

March 31, 1998

Mr. Lee Liu
Chairman of the Board
and Chief Executive Officer
IES Utilities Inc.
200 First Street, SE.
P.O. Box 351
Cedar Rapids, IA 52406-0351

SUBJECT: AMENDMENT NO. 221 TO FACILITY OPERATING LICENSE NO. DPR-49 - DUANE
ARNOLD ENERGY CENTER (TAC NO. MA0781)

Dear Mr. Liu:

The Commission has issued the enclosed Amendment No. 221 to Facility Operating License No. DPR-49 for the Duane Arnold Energy Center. The amendment consists of changes to the Technical Specifications (TS) in response to your application dated February 3, 1998.

The amendment revises the definitions of Cold Condition and Cold Shutdown and adds a new section, 3.17, "Vessel Hydrostatic Pressure and Leak Testing," to the Technical Specifications to specifically allow reactor vessel hydrostatic pressure testing to be performed during plant shutdown.

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

Sincerely,

Original signed by:

Richard J. Laufer, 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. 221 to License No. DPR-49
- 2. Safety Evaluation

cc w/encls: See next page

Distribution w/encls:

Docket File	GGrant, RIII	OGC	PRay	ACRS
PUBLIC	RLaufer	EAdensam	GHill(2)	
PDIII-3 Reading	EBarnhill	RSavio	WBeckner	

1/1
BFOI

DOCUMENT NAME: G:\DAUNEARN\ma0781.AMD

To receive a copy of this document, indicate in the box: "C" = Copy without enclosures "E" = Copy with enclosures "N" = No copy

OFFICE	PD33-LA	E	PD33-PM	E	PD33-PM	E	SRXB-BC	N	TSB-BC		PD33-(A)PD	OGC	
NAME	EBarnhill	EA	PRay	RLaufer	TCollins	to	WBeckner	WB	RSavio	RS	Comm		
DATE	3/9/98		3/9/98		3/9/98		3/9/98		3/10/98		3/10/98		3/10/98

OFFICIAL RECORD COPY

9804070326 980331
PDR ADOCK 05000331
P PDR

NRC FILE CENTER COPY

CPI

March 31, 1998

Mr. Lee Liu
Chairman of the Board
and Chief Executive Officer
IES Utilities Inc.
200 First Street, SE.
P.O. Box 351
Cedar Rapids, IA 52406-0351

SUBJECT: AMENDMENT NO. 221 TO FACILITY OPERATING LICENSE NO. DPR-49 - DUANE
ARNOLD ENERGY CENTER (TAC NO. MA0781)

Dear Mr. Liu:

The Commission has issued the enclosed Amendment No. 221 to Facility Operating License No. DPR-49 for the Duane Arnold Energy Center. The amendment consists of changes to the Technical Specifications (TS) in response to your application dated February 3, 1998.

The amendment revises the definitions of Cold Condition and Cold Shutdown and adds a new section, 3.17, "Vessel Hydrostatic Pressure and Leak Testing," to the Technical Specifications to specifically allow reactor vessel hydrostatic pressure testing to be performed during plant shutdown.

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

Sincerely,

Original signed by:

Richard J. Laufer, 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. 221 to License No. DPR-49
- 2. Safety Evaluation

cc w/encls: See next page

Distribution w/encls:

Docket File	GGrant, RIII	OGC	PRay	ACRS
PUBLIC	RLaufer	EAdensam	GHill(2)	
PDIII-3 Reading	EBarnhill	RSavio	WBeckner	

DOCUMENT NAME: G:\DAUNEARN\ma0781.AMD

To receive a copy of this document, indicate in the box: "C" = Copy without enclosures "E" = Copy with enclosures "N" = No copy

OFFICE	PD33-LA	E	PD33-PM	E	PD33-PM	E	SRXB-BC	N	TSB-BC		PD33-(A)PD	OGC	
NAME	EBarnhill		PRay		RLaufer		TCollins		WBeckner		RSavio		CMurphy
DATE	3/9/98		3/9/98		3/9/98		3/9/98		3/10/98		3/11/98		3/16/98

OFFICIAL RECORD COPY



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

March 31, 1998

Mr. Lee Liu
Chairman of the Board
and Chief Executive Officer
IES Utilities Inc.
200 First Street, SE.
P.O. Box 351
Cedar Rapids, IA 52406-0351

SUBJECT: AMENDMENT NO.221 TO FACILITY OPERATING LICENSE NO. DPR-49 - DUANE
ARNOLD ENERGY CENTER (TAC NO. MA0781)

Dear Mr. Liu:

The Commission has issued the enclosed Amendment No. 221 to Facility Operating License No. DPR-49 for the Duane Arnold Energy Center. The amendment consists of changes to the Technical Specifications (TS) in response to your application dated February 3, 1998.

