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ROTHERT,W.C. Iowa Electric Light & Power Co.
RECIP.NAME RECIPIENT AFFILIATION
MURLEY,T.E. Office of Nuclear Reactor Regulation, Director (Post 870411

SUBJECT: Application for amend to License DPR-49,supporting reload license for Cycle 10 operation of DAEC. SEE REPTS

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10 CFR 50.90

Iowa Electric Light and Power Company

August 19, 1988
NG-88-2298

Dr. Thomas E. Murley, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No: DPR-49
Technical Specification Change RTS-224
Reload License for Cycle 10
File: A-117, J-60a, A-225

Dear Dr. Murley:

We hereby request revision of the Technical Specifications (TS) for the Duane Arnold Energy Center in accordance with the Code of Federal Regulations, Title 10, Sections 50.59 and 50.90.

This proposed change (RTS-224) revises the current Technical Specification requirements in support of the reload license for the Cycle 10 operation of the DAEC.

We would appreciate timely review of these TS revisions since NRC approval is required prior to startup of Cycle 10 operation. We request, however, that the effective Date of Amendment be no earlier than the date of shutdown for the Cycle 9/10 refuel outage, currently scheduled for September 29, 1988, as this application involves changes which can only be made during a refuel outage. We will keep the staff advised as to any changes to this date.

A General Electric Proprietary report: Duane Arnold Energy Center SAFER/GESTR-LOCA Loss-of-Coolant Accident Analysis (NEDC-31310P, E & A No. 1, June, 1988), is enclosed in support of this application. This report contains information which the General Electric Company customarily maintains in confidence and withholds from public disclosure and as such, has been handled and classified as proprietary to General Electric. The confidential information has been identified in the report by vertical bars within the margins. As indicated in the attached affidavit, we hereby request that NEDC-31310-P be withheld from public disclosure in accordance with the provisions of 10 CFR 2.790(a)(4). A non-proprietary version of this report suitable for public disclosure has been provided.

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This application has been reviewed by the DAEC Operations Committee and DAEC Safety Committee. In accordance with the fee schedule for license amendments (10 CFR 170), a check for $150 is enclosed. The balance of the fee will be paid upon billing.

A copy of this submittal, which includes a no significant hazards analysis, is being forwarded to our appointed State Official pursuant to the requirements of 10 CFR 50.91.

This application is true and accurate to the best of my knowledge and belief.

IOWA ELECTRIC LIGHT AND POWER COMPANY

By William C. Rothert
William C. Rothert
Manager, Nuclear Division

Subscribed and sworn to before me on this 19th day of August, 1988.

NOTARIAL SEAL IOWA EILEEN M. BARBER 10-16-89

Eileen M. Barber
Notary Public in and for the State of Iowa

WCR/PMB/pjv+

Attachments:
1) Evaluation of Change Pursuant to 10 CFR 50.92
2) Proposed change RTS-224 including List of Affected Pages
3) Safety Analysis
4) 23A5906 "Supplemental Reload Licensing Submittal For Duane Arnold Energy Center, Unit 1, Reload 9, Cycle 10" June, 1988
5) NEDO-/NEDC-31310P, "Duane Arnold Energy Center SAFER/GESTR-LOCA Loss-of-Coolant Accident Analysis", E & A No. 1, June, 1988
6) General Electric Affidavit of Proprietary Information

cc: P. Bessette
L. Liu
L. Root
R. McGaughy
J. R. Hall (NRC-NRR)
A. Bert Davis (Region III)
J. Eure (State of Iowa)
NRC Resident Office
Commitment Control

EVALUATION OF CHANGE PURSUANT TO 10 CFR 50.92

Background:

In order to maintain fuel cycle economics and operational flexibility in Cycle 10, the Duane Arnold Energy Center (DAEC) will utilize General Electric's (GE) GE8B fuel design (BD303A and BD324B). The NRC has previously reviewed and approved the GE8B fuel design.

