August 23, 1990

Docket No. 50-331

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Mr. Lee Liu
Chairman of the Board and
Chief Executive Officer
Iowa Electric Light and Power Company
Post Office Box 351
Cedar Rapids, Iowa 52406

Dear Mr. Liu:

SUBJECT: AMENDMENT NO. 167 TO FACILITY OPERATING LICENSE NO. DPR-49; REMOVAL OF CYCLE-SPECIFIC PARAMETERS (TAC NO. 75946)

The Commission has issued the enclosed Amendment No. 167 to Facility Operating License No. DPR-49 for the Duane Arnold Energy Center (DAEC). This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated January 5, 1990, as revised by letter dated June 19, 1990. Additional clarification regarding proposed TS 6.11.2.a.4 was provided by telephone on June 22, 1990.

The amendment revises the DAEC TSs in accordance with NRC Generic Letter 88-16, dated October 4, 1988. The proposed changes modify those TSs having cycle-specific parameter limits by replacing the values for those limits with a reference to a new document, the Core Operating Limits Report (COLR). The COLR will also be added to the Definitions and Administrative Controls sections of the DAEC TSs. These changes will allow revision of the values of certain parameters in accordance with NRC approved methodologies without the requirement to amend the facility operating license for each refueling.

In your letter of June 19, 1990, you revised the portions of your January 5, 1990 request related to the TS value of the Safety Limit Minimum Critical Power Ratio (MCPR). Changes to the Safety Limit MCPR as described in your June 19, 1990 submittal will be treated as a separate license amendment request.

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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

James R. Hall, Project Manager
Project Directorate III-3
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 167 to License No. DPR-49
2. Safety Evaluation

cc w/enclosures:
See next page

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Date:	7/26/90	7/30/90	7/31/90	8/13/90

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

IOWA ELECTRIC LIGHT AND POWER COMPANY
CENTRAL IOWA POWER COOPERATIVE
CORN BELT POWER COOPERATIVE

DOCKET NO. 50-331

DUANE ARNOLD ENERGY CENTER

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 167
License No. DPR-49

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

   A. The application for amendment by Iowa Electric Light and Power Company, et al., dated January 5, 1990, as revised June 19, 1990, 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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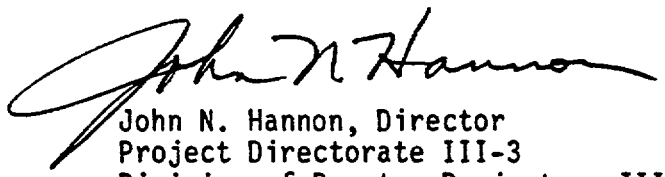
(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 167, 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



John N. Hannon, Director
Project Directorate III-3
Division of Reactor Projects - III, IV, V and Special Projects
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical Specifications

Date of Issuance: August 23, 1990

ATTACHMENT TO LICENSE AMENDMENT NO. 167

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 marginal lines.

Remove	Insert
vii	vii
viii	-
1.0-9	1.0-9
1.1-2	1.1-2
3.5-26	3.5-26
3.6-7a	3.6-7a
3.12-1	3.12-1
3.12-2	3.12-2
3.12-3	3.12-3
3.12-3a	-
3.12-4	3.12-4
3.12-5	3.12-5
3.12-5a	-
3.12-6	3.12-6
3.12-7	3.12-7
3.12-8	3.12-8
3.12-9	3.12-9
3.12-10	3.12-10
3.12-11	-
3.12-12	-
3.12-13	-
3.12-14	-
3.12-15	-
3.12-16	-
3.12-17	-
3.12-18	-
3.12-19	-
3.12-20	-
3.12-21	-
3.12-22	-
6.11-5	6.11-5

LIST OF FIGURES

34. VENTING

VENTING is the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration or other operating condition, in such a manner that replacement air or gas is not provided or required during the process. Vent, used in system names, does not imply a VENTING process.

35. PROCESS CONTROL PROGRAM (PCP)

The PROCESS CONTROL PROGRAM shall generally describe the essential process controls and checks used to assure that a process for solidifying radioactive waste from a liquid system produces a product that is acceptable for burial according to 10 CFR Part 61.56.

36. MEMBER(S) OF THE PUBLIC

Member(s) of the Public are persons who are not occupationally associated with Iowa Electric Light and Power Company and who do not normally frequent the DAEC site. The category does not include contractors, contractor employees, vendors, or persons who enter the site to make deliveries or to service equipment.

