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AUGUST 1 6 1979

Docket No. 50-331

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

Dear Mr. Arnold:

By letter dated August 7, 1979, we forwarded Amendment No. 53 to Facility Operating License No. DPR-49 for the Duane Arnold Energy Center. This amendment modified Appendix B Technical Specifications concerning chlorine and other chemical discharge limitations. The amendment was a partial response to your submittal of March 29, 1978 (IE 78-455) in that your request for modification of the monitoring requirement specification for chlorine was not addressed. No action was taken on this part of your submittal because insufficient information was provided to permit a staff evaluation.

We request you provide information to demonstrate that the automatic recording/control equipment for chlorine is acceptable in lieu of the manually-obtained chlorine sample requirements currently in the Technical Specifications. Such information is required prior to the staff completing action on your aforementioned submittal. We would appreciate receiving your input within 60 days.

Sincerely,

Original Signed by
T. A. Ippolito

Thomas A. Ippolito, Chief
Operating Reactors Branch #3
Division of Operating Reactors

cc: See page 2

CP

OFFICE	ORB #3	ORB #3				
SURNAME	TKevern:mjf	TIppolito			7909180098	
DATE	8/15/79	8/16/79				

cc:

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

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426 Third Avenue, S. E.
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8/7/79

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Docket No. 50-331

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

Dear Mr. Arnold:

The Commission has issued the enclosed Amendment No. 53 to Facility Operating 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-78-455).

This amendment changes the Appendix B Technical Specifications to (1) allow continuous chlorination of the DAEC circulating water systems, and (2) permit and control the amount of discharge of a number of proprietary water treatment chemicals for the circulating water systems.

Since the amendment applies only to chemical discharge limitations, it does not involve significant new safety information of a type not considered by a previous Commission safety review of the facility. It does not involve a significant increase in the probability or consequences of an accident, does not involve a significant decrease in a safety margin, and therefore does not involve a significant hazards consideration. We have also concluded that there is reasonable assurance that the health and safety of the public will not be endangered by this action.

A copy of the related Environmental Impact Appraisal and Notice of Issuance and Negative Declaration are also enclosed.

Sincerely,

CP

Original signed by

Thomas A. Ippolito, Chief
Operating Reactors Branch #3
Division of Operating Reactors

ORB#3
SSheppard
7/23/79

Enclosures:
1. Amendment No. 53
2. Environmental Impact Appraisal
3. Notice

cc w/enclosures:
See next page

OFFICE	ORB#3	OELD	AD/ORP/DOR	ORB#3
SURNAME	TKevern:acr	W. D. Paton	WGammill	TIppolito
DATE	7/13/79	8/2/79	7/25/79	7/24/79

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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

Director, Technical Assessment Division
Office of Radiation Programs (AW-459)
US EPA
Crystal Mall #2
Arlington, Virginia 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. 53
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. 53, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Thomas A. Ippolito, Chief
Operating Reactors Branch #3
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: August 7, 1979

ATTACHMENT TO LICENSE AMENDMENT NO. 53

FACILITY OPERATING LICENSE NO. DPR-49

DOCKET NO. 50-331

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

Remove	Insert
2.2-1	2.2-1
2.2-2	2.2-2
2.2-3/2.2-4	2.2-3

2.0 ENVIRONMENTAL PROTECTION CONDITIONS

2.2 Chemical

2.2.1 Chlorine

Ojective

To limit the concentrations of total residual chlorine in the discharge consistent with those specified under State and Federal Water Quality Standards and Criteria as protecting the designated water uses and aquatic life.

Specification

While the plant is discharging cooling tower effluent, total residual chlorine concentrations shall be limited to 0.1 mg/l or less at all times. The cooling tower effluent shall be dechlorinated as necessary to maintain the aforementioned limit.

Bases

The limit on maximum total residual chlorine concentration in the plant discharge is sufficient to accomplish the purpose of chlorination and will assure that the discharge will not contribute to non-complying water quality conditions in the Cedar River in the vicinity of the plant.

3.0 MONITORING REQUIREMENTS

3.2 Chemical

3.2.1 Chlorine

Objective

To assure that total residual chlorine discharges are maintained within the Technical Specifications.

