October 3, 1996

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Mr. Lee Liu
Chairman of the Board, President,
and Chief Executive Officer
IES Utilities Inc.
200 First Street, SE
Cedar Rapids, IA 52406-0351

SUBJECT: AMENDMENT NO. 218 TO FACILITY OPERATING LICENSE NO. DPR-49 - DUANE ARNOLD ENERGY CENTER (TAC NO. M95887)

Dear Mr. Liu:

The Commission has issued the enclosed Amendment No. 218 to Facility Operating License No. DPR-49 for the Duane Arnold Energy Center. This amendment consists of changes to the Technical Specifications (TS) in response to your application dated July 5, 1996 (NG-96-1297).

The amendment will support the implementation of noble metal chemical addition at the Duane Arnold Energy Center as a method to enhance the effectiveness of hydrogen water chemistry in mitigating intergranular stress corrosion cracking in reactor vessel internal components. Specifically, the amendment will permit an increase of the reactor water conductivity limit in Technical Specification (TS) Table 3.6.B.2-1 and several other changes in TS sections 4.6.B.2.c, 4.6.B.2.d, and the associated Bases.

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

Sincerely,

Original signed by:

Glenn B. Kelly, Project Manager
Project Directorate III-3
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-331

Enclosures: 1. Amendment No. 218 to License No. DPR-49
2. Safety Evaluation

cc w/encls: See next page

DOCUMENT NAME: G:\DUANEARN\DUA95887.AMD *See previous concurrence.

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OFFICE	PD33:LA	E	PD33:PM	E	OGC		SC:EMCB			
NAME	DFoster-Curseen		GKelly		MYoung*		DTerao*			
DATE	10/3 /96		10/3 /96		9/19/96		09/11/96			

* MEMO from DTerao to GMarcus dated September 11, 1996

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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2. Safety Evaluation

cc w/encls: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

IES UTILITIES INC.

CENTRAL IOWA POWER COOPERATIVE

CORN BELT POWER COOPERATIVE

DOCKET NO. 50-331

DUANE ARNOLD ENERGY CENTER

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 218
License No. DPR-49

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by IES Utilities Inc., et al., dated July 5, 1996, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

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

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

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

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-49 is hereby amended to read as follows:

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(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 218 are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Glenn B. Kelly, Project Manager
Project Directorate III-3
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of issuance: October 3, 1996

ATTACHMENT TO LICENSE AMENDMENT NO. 218

FACILITY OPERATING LICENSE NO. DPR-49

DOCKET NO. 50-331

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

Remove	Insert
3.6-4	3.6-4
3.6-6	3.6-6
3.6-21	3.6-21

LIMITING CONDITIONS FOR OPERATION

2) With the conductivity exceeding 10.0 μmo/cm at 25°C or chloride concentration exceeding 500 ppb, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

3) Continuously record the conductivity of the reactor coolant. With no continuous recording conductivity monitor OPERABLE, install a temporary in-line Conductivity monitor within 4 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

b. In STARTUP and HOT SHUTDOWN:

1) With the conductivity, chloride concentration or pH exceeding the limit specified in Table 3.6.B.2-1 for more than 48 continuous hours, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

c. In COLD SHUTDOWN and REFUEL:

1) With the conductivity or pH exceeding the limit specified in Table 3.6.B.2-1, restore the conductivity and pH to within the limit within 72 hours.

2) With chloride concentration exceeding the limit specified in Table 3.6.B.2-1, restore the chloride concentration to within the limit within 24 hours.

SURVEILLANCE REQUIREMENTS

c. Obtain and analyze a sample of the reactor coolant for chlorides at least once every 8 hours whenever either, the conductivity is greater than the limit specified in Table 3.6.b.2-1, or during Noble Metal Chemical Addition.

d. Obtain and analyze a sample of the reactor coolant for pH at least once every 8 hours whenever either, the conductivity is greater than the limit specified in Table 3.6.B.2-1, or during Noble Metal Chemical Addition.

e. With no continuous recording conductivity monitor OPERABLE, obtain an in-line conductivity measurement at least once per 4 hours when in RUN, STARTUP, or HOT SHUTDOWN MODES and 24 hours at all other times.

f. Perform a CHANNEL CHECK of the continuous conductivity monitor at least once per 7 days.

