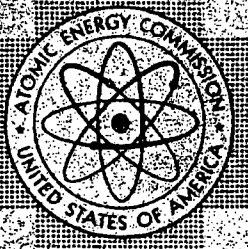
SAFETY EVALUATION OF THE DUANE ARNOLD ENERGY CENTER

Docket No: 50-331



U.S. ATOMIC ENERGY COMMISSION
DIRECTORATE OF LICENSING
WASHINGTON, D.C.

Issue Date: JANUARY 23, 1973

January 23, 1973

SAFETY EVALUATION

BY THE

DIRECTORATE OF LICENSING

U.S. ATOMIC ENERGY COMMISSION

IN THE MATTER OF

IOWA ELECTRIC LIGHT AND POWER COMPANY

DUANE ARNOLD ENERGY CENTER

DOCKET NO. 50-331

TABLE OF CONTENTS

TABLE OF CONTENTS (cont'd)

1.0 INTRODUCTION AND GENERAL DESCRIPTION OF PLANT

1.1 Introduction

This report is the Atomic Energy Commission's safety evaluation of the Iowa Electric Light and Power Company's application for a license to operate the Duane Arnold Energy Center (DAEC). The application was filed by Iowa Electric Light and Power Company (IELP, hereafter referred to as the applicant), and the Corn Belt Power Cooperative and the Central Iowa Power Cooperative (hereafter referred to as the co-applicants). The applicant and co-applicants will be co-owners of the facility. The Iowa Electric Light and Power Company is responsible for the design and construction of the facility and will be responsible for its operation. Therefore, in this Safety Evaluation, the term "applicant" refers to Iowa Electric Light and Power Company. When the intent is to refer to the other participating companies, they will be specifically identified.

The Atomic Energy Commission reported the results of its review at the Construction Permit stage in a Safety Evaluation dated February 13, 1970. Following public hearings before an Atomic and Safety Licensing Board in Cedar Rapids, Iowa, the Director of Reactor Licensing issued Provisional Construction Permit No. CPPR-70 on June 22, 1970. An Amendment of this construction permit was published on December 14, 1972 to delete certain requirements concerning Federal and State laws for protection of the environment.

The Duane Arnold Energy Center consists of a single unit boiling water reactor on a 480-acre site located on the west bank of the Cedar

See Page 2-1

River in Linn County, Iowa, approximately eight miles northwest of the city of Cedar Rapids. Since the Director of Regulation had granted on March 11, 1970, an exemption under the provisions of Section 50.12, 10 CFR Part 50,[2] construction work associated with facility structures began in March 1970. Authorized site related work such as land clearing had begun earlier, in March 1969.

On March 1, 1972, the applicant tendered an amended application for an operating license (OL) with six copies of the Final Safety Analysis Report[1] (FSAR) that were used by the AEC during a three week preliminary safety review. Inasmuch as more information was needed for the initial filing, the amended application for an OL was not officially docketed for the extended safety review until May 8, 1972; at that time, the FSAR and its Amendment No. 1 providing additional information were docketed and distributed.

The amended application for an OL is required by Part 50.34(b) of 10 CFR Part 50. The amended application requests a license to operate the facility at a thermal power level of 1658 megawatts (MWt) for which the corresponding ultimate electric output of the plant is expected to be about 589 megawatts-electric (MWe). The plant's thermal power level in the construction permit application was the rated thermal power level of 1593 MWt. In its Safety Evaluation for the Construction Permit review, the regulatory staff had indicated it would "perform a safety evaluation to assure that the core can be

operated at a higher power level." Therefore, we have performed an evaluation of thermal, hydraulic, and nuclear characteristics of the core as supplied by the applicant for both the rated and ultimate power levels. The evaluation of engineered safety features was made at the higher power level as was our evaluation of the results of abnormal operational transients. However, before the applicant is permitted normal power operation at the higher level, a program of progressive power increase testing, documentation, and evaluation must be accomplished by the applicant. This program is described in Amendment 9 to the FSAR and will be appropriately delineated in the Technical Specifications.

During our review of the information submitted in the FSAR, we requested the applicant to provide additional information needed for our evaluation. This additional information was provided in amendments to the OL application. We also held numerous meetings with the applicant to discuss and clarify the technical information submitted. As a result, we requested a number of changes to be made in the design and planned operation of the facility; these changes are described in the applicant's Amendments (No. 1 through 11) to the FSAR and are discussed in appropriate sections of this Safety Evaluation. The FSAR and its amendments have been made available for review by members of the public at the Atomic Energy Commission's Public Document Room at 1717 H Street, N.W., Washington, D. C. and at the Cedar Rapids Public Library, 426 Third Avenue, S.E., Cedar Rapids, Iowa, 52401. The applicant has submitted its Industrial Security Plan and

certain design information on the nuclear fuel as proprietary documents. We have determined that these documents may be withheld from public disclosure under the Commission's Rules and Regulations, 10 CFR Parts 2.790(d)[3] and 9.5(a)(4).[4] Accordingly, these documents will be withheld from public disclosure in accordance with the provisions of Section 9.10 of 10 CFR Part 9.

A chronology of the review by the regulatory staff is included in Appendix A of this evaluation.

1.2 General Plant Description

The Duane Arnold Energy Center employs a nuclear steam supply system consisting of a boiling water reactor. There are sixteen jet pumps supplied by two recirculating water lines, four main steamlines, and two feedwater lines. Fuel for the reactor will be slightly enriched uranium-dioxide (UO_2) in sintered ceramic pellets. Some of these ceramic fuel pellets will contain gadolinium-oxide (Gd_2O_3) in a mixture with the uranium-dioxide. The gadolinium is a "burnable poison" for power pattern and reactivity control that permits better fuel economy and elimination of the boron curtain neutron absorbers found in older plants. The fuel pellets are enclosed in Zircaloy-2 cladding tubes which are evacuated, backfilled with helium, and sealed by welding Zircaloy end plugs in each end. A fuel channel encloses a bundle of 48 fuel rods in a 7 x 7 array; the channel is made of Zircaloy-4. Water flowing through the core serves as both a moderator of neutrons and a coolant. Movement of water and a two phase water-steam mixture through the core is accomplished

Miller

DOCKET-50331-- 86

March 2, 1973

SUPPLEMENT NUMBER 1

TO THE

SAFETY EVALUATION

BY THE

DIRECTORATE OF LICENSING

U.S. ATOMIC ENERGY COMMISSION

IN THE MATTER OF

IOWA ELECTRIC LIGHT AND POWER COMPANY

DUANE ARNOLD ENERGY CENTER

DOCKET NO. 50-331

Introduction

The Atomic Energy Commission's Safety Evaluation Report (SER) on the Dunne Arnold Energy Center dated January 23, 1973, identified certain matters as requiring additional information from the applicant or that were still under review by the Regulatory staff.

The purpose of this Supplement is to update the SER based on the Regulatory staff's review of information contained in Amendment 12 to the FSAR and on a discussion held with the applicant since issuance of the SER.

