

August 25, 1992

Docket No. 50-331

DISTRIBUTION:

Mr. Lee Liu  
Chairman of the Board and  
Chief Executive Officer  
Iowa Electric Light and Power Company  
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Dear Mr. Liu:

SUBJECT: AMENDMENT NO.187 TO FACILITY OPERATING LICENSE NO. DPR-49  
(TAC NO. M82844)

The Commission has issued the enclosed Amendment No.187 to Facility Operating License No. DPR-49 for the Duane Arnold Energy Center. This amendment consists of changes to the Technical Specifications in response to your application dated February 18, 1992.

The amendment revises the Technical Specifications by revising the setpoints for isolation of the High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) systems on a high steam flow condition.

A copy of the related Safety Evaluation is also enclosed. Notice of issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

Original signed by

Clyde Y. Shiraki, Sr. Project Manager  
Project Directorate III-3  
Division of Reactor Projects III/IV/V  
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Amendment No. 187 to License No. DPR-49
- 2. Safety Evaluation

**NRC FILE CENTER COPY**

cc w/enclosures:  
See next page

OFC: LA:PD3-3:DRPW	:PM:PD3-3:DRPW	:D:PD3-3:DRPW	:OGC: [Signature]
NAME: PKreutzer	:CShiraki/cs	:JHannon	: EGreenman
DATE: 7/13/92	: 8/15/92 8/25/92	: 8/16/92	: 8/11/92

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DOCUMENT NAME: DA82844.AMD

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Mr. Lee Liu  
Iowa Electric Light and Power Company

Duane Arnold Energy Center

cc:

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

IOWA ELECTRIC LIGHT AND POWER COMPANY  
CENTRAL IOWA POWER COOPERATIVE  
CORN BELT POWER COOPERATIVE

DOCKET NO. 50-331

DUANE ARNOLD ENERGY CENTER

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 187  
License No. DPR-49

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Iowa Electric Light and Power Company, et al., dated February 18, 1992, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-49 is hereby amended to read as follows:

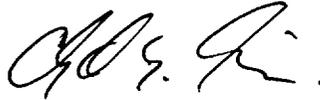
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(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No.187, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. The license amendment is effective as of the date of issuance and shall be implemented within 30 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Clyde Y. Shiraki, Sr. Project Manager  
Project Directorate III-3  
Division of Reactor Projects III/IV/V  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of issuance: August 25, 1992

ATTACHMENT TO LICENSE AMENDMENT NO. 187

FACILITY OPERATING LICENSE NO. DPR-49

DOCKET NO. 50-331

Replace the following page of the Appendix A Technical Specifications with the enclosed page. The revised areas are indicated by marginal lines.

Remove

3.2-13

3.2-40

Insert

3.2-13

3.2-40

TABLE 3.2-B (Continued)

INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE  
AND CONTAINMENT COOLING SYSTEMS

Minimum No. of Operable Instrument Channels Per Trip System (1)	Trip Function	Trip Level Setting	Number of Instrument Channels Provided by Design	Remarks
2	Suppression Chamber HPCI Suction Level	≤ 5" above normal water level	2 Instrument Channels	Transfers HPCI pump suction to suppressio chamber
1	RCIC Turbine High Flow	≤ 155 Inches H <sub>2</sub> O <sub>(2)</sub>	2 Instrument Channels	
2	RCIC Turbine Equipment Room High Ambient Temperature	≤ 175°F <sub>(2)</sub>	4 Instrument Channels	
2	RCIC Vent High Differential Temperature	≤ Δ 50°F <sub>(2)</sub>	4 Instrument Channels	
2	RCIC Steam Line Low Pressure	100 > P > 50 psig <sub>(2)</sub>	4 Instrument Channels	
1	HPCI Turbine Steam Line High Flow	≤ 103 Inches H <sub>2</sub> O <sub>(3)</sub> (Outboard Instr.)  ≤ 386 Inches H <sub>2</sub> O <sub>(3)</sub> (Inboard Instr.)	2 Instrument Channels	
2	Suppression Pool Area High Ambient Temperature	150°F	4 Instrument Channels	
2	Suppression Pool Area High Differential Temperature	50°F	4 Instrument Channels	
1	HPCI Leak Detection Time Delay	15 min.	2 Instrument Channels	

Amendment No. 28, 187

3.2-13

DAEC-1

The HPCI high flow and temperature instrumentation are provided to detect a break in the HPCI steam piping. Tripping of this instrumentation results in actuation of HPCI isolation valves. Tripping logic for the high flow is a 1 out of 2 logic.