The NRC, through the GESTAR docket, is allowing licensees with the second successive reload cores of GE8X8EB fuel to upgrade their Safety Limit Minimum Critical Power Ratio (SLMCPR). The details of this change are found in GE's Amendment 14 to NEDE-24011-P-A, "General Electric's Standard Application for Reactor Fuel" (GESTAR-II). The NRC has generically approved this change (see SER to Amendment 14 to NEDE-24011-P-A).

Iowa Electric Light and Power Company, Docket No. 50-331,
Duane Arnold Energy Center, Linn County, Iowa

Date of Amendment Request:

August 19, 1988

Description of Amendment Request: The proposed License Amendment would revise the Duane Arnold Energy Center's Technical Specifications to support Cycle 10 operation. The proposed changes update the fuel thermal limits of Section 3.12 and upgrade the fuel cladding integrity Safety Limit of Section 1.1.A.

As new bundle types are added to the reactor core, the design basis Loss-Of-Coolant Accident (LOCA) must be reanalyzed and the Technical

Specifications updated to include the operating limits of these new bundle types. As part of the reload for Cycle 10, GE has reanalyzed the design basis event for the new bundle type (BD324B) being added to the core. These analyses are reported in the updated LOCA report NEDC-31310P. The Technical Specification revision will add the Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) operating limits for the new bundle type.

Also as part of the reload licensing process for Cycle 10, GE has reanalyzed the most limiting abnormal operational transients as specified in Table 15.0-1 in the updated DAEC Final Safety Analysis Report. This analysis was performed using GE's GEMINI transient analysis methodology. The results of this analysis are reported in the Supplement to the Reload License Submittal (23A5906, Supplemental Reload Licensing Submittal for Duane Arnold Energy Center, Unit 1, Reload 9, Cycle 10, June 1988.) The Technical Specification change will revise the Minimum Critical Power Ratio (MCPR) operating limits, based on this analysis, for all fuel types to be used in Cycle 10 operation.

The new fuel assemblies being added to the core are the advanced GE8B design. GE analysis has proven that the increased enrichments of this fuel allow a lower MCPR Safety Limit to be utilized than for previous fuel designs. The new MCPR limit is only for D-lattice plants with a second successive reload core of GE8X8B fuel with a high initial bundle R-factor ($\geq$1.04). Because the above-mentioned reload requirements are met, Section 1.1.A of the Technical Specifications will be changed to reflect this new Safety Limit.

In addition, various administrative changes are being made, such as revising figure numbers, updating the Table of Contents, and re-numbering pages.

Basis for proposed no significant hazards consideration determination: The Commission has provided standards (10 CFR 50.92(c)) for determining whether a significant hazards consideration exists. A proposed amendment to an operating license for a facility involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

In reviewing this proposed request for Technical Specification change, we have concluded:

1) The proposed change will not involve any significant increase in the probability or consequences of an accident previously evaluated because no changes are being made to the facility or its equipment other than the introduction of the higher enrichment GE8XEB fuel. This fuel type is essentially the same as the fuel currently in place and has been found acceptable for use per NEDE-24011-P-A (GESTAR II). Details of the new fuel type are included in NEDC-31310P E & A No. 1.

   GE analysis of the LOCA for the new fuel was performed using the approved SAFER/GESTR models. This analysis provided the MAPLHGR operating limits which assure that the requirements of 10 CFR 50.46 are met during plant

operation so there is no significant increase in the probability or consequences of an accident previously evaluated.

The GEMINI transient modeling methodology was used to re-evaluate the most limiting operational transients for all bundle types used in Cycle 10. The new MCPR operating limits resulting from this analysis will assure the plant is operated within acceptable fuel cladding integrity safety limits. Therefore, there is no increase in the probability or consequences of an accident previously evaluated.