Specification

Samples will be taken from the discharge canal just prior to each chlorination and every 15 minutes thereafter, when discharge is taking place, until the concentration has decreased to less than 0.1 mg/l. If automatic recording equipment, acceptable to the staff, is installed, the above manual samples shall be deleted. Samples will be taken from the discharge canal just prior to the outfall into the Cedar River. Total and free residual chlorine levels will be determined by the amperometric method.

Bases

The chlorine monitoring program is designed to provide a reliable record of chlorine concentration in the discharge canal as a function of time after chlorination has started and to assure that chlorine residuals are maintained within the limits of the Technical Specifications.

2.0 ENVIRONMENTAL PROTECTION CONDITIONS

2.2.2 Other Chemicals

Objective

To specify significant amounts of chemical usage which result in effluent discharges to the river.

Specification

Chemicals which are used in large quantities at the plant are listed in Table 2.2-1. Also listed are chemicals which may be used in smaller quantities to provide control of water chemistry for certain specific water treatment problems.

Bases

No significant chemical discharges other than chlorine are made from the DAEC. An amount of sulphuric acid is added to the circulating water and subsequently discharged as sulfates, but its impact is not considered to be significant.

Since the other chemicals are used only in small quantities, it is considered that the chemical will be completely reacted with the object it is intended to control and the environmental impact is not considered to be significant.

3.0 MONITORING REQUIREMENTS

3.2.2 Other Chemicals

Objective

To specify record keeping requirements for chemicals used at the DAEC site and to specify monitoring requirements.

Specification

Appropriate receipt records of all chemicals brought into the plant will be maintained. Reports of sulphuric acid usage shall be in accordance with Section 5.4. Chemical analyses of samples taken from the river are described in Subsection 4.1.1.

The neutralizing tank shall be sampled prior to discharge to ensure pH is within State limits.

Bases

With the exception of chlorine and sulphuric acid, on-site chemical usage is insignificant. A listing of expected annual usage of minute quantities of laboratory chemicals is presented in Table 3.5-1 of the DAEC Environmental Report.

The neutralizing tank will be pumped to the river at a maximum of 100 gpm. This discharge is diluted with well water and any blowdown present.

Any significant effect in the river will be ascertained through the special study monitoring program detailed in Subsection 4.1.1.

Table 2.2-1

SOURCES OF ADDED CHEMICALS AND RESULTANT END PRODUCT CHEMICALS

System	Chemical Added Source Chemical	Annual Use Lbs.	Waste End Product Chemical	Maximum Resulting End Product Annual Lbs.	Maximum Resulting End Product Mean Daily Lbs.
1. Makeup Demineralizer	H_2SO_4, NaOH	182,000	SO_4	182,000	500
.a. Circulating Water	Liquid Chlorine	160,000	Cl Chloramines	158,000 2,000	433 5**
	H_2SO_4	7,000,000	SO_4	7,000,000	20,000
.b. Circulating Water	Nalco #7320 Organo -bromine	2,400	*	2,400	6.5
.c. Circulating Water	Nalco #7348 Non-ionic dispersant	14,600	*	14,600	40
.d. Circulating Water	Nalco #7312 Lignin-sulfunate	146,000	*	146,000	400
.e. Circulating Water	Nalco #345 or Nalco #7315 Organic -Phosphate	190,000	*	190,000	530
.f. Circulating Water	Nalco #71-D5 PolyGlycol	2,900	*	2,900	8
.g. Circulating Water	Nalco #19 Sodium sulfite	2,500	*	2,500	7
3. Well Water System	Nalco #918 Poly Phosphate	21,000	*	21,000	58
4. RHR Cooling System	Nalco #7320 Organo -bromine	400	*	400	1.1

* Waste end product not established

** Maximum allowed per Environmental Technical Specifications

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

ENVIRONMENTAL IMPACT APPRAISAL

BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 53 TO FACILITY LICENSE NO. DPR-49

IOWA ELECTRIC LIGHT AND POWER COMPANY, ET AL.

