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April 7, 1981

Docket No. 50-331

Mr. Duane Arnold, President
Iowa Electric Light & Power Company
Post Office Box 351
Cedar Rapids, Iowa 52406

Dear Mr. Arnold:

Reference is made to your application of October 17, 1980 (LDR-80-277) requesting authorization for single recirculation loop operation of the Duane Arnold Energy Center. To complete our review, we need responses to the enclosed request for additional information within 60 days of receipt of this letter.

Sincerely,

Original Signed by
T. A. Ippolito

Thomas A. Ippolito, Chief
Operating Reactors Branch #2
Division of Licensing

Enclosure:
As stated

cc w/encl:
See attached page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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cc w/encl:
See attached page

Mr. Duane Arnold
Iowa Electric Light & Power Company

cc:

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Harold F. Reis, Esquire
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Resident Inspectors Office
Rural Route #1
Palo, Iowa 52324

REQUEST FOR ADDITIONAL INFORMATION
DUANE ARNOLD ENERGY CENTER
SINGLE-LOOP OPERATION

1. Specify expected minimum and maximum operating core power/flow condition as percentage of Rated Core Power/Flow for Single-Loop Operation.

2. At the specified minimum and maximum operating Core Power/Flow Condition for Single-Loop Operation, provide the following:

   (1) Safety Limit MCPR values,

   (2) Fuel Loading Error MCPR analysis results,

   (3) Local Rod Withdrawal Error (with limiting instrument failure) Transient Summary, and

   (4) Core Wide Transients Analysis and Operating Limit MCPR results for all the fuel types in the core for the following transients per NEDE-24011-P-A-1: Flow decrease, Cold Water Injection, and Pressurization.

3. In Section 2.0, a 6% Core Flow Measurement Uncertainty has been established for single-loop operation (compared to 2.5% for two-loop operation). Explain how the contribution to the total core flow measurement uncertainty value of 6% was calculated and justify that this value conservatively reflects the one standard deviation accuracy of the core flow measurement system.

4. Describe how the change from normal two recirculation cooling loop operation to one loop operation would be accomplished, with what physical and administrative controls, and while complying with branch technical position EICSB 12 (attached) regarding multiple setpoints and their control, and with IEEE STD. 279-4.15.

5. What provisions would be made in the technical specification for decreased flow stability in single loop operation?

6. Describe changes made to the flow computer to automatically account for magnitude and sense change for reverse flow in the idle loop jet pumps during single loop operation.

7. Is there a requirement for the recirculation flow equalizer valves to be closed and tagged prior to commencing single recirculation loop operation as stated in NEDO-24272 Page 1-1 and how is this requirement ensured in the technical specification change?

BRANCH TECHNICAL POSITION ICSB 12
PROTECTION SYSTEM TRIP POINT CHANGES FOR OPERATION WITH REACTOR COOLANT PUMPS OUT OF SERVICE

A. BACKGROUND

For the past several years, including a time prior to the development of IEEE Std 279, the staff has required automatic adjustment to more restrictive settings of trips affecting reactor safety by means of circuits satisfying the single failure criterion. The basis for this requirement is that the function can be accomplished more reliably by automatic circuitry than by a human operator. This design practice, which has also been adopted independently by the national laboratories and by much of industry, served as the basis for paragraph 4.15, "Multiple Set Points," of IEEE Std 279.

More recently, all applicants have stated that their protection systems were designed to meet IEEE Std 279. Paragraph 4.15 of IEEE Std 279 specified that where a mode of reactor operation requires a more restrictive set point, the means for ensuring use of the more restrictive set point shall be positive and must meet the other requirements of IEEE Std 279. A number of designs have been proposed and accepted which reliably and simply satisfy this requirement. During the review of some applications, however, certain design deficiencies have been found. The purpose of this position is to provide additional guidance on the application of Section 4.15 of IEEE Std 279.

B. BRANCH TECHNICAL POSITION

1. If more restrictive safety trip points are required for operation with a reactor coolant pump out of service, and if operation with a reactor coolant pump out of service is of sufficient likelihod to be a planned mode of operation, the change to the more restrictive trip points should be accomplished automatically.

2. Plants with designs not in accordance with the above should have included in the plant technical specifications a requirement that the reactor be shut down prior to changing the set points manually.

C. REFERENCES

1. Millstone-3 Safety Evaluation Report, September 24, 1973.

2. Beaver Valley-2 Safety Evaluation Report, October 10, 1973.

3. IEEE Std 279, "Criteria for Protection Systems for Nuclear Power Generating Stations."