Each of the sequentially-numbered items in this Supplement contains a specific reference to the sub-section of the SER that is being updated, either by replacement with or addition of the material provided in this Supplement.

Appendix A of this Supplement contains an updated chronology of our review and Appendix B is a listing of errata to the SER.

Item 1 Replace Section 2.3.6 with:

2.3.6 Conclusion

The opinion of the staff is that the onsite meteorological data presented in the FSAR, and subsequently verified by the applicant, indicates that the atmospheric dispersion conditions at the plant site are much less favorable than would normally be expected for this part of the country. Since both the applicant and the staff used these less favorable dispersion conditions as presented in the FSAR in calculating relative concentrations for the site, the staff concludes that the relative concentrations used for evaluation of the site are conservative and acceptable.

Item 2 In Section 5.2.2 insert the following on page 5-4 before the first full paragraph.

The capacity of the six safety/relief valves is sufficient to prevent actuation of the spring loaded safety valves, following any anticipated operational transient with an anticipatory scram initiated by the steam line or turbine valve position switches. In addition, the combined capacity of the six safety/relief and the two safety valves is sufficient to maintain the reactor pressure below 1350 psig (a 25 psi margin below the ASME code allowable pressure of 1375 psig), following any anticipated operational transient assuming that a scram is initiated by high reactor pressure and assuming that any one safety/ refief or safety valve fails to open.

Item 3 Add the following at the end of Section 6.2.6

On February 7, 1973, a meeting was held with the applicant to discuss the status of the main steam line isolation valve seal system for the Duane Arnold plant. The applicant described three alternative seal systems which were studied: a water seal system, a pressurizing nitrogen system, and a controlled leakage system. The applicant proposes to adopt the controlled leakage system for the Duane Arnold plant. The detailed design of the controlled leakage system will be submitted in Amendment 13 on about March 15, 1973.

The controlled leakage system proposed by the applicant for the Duane Arnold plant used the one-inch diameter drain pipes located on each of the four steam lines just inboard of the outer isolation valve to collect and transport any leakage from the containment through the isolation valves, to the reactor building where the leakage will be filtered by the standby gas treatment system before being released to the atmosphere via the off-gas stack. Valve actuations necessary for system operation will be remote manually initiated, and will have interlocks to prevent initiation unless the pressure in the steam line at a point between the inner and outer isolation valves is below 50 psig. Design of the system will be in accordance with the ASME Boiler and Pressure Vessel Code, Section III, Class 2 requirements and seismic Category I requirements. Each of the four main steam lines will have an independent controlled leakage system and each system will be testable.

The controlled leakage system proposed would not preclude the later adoption and use of a water seal or nitrogen seal system in the event one of these alternative systems is developed and found acceptable by the Regulatory staff.

The applicant indicated that the proposed controlled leakage system could be installed prior to the first refueling outage.

Although the staff has not completed its detailed review of the proposed controlled leakage system we conclude that the proposed system would reduce the direct leakage through the main steam isolation valves. We find the approach acceptable and will review the design prior to installation at the first refueling outage.

Item 4 <u>Substitute the following for a portion of Section 9.1.2</u>

9.1.2 Spent Fuel Storage

On page 9-3, last paragraph, delete the last 8 lines starting with, "For the postulated event of...," and replace with: "The applicant has analyzed the postulated event of a cask drop and determined that the cask could penetrate the floor of the cask pool. The applicant has proposed, in Amendment 12, to install an energy absorbing material to mitigate the consequence of a cask drop on the cask pool floor. The design of the energy absorbing material will be submitted by the applicant and reviewed by the Regulatory staff, prior to its installation, which will be no later than the first refueling operation.

APRIL 9, 1973

SUPPLEMENT NUMBER 2

TO THE

SAFETY EVALUATION

BY THE

DIRECTORATE OF LICENSING

U.S. ATOMIC ENERGY COMMISSION

IN THE MATTER OF

IOWA ELECTRIC LIGHT AND POWER COMPANY

DUANE ARNOLD ENERGY CENTER

DOCKET NO. 50-331

Introduction

The Atomic Energy Commission's Safety Evaluation Report (SER) on the Duane Arnold Energy Center (DAEC), dated January 23, 1973, identified certain matters as requiring additional information from the applicant or that were still under review by the Regulatory staff. Supplement Number 1 to the SER, dated March 2, 1973, updated the SER by addressing eight of these matters. The ACRS completed its review of the DAEC at its March 8, 1973, meeting and reported its findings in a letter to Chairman Ray dated March 13, 1973.

The purpose of this Supplement is to address the ACRS comments in its letter of March 13, 1973, and to further update the SER, based on the Regulatory staff's review of information contained in Amendment 13 to the FSAR and on further discussions held with the applicant since issuance of Supplement 1 to the SER. Part A addresses the ACRS comments and Part B updates the SER.

Each of the sequentially-numbered items in Part B of this supplement contains a specific reference to the sub-section of the SER that is being updated, either by the replacement with, or the addition of, the material provided in this supplement.

Appendix A of this supplement contains an updated chronology of our review and Appendix B is a copy of the ACRS letter on the DAEC.

PART A: ACRS COMMENTS

Section 17.1 of the SER provides a discussion of the ACRS letter dated December 18, 1969, which reports on the DAEC construction permit review by the ACRS. This part of Supplement 2 to the SER is intended to replace Section 17.2 of the SER and addresses the ACRS letter dated March 13, 1973. In its letter of March 13, 1973, (Appendix B of this Supplement), the ACRS provided comments on the eight items discussed below.

Item 1: Leakage Control System for the MSL Isolation Valves

The ACRS noted that the criteria for functional adequacy of the leak-off system, and the detailed design in conformance with the criteria are not yet fully established, and requested that the Regulatory staff assure itself that the system finally installed does satisfy all of the considerations appropriate to the enhancement of containment reliability. The Regulatory staff stated on page 4 of Supplement 1 to the SER that "Although the staff has not completed its detailed review of the control leakage system, we conclude that the proposed system would reduce the direct leakage through the main steam isolation valves. We find the approach acceptable and will review the design prior to installation at the first refueling outage." The applicant provided in Amendment 13 to the FSAR some additional information regarding the leakage control system. The

Regulatory staff reaffirms its view expressed in Supplement 1 as cited above and will require the applicant to provide for its review prior to installation, detailed design information on the applicant's proposed leakage control system. In addition to the design description, the Regulatory staff will need for its review information on:

a. reliability of the rotometer at the flow rates considered in this application;

b. calibration of the rotometer when condensing steam is present in the leakage gas;

c. effect of moisture in the leakage gas on performance of the standby gas treatment system.

Item 2: Recirculation Pump Trip (ATWS)

The ACRS noted that the applicant will employ a recirculation pump trip system for the DAEC prior to initial fuel loading and recommended that the specific means for implementing the pump trip be resolved in a manner satisfactory to the Regulatory staff. This matter is currently under review by the Regulatory staff, as we indicated in Section 7.5 of the SER.