DUANE ARNOLD ENERGY CENTER

DOCKET NO. 50-331

Description of Proposed Action

By letter dated March 29, 1978, the Iowa Electric Light and Power Company (the licensee) requested changes to Appendix B, Environmental Technical Specifications for the Duane Arnold Energy Center (DAEC). The licensee's proposed changes are to Specifications 2.2.1 Chlorine and 2.2.2 Other Chemicals.

The proposed change to Specification 2.2.1 is to increase the discharge of chlorine to the levels allowed in the DAEC NPDES permit. Subsequent discussions between the NRC staff and the licensee have resulted in modifications to the licensee's proposed request. The licensee has agreed to these modifications. The proposed changes to Specification 2.2.2 are to allow the discharge of new water treatment chemicals to be used in the circulating water system.

This appraisal reviews the environmental impacts associated with the changes to the discharge of chlorine and other chemicals from the DAEC.

Environmental Impacts of Proposed Action

Specification 2.2.1

This specification presently limits the discharge of total residual chlorine (TRC) to 0.1 mg/l for a maximum of two hours per day. The licensee's proposal, as modified by the staff, is to allow continuous discharge of total residual chlorine at 0.1 mg/l. The licensee has proposed that a dechlorination system be put into operation, capable of operating continuously to bring the concentration of TRC in the plant discharge to 0.1 mg/l or less at all times. Catalyzed sodium sulfite is proposed for dechlorination.

The licensee and its consultant have conducted studies of plant heat exchanger performance under the current Technical Specification limitation. Results of these studies[1,2] indicate that biofouling is occurring in the heat exchanger surfaces at a rate that cannot be controlled by the present circulating water treatment system. In addition, mud and silt deposition, scale formation and corrosive effects in some parts of the circulating water systems are interfering with normal system operation.

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Under the Water Quality Standards of the State of Iowa[3], the Cedar River in the site vicinity is designated as Class B waters for a warmwater fishery. The surface water quality criteria require all toxic substances to be present in concentrations or amounts nontoxic or nondetrimental to aquatic life. The applicable criteria are designated by the State to be those found in Quality Criteria for Water[4]. For a warmwater fishery, total residual chlorine should not be present, according to this reference, in excess of 0.01 mg/l.

The DAEC Final Environmental Statement (FES) indicates that a discharge concentration of 0.1 mg/l TRC would result, based on dilution alone (and not considering uptake by chemical reaction), in a TRC concentration after mixing of 0.01 mg/l or less based on the historical 10 year low flow in the Cedar River at the site vicinity. The FES also indicates that the circulating water and receiving water chlorine demand are high whenever it is likely to be necessary to chlorinate at levels that would result in a violation of the TRC discharge concentration limit (without dechlorination). This fact, plus dechlorination at the plant discharge by the application of sodium sulfite, is expected to result in the removal of all measurable free available chlorine in the discharge. Dechlorination will lessen the potential for adverse effects on receiving water biota in the immediate vicinity of the plant discharge, where mixing of the discharge with the Cedar River water is incomplete and TRC levels are above the 0.01 mg/l level.

Discussions with the State of Iowa indicate that an officially defined mixing zone has not been established for the DAEC cooling tower blowdown discharge. The Water Quality Standards require that toxic effects in the mixing zone be considered when establishing such a zone on a case-by-case basis. The FES indicates that the area in which the TRC concentration will likely be above the completely mixed level will be relatively small in extent. The plant discharge is a single port submerged diffuser with a design exit velocity of 2 m/sec. This design is expected to promote mixing to the extent that, under all conditions, not more than 25% of the river width and less than 1 acre of surface area are to be affected by the unmixed effluent. The area of mixing is near the river shoreline and therefore has the potential for adversely affecting juvenile fish species which are typically found in shallow areas. These life stages are typically somewhat more sensitive to TRC than the adult life stages[5]. However, the Cedar River does not represent a unique fishery with respect to other midwestern streams and is considered to be predominantly comprised of species relatively pollution tolerant. If the river's water quality should improve to the extent that the species composition should change, the potential adverse effects of the chlorination scheme at DAEC would likely be mitigated by a reduction in the expected usage of chlorine.