The amendment revises the definitions of Cold Condition and Cold Shutdown and adds a new section, 3.17, "Vessel Hydrostatic Pressure and Leak Testing," to the Technical Specifications to specifically allow reactor vessel hydrostatic pressure testing to be performed during plant shutdown.

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

Sincerely,

A handwritten signature in cursive script, appearing to read "Richard J. Lauder".

Richard J. Lauder, 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.221 to
License No. DPR-49
2. Safety Evaluation

cc w/encls: See next page

Lee Liu
IES Utilities Inc.

Duane Arnold Energy Center

cc:

Jack Newman, Esquire
Kathleen H. Shea, Esquire
Morgan, Lewis, & Bockius
1800 M Street, NW.
Washington, DC 20036-5869

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

IES Utilities Inc.
ATTN: Gary Van Middlesworth
Plant Superintendent, Nuclear
3277 DAEC Road
Palo, IA 52324

John F. Franz, Jr.
Vice President, Nuclear
Duane Arnold Energy Center
3277 DAEC Road
Palo, IA 52324

Ken Peveler
Manager of Regulatory Performance
Duane Arnold Energy Center
3277 DAEC Road
Palo, IA 52324

U.S. Nuclear Regulatory Commission
Resident Inspector's Office
Rural Route #1
Palo, IA 52324

Regional Administrator, RIII
U.S. Nuclear Regulatory Commission
801 Warrenville Road
Lisle, IL 60532-4531

Parween Baig
Utilities Division
Iowa Department of Commerce
Lucas Office Building, 5th floor
Des Moines, IA 50319



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. 221
License No. DPR-49

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the IES Utilities Inc., et al., dated February 3, 1998, 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:

9804070342 980331
PDR ADOCK 05000331
P PDR

Enclosure 1

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. ²²¹, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 120 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Richard J. Laufer, 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: March 31, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 221

FACILITY OPERATING LICENSE NO. DPR-49

DOCKET NO. 50-331

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

Remove

1.0-2
1.0-3
1.0-11
--

Insert

1.0-2
1.0-3
1.0-11
3.17-1

5. OPERABLE-OPERABILITY

A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified functions(s). Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, normal and emergency electrical power sources, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component or device to perform its functions(s) are also capable of performing their related support functions(s).

A verification of OPERABILITY is an administrative check, by examination of appropriate plant records (logs, surveillance test records), to determine that a system, subsystem, train, component or device is not inoperable.

6. OPERATING

Operating means that a system or component is performing its intended functions in its required manner.

7. IMMEDIATE

Immediate means that the required action will be initiated as soon as practical considering the safe operation of the unit and the importance of the required action.

8. REACTOR POWER OPERATION

Reactor power operation is any operation with the mode switch in the "Startup" or "Run" position with the reactor critical and above 1% rated power.

- a) SINGLE LOOP OPERATION (SLO): REACTOR POWER OPERATION with only one of the two recirculation loops in operation.

9. HOT STANDBY CONDITION

Hot standby condition means operation with coolant temperature greater than 212°F, reactor vessel pressure less than 1055 psig, and the mode switch in the Startup/Hot Standby position.

10. COLD CONDITION

Reactor coolant temperature equal to or less than 212°F. During the performance of vessel hydrostatic pressure and leak testing the reactor coolant temperature may be considered NA, the reactor may be pressurized above atmospheric, and the reactor may be considered to remain in a COLD CONDITION/COLD SHUTDOWN if the requirements of 3.17.A are met.

11. HOT SHUTDOWN

The reactor is in the shutdown mode and the reactor coolant temperature greater than 212°F.

12. COLD SHUTDOWN

The reactor is in the shutdown mode, the reactor coolant temperature equal to or less than 212°F, and the reactor vessel is vented to atmosphere. During the performance of vessel hydrostatic pressure and leak testing the reactor coolant temperature may be considered NA, the reactor may be pressurized above atmospheric, and the reactor may be considered to remain in a COLD CONDITION/COLD SHUTDOWN if the requirements of 3.17.A are met.

