July 19, 2001
NG-01-0894

Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station 0-P1-17
Washington, DC 20555-0001

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No: DPR-49
Response to Request for Additional Information (RAI) to Technical Specification Change Request TSCR-042 – Extended Power Uprate (TAC # MB0543)

References:
1. B. Mozafari (USNRC) to G. Van Middlesworth (NMC), "Duane Arnold Energy Center – Request for Additional Information on the Proposed Extended Power Uprate Program (TAC No. MB0543)," dated June 4, 2001.
2. NG-00-1900, "Technical Specification Change Request (TSCR-042): 'Extended Power Uprate'," dated November 16, 2000.

File: A-117, SPF-189

Dear Sir(s):

By Reference 1, we received the Staff's Request for Additional Information (RAI) on our proposed license amendment request (Reference 2). Subsequently, we have held several conference calls with the Staff and General Electric (GE) regarding this RAI. Attachment 1 to this letter contains the information agreed to in those conference calls as resolving this issue for the Duane Arnold Energy Center (DAEC). GE will continue to pursue the generic resolution of this issue directly with the Staff under the Amendment 22 process of their fuel licensing topical report GESTAR-II (NEDE-24011-P-A).

Please note that the response in Attachment 1 contains information that the General Electric Company considers to be proprietary in nature and subsequently, pursuant to 10 CFR 9.17(a)(4), 2.790(a)(4) and 2.790(d)(1), requests that such information be withheld from public disclosure. The portion of the text containing the proprietary information is identified with either vertical sidebars in the right margin or is individually underlined. An affidavit supporting this request is provided as Attachment 2 to this letter. Attachment 3 is the redacted version of Attachment 1, with the GE proprietary material removed, suitable for public disclosure.

No new commitments are being made in this letter.

Please contact this office should you require additional information regarding this matter.

A P01

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

NUCLEAR MANAGEMENT COMPANY, LLC

By Gary Van Middlesworth
Gary Van Middlesworth
DAEC Site Vice-President

State of Iowa
(County) of Linn

Signed and sworn to before me on this 19th day of July, 2001,

by Gary Van Middlesworth.

Nancy S. Franck
Notary Public in and for the State of Iowa

NANCY S. FRANCK
Commission Number 011041
MY COMMISSION EXPIRES
4-28-01

Commission Expires

Attachments:
1) DAEC Response to NRC Reactor Systems Branch Request for Additional Information Regarding Proposed Amendment for Power Uprate
2) General Electric Affidavit of Proprietary Information
3) Redacted Version of DAEC Response to NRC Reactor Systems Branch Request for Additional Information Regarding Proposed Amendment for Power Uprate

cc: T. Browning
R. Anderson (NMC) (w/o Attachments 1&2)
B. Mozafari (NRC-NRR)
J. Dyer (Region III)
D. McGhee (State of Iowa) (w/o Attachments 1&2)
NRC Resident Office
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Attachment 2 to

NG-01-0894

General Electric Affidavit of Proprietary Information

General Electric Company

AFFIDAVIT

I, George B. Stramback, being duly sworn, depose and state as follows:

(1) I am Project Manager, Regulatory Services, General Electric Company ("GE") 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 Enclosure 1 to letter GEDA–AEP-559, *Response to NRC Reactor Systems Branch RAIs*, (GE Company Proprietary), dated July 13, 2001. The proprietary information is delineated by bars marked in the margin adjacent to the specific material in the *Enclosure 1 to Letter GEDA-AEP-559 GE Responses to NRC Reactor Systems Branch RAIs.*

(3) In making this application for withholding of proprietary information of which it is the owner, GE relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), 2.790(a)(4), and 2.790(d)(1) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information", and some portions also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).

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

a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by General Electric's competitors without license from General Electric constitutes a competitive economic advantage over other companies;

b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

c. Information which reveals cost or price information, production capacities, budget levels, or commercial strategies of General Electric, its customers, or its suppliers;

d. Information which reveals aspects of past, present, or future General Electric customer-funded development plans and programs, of potential commercial value to General Electric;

e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in both paragraphs (4)a. and (4)b., above.