37. SITE BOUNDARY

The Site Boundary is that line beyond which the land is neither owned, nor leased, nor otherwise controlled by IELP. UFSAR Figure 1.2-1 identifies the DAEC Site Boundary. For the purpose of implementing radiological effluent technical specifications, the Unrestricted Area is that land (offsite) beyond the Site Boundary.

38. ANNUAL

Occurring every 12 months.

For the purpose of designating surveillance test frequencies, annual surveillance tests are to be conducted at least once per 12 months.

39. CORE OPERATING LIMITS REPORT

The Core Operating Limits Report is the DAEC-specific document that provides cycle-specific operating limits for the current operating reload cycle. These cycle-specific operating limits shall be determined for each reload cycle in accordance with TS 6.11.2. Plant operation within these limits is addressed in individual technical specifications.

SAFETY LIMIT	LIMITING SAFETY SYSTEM SETTING
C. Power Transient To ensure that the Safety Limits established in Specification 1.1.A and 1.1.B are not exceeded, each required scram shall be initiated by its primary source signal. A Safety Limit shall be assumed to be exceeded when scram is accomplished by a means other than the Primary Source Signal.	Where: S = Setting in percent of rated power (1,658 MWt) W = Recirculation loop flow in percent of rated flow. Rated recirculation loop flow is that recirculation loop flow which corresponds to 49×10^6 lb/hr core flow.
D. With irradiated fuel in the reactor vessel, the water level shall not be less than 12 in. above the top of the normal active fuel zone. Top of the active fuel zone is defined to be 344.5 inches above vessel zero (see Bases 3.2).	NOTE: This setting assumes operation within the basic thermal design criteria. These criteria are LHGR and MCPR within the limits specified in the CORE OPERATING LIMITS REPORT. If it is determined that either of these design criteria is being violated during operation, IMMEDIATE action must be taken to return to operation within these criteria.
	2. APRM High Flux Scram When in the REFUEL or STARTUP and HOT STANDBY MODE, the APRM scram shall be set at less than or equal to 15 percent of rated power.

3.5 REFERENCES

1. Jacobs, I.M., Guidelines for Determining Safe Test Intervals and Repair Times for Engineered Safeguards, General Electric Company, APED, April 1968 (APED 5736).

2. General Electric Company, The GESTR-LOCA and SAFER Models for the Evaluation of Loss-of-Coolant Accident, NEDC-23785-P, October 1984.

3. General Electric, Duane Arnold Energy Center SAFER/GESTR-LOCA Loss-of-Coolant Accident Analysis, NEDC-31310P.*

4. General Electric Company, Analysis of Reduced RHR Service Water Flow at the Duane Arnold Energy Center, NEDE-30051-P, January 1983.

5. General Electric Company, Duane Arnold Energy Center Suppression Pool Temperature Response, NEDC-22082-P, March 1982.

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* Analysis is cycle-specific; see the report for the current operating cycle/reload.

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
a. MAPLHGR multipliers as indicated in the CORE OPERATING LIMITS REPORT.	been previously established since the last core refueling. Baseline values shall be established during SLO and core thermal power less than or equal to the limit specified in Figure 3.3-1.
b. During SLO and core thermal power greater than the limit specified in Figure 3.3-1, core flow must be greater than or equal to 39% of rated, and	
(1) the Surveillance Requirements of 4.6.F.2.a have not been satisfied, immediately initiate action to reduce core thermal power to less than or equal to the limit specified in Figure 3.3-1 within 4 hours, or	b. Prior to SLO and core flow greater than 45% of rated, establish baseline core plate ΔP noise levels with core flow less than or equal to 45% of rated, provided that baseline values have not been previously established during SLO since the last core refueling.
(ii) the Surveillance Requirements of 4.6.F.2.a have been satisfied, continue to determine the APRM and LPRM neutron flux levels at least once per 8 hours and also within 30 minutes after the completion of a core thermal power increase of at least 5% of rated core thermal power while operating in this region of the power/flow map. If the APRM and/or LPRM* neutron flux noise levels are greater than three times their established baseline values, immediately initiate corrective action and restore the noise levels to within the required limits within 2 hours by	

*Detector levels A and C of one LPRM string per core octant plus detector levels A and C of one LPRM string in the center of the core shall be monitored.

