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

REGION III

Report No. 50-331/79-20 Docket No. 50-331 Licensee: Iowa Electric Light and Power Company **IE Towers** P. O. Box 351 Cedar Rapids, IA 52406

Facility Name: Duane ArnoId Energy Center

Inspection At: Duane ArnoId Energy Center, Palo, IA

Inspection Conducted: August 28-31, 1979

For Stratter For

Inspector: E. T. Chow

<u> 18/79</u> 9/18/79

License No. DPR-49

Approved By: J. F. Streeter, Chief Nuclear Support Section 1

Inspection Summary

Inspection on August 28-31, 1979, (Report No. 50-331/79-20)

Areas Inspected: Routine, unannounced inspection of core power distribution limits; APRM calibration, determination of shutdown margin; core thermal power evaluation. The inspection involved 22 inspector-hours onsite by one NRC inspector.

Results: Of the four areas inspected, no items of noncompliance or deviations were identified in three areas. One item of noncompliance was identified in one area (deficiency - failure to document and promptly review a temporary procedure change - Paragraph 5).

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DETAILS

1. Persons Contacted

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Mr. R. Hannan, Reactor and Plant Performance Engineer

- *Mr. D. Vest, Reactor Engineer
- *Mr. A. Howard, Assistant Surveillance Coordinator
- *Mr. F. Brush, Nuclear Station Service Engineer
- *Mr. G. Middlesworth, Results Engineer
- *Mr. B. York, Operation Supervisor

*Denotes those present during the exit interview.

2. Verification of Conduct of Startup Physics Testing

The inspector reviewed the startup physics testing and verified that the licensee conducted the following:

- a. Control Rod Scram Time Tests
- b. Control Rod Sequence and Reactivity Checks
- c. Core Power Distribution Limits
- d. LPRM Calibration
- e. APRM Calibration
- f. Core Thermal Power Evaluation
- g. Determination of Shutdown Margin
- h. Determination of Reactivity Anomalies

3. Core Power Distribution Limits

The inspector examined the printouts of the periodic and the on-demand programs for August, 1979. The inspector determined that all prerequisites were met, and all thermal margins satisfied Technical Specification requirements. The inspector noted that the GE process computer printout P1, "Periodic Core Evaluation," dated August 19, 1979, indicated that the LPRM at Location 16-09, Level A was drifting. However, the inspector determined that the reading of the LPRM remained the same. The licensee stated that he would review this matter. This Unresolved Item (331/79-20-01) will be reviewed in a subsequent inspection.

The inspector also determined for August, 1979, that each time the process computer recovered from an outage, OD-15, "Computer Shutdown and Outage Recovery Monitor," was called in. The inspector noted that the licensee was periodically updating the input information for a GE Program BUCLE, "Backup Core Limits Evaluation," in case the process computer could not recover from an outage. The inspector concluded that operations would be within licensed limits under conditions where the process computer was unavailable. No items of noncompliance or deviations were identified.

4. APRM Calibration

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The Technical Specifications require that APRM's be calibrated daily.

The inspector reviewed information relating to Cycle 4B APRM calibration as described in Surveillance Test Procedure No. 42F007, Revision 6, APRM Gain Adjust Calibration." The inspector verified that the licensee had satisfied the daily calibration requirement.

The inspector examined the results of the APRM calibration performed on August, 1979. The acceptance criterion of the test procedure requires that the readings of the six APRM's be higher than the calculated power. The inspector noted that the gain adjustment factors were calculated from the maximum thermal peaking factors and the actual core thermal powers, and the calculated powers were obtained from the gain adjustment factors and the actual powers. The inspector verified all the calculations and noted that the adjusted APRM's were properly brought back into operation. The inspector concluded that the APRM's were properly calibrated.

No items of noncompliance or deviations were identified.

5. Determination of Shutdown Margin

The inspector reviewed information relating to Cycle 4B determination of shutdown margin as described in Surveillance Test Procedure No. 43A001, Revision 1, "Shutdown Margin Test." The acceptance criterion for shutdown margin is that if a shutdown margin of 0.38% of reactivity can not be demonstrated with the strongest control rod fully withdrawn, the core loading must be altered to meet this margin.

The inspector noted that GE supplied the rod worth curve and the equation.for determination of shutdown margin as shown in GE's Cycle Management Report for DAEC, Cycle 4. The inspector reviewed the shutdown margin test performed on March 6, 1979, and verified that the licensee had fully withdrawn the highest worth rod at Location 14-35 and had satisfied the shutdown margin requirement prior to withdrawing more rods to reach criticality.

The inspector noted that STP No. 43A001, Revision 1, incorrectly stated a shutdown margin of 0.38. The licensee agreed that the new revision would include the percent sign. The inspector further noted that a temporary change was made to the procedure without documentation and prompt review to allow further withdrawal of control



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rods instead of inserting control rods fully as stated in Procedure Step 4.7. Section 6.8.3 of Technical Specifications and Section 5.1.7 and 5.1.9 of Administrative Control Procedures No. 1402.2, Revision 4, "Revision to Plant Procedures/Instructions," require that temporary changes to procedures shall be documented and promptly reviewed by the Operations Committee and Chief Engineer. Not documenting and reviewing the temporary procedure change as required is considered to be an item of noncompliance (33/79-20-02) of the Deficiency level.

6. Core Thermal Power Evaluation

The licensee stated that core thermal power was evaluated at least once a day. The inspector noted that the licensee had done so.

The inspector examined information relating to the August 28, 1979, calculation of core thermal power. The reactor was operating at 96% of rated power and 976 psig. A computer code HEATBAL was used for core thermal power evaluation.

The inspector verified all the input parameters for the calculation and performed an independent determination of the core thermal power. The inspector's result was within 3% of the value determined by the licensee.

No items of noncompliance or deviations were identified.

7. Unresolved Items

Unresolved Items are matters about which more information is required in order to asceratin whether they are acceptable items, Items of Noncompliance, or Deviations. An Unresolved Item disclosed during the inspection is discussed in Paragraph 3.

8. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on August 31, 1979. The inspector summarized the purpose and the scope of the inspection and the findings.

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