Table 3.6.B-2-1

REACTOR COOLANT SYSTEM

CHEMISTRY LIMITS

MODES	CHLORIDES	CONDUCTIVITY μMHOS/CM@ 25°c	PH
RUN	≤ 200 ppb	≤ 1.0	5.6 ≤ PH ≤ 8.6
STARTUP/HOT SHUTDOWN	≤ 100 ppb	≤ 2.0 **	5.6 ≤ PH ≤ 8.6
COLD SHUTDOWN/REFUELING*	≤ 100 ppb	≤ 5.0	4.6 ≤ PH

* Not applicable with no fuel in the reactor vessel

** During Noble Metal Chemical Addition (NMCA), 10.0 μMHOS/CM is the limit

dependent corrosion rates and provide time for the RWCU System to re-establish the purity of the reactor coolant. During some periods of operation, conductivity or chloride concentration may exceed 5.0 μmo/cm or 200 ppb respectively because of the initial evolution of gases, the initial addition of dissolved metals, or the breaking out of chlorides entrapped in the system. The total time during which the conductivity or chloride concentration may exceed the specified limit must be limited to 2 weeks/year or less to prevent stress corrosion cracking.

At DAEC, conductivity is continuously monitored at the Reactor Water Cleanup System, between the hot well and the demineralizer beds, and at the outlet of the demineralizer beds. Any of these monitors are considered to fulfill the requirement of continuously monitoring the Reactor Coolant System. In the event that the conductivity cannot be continuously monitored, a temporary in-line monitor is to be installed.

The iodine radioactivity will be monitored by reactor water sample analysis. The total iodine activity would not be expected to change over a period of 1 week. In addition, the trend of the offgas stack release rate, which is continuously monitored, is an indication of the trend of the iodine activity in the reactor coolant. Since the concentration of radioactivity in the reactor coolant is not continuously measured, coolant sampling would be ineffective as a means to rapidly detect gross fuel element failures. however, the capability to detect gross fuel element failures is inherent in the radiation monitors in the Offgas System and on the main steam lines.

The conductivity of the reactor coolant is continuously monitored. Conductivity instrumentation will be checked every 4 days by instream measurements with an independent conductivity monitor to assure accurate readings. If conductivity is within its normal range, chlorides and other impurities will also be within their normal ranges. The reactor coolant samples will also be used to determine the chlorides. Therefore, the sampling frequency is considered adequate to detect long-term changes in the chloride ion content. Isotopic analyses to determine major contributors to activity can be performed by a gamma scan.

Noble Metal Chemical Addition (NMCA) has been developed by General Electric Nuclear Energy (GENE) as a method to enhance the effectiveness of Hydrogen Water Chemistry (HWC) in mitigating Intergranular Stress Corrosion Cracking (IGSCC) in Boiling Water Reactor (BWR) vessel internal components. Additionally, use of NMCA will allow lower injection rates of HWC which in turn reduces plant radiation exposure over the life of the plant. NMCA process will deposit a very thin, discontinuous layer of noble metals onto all wetted surfaces during the injection process. The treated surfaces will behave catalytically and promote oxidant-hydrogen recombination. This results in low corrosion potential of components at low hydrogen injection rates. Higher reactor water conductivity is anticipated during the application due to the effect of non-corrosive noble metals on the measured conductivity.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 218 TO FACILITY OPERATING LICENSE NO. DPR-49