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
3.12 CORE THERMAL LIMITS	4.12 CORE THERMAL LIMITS
Applicability The Limiting Conditions for Operation associated with the fuel rods apply to those parameters which monitor the fuel rod operating conditions.	Applicability The Surveillance Requirements apply to the parameters which monitor the fuel rod operating conditions.
Objective The Objective of the Limiting Conditions for Operation is to assure the performance of the fuel rods.	Objective The Objective of the Surveillance Requirements is to specify the type and frequency of surveillance to be applied to the fuel rods.
Specifications	Specifications
A. Maximum Average Planar Linear Heat Generation Rate (MAPLHGR)	A. Maximum Average Planar Linear Heat Generation Rate (MAPLHGR)
1. All MAPLHGRs shall be less than or equal to the limits specified in the CORE OPERATING LIMITS REPORT.	At least once per day during reactor power operation at ≥25% of rated power, verify all MAPLHGRs are less than or equal to required limits.

Amendment No. 120, 142, 167

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
2. If at any time during REACTOR POWER OPERATION (one or two loop) at ≥ 25% RATED POWER, it is determined by normal surveillance that the limiting value for MAPLHGR (LAPLHGR) is being exceeded, action shall then be initiated within 15 minutes to restore operation to within the prescribed limits. If the MAPLHGR (LAPLHGR) is not returned to within the prescribed limits within 2 hours, reduce reactor power to ≤ 25% of RATED POWER, or to such a power level that the limits are again being met, within the next 4 hours.	
3. If the reactor is being operated in SLO and cannot be returned to within prescribed limits within this 4 hour period, the reactor shall be brought to the COLD SHUTDOWN condition within 36 hours.	
4. For either the one or two loop operating condition surveillance and corresponding action shall continue until the prescribed action is met.	
B. Linear Heat Generation Rate (LHGR)	B. Linear Heat Generation Rate (LHGR)
1. All LHGRs shall be less than or equal to the limits specified in the CORE OPERATING LIMITS REPORT.	At least once per day during reactor power operation at ≥ 25% rated power, verify all LHGRs are less than or equal to the required limits.

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
2. If at any time during REACTOR POWER OPERATION at ≥ 25% RATED POWER it is determined by normal surveillance that the limiting value for LHGR is being exceeded, action shall then be initiated within 15 minutes to restore operation to within the prescribed limits. If the LHGR is not returned to within the prescribed limits within 2 hours, reduce reactor power to ≤25% of RATED POWER, or to such a power level that the limits are again being met, within the next 4 hours. Surveillance and corresponding action shall continue until the prescribed limits are again being met.	
C. Minimum Critical Power Ratio (MCPR)	C. Minimum Critical Power Ratio (MCPR)
1. MCPR shall be greater than or equal to the MCPR limit specified in the CORE OPERATING LIMITS REPORT.	1. Verify MCPR is greater than or equal to the required limit. a. At least once per day during REACTOR POWER OPERATION at ≥ 25% RATED POWER and b. Following any significant change in power level or distribution.

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
2. During SLO with core thermal power greater than or equal to 25% of rated, the Operating Limit MCPR is increased by adding 0.03 to the Operating Limit MCPR specified in the CORE OPERATING LIMITS REPORT.	
3. If at any time during REACTOR POWER OPERATION (one or two recirc. loop) at $\geq$ 25% RATED POWER, it is determined by normal surveillance that the limiting value for MCPR is being exceeded, action shall then be initiated within 15 minutes to restore operation to within the prescribed limits. If the operating MCPR is not returned to within the prescribed limits within two hours, reduce reactor power to $\leq$ 25% of RATED POWER, or to such a power level that the limits are again being met, within the next 4 hours.	
4. If the reactor is being operated in SLO, and cannot be returned to within prescribed limits within this 4 hour period, the reactor shall be brought to a COLD SHUTDOWN condition within 36 hours.	
5. For either the one or two recirc. loop operating condition surveillance and corresponding action shall continue until the prescribed action is met.	

3.12 BASES: CORE THERMAL LIMITS

A. Maximum Average Planar Linear Heat Generation Rate (MAPLHGR)

This specification assures that the peak cladding temperature (PCT) following the postulated design basis Loss-of-Coolant Accident (LOCA) will not exceed the limits specified in 10CFR50.46 and that the fuel design analysis limits specified in NEDE-24011-P-A (Reference 1) will not be exceeded.