Item 3: Rod Sequence Control System

The ACRS noted that the applicant has committed to installation of a rod sequence control system and recommended that approved

measures, satisfactory to the Regulatory staff, be placed in effect prior to operation above 1% of rated power. This matter which is generic to all BWR plants as discussed in paragraph 4.2.3 of the SER, will be resolved prior to operation of the DAEC above 1% of rated power.

Item 4: Postulated Drop of Spent Fuel Shipping Cask

The ACRS noted that a postulated cask drop is calculated to result in penetration or cracking of the cask pool bottom if unprotected, and that the applicant intends to install an energy absorbing material no later than the first refueling operation, and recommended that the matter be resolved in a manner satisfactory to the Regulatory staff. The applicant will be required to submit design information on the energy absorbing material along with those measures needed for its surveillance, for Regulatory staff review prior to installation, which will be no later than the first refueling operation requiring movement of a shipping cask.

Item 5: Potential for Missiles from Recirculation Pump and Motor

The ACRS noted that the applicant is reviewing means of dealing with the possibility of the recirculation pump impellor acting as a turbine causing the pump and motor to overspeed and become potential sources of missiles. The ACRS recommended that the matter be resolved in a manner satisfactory to the Regulatory staff. This matter

is currently under review by the Regulatory staff.

Item 6: Linear Fuel Heat Ratings

The ACRS noted that potential effects of some aspects of fuel performance and LOCA-related phenomena on acceptable linear fuel heat ratings for the DAEC are under study and recommended that the matter be resolved in a manner satisfactory to the Regulatory staff. The Regulatory staff is currently reviewing this matter and plans to advise the ACRS on any developments. (See Part B, Item 1 of this Supplement.)

Item 7: Protection Against Pipe Whip

The ACRS noted that provisions are made in the DAEC for protection against pipe whip in accordance with criteria proposed by the Regulatory staff and recommended that particular emphasis be devoted to the performance of the protective systems with special attention during pre-operational testing and hot startup to assure that the protective measures meet the design criteria. The Regulatory staff plans to audit the applicant's activities in this regard during its startup testing of the DAEC.

Item 8: Other Problems Relating to Large Water Reactors

The ACRS recommended that other problems relating to large water reactors cited in previous ACRS reports be dealt with

appropriately by the Regulatory staff and the applicant as suitable approaches are developed. The Regulatory staff intends to follow up on these other problems and intends to deal with them appropriately as recommended by the ACRS.

PART B: FURTHER UPDATING OF THE SER

In addition to the matters cited in Part A of this Supplement, the Regulatory staff has continued its evaluation, as discussed below, in the areas of fuel densification as discussed in Section 4.2.1 of the SER, postulated rupture in high energy lines outside containment as discussed in Item 7 of Supplement Number 1 to the SER, main steamline isolation valve leakage as discussed in Item 3 of Supplement Number 1 to the SER, and hydrogen-getter in the fuel as discussed in Section 4.2.1 of the SER.

Item 1: Fuel Densification

As anticipated in Section 4.2.1 of the SER, the matter of fuel densification is under review and evaluation by the Regulatory staff for all nuclear plants. Our current objective is to complete this review for the DAEC during the Summer of 1973. The areas of review include gap conductance and the effects of densification on gap conductance, clad creepdown, clad collapse, and the power spike due to axial gaps. We plan to address

these matters is a further Supplement to the SER on completion of this review.

Item 2: Postulated Rupture in High Energy Lines Outside Containment

As indicated in Item 7 of Supplement 1 to the SER, the matter of postulated high energy pipeline breaks occurring external to the primary containment building is currently under review by the Regulatory staff. The preliminary conclusion given in Supplement 1 on this matter remains valid and we plan to report our final conclusion on completion of our review of this matter for the DAEC, which is now scheduled for the Summer of 1973.

Item 3: Main Steamline Isolation Valve Leakage (Amendment 13)

The applicant's Amendment 13 to the FSAR, filed on March 20, 1973, addresses our concern regarding main steamline isolation valve (MSLIV) leakage following a postulated design basis LOCA. The applicant discusses its evaluation of three design alternatives, including a water seal system, a gaseous nitrogen seal system, and a leakage control system. The information provided by the applicant on this matter confirms the preliminary conclusion of the Regulatory staff as reported in Item 3 of Supplement 1 to the SER that the design concept proposed by the applicant for the leakage control system is acceptable. The Regulatory staff will review the detailed design when it is completed and prior to installation at the first

refueling outage to assure that all appropriate design criteria are satisfied. Additional consideration of this matter by the ACRS is given in Part A, Item 1, of this Supplement.

Item 4: Hydrogen-Getter

As indicated in Section 4.2.1 of the SER, the DAEC fuel will include a hydrogen-getter material. Substantive description of this material remains outstanding. We plan to address this matter in a further Supplement to the SER, when the applicant provides the necessary information and on completion of our review of the matter.

Appendix A

Chronology after February 28, 1973

March 2, 1973	Issuance of Supplement 1 to the Safety Evaluation for the Duane Arnold Energy Center.
March 8, 1973	ACRS meeting on the Duane Arnold Energy Center application.
March 13, 1973	Issuance of the ACRS letter on the Duane Arnold Energy Center.
March 20, 1973	Received Amendment 13 to the FSAR containing additional information on the applicant's proposed leakage control system.
March 27, 1973	Prehearing conference to consider environmental matters relating to the Duane Arnold Energy Center application.

APPENDIX B

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
UNITED STATES ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

March 13, 1973

Honorable Dixy Lee Ray
Chairman
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subject: REPORT ON DUANE ARNOLD ENERGY CENTER

Dear Dr. Ray:

At its 155th meeting, March 8-10, 1973, the Advisory Committee on Reactor Safeguards completed its review of the application by the Iowa Electric Light and Power Company for authorization to operate the Duane Arnold Energy Center at power levels up to 1658 MWt. This project was considered at a Subcommittee meeting at the site on December 20, 1972, and at a Subcommittee meeting in Washington, D. C. on January 27, 1973. During its review the Committee had the benefit of discussions with representatives and consultants of Iowa Electric Light and Power Company, General Electric Company, Bechtel Corporation, Chicago Bridge and Iron Company, and the AEC Regulatory Staff. The Committee also had the benefit of the documents listed. The Committee reported to the Commission on the construction of this plant in its letter of December 18, 1969 and in its supplementary letter of February 11, 1970.

The Duane Arnold Energy Center Nuclear Plant will be located on a site of approximately 500 acres adjacent to the west bank of the Cedar River in a rural area approximately eight miles northwest of the city of Cedar Rapids, Iowa.

The applicant proposes to install, no later than the first scheduled refueling outage, a leak-off system intended to reduce the potential consequences of excessive leakage from the main steam isolation valves. The criteria for functional adequacy of the leak-off system and the detailed design in conformance with the criteria are not yet fully established. The Regulatory Staff should assure itself that the system finally installed does satisfy all of the considerations appropriate to the enhancement of containment reliability.