Changes in fuel design and modeling methods have enabled GE to upgrade the Minimum Critical Power Ratio Safety Limit to 1.04 while maintaining all fuel performance criteria specified in the DAEC Final Safety Analysis Report. The NRC has generically approved this upgrade (NRC SER to Amendment 14 to NEDE-24011-P-A). Therefore it will not involve a significant increase in the probability or consequences of an accident previously evaluated.

The administrative changes will not involve significant increases in the probability or consequences of an accident previously evaluated.

2) The proposed change will not create the possibility of a new or different kind of accident from any accident previously evaluated because the facility is not being changed except for the introduction of the higher enrichment fuel. Since this fuel is essentially the same as the fuel currently in place and has been found acceptable for use per NEDE-24011-P-A (GESTAR II), there is no possibility that its use will create a new or different kind of accident.

The MAPLHGR curve for this new fuel and revised MCPR operating limit are specified to assure the plant does not exceed applicable safety limits and thus, do not, in and by themselves, create the possibility of a new or different accident from previously evaluated.

Upgrading the MCPR Safety Limit will not create the possibility of a new or different kind of accident from previously evaluated because the new Safety Limit value satisfies all fuel performance criteria specified in the updated DAEC Final Safety Analysis Report. This change has been generically approved for use by the NRC's SER to Amendment 14 to GESTAR II.

The administrative changes will not create the possibility of a new or different kind of accident than previously evaluated.

3) The proposed change will not involve a significant reduction in the margin of safety because the higher enrichment fuel is designed to meet all standards of safety as the fuel previously described in GESTAR II.

The addition of the new fuel's MAPLHGR operating limit will assure the acceptance criteria of 10 CFR 50.46 will be met. Therefore, this change will not involve a reduction in the margin of safety since the margin of safety is defined by the acceptance criteria of 10 CFR 50.46.

Alteration of the MCPR operating limit curve is based on maintaining the margin of safety as specified in the FSAR during the most limiting operation transients. Therefore, this change assures the plant is operated within acceptable fuel cladding safety limits and thus, does not involve a significant reduction in the margin of safety.

The upgrade of the MCPR Safety limit to 1.04 meets all fuel performance criteria specified in the DAEC FSAR. Therefore, this change will not significantly reduce the margin of safety.

The administrative changes will not involve a significant reduction in the margin of safety.

This proposed amendment, having been evaluated against the requirements of 10 CFR 50.92, is determined to involve a no significant hazards consideration.

Local Public Document Room Location: Cedar Rapids Public Library, 500 First Street SE, Cedar Rapids, Iowa 52401

Attorney for Licensee: Jack Newman, Kathleen H. Shea, Newman and Holtzinger, 1615 L Street NW, Washington, DC 20036

PROPOSED CHANGE RTS-224 TO THE DUANE ARNOLD ENERGY CENTER TECHNICAL SPECIFICATIONS

The holders of license DPR-49 for the Duane Arnold Energy Center propose to amend Appendix A (Technical Specifications) to said license by deleting current pages and replacing them with the attached, new pages. The List of Affected Pages is given below.

As a new bundle type is added to the reactor core, the design basis Loss-of-Coolant Accident (LOCA) must be re-analyzed and the Technical Specifications updated to include the operating limits for this new bundle type. As part of the reload for Cycle 10, GE has re-analyzed the design basis event for the new bundle type (BD324B) being added to the core using the SAFER/GESTR LOCA analysis methodology. These analyses are reported in the updated LOCA report NEDC-31310P, E & A No. 1. This change to the Technical Specifications is to add the Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) operating limits for the new bundle type.

Also as part of the reload licensing process for Cycle 10, GE has reanalyzed the most limiting abnormal operational transients as specified in Table 15.0-1 in the updated Final Safety Analysis Report. This analysis was performed using GE's GEMINI transient analysis methodology. The results of this analysis are reported in the supplement to the Reload License Submittal (23A5906, Supplemental Reload Licensing Submittal for Duane Arnold Energy Center, Unit 1, Reload 9, Cycle 10, June 1988.) This change to the Technical Specifications is to revise the Minimum Critical Power Ratio (MCPR) operating limits, based on this analysis, for all fuel types to be used in Cycle 10 operation.