Mechanical Design Analysis: NRC approved methods (specified in Reference 1) are used to demonstrate that all fuel rods in a lattice operating at the bounding power history, meet the fuel design limits specified in Reference 1. No single fuel rod follows, or is capable of following, this bounding power history. This bounding power history is used as the basis for the fuel design analysis MAPLHGR limit.

LOCA Analysis: A LOCA analysis is performed in accordance with 10CFR50 Appendix K to demonstrate that the permissible planar power (MAPLHGR) limits comply with the ECCS limits specified in 10CFR50.46. The analysis is performed for the most limiting break size, break location, and single failure combination for the plant (Reference 2).

The MAPLGHR limit given in the CORE OPERATING LIMITS REPORT is the most limiting composite of the fuel mechanical design analysis MAPLHGR and the LOCA analysis MAPLHGR limit.

The actual MAPLHGR values for the GE fuel design are lattice-type dependent and are explicitly modeled by the plant process computer. The lattice-type dependent values can be found in Reference 2. The CORE OPERATING LIMITS REPORT MAPLGHR limit is a nominal representation of the lattice-dependent values, (i.e., the most limiting lattice-type, other than the natural uranium bundle ends), which can be used to conservatively model the MAPLGHR limit if the process computer becomes unavailable. The flow-dependent correction factor applied to the MAPLHGR limits at rated conditions assures that (1) the 10CFR50.46 limit would not be exceeded during a LOCA initiated from less than rated core flow conditions and (2) the fuel thermal-mechanical design criteria would be met during abnormal operating transients initiated from less than rated core flow conditions (Reference 5).

The power-dependent correction factor applied to the MAPLGHR limits at rated conditions assures that the fuel thermal-mechanical design criteria would be met during abnormal operating transients initiated from less than rated power conditions (Reference 5).

For two recirculation loop operation, the calculational procedures used to establish the MAPLHGRs are documented in Reference 1. The reduction factors for SLO were derived in Reference 4.

B. Linear Heat Generation Rate (LHGR)

This specification assures that the linear heat generation rate in any rod is less than the design linear heat generation rate and that the fuel cladding 1% plastic diametral strain linear heat generation rate is not exceeded during any abnormal operating transient if fuel pellet densification is postulated. The LHGR as a function of core height shall be checked daily during reactor operation at $\geq$ 25% power to determine if fuel burnup, or control rod movement has caused changes in power distribution. For LHGR to be a limiting value below 25% rated thermal power, the Maximum Total Peaking Factor (MTPF) would have to be greater than 10 which is precluded by a considerable margin when employing any permissible control rod pattern. Values for LHGR are contained in the CORE OPERATING LIMITS REPORT.

C. Minimum Critical Power Ratio (MCPR)

1. Operating Limit MCPR

The required operating limit MCPRs at steady state operating conditions are derived from the established fuel cladding integrity Safety Limit MCPR value and an analysis of abnormal operational transients (Reference 1). For any abnormal operating transient, with the reactor initially at the steady state operating limit, it is required that the resulting MCPR does not decrease below the Safety Limit MCPR at any time during the transient. Instrument trip settings given in Specification 2.1 are adjusted in accordance with the transient analysis guidelines and used as inputs to this analysis.

To assure that the fuel cladding integrity Safety Limit is not exceeded during any anticipated abnormal operational transient, the most limiting transients have been analyzed to determine which result in the largest reduction in critical power ratio (CPR). The type of transients evaluated were loss of flow, increase in pressure and power, positive reactivity insertion, and coolant temperature decrease. The limiting transient, which determines the required steady state MCPR limit, is the transient which yields the largest ΔCPR. The minimum Operating Limit MCPR bounds the sum of the Safety Limit MCPR and the largest ΔCPR. Values for the Operating Limit MCPR are contained in the CORE OPERATING LIMITS REPORT.

