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Mr. Regan	1 signed			

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		1	50-331

DESCRIPTION:
Ltr submitted on behalf of the Iowa Electric Light & Power Company, re our 2-7-73 ltr, trans the following:

ENCLOSURES:
Proposed Enviro Tech Specs for the Duane Arnold Energy Center.

(3 signed & 40 conf'd cys rec'd)

PLANT NAMES: Duane Arnold

ACKNOWLEDGED
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FOR ACTION/INFORMATION 3-16-73 AB

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Regulatory File

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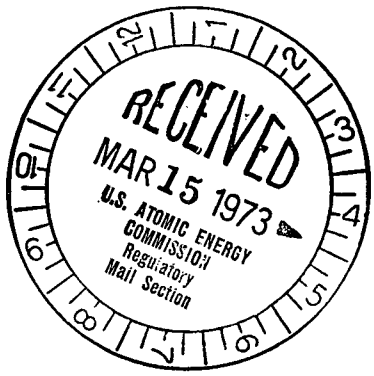
March 15, 1973



Mr. William H. Regan, Jr., Chief
Environmental Projects Branch of
Directorate of Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

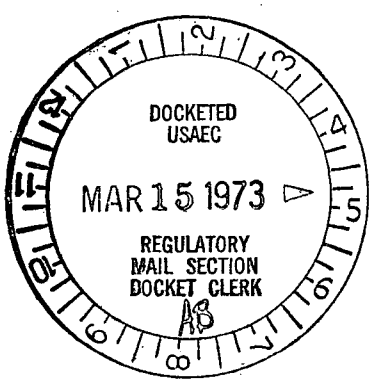
Re: Duane Arnold Energy Center #1,
Docket No. 50-331

Dear Mr. Regan:

I am enclosing herewith under cover letter from C. W. Sandford, Vice President, Iowa Electric Light and Power Company, three originals and forty copies of Proposed Environmental Technical Specifications for the Duane Arnold Energy Center. This material is submitted in response to your letter of February 7, 1973.

Very truly yours,

Jack R. Newman
Newman, Reis & Axelrad
Attorneys for Iowa Electric
Light and Power Company



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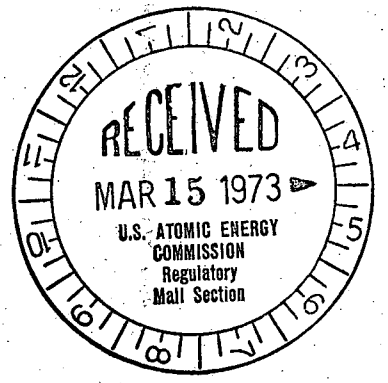
IOWA ELECTRIC LIGHT AND POWER COMPANY

General Office
CEDAR RAPIDS, IOWA

March 14, 1973
IE-73-941

C. W. SANDFORD
VICE PRESIDENT



Mr. William H. Regan, Jr., Chief
Environmental Projects Branch of
Directorate of Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Re: Duane Arnold Energy Center #1, Docket No. 50-331
Subject: Proposed Environmental Technical Specifications
Reference: Your letter of February 7, 1973
File: A-87b, A-116

Dear Mr. Regan:

Enclosed are the proposed Environmental Technical Specifications as requested in your letter.

Very truly yours,

C. W. Sandford

C. W. Sandford
Vice President

KAM:CWS:hh

Encl.

cc: Mr. L. D. Root
Mr. J. A. Wallace
Mr. G. G. Hunt
Mr. H. A. Herold
Mr. K. A. Meyer
Mr. J. N. Ward
Mr. S. M. Cott
Mr. R. Graybeal

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1.0 ENVIRONMENTAL PROTECTION CONDITIONS

1.1 THERMAL

A.1 Thermal discharges into the Cedar River shall be controlled such that compliance with applicable Iowa Water Quality Standards is assured.

A.2 The method of assuring compliance is the solving of the following equation:

$V_R T_R + V_B T_B = (V_R + V_B)\ T_{RC}$ where:

V_R= River Flow

T_R= River Temperature

V_B= Blowdown Flow

T_B= Blowdown Temperature

T_{RC}= Combined River Temperature - After Mixing

T_{RC} is limited to a maximum of 90°F, and also to be less than $(T_R + 5°F)$

2.0 MONITORING REQUIREMENTS

2.1 THERMAL

A. Instrumentation to measure temperature is provided as follows:

1. Upstream river temperature - Continuous recorder in screenhouse with transmitter input to computer.

2. Discharge canal temperature - Transmitter input to computer.

3. Intake temperature - Transmitter input to computer. (Backup for 1 above)

4. Cooling tower basin temperature - Transmitter input to computer. (Backup for 2 above)

B. Instrumentation to measure flow information is provided as follows:

1. Cooling tower blowdown flow - Continuously recorded in pumphouse with transmitter input to computer.

2. River Stage - Continuously recorded at intake structure with transmitter input to computer.

C. During the first year of operation, temperature measurements in the river will be made during high flow conditions, low flow conditions and high temperature conditions to verify the extent of the thermal plume. A report of these findings will be submitted to the staff upon completion of this study.