The new fuel assemblies being added to the core are the advanced GE8B design. GE analysis has proven the increased enrichment of this fuel allows a lower MCPR Safety Limit to be utilized than for previous fuel designs. The new MCPR limit is only for D-lattice plants with a second successive reload core of GE8X8B fuel with high initial bundle R-factor. Because these requirements are met, Section 1.1.A of the Technical Specifications will be changed to reflect this new Safety Limit.

The changes being made are as follows:

1) Revise the List of Figures (page vii) to delete the MAPLHGR curve, Figure 3.12-9, for the fuel being removed (type P8DRB284H) and add the MAPLHGR curve for the new fuel (type BD324B) as new Figure 3.12-9.

2) Revise Section 1.1.A to reflect the upgrade of two recirculation loop MCPR from 1.07 to 1.04 and single loop MCPR from 1.10 to 1.07.

3) Revise the references listed in Section 3.5 to reflect an updated LOCA analysis report.

4) Revise Section 3.12 (Core Thermal Limits) as follows:

   a) Revise the references listed in Section 3.12 to reflect an updated LOCA analysis report.

   b) Revise Figure 3.12-3 to reflect new MCPR (100) limits for all fuel types during Cycle 10 operation and list the correct Reference number.

c) Delete Figure 3.12-9 (MAPLHGR vs. Fuel Exposure for fuel type P8DRB284H) and replace it with new figure 3.12-9 (MAPLHGR vs. Fuel Exposure for new fuel type BD324B).

List of Affected Pages

vii

1.1-1

3.5-26

3.12-10

3.12-13

3.12-19

Safety Analysis
for RTS-224
Reload License for Cycle 10

1. INTRODUCTION

By a letter dated August 19, 1988, the Iowa Electric Light and Power Company submitted an application to amend the Duane Arnold Energy Center (DAEC) Technical Specifications (TSs). The changes were proposed to support the DAEC reload and operation for Cycle 10 and to incorporate administrative changes reflecting revision to figure numbers and references.

The licensee proposes to change the TSs by updating the fuel thermal limits of TS Section 3.12 and upgrading the Safety Limit Minimum Critical Power Ratio (SLMCPR) in Section 1.1.A.

2. EVALUATION

Fuel Mechanical Design

For Cycle 10, 120 irradiated fuel assemblies will be removed from the reactor core and replaced by General Electric standard 8X8EB fuel. This fuel is essentially the same as the fuel currently in place and was approved for use by NEDE-24011-P-A, "General Electric's Standard Application for Rector Fuel", GESTAR II.

Nuclear Design

The nuclear design and analysis of the Cycle 10 reload was performed with methods and techniques which are described in GESTAR II. The results of the analysis are given in 23A5906, "Supplemental Reload Licensing Submittal for Duane Arnold Atomic Energy Center, Unit 1 Reload 9, Cycle 10" and NEDO-/NEDC-31310P, "Duane Arnold Energy Center SAFER/GESTR Loss-of-Coolant Accident Analysis" E & A No. 1, June, 1988. The results of the Duane Arnold analyses are within the range of those reload cores previously reviewed and found to be acceptable by the NRC staff. We therefore conclude that the nuclear design and analysis of the Cycle 10 reload is acceptable.

Thermal-Hydraulic Design

The methods and procedures employed in the thermal-hydraulic design and analysis of the Cycle 10 core are described in GESTAR II. The value of 1.04 for the SLMCPR, previously reviewed and approved by the NRC staff in the SER for Amendment 14 to GESTAR II, is used for Cycle 10. This upgraded SLMCPR is generically approved for D-lattice plants on their second successive reload core of GE8X8EB fuel type with a high bundle R-factor ($\geq$1.04). As the DAEC's Cycle 10 reload consists of their second successive use of the GE8X8EB fuel with bundle R-factors all meeting the 1.04 criteria, the upgraded SLMCPR is applicable to DAEC's Cycle 10 operation. Therefore, the methods and

procedures used to obtain the operating limit MCPR as described in GESTAR II, are acceptable.