The required MCPRs at rated power [MCPR(100)] are determined using the GEMINI transient analysis methods described in Reference 1. These limits were derived by using the GE 67B scram times, given in Section 3.3.C, which are based upon extensive operating plant data, as well as GE test data. The ODYN Option B scram insertion times were statistically derived from the 67B data to ensure that the resulting Operating Limit from the transient analysis would, with 95% probability at the 95% confidence level, result in the Safety Limit MCPR not being exceeded. The scram time parameter (τ), as calculated by the following formula, is a measure of the conformance of the actual plant control rod drive performance to that used in the ODYN Option-B licensing basis:

$$\tau = \frac{\tau_{ave} - \tau_b}{\tau_a - \tau_b}$$

where: τ_{ave} = average scram insertion time to Notch 38, as measured by surveillance testing

τ_b = scram insertion time to Notch 38 used in the ODYN Option-B Licensing Basis.

τ_a = 67B scram insertion time to Notch 38

As the average scram time measured by surveillance testing (τ_{ave}), exceeds the ODYN Option B scram time (τ_b), the MCPRs at rated power [MCPR(100)] must be adjusted.

2. MCPR Limits for Other Than Rated Power and/or Rated Flow Conditions

At less than 100% of rated power and/or flow the required Operating Limit MCPR is the larger value of the flow-dependent MCPR ($MCPR_F$) or the power-dependent multiplier (K_p) times the rated power MCPR [MCPR(100)] at the existing core power/flow state. The required Operating Limit MCPR is a function of flow in order to protect the fuel from inadvertent core flow increases such that the Safety Limit MCPR requirement can be assured.

The $MCPR_F$s were calculated such that, for the maximum core flow rate and core thermal power along a conservative load line, the limiting bundle's relative power was adjusted until the MCPR was slightly above the Safety Limit MCPR. Using this relative bundle power, the MCPRs were calculated at different points along this conservative load line corresponding to different core flows. The resulting $MCPR_F$s are given in the CORE OPERATING LIMITS REPORT.

For operation above 30% of rated thermal power, the core power-dependent MCPR operating limit is the rated power MCPR [MCPR(100)], multiplied by the factor K_p.

For operation below 30% of rated thermal power, where the direct scrams on turbine control valve fast closure and turbine stop valve closures are bypassed, absolute MCPR limits are established.

Values for K_p, $MCPR_F$ and MCPR (100) can be obtained from the CORE OPERATING LIMITS REPORT.

This limit protects the fuel from abnormal operating transients, including localized events, such as a rod withdrawal error, other than those resulting from inadvertent core flow increases, which are covered by the flow-dependent MCPR limits. This power-dependent MCPR limit was developed based upon bounding analyses for the most limiting transient at the given core power level. Further information on the MCPR operating limits for off-rated conditions is presented in Reference 5 and the CORE OPERATING LIMITS REPORT.

At thermal power levels less than or equal to 25% of rated thermal power, operating plant experience indicates that the resulting MCPR value is in excess of the requirements by considerable margin. Therefore, monitoring of MCPRs below this power level is unnecessary. The daily monitoring of MCPRs above 25% of rated thermal power is sufficient, since power distribution shifts are very slow, provided that no significant changes in core flow or control rod pattern have taken place.

During SLO, the Operating Limit MCPR must be increased by 0.03 to account for the increased uncertainty in the core flow and Transversing In-core Probe (TIP) readings used in the statistical analyses to derive the Safety Limit MCPR (see Reference 4).

4.12 BASES: CORE THERMAL LIMITS

C. Minimum Critical Power Ratio (MCPR) - Surveillance Requirement

At core thermal power levels less than or equal to 25%, the reactor will be operating at minimum recirculation pump speed and the moderator void content will be very small. For all designated control rod patterns which may be employed at this point, operating plant experience indicated that the resulting MCPR value is in excess of requirements by a considerable margin. With this low void content, any inadvertent core flow increase would only place operation in a more conservative state relative to MCPR. The daily requirement for calculating MCPR above 25% rated thermal power is sufficient since power distribution shifts are very slow when there have not been significant power or control rod changes.

3.12 REFERENCES

1. General Electric Standard Application for Reactor Fuel, NEDE-24011-P-A*.
2. Duane Arnold Energy Center SAFER/GESTR-LOCA Loss-of-Coolant Accident Analysis, NEDC-31310P.**
3. Supplemental Reload Licensing Submittal for Duane Arnold Atomic Energy Center, Unit 1.**
4. Duane Arnold Energy Center Single Loop Operation, NEDO-24272, July 1980.
5. Average Power Range Monitor, Rod Block Monitor and Technical Specification Improvement (ARTS) Program for the Duane Arnold Energy Center, NEDC-30813-P, December 1984.