The applicant will employ a recirculation pump trip as a means of limiting the consequences of the unlikely occurrence of a failure to scram during an anticipated transient. The trip will be installed prior to initial fuel loading. The Committee believes that this represents a substantial improvement. The specific means for implementing the pump trip should be resolved in a manner satisfactory to the Regulatory Staff.

Honorable Dixy Lee Ray March 13, 1973

The applicant is committed to the installation of a rod sequence control system which will render the probability of occurrence of a postulated, high-worth control rod drop accident negligibly low. This matter is under review and should be resolved in a manner satisfactory to the Regulatory Staff. Approved measures should be placed in effect prior to operation above 1% of rated power.

The shipping cask pool is physically separated from the spent fuel pool by a wall to a height above the top of stored fuel elements and a removable gate above that level. A postulated cask drop is calculated to result in penetration or cracking of the cask pool bottom if unprotected. To avoid such damage, the applicant intends to install an energy absorbing material covering the bottom of the cask pool, no later than the first refueling operation. This matter should be resolved in a manner satisfactory to the Regulatory Staff.

In the unlikely event that a break occurs in the recirculation pump discharge line, the pump impeller might act as a turbine causing the pump and motor to overspeed and become potential sources of missiles. The applicant is reviewing means of dealing with this possibility. The Committee believes that this matter should be resolved in a manner satisfactory to the Regulatory Staff.

The potential effects of some aspects of fuel performance and LOCA-related phenomena on acceptable linear fuel heat ratings for the Duane Arnold Energy Center are under study. This matter should be resolved in a manner satisfactory to the Regulatory Staff. The Committee wishes to be kept informed.

The applicant has provided protection against pipe whip in accordance with the criteria proposed by the Regulatory Staff in the Regulatory Guide, "Protection Against Pipe Whip Inside Containment", now under preparation. The Committee has emphasized the desirability of such protective measures in several letters. The Committee also recognizes that systems for restraining against pipe whip could generate undesirable stress concentrations unless properly designed and suitably installed. Therefore, particular emphasis should be devoted to the following: (1) a better understanding of transient response in piping than is usually required; (2) quality assurance pertaining to design and installation of pipe restraints, including verification that the design computational techniques account for operational conditions and postulated transients; (3) careful examination during preoperational testing and hot startup to validate that the installation meets the design criteria.

Honorable Dixy Lee Ray March 13, 1973

Other problems relating to large water reactors which have been identified by the Regulatory Staff and the ACRS and cited in previous ACRS reports should be dealt with appropriately by the Regulatory Staff and the applicant as suitable approaches are developed.

The Advisory Committee on Reactor Safeguards believes that, if due regard is given to the items mentioned above, and subject to satisfactory completion of construction and preoperational testing, there is reasonable assurance that the Duane Arnold Energy Center can be operated at power levels up to 1658 MWt without undue risk to the health and safety of the public.

Sincerely yours,

H. G. Mangelsdorf
Chairman

References Attached:

References

1) Final Safety Analysis Report, Duane Arnold Energy Center

2) Amendments 1-12, Final Safety Analysis Report, Duane Arnold Energy Center

3) Supplement to Amendment No. 1, dated June 6, 1972

4) Iowa Electric Light and Power Company letter dated July 10, 1972 re: Relief Valve Discharge Line

5) Iowa Electric Light and Power Company letter dated October 24, 1972 re: fuel design (proprietary)

6) Iowa Electric Light and Power Company letter dated December 18, 1972 re: installation of a main steam line isolation valve seal system in the Duane Arnold Energy Center

7) Iowa Electric Light and Power Company letter dated January 15, 1973 adopts the GE NEDM-10735 "Densification Considerations in BWR Fuel Design and Performance"

8) Iowa Electric Light and Power Company letter dated January 16, 1973, re: the gaseous effluent discharges from the Duane Arnold Energy Center being "as low as practicable" and consistent with the proposed Appendix I to 10 CFR Part 50

9) Iowa Electric Light and Power Company letter dated January 22, 1973 transmitting revised operating pressure and temperature limits for Duane Arnold Energy Center

10) Directorate of Licensing Safety Evaluation Report dated January 23, 1973

11) Directorate of Licensing Supplement No. 1 to the Safety Evaluation dated March 2, 1973

February 20, 1974

SUPPLEMENT NUMBER 3

TO THE

SAFETY EVALUATION

BY THE

DIRECTORATE OF LICENSING

U.S. ATOMIC ENERGY COMMISSION

IN THE MATTER OF

IOWA ELECTRIC LIGHT AND POWER COMPANY

DUANE ARNOLD ENERGY CENTER

DOCKET NO. 50-331

INTRODUCTION

The Atomic Energy Commission's Safety Evaluation Report (SER) on the Duane Arnold Energy Center (DAEC), dated January 23, 1973, identified certain matters as requiring additional information from the applicant or that were still under review by the Regulatory staff. Supplement Number 1 to the SER, dated March 2, 1973, updated the SER by addressing eight of these matters. The ACRS completed its review of the DAEC at its March 8, 1973, meeting and reported its findings in a letter to Chairman Ray, dated March 13, 1973. Supplement Number 2 to the SER, dated April 9, 1973, addressed the ACRS comments and further updated the SER.

The purpose of this Supplement is to again update the SER, based on the Regulatory staff's review of the additional information provided by the applicants. Each of the sequentially numbered items of this Supplement contains a specific reference to the subsection of the SER that is being updated, either by the replacement with, or by the addition of, the material provided in this Supplement.

With the indicated resolution of these outstanding matters, the Regulatory staff has completed its review of those items for which resolution is required prior to issuance of an operating license and concludes that there is reasonable assurance that the activities authorized by the operating license can be conducted without endangering the health and safety of the public, and that such activities will be conducted in compliance with the regulations of the Commission set forth in 10 CFR Chapter 1.

ITEM 1 REPLACEMENT FOR THE FOURTH PARAGRAPH OF SECTION 4.2.3 (PAGE 4-7)

The Regulatory staff requires that peak fuel enthalpies not exceed 280 (calories per gram) in the event of any postulated control rod drop accident. As described in General Electric Company's (GE) Topical Report NEDO-10527 and its Supplements, if the control rod worth does not exceed 1.43% Δk/k at low power levels (20% of rated power or less), the peak fuel enthalpy in the event of a rod drop accident will not exceed 280 cal/gm. Limiting the maximum control rod worth while at power levels below 30% of rated power to less than 1.43% Δk/k, will be accomplished by: 1) electrically restricting the removal of the first 50% of the rods to be withdrawn in a prescribed configuration, and the remaining 50% of the rods to single notch movement, as restricted by a Rod Sequence Control System (RSCS) which employs a notch group mode of operation as described in Amendment 14 to the PSAR; and 2) the Rod Worth Minimizer (RWM) which controls the specific order of control rod withdrawal. In the event of RWM inoperability, the applicant will be required to assign a second operator to monitor control rod movement to assure that the first operator follows the pre-selected order.