(5) The information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GE, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GE, no public disclosure has been made, and it is not available in public sources. All disclosures to third parties including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.

(6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within GE is limited on a "need to know" basis.

(7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GE are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

(8) The information identified in paragraph (2), above, is classified as proprietary because it contains further details regarding the GE proprietary report NEDC-32980P, *Safety Analysis Report for Duane Arnold Energy Center Extended Power Uprate,* Class III (GE Proprietary Information), dated November 2000, which contains detailed results of analytical models, methods and processes, including computer codes, which GE has developed, obtained NRC approval of, and applied to

perform evaluations of transient and accident events in the GE Boiling Water Reactor ("BWR").

The development and approval of these system, component, and thermal hydraulic models and computer codes was achieved at a significant cost to GE, on the order of several million dollars.

The development of the evaluation process along with the interpretation and application of the analytical results is derived from the extensive experience database that constitutes a major GE asset.

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GE's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GE's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

The research, development, engineering, analytical and NRC review costs comprise a substantial investment of time and money by GE.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GE's competitive advantage will be lost if its competitors are able to use the results of the GE experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GE would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GE of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing these very valuable analytical tools.

STATE OF CALIFORNIA)
) ss:
COUNTY OF SANTA CLARA)

George B. Stramback, being duly sworn, deposes and says:

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

Executed at San Jose, California, this 13th day of July 2001.

George B. Stramback
George B. Stramback
General Electric Company

Subscribed and sworn before me this 13TH day of JULY 2001.

Anna Hanlin
Notary Public, State of California

Redacted Version of
DAEC Response to NRC
Reactor Systems Branch
Request for Additional Information
Regarding Proposed Amendment for Power Uprate

During the week of March 26, 2001, four members of the NRC staff visited the General Electric (GE) Facility, Global Nuclear Fuel (GNF), at Wilmington, North Carolina, to audit material pertinent to the licensee's power uprate for the Duane Arnold Energy Center (DAEC). Material reviewed included the data base used for the development of the GEXL14 Correlation for the GE14 fuel, analyses of the Anticipated Transient Without Scram (ATWS) event, and loss of coolant (LOCA) related analyses. The audit identified several open issues which are listed below in the form of a request for additional information (RAI).

1) The COBRAG computer code was the critical power ratio (CPR) methodology used to predict critical power behavior throughout the core. The NRC staff has not reviewed this code. The licensee for DAEC has indicated that COBRAG uses first principle models to predict boiling transition and the details of the flow field. Justify the adequacy of the COBRAG code in predicting, from "first principles", boiling transition phenomena in the upper portion of GE12 and GE14 fuels.

DAEC Response:

This response applies to plants with GE12 and GE14 fuel.

Global Nuclear Fuel (GNF) will remove the COBRAG-generated data from the correlation uncertainty calculations. The capability of the GEXL correlations for GE12 and GE14 fuel to predict the axial power shape effect, specifically the correlation uncertainty, will be re-evaluated based solely on the full scale ATLAS test data consistent with the approved Amendment 22 process. The following specific actions will be taken.

[[General Electric Proprietary Information Redacted]]

With the removal of the COBRAG-generated data from the basis for the current GEXL correlations for GE12 and GE14 fuel designs, justification of the adequacy of the COBRAG code is unnecessary.

2) Describe the testing of the new GE14 fuel that was conducted to test the respective CPR correlations. Identify any additional data, available or planned, to substantiate and validate the correlations. Provide upskew or downskew data that has been collected to validate the GEXL10 or the GEXL14 correlations for use at DAEC.

DAEC Response:

This response applies to plants with GE12 and GE14 fuel.