*Approved revision number at time reload fuel analyses are performed.

**Analysis is cycle-dependent; see the report for the current operating cycle/reload.

g. (Continued)

(7) Results of participation in the Interlaboratory Comparison Program.

(8) Deviation from environmental sampling schedule.

(9) A report of all analyses in which the LLD, required by Table 3.16-2, was not achieved.

(10) A report of any changes in sample locations.

6.11.2 CORE OPERATING LIMITS REPORT

a. Core cycle-dependent limits shall be established prior to each reload cycle, or prior to any remaining part of a reload cycle, for the following:

1) Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) - Specification 3.12.A.

2) Linear Heat Generation Rate (LHGR) - Specification 3.12.B.

3) Minimum Critical Power Ratio (MCPR) - Specification 3.12.C.

4) $MAPFAC_F$ and $MAPFAC_P$ Factors which multiply the MAPLHGR limits - Specification 3.6.F.2.a.

These limits shall be documented in the CORE OPERATING LIMITS REPORT.

b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC in General Electric Standard Application for Reactor Fuel, NEDE-24011-P-A, (GESTAR II).*

c. The core operating limits shall be determined such that all applicable limits (e.g. fuel thermal-mechanical limits, core thermal hydraulic limits, ECCS limits, nuclear limits such as shutdown margin, and transient and accident analysis limits) of the safety analysis are met.

d. The CORE OPERATING LIMITS REPORT, including any mid-cycle revisions or supplements shall be provided upon issuance, for each reload cycle, to the NRC Document Control Desk with copies to the Regional Administrator and Resident Inspector.

* Approved revision number at time reload fuel analyses are performed.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO.167 TO FACILITY OPERATING LICENSE NO. DPR-49

IOWA ELECTRIC LIGHT AND POWER COMPANY
CENTRAL IOWA POWER COOPERATIVE
CORN BELT POWER COOPERATIVE

DUANE ARNOLD ENERGY CENTER

DOCKET NO. 50-331

1.0 INTRODUCTION

By letter dated January 5, 1990 (Ref. 1), as amended by letter dated June 19, 1990 (Ref. 2), Iowa Electric Light and Power Company (the licensee) proposed changes to the Technical Specifications (TS) for the Duane Arnold Energy Center (DAEC). The proposed changes would modify specifications having cycle-specific parameter limits by replacing the values of those limits with a reference to a Core Operating Limits Report (COLR) for the values of those limits. The proposed changes also include the addition of the COLR to the Definitions section and to the reporting requirements of the Administrative Controls section of TS. Guidance on the proposed changes was developed by NRC on the basis of the review of a lead-plant proposal submitted on the Oconee plant docket by Duke Power Company. This guidance was provided to all power reactor licensees and applicants by Generic Letter 88-16, dated October 4, 1988 (Ref. 3).

The licensee's June 19, 1990 submittal withdrew those portions of the January 5, 1990 request relating to the Safety Limit Minimum Critical Power Ratio (SLMCPR). The staff had previously indicated that the SLMCPR was outside the scope of those cycle-specific parameters addressed by Generic Letter 88-16. Consequently, proposed changes to the SLMCPR (TS 1.1.A) are being addressed as a separate action.

In further discussions between the staff and the licensee on June 22, 1990, it was agreed that an additional revision to the original request should be made. The additional change consists of a revision to proposed TS 6.11.2.a.4, to explicitly state that certain multiplying factors for MAPLHGR limits shall be documented in the COLR. This change is merely a clarification, as the licensee had included these factors in the sample COLR provided with its initial request and would also continue to include them in future revisions of the COLR.

Consequently, the licensee's June 19, 1990 withdrawal of portions of the original request and the added clarification agreed to by the licensee on June 22, 1990 did not significantly alter the proposed action or affect the conclusions in the staff's initial no significant hazards consideration determination published in the Federal Register on May 16, 1990.

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2.0 EVALUATION

The licensee's proposed changes to the TS are in accordance with the guidance provided by Generic Letter 88-16 and are addressed below.

(1) The Definition section of the TS was modified to include a definition of the Core Operating Limits Report that requires cycle/reload-specific parameter limits to be established on a unit-specific basis in accordance with an NRC-approved methodology that maintains the limits of the safety analysis. The definition notes that plant operation within these limits is addressed by individual specifications.

(2) The following specifications were revised to replace the values of cycle-specific parameter limits with a reference to the COLR that provides these limits.