Loss-of-Coolant Accident Analysis

The LOCA analyses were performed using the SAFER/GESTR code and their applicable methodology. The accident analyses have been performed using approved methods and the results meet the NRC's acceptance criteria of 10 CFR 50.46, therefore, these analyses are acceptable.

MCPR and MAPLHGR Limits

A Safety Limit MCPR has been imposed to assure that 99.9 percent of the fuel rods in the core will not experience boiling transition during normal operation and anticipated operational transients. As stated previously, the revised Safety Limit of 1.04 was used for Cycle 10.

To assure that the fuel cladding integrity Safety Limit MCPR will not be violated during any anticipated transient, the most limiting events were reanalyzed for this reload to determine which events result in the largest reduction in critical power ratio (CPR). The operation limit MCPR was then established by adding the largest reduction factor in the CPR to the Safety Limit MCPR. Since acceptable methods have been used, we find the MCPR TS changes to be acceptable.

The MAPLHGR limits specified in the proposed TS changes are less than or equal to the bounding MAPLHGR used in the SAFER/GESTR-LOCA analysis and are, therefore, acceptable.

RTS-224
NG-88-2298

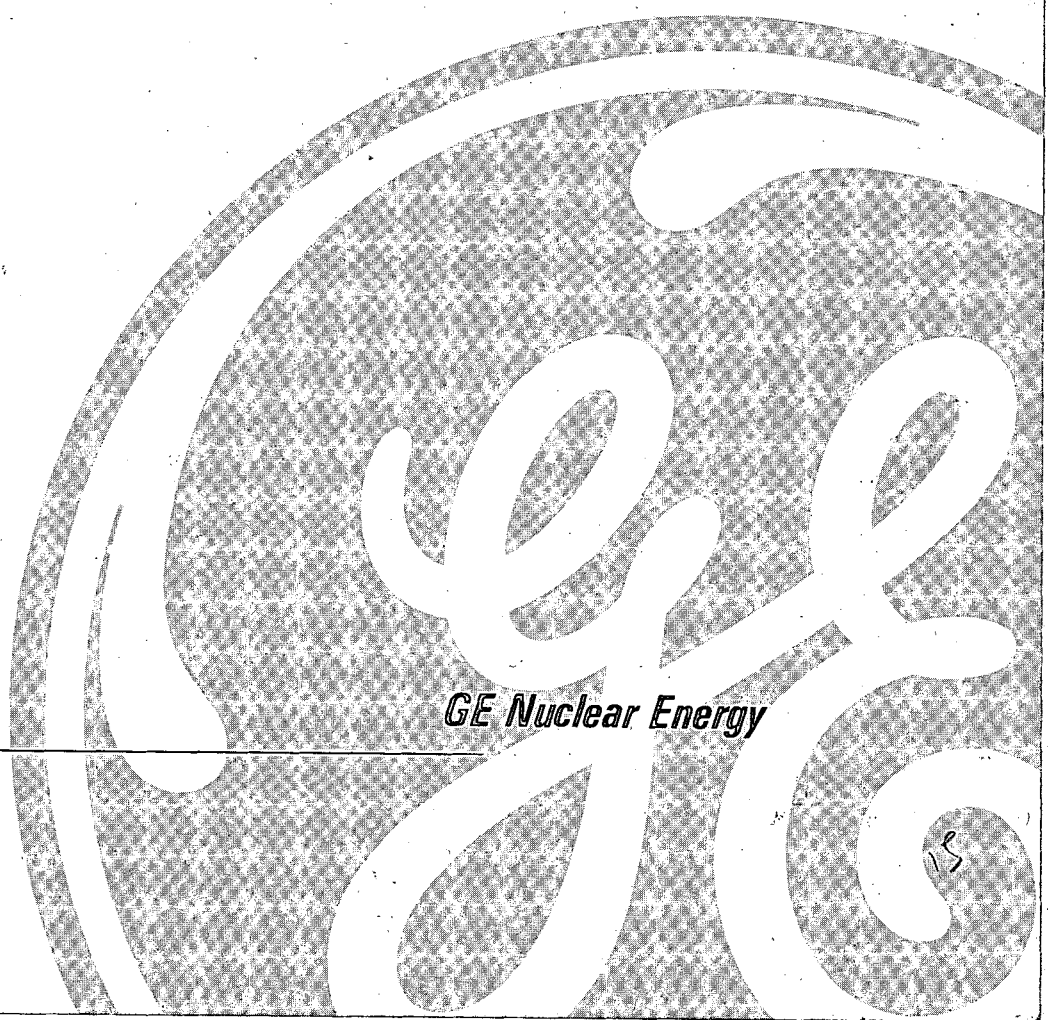
ATTACHMENT 4
SUPPLEMENTAL RELOAD LICENSE SUBMITTAL

RTS-224
NG-88-2298

ATTACHMENT 5
LOCA ANALYSIS E & A NO. 1 JUNE 88

RTS-224
NG-88-2298

ATTACHMENT 6
GE Affidavit of Proprietary Info.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NRC Form 190
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GENERAL ELECTRIC COMPANY

AFFIDAVIT

I, Janice Charnley, being duly sworn, depose and state as follows:

1. I am Manager, Fuel Licensing, General Electric Company, and have been delegated the function of reviewing the information described in paragraph 2 which is sought to be withheld and have been authorized to apply for its withholding.

2. The information sought to be withheld is contained in "Duane Arnold Energy Center SAFER/GESTR-LOCA Loss-of-Coolant Accident Analysis," NEDC-31310P, August 1986.

3. In designating material as proprietary, General Electric utilizes the definition of proprietary information and trade secrets set forth in the American Law Institute's Restatement of Torts, Section 757. This definition provides:

> "A trade secret may consist of any formula, pattern, device or compilation of information which is used in one's business and which gives him an opportunity to obtain an advantage over competitors who do not know or use it.... A substantial element of secrecy must exist, so that, except by the use of improper means, there would be difficulty in acquiring information.... Some factors to be considered in determining whether given information is one's trade secret are: (1) the extent to which the information is known outside of his business; (2) the extent to which it is known by employees and others involved in his business; (3) the extent of measures taken by him to guard the secrecy of the information; (4) the value of the information to him and to his competitors; (5) the amount of effort or money expanded by him in developing the information; (6) the ease or difficulty with the which the information could be properly acquired or duplicated by others."

4. Some examples of categories of information which fit into the definition of proprietary information are:

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8. The information to the best of my knowledge and belief has consistently been held in confidence by the General Electric Company, no public disclosure has been made, and it is not available in public sources. All disclosures to third parties have been made pursuant to regulatory provisions of proprietary agreements which provide for maintenance of the information in confidence.

9. Public disclosure of the information sought to be withheld is likely to cause substantial harm to the competitive position of the General Electric Company and deprive or reduce the availability of profit making opportunities because it would provide other parties, including competitors, with valuable information

STATE OF CALIFORNIA)
COUNTY OF SANTA CLARA) ss:

Janice Charnley, being duly sworn, deposes and says:

That she has read the foregoing affidavit and the matters stated therein are true and correct to the best of her knowledge, information, and belief.

Executed at San Jose, California, this 16 day of August, 1988.

Janice Charnley
General Electric Company

Subscribed and sworn before me this 16th day of August 1988.

Paula F. Hussey
NOTARY PUBLIC, STATE OF CALIFORNIA

OFFICIAL SEAL
PAULA F HUSSEY
NOTARY PUBLIC - CALIFORNIA
SANTA CLARA COUNTY
My comm. expires JAN 13, 1989

GE Nuclear Energy
175 Curtner Avenue
San Jose, CA 95125