The U. S. Environmental Protection Agency (EPA) has reviewed the licensee's dechlorination proposal. The staff has contacted the EPA and the State concerning the dechlorination scheme for DAEC. No objections to the proposal were received as a result of these reviews, nor were potentially adverse effects from its use identified. In addition, these agencies as well as staff records were examined to determine if adverse effects have been noted as a result of the chlorination procedures used at the DAEC to date (i.e., discharge concentrations of TRC of 0.1 mg/l or less resulting from chlorine application to the closed cycle cooling system for up to 2 hours per day). No adverse effects have been reported.

Specification 2.2.2

The licensee proposes to add 8 chemicals to the list of other chemicals which are used at DAEC. According to the licensee, small quantities of these chemicals are needed to provide control of water chemistry for certain specific water treatment problems. The compositions of these chemicals has been designated as proprietary by the manufacturer. Information provided by the manufacturer[1] indicates that only one of the formulations to be used at the plant is designated as toxic by EPA. This product is an organo-bromine compound known as NALCO 7320. The licensee will only use this compound when the regular chlorinating system is not operating as planned, and during its use, blowdown will be suspended, allowing for its rapid decomposition by chemical reaction to unidentified less toxic substances[1]. Anticipated mean daily use and annual total use is low relative to other plant chemical uses. Of the remaining seven formulations, fish bioassay data are available for three as follows:

Formulation Identification	96 hr Bioassay Results on Trout and Bluegill
Nalsperse 7348	No effects @ 1000 ppm
Nalco 7315	TL_{50} >10,000 ppm
Nalco 345	TL_{50} >10,000 ppm

As proposed for use at DAEC none of these proprietary formulations will be discharged in concentrations cited as harmful to aquatic biota. Other adverse effects due to the use of these chemicals, such as contributions to conditions that would be in violation of State water quality standards, alterations to levels of dissolved solids, dissolved oxygen or availability of nutrients contributing to eutrophication, are not expected.

Conclusion and Basis for Negative Declaration

On the basis of the foregoing analysis, it is concluded that significant adverse impacts on the environment in the vicinity of the Duane Arnold Energy Center will not occur as a result of the proposed changes to Specification 2.2.1 Chlorine and 2.2.2 Other Chemicals.

On this basis and in accordance with 10 CFR Part 51.5(d), the Commission concludes that no environmental impact statement for the proposed action be prepared and a negative declaration to this effect is appropriate.

Dated: August 7, 1979

REFERENCES

1. Letter from R. H. McKenzie, NALCO Chemical Co. to R. Thiede, Iowa Electric Light and Power Co.; May 3, 1979.

2. Letter from R. H. McKenzie, NALCO Chemical Co. to R. Thiede, Iowa Electric Light and Power Co.; May 9, 1979.

3. State of Iowa Water Quality Standards; Chapter 16 400 Iowa Administrative Code; March 1978.

4. Quality Criteria for Water; U. S. Environmental Protection Agency; EPA-440/9-76-023; July 1976.

5. Effects of Wastewater and Cooling Water Chlorination on Aquatic Life; W. Brungs; U. S. Environmental Protection Agency; EPA-600/3-76-098; August 1976.

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-331

IOWA ELECTRIC LIGHT AND POWER COMPANY, ET AL.

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

AND

NEGATIVE DECLARATION

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 53 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 the date of its issuance.

The amendment will: (1) allow continuous chlorination of the DAEC circulating water systems, and (2) permit and control the amount of discharge of a number of proprietary water treatment chemicals for the circulating water systems.

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 prepared an environmental impact appraisal for this action and has concluded that an environmental impact statement for this particular action is not warranted because there will be no significant

environmental impact attributable to the action other than that which has already been predicted and described in the Commission's Final Environmental Statement for the facility dated March, 1973.

For further details with respect to this action, see (1) the application for amendment dated March 29, 1978, (2) Amendment No. 53 to License No. DPR-49, and (3) the Commission's related Environmental Impact Appraisal. 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 7th day of August 1979.

FOR THE NUCLEAR REGULATORY COMMISSION

Thomas A. Ippolito, Chief
Operating Reactors Branch #3
Division of Operating Reactors