(a) Specification 3.6.F.2.a

The $MAPFAC_F$ and $MAPFAC_P$ factors, which multiply the Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) limits, for this specification are specified in the COLR.

(b) Specification 3.12.A.1

The Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) limits for this specification are specified in the COLR.

(c) Specification 3.12.B.1

The Linear Heat Generation Rate (LHGR) limits for this specification are specified in the COLR.

(d) Specifications 3.12.C.1 and 3.12.C.2

The Minimum Critical Power Ratio (MCPR) limits and the MCPR power dependent multiplier (K_p) for this specification are specified in the COLR.

These changes to the specifications also required changes to the bases. Based on its review, the staff concludes that the changes to these bases are acceptable.

(3) Specification 6.11.2 was added to the reporting requirements of the Administrative Controls section of the TS. This specification requires that the COLR be submitted, upon issuance, to the NRC Document Control Desk with copies to the Regional Administrator and Resident Inspector. The report provides the values of cycle-specific parameter limits that are applicable for the current fuel cycle. Furthermore, this specification requires that the values of these limits be established using an NRC-approved methodology and be consistent with all applicable limits of the safety analysis. The approved methodology is the following:

NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel" (approved revision number at time reload analyses are performed.)

Finally, the specification requires that all changes in cycle-specific parameter limits be documented in the COLR before each reload cycle or remaining part of a reload cycle and, upon issuance, be submitted to NRC prior to operation with the new parameter limits.

On the basis of the review of the above items, the NRC staff concludes that the licensee provided an acceptable response to those items as addressed in the NRC guidance in Generic Letter 88-16 on modifying cycle-specific parameter limits in TS. Because plant operation continues to be limited in accordance with the values of cycle-specific parameter limits that are established using an NRC-approved methodology, the NRC staff concludes that this change is administrative in nature and there is no impact on plant safety as a consequence. Accordingly, the staff finds that the proposed changes are acceptable.

As part of the implementation of Generic Letter 88-16, the staff has also reviewed a sample COLR that was provided by the licensee. On the basis of this review, the staff concludes that the format and content of the sample COLR are acceptable.

The staff has reviewed the proposed change to Surveillance Requirement 4.12.c. to delete the requirement to determine MCPR every 12 hours during a Limiting Control Rod Pattern. The MCPR will still be required to be determined every 24 hours during power operation above 25% of rated power, consistent with the surveillance frequency for MAPLHGR (TS 4.12.A) and LHGR (TS 4.12.B), and following any significant change in power level or distribution. The Rod Block Monitor system will still be required to be operable during operation with a Limiting Control Rod Pattern (TS. 3.3.B.5). The staff concludes that these requirements will ensure timely determination of the MCPR and will restrict control rod withdrawal while operating with a Limiting Control Rod Pattern; therefore, the requested change is acceptable.

In addition to the changes discussed above, the licensee made a number of other changes to the TS that are administrative in nature. Technical Specification 2.1.A.1 is revised to refer to the LHGR and MCPR limits listed in the COLR. Reference 3 on page 3.5-26 is revised to indicate that the report is cycle-specific. TS Surveillance Requirements 4.12.A, B and C are reworded for clarification. The staff has reviewed these TS changes and concludes that they appropriately clarify the TSs and, therefore, they are acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or a change to 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 effluents 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). This amendment also involves changes in record-keeping, reporting or administrative procedures or requirements. Accordingly, with respect to these items, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR §51.22(c)(10). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

4.0 CONCLUSION

The staff has reviewed the request by the Iowa Electric Light and Power Company to modify the Technical Specifications of the Duane Arnold plant to remove the specific values of some cycle-dependent parameters from the specifications and place the values in a Core Operating Limits Report that would be referenced by the specifications. Based on this review, the staff concludes that these Technical Specifications modifications are acceptable because they are in accordance with Generic Letter 88-16.

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, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Dated: August 23, 1990

5.0 REFERENCES

1. Letter (NG-90-0002) from D. L. Mineck (IELP) to T. E. Murley (NRC), dated January 5, 1990.

2. Letter (NG-90-1293) from D. L. Mineck (IELP) to T. E. Murley (NRC), dated June 19, 1990.

3. Generic Letter 88-16, "Removal of Cycle-Specific Parameter Limits from Technical Specifications," dated October 4, 1988.