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RS-01-158

August 9, 2001

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Dresden Nuclear Power Station, Units 2 and 3  
Facility Operating License Nos. DPR-19 and DPR-25  
NRC Docket Nos. 50-237 and 50-249

Quad Cities Nuclear Power Station, Units 1 and 2  
Facility Operating License Nos. DPR-29 and DPR-30  
NRC Docket Nos. 50-254 and 50-265

Subject: Additional Reactor Systems Information Supporting the License  
Amendment Request to Permit Uprated Power Operation at Dresden  
Nuclear Power Station and Quad Cities Nuclear Power Station

- References
- (1) Letter from R. M. Krich (Commonwealth Edison Company) to U. S. NRC, "Request for License Amendment for Power Uprate Operation," dated December 27, 2000
  - (2) Letter from U. S. NRC to O. D. Kingsley (Exelon Generation Company), DNPS and QCNPS – Extended Power Uprate and GE14 Fuel Amendment Requests - Request for Additional Information," dated July 20, 2001

In Reference 1, Commonwealth Edison (ComEd) Company, now Exelon Generation Company (EGC), LLC, submitted a request for changes to the operating licenses and Technical Specifications (TS) for Dresden Nuclear Power Station (DNPS), Units 2 and 3, and Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2, to allow operation with an extended power uprate (EPU). In Reference 2, the NRC requested additional information regarding these proposed changes. Attachment A to this letter provides the requested information.

Some of the information in Attachment A is proprietary information to the General Electric Company, and EGC requests that it be withheld from public disclosure in accordance with 10 CFR 2.790(a)(4), "Public Inspections, Exemptions, Requests for Withholding." This information is indicated with sidebars. Attachment B provides the affidavit supporting the request for withholding the proprietary information in Attachment A from public disclosure, as required by 10 CFR 2.790(b)(1). Attachment C contains a non-proprietary version of Attachment A.

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Should you have any questions related to this letter, please contact Mr. Allan R. Haeger at (630) 657-2807.

Respectfully,

  
for K. A. Ainger  
Director – Licensing  
Mid-West Regional Operating Group

Attachments:

Affidavit

Attachment A: Additional Reactor Systems Information Supporting the License Amendment Request to Permit Up-rated Power Operation at Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2 (Proprietary)

Attachment B: Affidavit for Withholding Portions of Attachment A from Public Disclosure

Attachment C: Additional Reactor Systems Information Supporting the License Amendment Request to Permit Up-rated Power Operation at Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2 (Non-Proprietary)

cc: Regional Administrator – NRC Region III  
NRC Senior Resident Inspector – Dresden Nuclear Power Station  
NRC Senior Resident Inspector – Quad Cities Nuclear Power Station  
Office of Nuclear Facility Safety – Illinois Department of Nuclear Safety

**Attachment B**  
**Additional Reactor Systems Information Supporting the License Amendment**  
**Request to Permit Upgraded Power Operation**  
**Dresden Nuclear Power Station, Units 2 and 3**  
**Quad Cities Nuclear Power Station, Units 1 and 2**

**Affidavit for Withholding Portions of Attachment A from Public Disclosure**

STATE OF ILLINOIS	)	
COUNTY OF DUPAGE	)	
IN THE MATTER OF	)	
EXELON GENERATION COMPANY, LLC	)	Docket Numbers
DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3	)	50-237 AND 50-249
QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2	)	50-254 AND 50-265

**SUBJECT:** Additional Reactor Systems Information Supporting the License Amendment Request to Permit Up-rated Power Operation at Dresden Nuclear Power Station and Quad Cities Nuclear Power Station

**AFFIDAVIT**

I affirm that the content of this transmittal is true and correct to the best of my knowledge, information and belief.

*T. W. Simpkin*  
 T. W. Simpkin  
 Manager – Licensing

Subscribed and sworn to before me, a Notary Public in and

for the State above named, this 9<sup>th</sup> day of

August, 2001.

*Jacqueline T. Evans*  
 Notary Public



# 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 Attachment 1 to letter GE-DQC-EPU-01-465, *Reactor Systems RAIs*, (GE Company Proprietary), dated August 1, 2001. The proprietary information is delineated by bars marked in the margin adjacent to the specific material in the Attachment 1 to Letter GE-DQC-EPU-01-465, *GE Response 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-32961P, *Safety Analysis Report for Quad Cities 1 & 2 Extended Power Uprate*, Class III (GE Proprietary Information), dated December 2000, and NEDC-32962P, *Safety Analysis Report for Dresden 2 & 3 Extended Power Uprate*, Class III (GE Proprietary Information), dated December 2000, which contain 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.