We conclude that the applicants' proposed system of rod movement control and the specified rod removal order adequately assure, for the first fuel cycle, that a control rod worth greater than 1.43% will not occur at power levels below 20% of rated power. Calculated results reported by the applicants in Amendment 14 indicate

that the maximum worth rod, when employing the notch group mode of RSCS operation, would be significantly less than 1.0%. Nevertheless, we require that the RSCS system, as proposed by the applicants, be improved by adding an electrical interlocking circuit which assures that the rods in a particular notch group are positioned within one notch of each other. We will require the applicants to make this design change and to submit the proposed RSCS design modification for our review, prior to its installation during the first refueling outage.

ITEM 2 REPLACEMENT FOR SECTION 7.6 (PAGE 7-7)

7.6 Control Over Maximum Rod Reactivity Worth

In response to the current Regulatory staff concern for the control over selection and movement of control rods during reactor startup (see Item 3 below on Control Rod Drop Accident), the applicants have installed additional controls as described in Amendment 14 to the FSAR, which meet the requirements of the Regulatory staff for the first operating cycle (see Item 1 above). However, we require that further design improvements be developed for installation during the first refueling outage; these further design improvements will electrically restrict rod positions within a notch group. The applicants will be required to submit the details of this design change for review by the Regulatory staff prior to its installation.

FEB 22 1974

ML021860274

Docket No. 50-331

Iowa Electric Light and Power Company
ATTN: Duane Arnold, President
Security Building
P. O. Box 351
Cedar Rapids, Iowa 52406

Gentlemen:

The Atomic Energy Commission has issued Facility Operating License No. DPR-49. The licensees of DPR-49 are Iowa Electric Light and Power Company, Central Iowa Power Cooperative and Corn Belt Power Cooperative. DPR-49 authorizes operation of the Duane Arnold Energy Center in accordance with the Technical Specifications, Appendices A & B, attached thereto. The steady state reactor core power levels authorized by DPR-49 shall not exceed 1658 megawatts thermal. A copy of the license and technical specifications are enclosed.

Note that the Technical Specifications specify that the licensee shall not undertake initial criticality until specifically approved in writing by the Commission. Representatives of the Division of Regulatory Operation will be at the site during fuel loading and will verify that the assessment of the preoperational test data, the Surveillance Test procedures and the review of non-conformance reporting has been completed. We will inform you promptly of the results of their review.

A related notice, which is being forwarded to the Office of the Federal Register for filing and publication, is enclosed for your information.

Four signed originals of Amendment No. 1 to Indemnity Agreement No. B-68, which covers the activities authorized under License No. DPR-49, are enclosed for review and acceptance by the licensees. One copy of this agreement should be retained by each licensee and one copy signed by all licensees should be returned to this office.

Sincerely,

/s/ D. VASSALLO

R. C. DeYoung, Assistant Director
for Light Water Reactors Group 1
Directorate of Licensing

Enclosures:
See Page Two

Appr LB

OFFICE ➤						
SURNAME ➤						
DATE ➤						

Form AEC-318 (Rev. 9-53) AECM 0240 GPO C43 16 81465-1 520-284

Enclosures:
1. License No. DPR-49 w/Tech. Specs. A & B
2. Federal Register Notice
3. Indemnity Agreement - Amendment No. 1 to B-68

cc: Jack R. Newman, Esq.
Harold F. Reis, Esq.
Newman, Reis & Axelrad
1025 Connecticut Avenue, N.W.
Washington, D. C. 20036

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

Mr. Dudley Henderson
Chairman, Linn County
Board of Supervisors
Cedar Rapids, Iowa 52406

Mr. Ed Vest
Environmental Protection Agency
1735 Baltimore Avenue
Kansas City, Missouri 64108

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Mr. T. B. Abernathy
U. S. Atomic Energy Commission
Division of Technical Information Ext.
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bcc: A. Rosenthal, ASLAB
N. H. Goodrich, ASLBP

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RP Reading(w/o Tech.Specs.)
R. Newton, OGC
W. Massar, OGC
RO (3)
N.Dube(w/o Tech. Specs.)
M. Jinks (w/2 encls.)
R. C. DeYoung
R. Vollmer
C.Hebron,F&M(w/o Tech.Specs
D.Foster,F&M(w/o Tech.Specs
Ellen Brown, F&M
A.Braitman,OAI(w/o Tech. Specs.)
G. Owsley
M. Maigret
S.Kari (w/o Tech. Specs.)
W.Miller,DR:AO(w/o Tech Specs)
F. St. Mary, EP-4
S. Sheppard, EP-4 (w/0 TechSpecs)
D. Muller, AD/EP
K. Goller, LWR 1-3
D. Vassallo, LWR 1-1
ACRS (16)

OFFICE ▶	L:LWR 1-2	L:LWR 1-2	OGC	OAI	L:AD/EP	L:AD/LWR 1
SURNAME ▶	MMaigret:eg GOwsley	WButler	RAS	ABraitman	DMuller	RCDeYoung
DATE ▶	2/22/74	2/22/74	2/22/74	2/22/74	2/22/74	2/27/74

Form AEC-318 (Rev. 9-53) AECM 0240 GPO 043—16—81465-1 445-678

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

IOWA ELECTRIC LIGHT AND POWER COMPANY
CENTRAL IOWA POWER COOPERATIVE
CORN BELT POWER COOPERATIVE
DOCKET 50-331
DUANE ARNOLD ENERGY CENTER
FACILITY OPERATING LICENSE

License No. DPR-49

1. The Atomic Energy Commission (the Commission) having found that:

   A. The application for license filed by Iowa Electric Light and Power Company, Central Iowa Power Cooperative and Corn Belt Power Cooperative (the licensees) 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 and all required notifications to other agencies or bodies have been duly made;

   B. Construction of the Duane Arnold Energy Center (facility) has been substantially completed in conformity with Construction Permit No. DPPR-70; the application, as amended; the provisions of the Act; and the rules and regulations of the Commission;

   C. The facility will operate in conformity with the application, as amended; the provisions of the Act; and the rules and regulations of the Commission;

   D. There is reasonable assurance: (i) that the activities authorized by this operating license can be conducted without endangering the health and safety of the public; and (ii) that such activities will be conducted in compliance with the rules and regulations of the Commission;

   E. Iowa Electric Light & Power Company is technically qualified and the licensees are financially qualified to engage in the activities authorized by this operating license in accordance with the rules and regulations of the Commission;

   F. The licensees have satisfied the applicable provisions of 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements", of the Commission's regulations;

G. The issuance of this operating license will not be inimical to the common defense and security or to the health and safety of the public;

H. After weighing the environmental, economic, technical, and other benefits of the facility against environmental costs and considering available alternatives, the issuance of Facility Operating License No. DPR-49 is in accordance with 10 CFR Part 50, Appendix D, of the Commission's regulations and all applicable requirements of said Appendix D have been satisfied;

I. The receipt, possession, and use of source, by-product and special nuclear material as authorized by this license will be in accordance with the Commission's regulations in 10 CFR Part 30 and 70, including 10 CFR Section 30.33, 70.23 and 70.31.