13. MODE OF OPERATION

A reactor mode switch selects the proper interlocks for operational status of the unit. The following are the modes and interlocks provided:

- a. Startup/Hot Standby Mode - In this mode the reactor protection scram trips, initiated by main steam line isolation valve closure, are bypassed. The reactor protection system is energized with IRM neutron monitoring system trip, the APRM 15% high flux trip, and control rod withdrawal interlocks in service. The lower pressure MSIV closure 850 psig trip is also bypassed. This is intended to imply the Startup/Hot Standby position of the mode switch.
- b. Run Mode - In this mode the reactor vessel pressure is at or above 850 psig and the reactor protection system is energized with APRM protection (excluding the 15% high flux trip) and RBM interlocks in service.
- c. Shutdown Mode - Placing the mode switch to the shutdown position initiates a reactor scram and power to the control rod drives is removed. After a short time period (about 10 seconds), the scram signal is removed allowing a scram reset and restoring the normal valve lineup in the control rod drive hydraulic system; also, the main steam line isolation scram is bypassed.
- d. Refuel Mode - With the mode switch in the refuel position interlocks are established so that one control rod only may be withdrawn when the Source Range Monitor indicates at least 3 cps and the refueling crane is not over the reactor; also, the main steam line isolation scram is bypassed. If the refueling crane is over the reactor, all rods must be fully inserted and none can be withdrawn.

14. RATED POWER

Rated power (100% power) refers to operation at a reactor power of 1658 Mwt.

TABLE 1.0-1

OPERATING MODES

OPERATING MODE	REACTOR MODE SWITCH POSITION	AVERAGE REACTOR COOLANT TEMPERATURE ^(g)
1. RUN/POWER OPERATION	Run	NA
2. STARTUP	Startup/Hot Standby or Refuel ^(a)	NA
3. HOT SHUTDOWN ^(a)	Shutdown ^{(c)(d)}	> 212°F
4. COLD SHUTDOWN ^(a)	Shutdown ^{(c)(d)(e)}	≤ 212°F
5. REFUELING ^(b)	Shutdown or Refuel ^{(c)(f)}	NA

- (a) Fuel in the reactor vessel with the reactor vessel head closure bolts fully tensioned.
- (b) Fuel in the reactor vessel with the vessel head closure bolts less than fully tensioned or with the head removed.
- (c) The reactor mode switch may be placed in the Run, Startup/Hot Standby or Refuel position to test the switch interlock functions and related instrumentation provided that the control rods are verified to remain fully inserted by a second licensed operator.
- (d) The reactor mode switch may be placed in the Refuel position while a single control rod is being recoupled or withdrawn provided that the one-rod-out interlock is OPERABLE.
- (e) The reactor mode switch may be placed in the Refuel position while a single control rod drive is being removed from the reactor pressure vessel per Specification 3.9.A.
- (f) The reactor mode switch may be placed in the Startup position for demonstration of shutdown margin per Specification 4.3.A.1.
- (g) During the performance of vessel hydrostatic pressure and leak testing the reactor coolant temperature may be considered NA and the reactor may be considered to remain in COLD SHUTDOWN if the requirements of 3.17.A are met.

LIMITING CONDITIONS FOR OPERATION**3.17 VESSEL HYDROSTATIC PRESSURE AND LEAK TESTING****Applicability :**

Applies to the performance of ASME required reactor vessel hydrostatic pressure and leak testing.

Specification:

- A. System Availability**
1. Prior to and while exceeding 212°F during the performance of vessel hydrostatic pressure and leak testing, the following requirements must be met:
 - a. The Reactor Vessel Water Level - Low, Refuel Floor Exhaust Duct - High Radiation, and Reactor Building Exhaust Shaft - High Radiation trip functions shall be operable and,
 - b. Secondary Containment shall be operable, and
 - c. Secondary Containment Automatic Isolation Dampers shall be operable, and
 - d. Both trains of Standby Gas Treatment shall be operable, and
 - e. Two low pressure core cooling pumps (any combination of Core Spray and LPCI) shall be operable and capable of injecting into the vessel.
 2. If Specification 3.17.A.1 cannot be met, immediately suspend activities that could increase average reactor coolant temperature or pressure and reduce the average reactor coolant temperature to 212°F within 24 hours.

