



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

NOV 22 1977

Docket No. 50-331

Iowa Electric Light and Power
Company
ATTN: Mr. Duane Arnold
President
IE Towers
Post Office Box 351
Cedar Rapids, IA 52406

Gentlemen:

This refers to the inspection conducted by Mr. J. L. Barker of this office on November 8-10, 1977, of activities at Duane Arnold Energy Center authorized by NRC Operating License No. DPR-49 and to the discussion of our findings with Mr. E. Hammond and others of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

No items of noncompliance with NRC requirements were identified during the course of this inspection.

In accordance with Section 2.790 of the NRC'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 NRC's Public Document Room, except as follows. If this report contains information that you or your contractors believe to be proprietary, you must apply in writing to this office, within twenty days of your receipt of this letter, to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is considered proprietary, and should be prepared so that proprietary information identified in the application is contained in an enclosure to the application.

Iowa Electric Light and
Power Company

- 2 -

NOV 22 1977

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

Gaston Fiorelli, Chief
Reactor Operations and
Nuclear Support Branch

Enclosure: IE Inspection
Report No. 50-331/77-20

cc w/encl:
Mr. E. L. Hammond,
Chief Engineer
↓ Central Files
Reproduction Unit NRC 20b
PDR
Local PDR
NSIC
TIC

OFFICE →	RIII	RIII	RIII	RIII		
SURNAME →	Barker/bk	Little	Fiorelli <i>RF</i>	Kister <i>JK</i>		
DATE →	11/18/77					

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-331/77-20

Docket No. 50-331

License No. DPR-49

Licensee: Iowa Electric Light and Power
Company
Post Office Box 351
Cedar Rapids, IA 54206

Facility Name: Duane Arnold Energy Center

Inspection At: Duane Arnold Site, Palo, IA

Inspection Conducted: November 8-10, 1977

Inspector: *J. L. Barker*
J. L. Barker

11/21/77

Approved by: *J. L. Barker Jr*
W. S. Little, Chief
Nuclear Support Section

11/21/77

Inspection Summary

Inspection on November 8-10, 1977 (Report No. 50-331/77-20)

Areas Inspected: Routine, unannounced inspection of surveillance of core power distribution limits, calibration of LPRM system, calibration of APRM system, core thermal power evaluation, and determination of reactor shutdown margin. The inspection involved 25 inspector-hours onsite by one NRC inspector.

Results: No items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

- *E. Hammond, Chief Engineer
- *D. Mineck, Assistant Chief Engineer
- R. Hannon, Reactor and Plant Performance Engineer
- *D. Vest, Station Services Engineer

The inspector also contacted several other licensee employees, including shift supervisors, reactor engineering staff members, and nuclear station operators.

*Denotes those present at the exit interview.

2. Surveillance of Core Power Distribution Limits

The inspector verified that for a recent Local Power Range Monitor (LPRM) calibration and Base Distribution Calculations, Traversing Incore Probe (TIP) data for all LPRM locations were accepted by the computer, and machine normalization factors were properly obtained for all machines by traversing each probe, one at a time, through the common calibration tube; verified, from a recent P-1 printout, conformance with the Linear Heat Generation Rate (LHGR) limit, proper Average Power Range Monitor (APRM) gain adjustment, and the clearing of Base Crit Codes by running necessary TIP traces; verified that Minimum Critical Power Ratio (MCPR) and Average Planar Linear Heat Generation Rate (APLHGR) were within their prescribed limits; verified the adequacy of the licensee's plans for ascertaining operation within licensed limits when the process computer is unavailable; verified that each time the computer recovered from an outage, OD-15, "Computer Shutdown and Outage Recovery Monitor," was called in; verified that after LPRM gain changes, an OD-1 or OD-2 was successfully run; verified that the site nuclear engineering staff was knowledgeable of the core analysis code being used; and verified that licensee procedures for evaluating changes or alterations to calculational methods were adequate.

The inspector noted that the licensee uses the Backup Core Limits Evaluation (BUCL) computer program off the time-shared Mark III system to monitor core parameters during computer outages. The inspector also noted that the reactor engineering staff, although several are new to the station, possess extensive experience

backgrounds and are extremely well versed in the station reactor engineering operations and limitations. Each of the reactor engineering staff has successfully completed General Electric's Station Nuclear Engineer's Course.

No items of noncompliance or deviations were identified.

3. Calibration of LPRM System

The inspector verified that the calibration of the LPRM system was technically correct and in accordance with the facility's procedures, that each APRM was recalibrated following adjustment of the LPRM's, and that the LPRM calibrations have been performed as required by Technical Specifications. The inspector reviewed licensee procedure STP 41A015, "LPRM Instrument Calibration." The inspector also observed a LPRM calibration in progress.

No items of noncompliance or deviations were identified.

4. Calibration of APRM System

The inspector verified that the APRM system is being properly calibrated to Core Thermal Power, that the core was maintained at steady state operating conditions during calibration, that only one APRM channel per Reactor Protection System (RPS) was bypassed at a time, that the APRM's were adjusted to read the calculated percent rated power, that the "as left" APRM readings have been properly recorded, and that the frequency of calibrations was as prescribed by Technical Specifications. The inspector reviewed licensee procedure STP 42F007, "APRM Gain Adjustment Calibration."

No items of noncompliance or deviations were identified.

5. Core Thermal Power Evaluation

The inspector verified that the calculation of core thermal power was correct and consistent with NRC requirements, that the test instruments utilized met the applicable accuracy and calibration specifications, and that the frequency of evaluations was as prescribed by the facility's Technical Specifications.

The inspector noted that the licensee uses an inhouse derived heat balance program which can be used through the time-shared Mark III System to determine very accurately core thermal power when the process computer is unavailable.

No items of noncompliance or deviations were identified.

6. Determination of Reactor Shutdown Margin

The inspector verified that the licensee was ensuring adequate shutdown margin throughout the operating cycle, that calculation of the reactor shutdown margin was technically correct and in accordance with the facility's Technical Specifications, and that the shutdown margin determination was performed at the frequency required by the facility's Technical Specifications. The inspector reviewed licensee procedure STP 43A001, "Shutdown Margin Test."

No items of noncompliance or deviations were identified.

7. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on November 10, 1977. The scope and findings of the inspection were summarized.