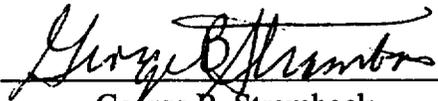
STATE OF CALIFORNIA            )  
  )  
COUNTY OF SANTA CLARA        )

  )        ss:

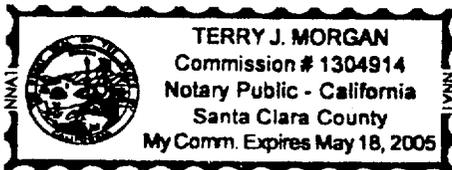
George B. Stramback, being duly sworn, deposes and says:

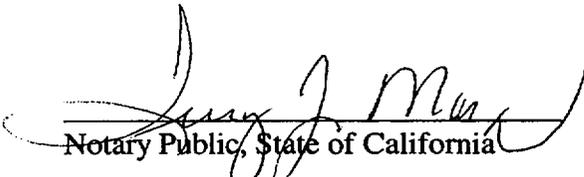
That he has read the foregoing affidavit and the matters stated therein are true and correct to the best of his knowledge, information, and belief.

Executed at San Jose, California, this 1<sup>st</sup> day of August 2001.

  
George B. Stramback  
General Electric Company

Subscribed and sworn before me this 1<sup>st</sup> day of August 2001.



  
Notary Public, State of California

**Attachment C**  
**Additional Reactor Systems Information Supporting the License Amendment**  
**Request for Up-rated Power Operation (Non-Proprietary)**  
**Dresden Nuclear Power Station, Units 2 and 3**  
**Quad Cities Nuclear Power Station, Units 1 and 2**

**Additional Reactor Systems Information Supporting the License Amendment Request to**  
**Permit Up-rated Power Operation (non-proprietary version)**

**Attachment C**  
**Additional Reactor Systems Information Supporting the License Amendment**  
**Request for Up-rated Power Operation (Non-Proprietary)**  
**Dresden Nuclear Power Station, Units 2 and 3**  
**Quad Cities Nuclear Power Station, Units 1 and 2**

Question

1. *The COBRAG computer code is the critical power ratio (CPR) methodology used to predict critical power behavior throughout the core. The NRC staff has not reviewed this code. We understand 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 GE14 fuel and, if applicable to Quad Cities or Dresden, for GE12 fuel.*

Response

The Dresden Nuclear Power Station (DNPS) and Quad Cities Nuclear Power Station (QCNPS) reactors do not contain any GE12 fuel, and thus issues relative to the GEXL10 correlation are not applicable.

Question

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 Quad Cities, Units 1 and 2, and Dresden, Units 2 and 3.*

Response

The DNPS and QCNPS reactors do not contain any GE12 fuel, and thus issues relative to the GEXL10 correlation are not applicable.

**Attachment C**  
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Question

3. In 1992, following an NRC Team Audit of GE11 fuel design compliance with Amendment No. 22 of NEDE-20411-PA, GE was encouraged to develop a procedure for implementing Amendment No. 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 Quad Cities and Dresden, especially with regard to items 3 and 4, given the apparent absence of raw data for upskew and downskew power profiles. Provide technical justification if the criteria of the Amendment No. 22 process criteria were not met.

Response

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 Reference 1. The reference 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 the 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 the response to Question 2 above). With this action, the GEXL correlations for GE14 10X10 fuel will be in full compliance with Amendment 22 to GESTAR II and the application of the approved Amendment 22 process documents the safety of the GE14 fuel design.

Question

4. The LOCA analysis of off-rated conditions (specifically, single-loop operation) assumes that the statistical adders developed for the SAFER code at rated conditions will apply. Justify the use of these adders for single-loop operation at Quad Cities and Dresden.

**Attachment C**  
**Additional Reactor Systems Information Supporting the License Amendment**  
**Request for Up-rated Power Operation (Non-Proprietary)**  
**Dresden Nuclear Power Station, Units 2 and 3**  
**Quad Cities Nuclear Power Station, Units 1 and 2**

Response

The maximum average planar linear heat generation rate (MAPLHGR) multiplier for single loop operation (SLO) is set at a value that keeps the nominal SLO peak cladding temperature (PCT) below the nominal two-loop PCT for the design basis accident (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

Justification for Upper Bound Adders

**Attachment C**  
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**Dresden Nuclear Power Station, Units 2 and 3**  
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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.

**References**

1. NEDC-32851, Revision 1, "GEXL14 Correlation for GE14 Fuel," September 1999.
2. NEDE-23785-1-PA, Revision 1, "The GESTR-LOCA and SAFER Models for the Evaluation of the Loss-of-Coolant Accident, Volume III, SAFER/GESTR Application Methodology," October 1984.