SURVEILLANCE REQUIREMENTS**4.17 VESSEL HYDROSTATIC PRESSURE AND LEAK TESTING****Applicability:**

Applies to the surveillance requirements during the performance of ASME required reactor vessel hydrostatic pressure and leak testing.

Specification:

- A. System Availability**
1. Channel checks shall be performed every 12 hours on the Reactor Vessel Water Level - Low, Refuel Floor Exhaust Duct - High Radiation, and Reactor Building Exhaust Shaft - High Radiation trip functions.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 221 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 February 3, 1998, the licensee submitted a request for changes to the Duane Arnold Energy Center (DAEC) Technical Specifications (TS). The proposed amendment would revise the definitions of Cold Condition and Cold Shutdown and add a new section, 3.17, "Vessel Hydrostatic Pressure and Leak Testing," to the Technical Specifications to specifically allow reactor vessel hydrostatic pressure testing to be performed during plant shutdown. This proposed revision to DAEC TS is consistent with NUREG 1433, Revision 1, "Standard Technical Specifications, General Electric Plants, BWR/4."

2.0 BACKGROUND

The current DAEC TS contain no explicit exceptions to the definition of Cold Shutdown to allow performing inservice hydrostatic testing and system leakage tests required by Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. This testing is required to be performed prior to the reactor going critical after a refueling outage. Recirculation pump operation and water solid reactor pressure vessel, as well as hydrostatic pump and control rod drive pump operation, are used to achieve the necessary temperatures and pressures required for these tests. The minimum allowable temperatures for these tests are determined from the Operating Limits Curve, TS Figure 3.6-1. These temperatures are conservatively based on the fracture toughness of the reactor vessel, taking into account anticipated vessel neutron fluence.

With increased reactor vessel fluence over time, the minimum allowable vessel temperature increases at a given pressure. Periodic updates to TS Figure 3.6-1 are performed as necessary, based upon the results of analyses of irradiated surveillance specimens removed from the vessel. Hydrostatic pressure and leak testing will eventually

9804070344 980331
PDR ADDCK 05000331
P PDR

be required with minimum reactor coolant temperatures greater than 212°F, which is the maximum temperature defined for the Cold Condition and Cold Shutdown.

3.0 EVALUATION

This proposed revision to DAEC TS would provide an exception to Hot Shutdown requirements, including operability of primary containment and the full complement of redundant Emergency Core Cooling Systems allowing the reactor to be considered in Cold Shutdown during hydrostatic or leak testing when the reactor coolant temperature is > 212°F. Since the hydrostatic or leak tests are performed water solid, at low decay heat values, and near Cold Shutdown conditions, the stored energy in the reactor core will be very low. Under these conditions, the potential for failed fuel and a subsequent increase in coolant activity above the Limiting Conditions for Operation (LCO) 3.6.B, "Coolant Chemistry," limits are minimized. In addition, the secondary containment will be operable, in accordance with proposed LCO 3.17, "Vessel Hydrostatic Pressure and Leak Testing," and will be capable of handling any airborne radioactivity or steam leaks that could occur during the performance of hydrostatic or leak testing.

In the event that leaks occur during the test, small system leaks would be detected by leakage inspections before significant inventory loss occurred. In the event of a large primary system leak, the reactor vessel would rapidly depressurize, allowing the low pressure core cooling systems to operate. The capability of the low pressure coolant injection and core spray subsystems, as required in Cold Shutdown by LCO 3.5, "Core and Containment Cooling Systems," would be more than adequate to keep the core flooded under this low decay heat load condition. In addition, the required pressure testing conditions established by the proposed LCO 3.17, provide adequate assurance that the consequences of a steam leak will be conservatively bounded by the consequences of the postulated main steam line break outside of primary containment.

The staff has reviewed the licensee's proposed changes and determined that the protection provided by normally required Cold Shutdown applicable LCOs, in addition to the secondary containment requirements required to be met by the proposed LCO 3.17, "Vessel Hydrostatic Pressure and Leak Testing," will ensure acceptable consequences during normal hydrostatic test conditions and during postulated accident conditions. The staff, therefore, finds the proposed changes acceptable.

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 CONSIDERATION

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 and 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 (63 FR 9874). 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 this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: P. Ray
R. Laufer

Date: March 31, 1998