2. Facility Operating License No. DPR-49 is hereby issued to the Iowa Electric Light and Power Company (IEL&P), Central Iowa Power Cooperative (CIPCO) and Corn Belt Power Cooperative (Corn Belt) to read as follows:

A. This license applies to the Duane Arnold Energy Center, a boiling water reactor and associated equipment (the facility), owned by the licensees and operated by IEL&P. The facility is located on the licensees' site near Palo in Linn County, Iowa. This site consists of approximately 500 acres adjacent to the Cedar River and is described in the "Final Safety Analysis Report" as supplemented and amended (Amendments 1 through 14) and the Environmental Report as supplemented and amended (Supplements 1 through 5).

B. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses:

(1) Iowa Electric Light & Power Company, pursuant to Section 104b of the Act and 10 CFR Part 50, "Licensing of Production and Utilization Facilities", to possess, use, and operate the facility; and CIPCO and Corn Belt to possess the facility at the designated location in Linn County, Iowa, in accordance with the procedures and limitations set forth in this license;

(2) IEL&P, pursuant to the Act and 10 CFR Part 70, "Special Nuclear Material", to receive, possess and use at any time up to 3500 kilograms of U-235 in reactor fuel assemblies enriched in the U-235 isotope in connection with operation of the facility;

(3) IEL&P, pursuant to the Act and 10 CFR Part 30, "Rules of General Applicability to Licensing of Byproduct Material", to receive, possess, and use in connection with operation of the facility:

(a) Any byproduct material with Atomic Numbers 3 to 83, inclusive, without restrictions as to chemical and physical form, not to exceed 1 millicurie each, total not to exceed 50 millicuries;

(b) Cobalt 60, in sealed sources not to exceed 15 millicuries;

(c) Strontium 90, in sealed sources not to exceed 5 millicuries;

(d) Cesium 137, in sealed sources not to exceed a total of 210 curies;

(e) Antimony 124, in sealed sources not to exceed four sources each of 1200 curies;

(f) Americium 241, in sealed sources not to exceed 6 curies; and

(4) IEL&P, pursuant to the Act and 10 CFR Parts 30 and 70, to possess, but not to separate, such by-product and special nuclear materials as may be produced by the operation of the facility.

C. This license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

IEL&P is authorized to operate the Duane Arnold Energy Center at steady state reactor core power levels not in excess of 1658 megawatts (thermal).

(2) Technical Specifications

The Technical Specifications contained in Appendices A & B attached hereto are hereby incorporated in this license. IEL&P shall operate the facility in accordance with the Technical Specifications.

D. This license is effective as of the date of issuance and shall expire at midnight on June 21, 2010.

FOR THE ATOMIC ENERGY COMMISSION

A. Giambusso, Deputy Director
for Reactor Projects
Directorate of Licensing

Attachment:
Appendices A & B - Technical Specifications

Date of Issuance: FEB 2 2 1974

UNITED STATES ATOMIC ENERGY COMMISSION

DOCKET NO. 50-331

IOWA ELECTRIC LIGHT AND POWER COMPANY

CENTRAL IOWA POWER COOPERATIVE

CORN BELT POWER COOPERATIVE

(DUANE ARNOLD ENERGY CENTER)

NOTICE OF ISSUANCE OF FACILITY OPERATING LICENSE

Notice is hereby given that the Atomic Energy Commission has issued Facility Operating License No. DPR-49 to Iowa Electric Light and Power Company, Central Iowa Power Cooperative, and Corn Belt Power Cooperative authorizing operation of the Duane Arnold Energy Center in accordance with the provisions of the license and the Technical Specifications. The steady state reactor core power levels authorized by the license shall not exceed 1658 megawatts thermal. The Duane Arnold Energy Center is a boiling water nuclear reactor located at the licensees' site near Palo in Linn County, Iowa.

The Commission has made appropriate findings as required by the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license. The application for the license complies with the standards and requirements of the Act and the Commission's rules and regulations.

The license is effective as of its date of issuance and shall expire on June 21, 2010.

A copy of (1) Facility Operating License No. DPR-49, complete with Technical Specifications (Appendices "A" and "B"); (2) the report of the Advisory Committee on Reactor Safeguards, dated March 13, 1973; (3) the Directorate of Licensing's Safety Evaluation, dated January 1973; (4) Supplement No. 1 to the Safety Evaluation, dated March 2, 1973; (5) Supplement No. 2

to the Safety Evaluation, dated April 9, 1973; (6) Supplement No. 3 to the Safety Evaluation, dated February 20, 1974; (7) the Final Safety Analysis Report and amendments thereto; (8) the applicants' Environmental Report, dated April 1971, revised November 1971, and supplements thereto; (9) the Draft Environmental Statement, dated November 1972; and (10) the Final Environmental Statement, dated March 1973, are available for public inspection at the Commission's Public Document Room at 1717 H Street, N.W., Washington, D. C. and at the Reference Service, Cedar Rapids Public Library, 426 Third Avenue, S.E., Cedar Rapids, Iowa 52401. A copy of the license and the Safety Evaluation and Supplements thereto may be obtained upon request addressed to the United States Atomic Energy Commission, Washington, D. C. 20545, Attention: Deputy Director for Reactor Projects, Directorate of Licensing.

Dated at Bethesda, Maryland, this 22nd day of February, 1974.

FOR THE ATOMIC ENERGY COMMISSION

Raymond R. Powell

Raymond R. Powell, Acting Chief
Light Water Reactors Projects Branch 1-2
Directorate of Licensing

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

Docket Nos. 70-1384
50-331

AMENDMENT TO INDEMNITY AGREEMENT NO. B-68

AMENDMENT NO. 1

Effective February 22, 1974, Indemnity Agreement No. B-68 between Iowa Electric Light and Power Company, Central Iowa Power Cooperative, and Corn Belt Power Cooperative and the Atomic Energy Commission, dated May 15, 1973, is hereby amended as follows:

Item 2a of the Attachment to the indemnity agreement is deleted in its entirety and the following substituted therefor:

Item 2 - Amount of financial protection

a.	$ 1,000,000	(From 12:01 a.m., May 15, 1973, to 12:00 midnight, February 21, 1974 inclusive)
	$95,000,000	(From 12:01 a.m., February 22, 1974)

Item 3 of the Attachment to the indemnity agreement is deleted in its entirety and the following substituted therefor:

Item 3 - License number or numbers

SNM-1349	(From 12:01 a.m., May 15, 1973, to 12:00 midnight, February 21, 1974 inclusive)
DPR-49	(From 12:01 a.m., February 22, 1974)

Item 5 of the Attachment to the indemnity agreement is amended by adding the following:

Nuclear Energy Liability Policy (Facility Form) No. MF-72
issued by Mutual Atomic Energy Liability Underwriters.