Discussion:

The applicable Iowa Water Quality Standards state "Interior streams - not to exceed a 90°F maximum temperature nor a maximum 5°F increase over background or nature temperature." The Standards also state "Sampling to determine conformance to these criteria shall be done at sufficient distances downstream from waste discharge points to permit adequate mixing of waste effluents with the surface waters."

The Standards further state that these "criteria are applicable at flows greater than the lowest flow for seven consecutive days which can be expected to occur at a frequency of once every ten years."

Inherent in the design of a closed cycle cooling system using cooling towers is that very low thermal additions are made to the river. Therefore; rate of change limitations are not meaningful as no significant river water temperature change is possible.

ENVIRONMENTAL PROTECTION CONDITIONS

1.2 CHLORINE

A.1 During the first 12 months of operation,

a) The free residual chlorine in the discharge canal shall not exceed 0.1 ppm at any time.

b) The total residual chlorine in the discharge canal shall not exceed 0.5 ppm.

c) The total residual chlorine in the discharge canal shall not exceed 0.1 ppm for more than 2 hours per day.

B. If total residual chlorine is not maintained below 0.1 ppm at all times, the additional studies described in subsection 2.2.B shall be conducted.

MONITORING REQUIREMENTS

2.2 CHLORINE

A.1 The amperometric method will be used to determine levels of total and free residual chlorine.

A.2 Samples will be taken from the discharge canal immediately before outfall into the Cedar River.

A.3 Samples from the discharge canal will be taken just prior to chlorination and will be taken every 15 minutes until 2 successive readings indicate less than 0.1 ppm total residual chlorine in the discharge.

A.4 During the thermal plume verification of 2.1.B above chlorine measurements will be made within the plume to define the area of the river in which residual chlorine is detectable.

B. If total residual chlorine exceeds 0.1 ppm in the discharge canal at any time, live boxes containing native fish will be placed in the river upstream of the plant and at the mouth of the discharge canal. These studies will be conducted in conjunction with the summer quarterly studies of section 3 below. Live boxes will be left in place for a period of 48 hours and mortality rates of boxes above the plant and in the discharge compared.

1.2 and 2.2 Discussion:

The State of Iowa has not specified an allowable residual chlorine concentration in discharge waters. The AEC staff has established the following guidelines for receiving streams in cases of intermittant chlorine utilization. For a period of two hours per day, the concentration of total residual chlorine may be up to, but not exceed 0.1 mg/l. This concentration would not protect trout and salmon, but should protect warm water species. This recommendation assumes that no free chlorine is present. For continuous discharge, the concentration of total chlorine in the receiving stream must not exceed 0.005 mg/l to protect most warm water species of fish.

These guidelines are for the receiving stream. As concentrations of total chlorine below 0.1 mg/l with present field methods cannot be reliably measured, the chlorine level measurements shall be made in the discharge canal. For the same reason, it is only possible to measure that levels are less than 0.1 mg/l.

The results of the program designed to monitor the effects of chlorine addition on the receiving stream will be reviewed upon completion with the Staff and the State to determine the applicability of chlorine limits to future plant operation.

ENVIRONMENTAL PROTECTION CONDITIONS

1.3 OTHER CHEMICALS

A. All other chemicals shall be discharged in accordance with Iowa Water Pollution Control Commission Permit #71-56-S approved April 14, 1971 and as described in question 3.5.10 Amendment 2 to the DAEC Environmental Report.

MONITORING REQUIREMENTS

2.3 OTHER CHEMICALS

A. Discharge of non-radioactive chemical wastes will be sampled prior to discharge from the normal waste tank.

B. Samples taken from the river for chemical analyses are described in subsection 3.

1.3 and 2.3 Discussion:

Iowa Electric has received its Certification of Compliance with the Iowa Water Quality Standard pursuant to Section 21b of the Federal Pollution Control Act. A presentation of expected chemical levels are contained in table 3.2-4, 3.2-5, 3.5-1 and 2-3.5.10 of the DAEC Environmental Report.

ENVIRONMENTAL PROTECTION CONDITIONS

1.4 FISH IMPINGEMENT

A. Fish impingement shall be monitored as described in subsection 2.4.A. If excessive numbers of fish are taken from the travelling screens, Iowa Electric's limnologist will be immediately notified and additional studies and corrective action will be initiated.

MONITORING REQUIREMENTS

2.4 FISH IMPINGEMENT

A. Once a day, the number of fish found in the trash collection basket on the station's intake will be determined by the station personnel. This data will be forwarded monthly to Iowa Electric's limnologist for analysis. An inventory of species, numbers, and size of all fish taken from the trash collection baskets on a given day will be conducted quarterly. An annual report of this data and analysis will be submitted to the staff.

1.4 and 2.4 Discussion:

The monitoring program as described, will serve as a basis to ensure that the fish impingement effects are as predicted.

3.0 CEDAR RIVER MONITORING PROGRAM

The following program describes the post operational studies for the Cedar River in the vicinity of the Duane Arnold Energy Center. Studies to determine the base line physical, chemical and biological characteristics of the Cedar River near the Duane Arnold Energy Center prior to plant startup have been in progress since April 1971. These preoperational studies have previously been submitted. Data from these studies served as a basis for the development of the post-operational study.