[[General Electric Proprietary Information Redacted]]

The ATLAS testing covers the following parameter ranges:

Table 2.1 ATLAS test range

[[General Electric Proprietary Information Redacted]]

3) Following an NRC Team Audit of GE11 fuel design compliance with Amendment 22 of NEDE-20411-PA, in 1992, GE was encouraged to develop a procedure for implementing Amendment 22 criteria for new correlation development as defined in GESTARII. This procedure is documented in TDP-0117, Rev. 2, page 8. Explain how the procedure was applied in the development of the GEXL14 correlation for use at DAEC, especially with regard to items 3 and 4, given the absence of raw data for upskew and downskew power profiles. Provide technical justification if the criteria of the Amendment 22 process criteria were not met.

DAEC Response:

This response applies to plants with GE12 and GE14 fuel.

TDP-0117, Rev. 2, Sections 5.3 and 5.4 describes the test matrix for the ATLAS testing for the development of the GEXL correlation. This process was used, as described in "GEXL14 Correlation for GE14 Fuel", NEDC-32851, Revision 1, September 1999. NEDC-32851, Rev. 1 also provides the process that was used to develop the uncertainties for GEXL14, using the COBRAG code to simulate the upskew and downskew power shape effects.

As discussed in our Response to Question 1 above, the GEXL correlation will be re-evaluated based on test data alone. This includes data characterizing the trend with axial power shape (See RAI 2). With this action, the GEXL correlations for GE12 and GE14 10X10 fuel will be in full compliance with Amendment 22 to GESTAR II. GE considers that application of the approved Amendment 22 process will document the safety of the GE12 and GE14 fuel designs. During phone calls regarding this matter, NRC staff also stated there were no safety issues with the plants operating with GE 12 and GE 14 fuel designs.

GNF has opened a Corrective Action Request (CAR) to track the corrective actions described above. In addition, GNF has also opened a Potentially Reportable Condition (PRC) to evaluate the impact of this issue on those operating plants that currently utilize GE12 and GE14 fuel designs. The result of the re-evaluation will be documented by GNF

per their corrective action program and communicated to the affected licensees and the NRC staff, as required.

4) The LOCA analysis of off-rated conditions (specifically, single loop operation) assumes that the statistical adders developed for SAFER code at rated conditions will apply. Provide justification for the use of these adders for the single loop operation at DAEC.

DAEC Response:
The MAPLHGR multiplier for single loop operation (SLO) is set at a value that keeps the nominal SLO PCT below the nominal two-loop PCT for the DBA. The upper bound PCT is then calculated for the limiting two-loop DBA case. This process assumes that the two-loop upper bound PCT would bound an explicit SLO upper bound PCT calculation. Inherent in this process is the assumption that the upper bound adder terms used in the two-loop calculation are bounding for SLO conditions.

Background

The SLO PCT is first peak limited; the two-loop PCT is second peak limited. There is less uncertainty in the first peak PCT calculation than the second peak PCT calculation. **[[General Electric Proprietary Information Redacted]]** These uncertainties are reflected in the upper bound adder terms used for the first and second peak upper bound PCT calculations. **[[General Electric Proprietary Information Redacted]]** Therefore, the assumption that the upper bound adder terms used in the two-loop calculation are bounding for SLO is valid.

[[General Electric Proprietary Information Redacted]]

Justification for Upper Bound Adders

[[General Electric Proprietary Information Redacted]]

Summary and Conclusion

The SLO PCT is first peak limited; the two-loop PCT is second peak limited. There is less uncertainty in the first peak PCT calculation than the second peak PCT calculation. **[[General Electric Proprietary Information Redacted]]** These uncertainties are reflected in the upper bound adder terms used for the first and second peak upper bound PCT calculations. **[[General Electric Proprietary Information Redacted]]** Because the early boiling transition occurs throughout the bundle for SLO conditions, this reduces the uncertainty associated with the first peak PCT calculation for SLO. Therefore, the assumption that the upper bound adder terms used in the two-loop calculation are bounding for SLO is valid and the two-loop upper bound PCT is bounding for SLO conditions.

Reference

NEDE-23785-1-PA Rev. 1, "The GESTR-LOCA and SAFER Models for the Evaluation of the Loss-of-Coolant Accident, Volume III, SAFER/GESTR Application Methodology," October 1984.