

JUNE 6 1978

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Docket No. 50-331

Iowa Electric Light & Power Company  
ATTN: Mr. Duane Arnold, President  
P. O. Box 351  
Cedar Rapids, Iowa 52406

Gentlemen:

The Commission has issued the enclosed Amendment No. 44 to Facility License No. DPR-49 for the Duane Arnold Energy Center. This amendment consists of changes to the Technical Specifications and is in response to your application dated March 29, 1978 (IE-78-454).

This amendment will delete the Reactor Water Cleanup System High-High Temperature Limitation from Tables 3.2-A and 4.2-A.

Copies of the related Safety Evaluation and Notice of Issuance are also enclosed.

Sincerely,

Original signed by

George Lear, Chief  
Operating Reactors Branch #3  
Division of Operating Reactors

Enclosures:

1. Amendment No. 44
2. Safety Evaluation
3. Notice

cc w/enclosures:  
See next page

\*SEE PREVIOUS YELLOW FOR CONCURRENCES

*Const. 1*  
*GD*

OFFICE →	ORB #3	ORB #3	OELD	ORB #3		
SURNAME →	*SSheppard	*RClark:mjf	*	GLear <i>GL</i>		
DATE →	5/12/78	5/12/78	5/18/78	6/7/78		

Docket No. 50-331

Iowa Electric Light & Power Company  
ATTN: Mr. Duane Arnold, President  
P. O. Box 351  
Cedar Rapids, Iowa 52406

Gentlemen:

The Commission has issued the enclosed Amendment No. to Facility License No. DPR-49 for the Duane Arnold Energy Center. This amendment consists of changes to the Technical Specifications and is in response to your application dated March 29, 1978 (IE-78-454).

This amendment will delete the Reactor Water Cleanup System High-High Temperature and its associated instrumentation from Tables 3.2-A and 4.2-A

Copies of the related Safety Evaluation and Notice of Issuance are also enclosed.

Sincerely,

George Lear, Chief  
Operating Reactors Branch #3  
Division of Operating Reactors

Enclosures:

- 1. Amendment No.
- 2. Safety Evaluation
- 3. Notice

cc w/enclosures:  
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SURNAME →	SSheppard	RClark	W.D. Patton	GLear		
DATE →	5/12/78	5/12/78	5/18/78	5/ /78		

June 6, 1978

cc:

Mr. Robert Lowenstein, Esquire  
Harold F. Reis, Esquire  
Lowenstein, Newman, Reis and Axelrad  
1025 Connecticut Avenue, N. W.  
Washington, D. C. 20036

Office for Planning and Programming  
523 East 12th Street  
Des Moines, Iowa 50319

Chairman, Linn County  
Board of Supervisors  
Cedar Rapids, Iowa 52406

Iowa Electric Light & Power Company  
ATTN: Ellery L. Hammond  
P. O. Box 351  
Cedar Rapids, Iowa 52406

Chief, Energy Systems Analysis Branch (AW-459)  
Office of Radiation Programs  
U. S. Environmental Protection Agency  
Room 645, East Tower  
401 M Street, S. W.  
Washington, D. C. 20460

U. S. Environmental Protection Agency  
Region VII  
ATTN: EIS COORDINATOR  
1735 Baltimore Avenue  
Kansas City, Missouri 64108

Cedar Rapids Public Library  
426 Third Avenue, S. E.  
Cedar Rapids, Iowa 52401



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. 44  
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, Central Iowa Power Cooperative, and Corn Belt Power Cooperative (the licensees) dated March 29, 1978, 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:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 44, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



George Lear, Chief  
Operating Reactors Branch #3  
Division of Operating Reactors

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: June 6, 1978

ATTACHMENT TO LICENSE AMENDMENT NO. 44

TO THE TECHNICAL SPECIFICATIONS

FACILITY OPERATING LICENSE NO. DPR-49

DOCKET NO. 50-331

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change.