The post-operational studies are designed to identify and evaluate any significant effects of chemical or thermal discharges from the generating station into the Cedar River as well as the effects of impingement on the intake screens or condensor passage on entrained aquatic organisms.

The specific objectives of this study are threefold:

1. To continue routine water quality determinations in the Cedar River in order to identify any conditions which could result in environmental or water quality problems.
2. To conduct physical, chemical and biological studies in and adjacent to the discharge canal and to compare the results with similar studies above the intake. This will make it possible to determine any water quality changes occurring as the result of chemical additions or condensor passage and to identify any impact of the plant effluent on aquatic communities adjacent to the discharge.
3. To identify and quantify organisms impinged on the intake screens and entrained in the intake water in order to estimate the magnitude and effects of impingement and condensor passage on the ecology of the Cedar River.

STUDY PLAN

Sampling sites will be established in the discharge canal and at four locations in the Cedar River (Figure 1): 1) upstream of the plant at the Lewis Access Bridge (present Site 1); 2) directly above the plant intake; 3) at a point to be determined no more than 300' below the plant discharge; 4) adjacent to Comp Farm about 1/2 mile below the plant (present Site 3). The Mohawk Park location (present Site 4) near Cedar Rapids will be deleted from the post-operational study.

Samples for general chemical, bacterial and plankton analysis will be routinely taken twice per month while complete chemical analysis, benthic studies and periphyton will be conducted during the spring, summer and autumn quarters. Additional samples will be taken whenever unusual environmental or operational conditions warrant.

The following specific studies will be conducted:

3.1 General Water Quality Analysis

A. Frequency: Twice per month routinely and as necessary when conditions warrant.

B. Location: At all five sites.

C. Parameters to be measured:

1. D.O.
2. pH
3. CO_2
4. Total Alkalinity
5. CO_3 Alkalinity
6. Total Hardness
7. Ca Hardness
8. Total PO_4
9. Ortho PO_4
10. NO_3^-
11. NH_3+
12. Fe
13. Lignins & tannins
14. BOD
15. COD
16. Taste and Odor
17. Temperature
18. Turbidity
19. Color

3.2 Complete Water Quality Analysis

A. Frequency: Quarterly, during spring, summer and fall.

B. Location: At all five locations.

C. Parameters to be measured: All general water quality parameters plus -

1. Cu
2. Zn
3. Hg
4. Pb
5. Cr^{+6}
6. Mn
7. Cl^{-}
8. SO_4^{-}
9. NO_2^{-}
10. Total Solids
11. Pesticides in fish from two sites, above and below plant

In addition, D.O., pH and alkalinity will be determined at each site every four hours over a 24-hour period.

3.3 Plankton Studies

A. Frequency: Twice per month routinely and as necessary when conditions warrant.

B. Location: At all five locations.

C. Analyses to be made: Numbers and kinds (to genus whenever possible) of organisms present.

3.4 Bacteriological Studies

A. Frequency: Twice per month. Additional determinations of fecal coliforms will be conducted on samples from the effluent from the station's sewage treatment plant.

B. Location: At all five locations

C. Analyses to be made:

3.4 Bacterial Studies (Cont'd)

1. Total plate count (20 C.)
2. Total coliform (MF)
3. Fecal coliform (MF)
4. Fecal streptococci (MF)

3.5 Benthic (bottom organism) Studies

A. Frequency: Quarterly

B. Location: At four sites (omit station in discharge canal)

C. Analysis: Kinds (to genus whenever possible) and numbers of organisms present will be determined. Sediment type will also be determined.

3.6 Periphyton

A. Frequency: Quarterly during spring, summer and fall, as available.

B. Location: Artificial substrates will be installed at Site 2, above the plant intake, and at Site 3, below the plant, and in the discharge canal.

C. Analyses to be made: Substrates will be removed after two weeks to one month. The biomass and generic composition will be determined.

3.7 The present fisheries studies will be continued on a quarterly basis (spring, summer and fall) above and below the plant in consultation with the Iowa Conservation Commission.

3.8 In order to assess the nature and extent of the biota passing through the condensors, quarterly determinations of the species and biomass of biota entrained in the intake water will be determined by placing plankton nets at the intake structure. The total volume of organisms subject to condensor passage may be calculated by determining the area of the plankton net, the velocity of the water, and the volume of water entering the plant. This study will continue for a minimum of two years.

4.0 TERRESTRIAL MONITORING PROGRAM

4.1 The terrestrial monitoring program as reported in the DAEC Terrestrial Flora Study (August 1972) and Terrestrial Fauna Study (October 1972) will be repeated two years after commercial operation of the plant commences.

4.2 A monthly visual inspection will be made of the vegetation on and around the site in the direction of prevailing winds to determine any possible salt drift damage. If symptoms of salt damage are apparent, samples of affected and unaffected individuals of the same plant species should be photographed, sampled and the unwashed samples analyzed for total salts.

The results of these inspections shall be reported annually. This program will continue for a minimum of two years.