FOR THE UNITED STATES ATOMIC ENERGY COMMISSION

Jerome Saltzman, Deputy Chief
Office of Antitrust & Indemnity
Directorate of Licensing

Accepted _____, 1974

By _____
IOWA ELECTRIC LIGHT AND POWER COMPANY

Accepted _____, 1974

By _____
CENTRAL IOWA POWER COOPERATIVE

Accepted _____, 1974

By _____
CORN BELT POWER COOPERATIVE

Enclosure 3

CHECKLIST FOR ISSUANCE OF FACILITY LICENSE

APPLICANT Iowa Electric Light & Power Company DOCKET NO. 50-331

FACILITY Duane Arnold Energy Center

PROJECT MANAGER Gerry Owsley

LICENSING ASSISTANT Madelyn J. Maigret

	DATE
Notice of Consideration of Issuance of License:	
Published in FEDERAL REGISTER	September 29, 1972
Action Date	~~October 30, 1972~~
OR	
Initial Decision	June 20, 1973
Safety Review:	
L Safety Evaluation	January 23, 1973
ACRS Letter	March 13, 1973
Environmental Review:	
Final Environmental Statement	March 1973
Published in FEDERAL REGISTER	March 1973
Antitrust Review:	
OAI Concurrences	February 22, 1974
Notifications Required by Act & Commission Rules*:	
State Official	May 26, 1972
Local Official	May 26, 1972
Water Quality Certification: (401)	
Submittal by Applicant	April 27, 1973
Transmitted to EPA	~~April 27, 1973~~
License Fee:	
Amount: $544,705 Paid	February 21, 1974
Indemnity Agreement:	
OAI Concurrence	~~February 22, 1974~~
Status of Outstanding Construction Items Checked w/RO	February 20, 1974
Regulatory Operations Final Report: (If Available)	February 20, 1974
Technical Specifications:	
RP Concurrence	~~February 20, 1974~~
EP Concurrence	February 5, 1974
OR Concurrence	February 22, 1974
Public Announcement (to be released):	Copy Attached
Issuance Package: OGC Concurrence	February 22, 1974
1. License	February 22, 1974
2. FEDERAL REGISTER Notice	~~February 22, 1974~~
3. Letter to Applicant	February 22, 1974
4. Information Report	February 28, 1974

* Date Initial Application Forwarded

Revised: MAY 7 1973

PROPOSED PRESS RELEASE

AEC ISSUES OPERATING LICENSE FOR NUCLEAR POWER PLANT IN IOWA

A full power, full-term operating license for the Duane Arnold Energy Center near Cedar Rapids, Iowa, was issued on _____, 1974, to the Iowa Electric Light and Power Company, Cornbelt Power Cooperative and Central Power Cooperative by the Atomic Energy Commission's ~~Regulatory Staff~~ Directorate of Licensing.

At full power the plant, which uses a boiling water reactor, will have a net electrical output of about 569 megawatts.

The term of the license is 40 years from June 1970 when the AEC construction permit for the plant was issued. The station is located near the City of Palo in Linn County, adjacent to the Cedar River, about 8 miles northwest of Cedar Rapids.

The license was issued after findings by the AEC that the application for the operating license complied with AEC requirements and that the plant has been satisfactorily constructed and is ready for fuel loading.

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UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

FEB 20 1974

A. Giambusso, Deputy Director
For Reactor Projects
Directorate of Licensing

Docket No. 50-331

IOWA ELECTRIC LIGHT AND POWER COMPANY (DUANE ARNOLD)

We have been informed by our Region III Office that the Duane Arnold facility has been substantially completed in accordance with the amended application with the exceptions listed in the enclosure. As indicated in our memorandum to Mr. R. S. Boyd on January 4, 1974, we have found that the licensee has implemented an acceptable Q/A program for operations.

The licensee plans to complete the listed exceptions within the time frame stated in the enclosure. Assuming satisfactory resolution of the items in the enclosure and verification of their completion by Regulatory Operations, we recommend that an Operating License be issued to the applicant. We also recommend that the letter transmitting the Operating License to the applicant state that fuel loading and initial criticality shall not be commenced until verification of completion of the items in the enclosure by Regulatory Operations.

Harold R. Denton

John G. Davis, Deputy Director
for Field Operations
Directorate of Regulatory Operations

Enclosure:
As Stated

Enclosure

The following updated findings are the result of recent regulatory inspections at the Duane Arnold Energy Center. These inspections were performed by the identified regulatory groups on the following dates:

Group	Dates
Testing and Startup	Feb. 7-8, 15-16-19-18-19, 1974
Construction	Feb. 17-18-19, 1974
Security	Jan. 29-30, 1974
Preparedness Plan	Jan. 29-30-31, Feb. 1, 18-19, 1974
Health Physics	Jan. 30, Feb. 1, 15-16, 18-19, 1974
Special Nuclear Materials	Jan. 24, 1974

Items requiring resolution:

a. All construction and preoperational testing required for initial fuel loading and sub-critical testing has been completed. Final evaluation of the preoperational test data remains to be completed, however, and is scheduled for completion on February 22, 1974. Completion of this data is required prior to initial fuel loading and sub-critical testing.

b. The identified Cold Functional Testing Program remains to be completed. The remainder is in progress and is scheduled for completion on February 22, 1974. Completion of this item is required prior to initial fuel loading and sub-critical testing.

c. The functional verification of the identified Surveillance Test Procedures remains to be completed and is scheduled for completion on February 22, 1974. Resolution of this item is required prior to initial fuel loading and sub-critical testing.

d. Review and resolution of nonconformance Reports (NCR), Deficiency Reports (DR) and Field Change Notices (FCN) on safety related systems required for initial fuel loading and sub-critical testing are in progress. Regulatory inspections verify that these items are identified and the licensee is committed to proper evaluation and resolution prior to the start of the initial fuel loading program.

MAR 1 3 1974

ML021860271

Docket No. 50-331

Iowa Electric Light and Power Company
ATTN: Duane Arnold, President
Security Building
P. O. Box 351
Cedar Rapids, Iowa 52406

Gentlemen:

The Atomic Energy Commission has issued Amendment No. 1 to Facility Operating License No. DPR-49 (copy enclosed), which authorizes the licensees to own, possess and use an increased amount of Antimony-124 not to exceed eight sources, each of 1200 curies in sealed sources. This amendment has been issued to correct an error in the number of sources previously authorized for the Duane Arnold Energy Center site. Iowa Electric Light & Power Company previously understood that the standard startup source contained a single 1200 curie Antimony-124 source pin per source holder. However, it has since been learned that four such source holders, each containing two (2) source pins, were delivered to the site and are necessary for startup of the Duane Arnold Energy Center. Therefore, Amendment No. 1 to Facility Operating License No. DPR-49 authorizing possession and use of eight (8) Antimony-124 source pins each not to exceed 1200 curies is necessary. We have determined that this amendment does not present a significant hazards consideration.

A copy of a related notice, which has been forwarded to the Office of the Federal Register for publication, is enclosed for your information.