Remove

3.2-5  
3.2-24

Replace

3.2-5  
3.2-24

TABLE 3.2-A

## INSTRUMENTATION THAT INITIATES PRIMARY CONTAINMENT ISOLATION

Minimum No. of Operable Instrument Channels Per Trip System (1)	Instrument	Trip Level Setting	Number of Instrument Channels Provided by Design	Action(2)
2 (6)	Reactor Low Water Level	$\geq +12$ " Indicated Level (3)	4 Inst. Channels	A
1	Reactor Low Pressure (Shutdown Cooling Isolation)	$\leq 135$ psig	2 Inst. Channels	C
2	Reactor Low-Low-Water Level	At or above $-38.5$ " indicated level (4)	4 Inst. Channels	A
2 (6)	High Drywell Pressure	$\leq 2.0$ psig	4 Inst. Channels	A
2	High Radiation Main Steam Line Tunnel	$\leq 3$ X Normal Rated Power Background (8)	4 Inst. Channels	B
2	Low Pressure Main Steam Line	$\geq 880$ psig (7)	4 Inst. Channels	B
2 (5)	High Flow Main Steam Line	$\leq 140\%$ of Rated Steam Flow	4 Inst. Channels	B
2	Main Steam Line Tunnel/Turbine Bldg. High Temperature	$\leq 200$ deg. F	4 Inst. Channels	B
1	Reactor Cleanup System High Diff. Flow	$\leq 40$ gpm	2 Inst. Channel	D

TABLE 4.2-A

## MINIMUM TEST AND CALIBRATION FREQUENCY FOR PCIS

<u>Instrument Channel (5)</u>	<u>Instrument Functional Test (9)</u>	<u>Calibration Frequency (9)</u>	<u>Instrument Check</u>
1) Reactor Low Pressure (Shutdown Cooling Permissive)	(1)	Once/3 months	None
2) Reactor Low-Low Water Level	(1)	Once/3 months	Once/day
3) Main Stream High Temp.	(1)	Once/operating cycle	Once/day
4) Main Steam High Flow	(1)	Once/3 months	None
5) Main Steam Low Pressure	(1)	Once/3 months	None
6) Reactor Water Cleanup High Flow (7)	(1)	Once/3 months	Once/day
8) Reactor Cleanup Area High Temp. (8)	(1)	Once/operating cycle	None
9) Loss of Main Condenser Vacuum	(1)	Once/operating cycle	None
<u>Logic System Functional Test (4) (6)</u>			
1) Main Steam Line Isolation Valves Main Steam Line Drain Valves Reactor Water Sample Valves		Once/6 months	
2) RHR - Isolation Valve Control Shutdown Cooling Valves Head Spray		Once/6 months	
3) Reactor Water Cleanup Isolation		Once/6 months	

degradation at temperatures above 165°F. The degree of degradation depends on the time of exposure to hot water and the temperature. For example, at temperatures of 60°C (140°F), the loss in exchange capacity would probably be about 25% in a years time. Exposure to 80°C (176°F) water, on the other hand, would result in the loss of 25% capacity in about 100 days. The filter-demineralizer resins used in the Duane Arnold cleanup systems are generally changed every 10 to 15 days, so that long-term thermal stability is not a concern.

Continual exposure of the anion resin to temperature in the range of 165°F could result in the release of NH<sub>3</sub> from the resin. The ammonia poses no problems, since it is soluble and, in the reactor core, would be converted (via radiolysis) into N<sub>2</sub> and H<sub>2</sub>. (Ammonium hydroxide is added intentionally to some PWRs to raise OH level and primary coolant pH). If the anion resin were continually exposed to temperatures above 180°F, this could result in splitting off the CH<sub>3</sub> and CH<sub>2</sub>N from the divinylbenzene matrix. In the core, under a neutron flux, these organic degradation products could be decomposed to a carbon deposit on core surfaces. Hence, it is desirable to limit the temperature of water being processed by the filter-demineralizers to less than about 165°F during prolonged operation.

The 140°F limit commonly used in the industry for normal operation provides sufficient margin to prevent significant degradation of the ion exchange resins. Short term (i.e., periods up to 24 hours) excursions with water temperatures up to 165°F are also acceptable.

As discussed above, the basis for establishing a limit on the temperature of water entering the filter-demineralizers is to protect the resin. The FSAR for DAEC states (p. 7.3-41) that the temperature monitor performs "an operational, not a protective function".

