matter with the Directorate of Licensing Project Manager and concluded that the licensee's proposed test did meet the intent of the RSC System, i.e., the checker board rod withdrawal pattern, sequence A, would not be violated.

5. Inspector Observations

a. Control Room Staffing

The minimum manning requirements as stated in Technical Specification 6.2.2 and Table 6.2-1 were exceeded at all times during the performance of the initial criticality.

b. Adherence to Procedure

The master planning checklist and STI No. 4 were followed in sequence. The inspector observed that as each step was completed, the responsible individual signed off on that portion of the procedure.

c. Critical Prediction Plots

Critical prediction plots (1/M) were maintained for each SRM unit and an average SRM 1/M plot was maintained. Data was taken, plotted, and evaluated following specified incremental rod withdrawals. The average of the SRM 1/M plots very accurately identified where criticality would occur.

d. Calculated Critical Vs. Actual Critical

Both General Electric Company and Iowa Electric Light and Power had prepared calculations of where initial criticality should occur. Both calculations were in close agreement with each other, and both were in close agreement with the actual criticality configuration.

6. Violation, Failure to Perform Daily Response Checks of Fuel Loading Chambers

The licensee reported that due to a misinterpretation of the intent of Technical Specification Surveillance Requirement 4.9.B, the source range monitoring circuit was not response checked daily as required.

Members of licensee management, while reviewing the weekend activities of the Operations Group, noted that daily response checks of the SRM circuitry associated with the fuel loading chambers (FLC) had not been made from March 8, 1974, at 0600 until March 10, 1974, at 1042. Specification 4.9.B states "Prior to making any alterations to the core, the SRM's shall be functionally tested and checked for neutron response. Thereafter, while required to be operable, the SRM's will be checked daily for response." On March 9, 1974, the reactor was in the Refuel Mode for initial fueling and all fuel had been loaded into the reactor except for the

four locations containing FLC's. The SRM shorting links were removed, all control rods were fully inserted, the vessel temperature was "cold", the reactor vessel head was removed and the reactor vessel internals were removed. The reactor vessel cavity and spent fuel pool were being filled with water preparatory to installing the startup sources.

Investigation of the violation revealed that the Shift Supervising Engineer interpreted the Technical Specification requirements to mean that the daily response checks of SRM circuitry associated with the FLC's were not required as long as refueling activities were not being performed during the 24-hour period. During this interval, all FLC's were reading greater than 3 cps and were in place as required in Section 3.9.B of the Technical Specifications. Investigation revealed that the SRM circuitry associated with the FLC's had been functionally tested on March 5, 1974, and that daily response checks had been made each day until March 9, 1974.

Daily SRM circuitry response checks were resumed on March 10, 1974, and have been continued daily. All Shift Supervising Engineers were made aware of the correct interpretation of Specification 4.9.B in the Technical Specifications.