Sincerely,

Original Signed by
R. C. DeYoung

Richard C. DeYoung, Assistant Director
for Light Water Reactors, Group 1
Directorate of Licensing

Enclosures:
1. Amendment No. 1 to DPR-49
2. Federal Register Notice

cc's: See Next Page

F/P LB

OFFICE ▶	L:LWR 1-2	L:LWR 1-2	L:LWR 1-2	OGC	L:AD/LWR 1	
SURNAME ▶	MMargeteag	GOwsley	WRButler	W. MASSAR	RCDeYoung	
DATE ▶	3/13/74	3/13/74	3/13/74	3/13/74	3/13/74	

Form AEC-318 (Rev. 9-53) AECM 0240 GPO 643—16—81465-1 445-678

cc's: Jack R. Newman, Esq.
Harold F. Reis, Esq.
Newman, Reis & Axelrad
1025 Connecticut Avenue, N.W.
Washington, D. C. 20036

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

Mr. Dudley Henderson
Chairman, Linn County
Board of Supervisors
Cedar Rapids, Iowa 52406

Mr. Ed Vest
Environmental Protection Agency
1735 Baltimore Avenue
Kansas City, Missouri 64108

Mr. J. R. Buchanan
Assistant Director
Nuclear Safety Information Center
Oak Ridge National Lab
P. O. Box Y
Oak Ridge, Tennessee 37830

Mr. T. B. Abernathy
U. S. Atomic Energy Commission
Division of Technical Information Ext.
Document Management Branch
P. O. Box 62
Oak Ridge, Tennessee 37830

bcc: A. Rosenthal, ASLAB
N. H. Goodrich, ASLBP

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R. Newton, OGC
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Ellen Brown,F&M(OL only)
A. Braitman, OAI(w/o Tech Specs)
S. Kari(w/o Tech Specs)
W. Miller,DR:AO(w/o T.S.)
LWR 1 Branch Chiefs(w/o Tech Specs)
ACRS (16)
D. Muller
M. Maigret
G. Owsley

OFFICE ▶						
SURNAME ▶						
DATE ▶						

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

IOWA ELECTRIC LIGHT AND POWER COMPANY
CENTRAL IOWA POWER COOPERATIVE
CORN BELT POWER COOPERATIVE
DOCKET NO. 50-331
DUANE ARNOLD ENERGY CENTER
FACILITY OPERATING LICENSE

License No. DPR-49
Amendment No. 1

1. The Atomic Energy Commission (the Commission) having found that:

   A. The application for amendment, dated March 13, 1974, complies with the requirements of the Atomic Energy Act of 1954, as amended, and the Commission's regulations set forth in 10 CFR Chapter 1;

   B. The facility will operate in conformity with the license, as amended, 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 regulation;

   D. Prior public notice of proposed issuance of this amendment is not required since the amendment does not present a significant hazards consideration.

2. Accordingly, Facility Operating License No. DPR-49 issued to Iowa Electric Light & Power Company, Central Iowa Power Cooperative and Corn Belt Power Cooperative is hereby amended by revising the following paragraph thereof in its entirety to read:

   2.B.(3) (e) Antimony-124, in sealed sources not to exceed eight sources each of 1200 curies

This amendment is effective as of the date of issuance.

FOR THE ATOMIC ENERGY COMMISSION

for A. Giambusso, Deputy Director
for Reactor Projects
Directorate of Licensing

Date of Issuance: MAR 13 1974

UNITED STATES ATOMIC ENERGY COMMISSION

DOCKET NO. 50-331

IOWA ELECTRIC LIGHT AND POWER COMPANY

CENTRAL IOWA POWER COOPERATIVE

CORN BELT POWER COOPERATIVE

(DUANE ARNOLD ENERGY CENTER)

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

Notice is hereby given that the Atomic Energy Commission (the Commission) has issued Amendment No. 1 to the Facility Operating License No. DPR-49 to the Iowa Electric Light and Power Company, Central Iowa Power Cooperative and Corn Belt Power Cooperative (the licensees). This amendment authorizes the licensees to increase the amount of byproduct material they may receive, possess, and use in connection with operation of the Duane Arnold Energy Center located on the licensees' site near Palo in Linn County, Iowa. The amendment, effective as of the date of issuance, authorizes the receipt, possession and use of an additional four sources for a total of eight sources, each of 1200 curies of Antimony 124 in sealed sources.

The licensees stated, in a letter to the Commission, dated March 13, 1974, that the existence and need for the additional four source pins was discovered subsequent to delivery of the sources to the site. Four source holders, each containing two (2) 1200 curie Antimony-124 source pins, are at the site and are necessary for startup of the Duane Arnold Energy Center. Therefore, Amendment No. 1 to Facility Operating License No. DPR-49 authorizing possession and use of eight (8) Antimony-124 source pins, each not to exceed 1200 curies is necessary.

The Staff's Safety Evaluation Report, upon the basis of which the original license was issued, is based upon the Final Safety Analysis Report which, on Page 3.3-14 of the text and in Figure 7.5.1 describes the correct number of sources for the Duane Arnold Energy Center. Accordingly, the Regulatory staff has determined that this amendment does not present a significant hazards consideration.

The Director of Regulation has made appropriate findings as required by the Act and the Commission's regulations in 10 CFR Chapter I, which are set forth in the license amendment.

The amendment is effective as of the date of issuance. The licensees' application for amendment, dated March 13, 1974, and a copy of Amendment No. 1 to Facility Operating Licensing No. DPR-49 are available for public inspection at the Commission's Public Document Room at 1717 H Street, N.W., Washington, D. C. 20545, and at the Reference Service, Cedar Rapids Public Library, 426 Third Avenue, S.E., Cedar Rapids, Iowa 52401. Single copies of the amendment may be obtained upon request addressed to the United States Atomic Energy Commission, Washington, D. C. 20545, Attention: Deputy Director for Reactor Projects, Directorate of Licensing.

Dated at Bethesda, Maryland, this 13th day of March, 1974.

FOR THE ATOMIC ENERGY COMMISSION

Walter R. Butler

Walter R. Butler, Chief
Light Water Reactors Project Branch 1-2
Directorate of Licensing

CHECKLIST FOR ISSUANCE OF AMENDMENT
CONSTRUCTION PERMIT OR FACILITY OPERATING LICENSE

APPLICANT Iowa Electric Light & Power Company DOCKET NO. 50-331

FACILITY Duane Arnold Energy Center

PROJECT MANAGER Gerald Owsley

LICENSING ASSISTANT Madelyn J. Maigret

	DATE
Notice of Proposed Issuance Published In FEDERAL REGISTER Action Date	March 20, 1974
OR	
Order Directing Action by whom: IE&P Co. letter requesting Amendment	March 13, 1974
Issuance Package: OGC Concurrence	
1. License Amendment	3/13/74
2. FEDERAL REGISTER Notice	3/13/74
3. Staff Evaluation	3/13/74
4. Letter to applicant	3/13/74
NO CHANGE IN POWER LEVEL	
For Amendments Affecting Power Level:	
RO Notification and/or Concurrence	
OAI Notification and/or Concurrence	
Bus. Mgmt-OA Notification and/or Concurrence	
OIS Notification	