The licensee will retain the temperature monitor in the reactor water cleanup system. This monitor alarms in the control room if the temperature of water upstream of the filter-demineralizers exceeds 140°F. The DAEC will incorporate in plant operating procedure OI-61 a requirement that the operators shut off flow in the reactor water cleanup system if the temperature of the water exceeds 165°F or if the temperature of the water remains above 140°F, but less than 165°F, for more than 24 hours. Plant operating experience has demonstrated that these conditions rarely occur and are not likely to occur. This precaution will ensure that there will be no significant thermal degradation on the ion exchanger resin and thus no safety concern with the proposed amendment.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 44 TO LICENSE NO. DPR-49

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

DOCKET NO. 50-331

DUANE ARNOLD ENERGY CENTER

Introduction

By letter dated March 29, 1978 (IE-78-454) Iowa Electric Light and Power Company (the licensee) requested a change to the Technical Specifications (Appendix A) appended to Facility Operating License No. DPR-49 for the Duane Arnold Energy Center (DAEC). The proposed amendment and revised Technical Specifications would delete the high-high temperature in the reactor water cleanup system as one of the parameter values in Table 3.2-A that initiates primary containment isolation.

Discussion

Table 3.2-A of the DAEC Technical Specifications, Appendix A, lists 13 instrument trip level settings that initiate primary containment isolation. Included in this list is a high-high temperature (greater than 140°F) trip for temperature in the reactor water cleanup system downstream of the nonregenerative heat exchanger.

Evaluation

The temperature measuring instrument in the reactor water cleanup system monitors the temperature of the water leaving the tube side of the non-regenerative heat exchanger. The purpose of the monitoring is to warn the operators if hot water (greater than 140°F) is entering the filter-demineralizer units downstream of heat exchanger. The filter-demineralizers are pressure precoat type filters using Solka-Floc and finely ground mixed ion exchange resins as a filter-ion exchange medium. Spent resins are not regenerated. Spent resin is sluiced to the radwaste system for dewatering and disposal.

The mixed ion exchange resin on the filters consists of a cation and an anion fraction. The cation fraction is relatively resistant to high temperature. Beds of cation resin are commonly used in condensate purification systems at temperatures above 250°F. The anion fraction is a quaternary ammonium resin based on a styrene divinylbenzene copolymer matrix. Anion resins - particularly the strongly basic Type I bead type resins - are susceptible to thermal

At present, the temperature monitor in the reactor water cleanup system is listed in Technical Specification Table 3.2-A which is entitled "Instrumentation That Initiates Primary Containment Isolation". In view of the foregoing discussion, it is not necessary from either an operational or safety standpoint to automatically close the reactor water cleanup system isolation valves when the temperature of water downstream of the nonregenerative heat exchanger exceeds 140°F. Hence, we have determined that this temperature monitor should be deleted from Table 3.2-A.

### Environmental Considerations

The amendment relating to deleting the temperature control function in the RWCS does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and pursuant to 10 CFR §51.5(d)(4) that an environmental statement, negative declaration, or environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

### Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: June 6, 1978

UNITED STATES NUCLEAR REGULATORY COMMISSIONDOCKET NO. 50-331IOWA ELECTRIC LIGHT AND POWER COMPANY  
CENTRAL IOWA POWER COOPERATIVE  
CORN BELT POWER COOPERATIVENOTICE OF ISSUANCE OF AMENDMENT TO FACILITY  
OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 44 to Facility Operating License No. DPR-49 issued to Iowa Electric Light and Power Company, Central Iowa Power Cooperative, and Corn Belt Power Cooperative, which revises the Technical Specifications for operation of the Duane Arnold Energy Center, located in Linn County, Iowa. The amendment is effective as of its date of issuance.

The amendment will delete the Reactor Water Cleanup System High-High Temperature limitation from Table 3.2-A and 4.2-A.

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of this amendment was not required since the amendment does not involve a significant hazards consideration.

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of this amendment.

For further details with respect to this action, see (1) the application for amendment dated March 29, 1978 (IE-78-454), (2) Amendment No. 44 to License No. DPR-49, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Cedar Rapids Public Library, 426 Third Avenue, S. E., Cedar Rapids, Iowa 52401. A copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland this 6th day of June 1978.

FOR THE NUCLEAR REGULATORY COMMISSION



George Leav, Chief  
Operating Reactors Branch #3  
Division of Operating Reactors