IES UTILITIES INC.
CENTRAL IOWA POWER COOPERATIVE
CORN BELT POWER COOPERATIVE

DUANE ARNOLD ENERGY CENTER

DOCKET NO. 50-331

1.0 INTRODUCTION

By letter dated July 5, 1996, IES Utilities Inc. (the licensee) submitted a request for an amendment to the Technical Specifications (TS) for the Duane Arnold Energy Center (DAEC). The licensee requested an increase of the reactor water conductivity limit in Table 3.6.B.2-1 and several other changes in TS sections 4.6.B.2.c and 4.6.B.2.d, and the associated Bases to support the implementation of nobel metal chemical addition (NMCA). The licensee plans to perform NMCA when DAEC is in a Hot Shutdown condition during Refuel Outage 14 (RFO 14). The RFO 14 is scheduled to begin in October 1996.

The NMCA process was developed by General Electric Nuclear Energy (GENE) as a measure to enhance the effectiveness of hydrogen water chemistry (HWC) in mitigating the intergranular stress corrosion cracking (IGSCC) of reactor vessel internals in boiling water reactors (BWRs). The NMCA will deposit a very thin discontinuous layer of the noble metals on the component surfaces during the application period. The treated surfaces will behave catalytically and promote oxidant-hydrogen recombination, which will allow the treated components to reach the low electrochemical corrosion potential (ECP) at low hydrogen injection rates. The low hydrogen injection rates will reduce the plant radiation exposure over the life of the plant.

2.0 EVALUATION

The NRC staff has evaluated the following changes in the TS which were proposed by the licensee to support the implementation of the NMCA:

(i) In Table 3.6.B.2-1, REACTOR COOLANT SYSTEM CHEMISTRY LIMITS (page 3.6.6), the licensee proposed to add:

(a) two asterisks to the conductivity limit for the STARTUP/HOT SHUTDOWN Modes and

(b) a note of "** During Noble Metal Chemical Addition (NMCA), 10.0 μmhos/cm is the limit." to Table 3.6.B.2-1.

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During the implementation of the NMCA process, the conductivity is expected to increase and exceed the limit of 2.0 μmhos/cm, because noble metal is being added to the reactor water. The noble metal will form a thin discontinuous layer on the surface of the reactor internals which will enhance its resistance to IGSCC when mitigated with HWC. Noble metal in the coolant water is not expected to have any effect to the normal operation of reactor plant. After completion of the NMCA process, the conductivity of the reactor water will return to the normal range allowed in the TS, because the excess noble metal is constantly being removed by the reactor water cleanup system. Since the increase of the conductivity limit is to support the implementation of the NMCA process and the excess noble metal will be removed after completion of the NMCA process, the NRC staff concludes that the proposed increase of the conductivity limit is acceptable.

(ii) In TS Sections 4.6.B.2.c and 4.6.B.2.d (page 3.6-4), the licensee proposed to add a monitoring frequency of at least once every 8 hours for chlorides and acidity (pH) in reactor coolant during Noble Metal Chemical Addition (NMCA).

The proposed additional monitoring of chlorides and acidity during the NMCA process is to ensure that the chlorides and acidity stay in the normal acceptable ranges when noble metal is being added to the reactor water. The NRC staff concludes that the proposed changes are acceptable.

(iii) The licensee proposed to add the TS Bases for NMCA process (page 3.6-21)

The proposed addition in the Bases section describes the NMCA process and is editorial in nature. Therefore, it is acceptable.

Based on the NRC staff's review, the staff concludes that the licensee's proposal to support the implementation of NMCA is acceptable. This is because the NMCA process will enhance the reactor internals in its resistance to IGSCC and will also reduce the plant radiation exposure over the life of the plant when mitigated with the HWC. The increase in conductivity during the implementation of the NMCA process involves no significant hazards and will not endanger public safety and health.

3.0 STATE CONSULTATION

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

4.0 ENVIRONMENTAL CONSIDERATIONS

This amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or changes a surveillance requirement. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluent that may be released offsite, and that there is no significant increase in individual or cumulative

occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (61 FR 40020). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

5.0 CONCLUSION

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

Principal Contributor: W. Koo

Date: October 3, 1996