Temperature is monitored at two (2) locations with four (4) temperature sensors at each location. Two (2) sensors at each location are powered by "A" direct current control bus and two (2) by "B" direct current control bus. Each pair of sensors, e.g., "A" or "B", at each location are physically separated and the tripping of either "A" or "B" bus sensor will actuate HPCI isolation valves.

The trip settings of 103 inches H<sub>2</sub>O (outboard instrument) and 386 inches H<sub>2</sub>O (inboard instrument) which correspond to 300% of design flow for high flow and 175°F and Δ45° for high temperature are such that core uncover is prevented and fission product release is within limits.

The RCIC high flow and temperature instrumentation are arranged the same as that for the HPCI. The trip setting of 155 inches H<sub>2</sub>O for high flow and 175° and Δ45° for temperature are based on the same criteria as the HPCI.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 187 TO FACILITY OPERATING LICENSE NO. DPR-49

IOWA ELECTRIC LIGHT AND POWER COMPANY  
CENTRAL IOWA POWER COOPERATIVE  
CORN BELT POWER COOPERATIVE

DUANE ARNOLD ENERGY CENTER

DOCKET NO. 50-331

1.0 INTRODUCTION

By letter dated February 18, 1992, Iowa Electric Light and Power Company (the licensee) proposed changes to the Technical Specifications for Facility Operating License No. DPR-49 for the Duane Arnold Energy Center (DAEC). The proposed changes incorporate revised setpoints for isolation of the High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) systems on a high steam flow condition.

2.0 EVALUATION

Boiling Water Reactor (BWR) HPCI and RCIC Systems include instrumentation that measures differential pressure as a means of detecting high steam flow to the turbine, which may be indicative of a break in system piping. System isolation occurs if the flow exceeds 300% of rated steam flow. This value is a historically accepted industry standard which is below the choke flow limit and above the values for steam flow which could occur during system startup transients. Testing at several BWRs showed that the method originally used to convert 300% of rated flow to a differential pressure value may not be conservative with respect to the analytic limit, i.e., the result may exceed 300%. As a result, General Electric suggested that BWR licensees recalculate the affected setpoints.

The licensee has determined that the current setpoints for the HPCI and RCIC high steam flow isolation are conservative with respect to the analytic limits. Further study has concluded that the isolation setpoints should be increased to provide additional margin above the values of steam flow expected during system startup transients. This change will reduce the likelihood of an inadvertent isolation during system startup, thereby improving overall system reliability. This increase in setpoint will still ensure that the analytic limit is not exceeded when all errors are taken into consideration as discussed in the plant's setpoint methodology.

The following are the proposed changes to the DAEC Technical Specifications for the trip level settings of the HPCI Turbine Steam Line High Flow and RCIC Turbine High Flow Trip functions.

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- (1) On Page 3.2-13, the setpoints for the HPCI and RCIC High Steam Flow Isolation have been revised. The " $\leq$ " notation is being incorporated to ensure conservative adjustment of the associated setpoints. The reference to a setpoint tolerance for the RCIC High Steam Flow Isolation has been deleted. The reference to Note 3 in the HPCI trip level setting is being duplicated for each instrument to ensure that it is applied to both instruments.
- (2) On page 3.2-40, the Bases for Section 3.2/4.2 are being revised to reflect the change to the HPCI and RCIC High Steam Flow Isolation setpoints. The word "which" in the third paragraph is being added.

The proposed setpoints are conservative with respect to the 300% flow analytic limit. Increasing the setpoints to the proposed values will provide additional margin above the transient flow rates that can occur during system startup. The changes will help prevent unwanted system isolations and increase the probability that HPCI and RCIC will be available to perform their design functions. These changes to the Technical Specifications Table 3.2-B and Bases are, therefore, acceptable.

### 3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Iowa State official was notified of the proposed issuance of the amendment. The State official had no comments.

### 4.0 ENVIRONMENTAL CONSIDERATIONS

This amendment involves a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding (57 FR 9446). Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

5.0 CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: C. Y. Shiraki

Date: August 25, 1992