

**PROPRIETARY INFORMATION – WITHHOLD UNDER 10 CFR 2.390**

RS-22-005

10 CFR 50.90

January 11, 2022

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555-0001Quad Cities Nuclear Power Station, Units 1 and 2  
Renewed Facility Operating License Nos. DPR-29 and DPR-30  
NRC Docket Nos. 50-254 and 50-265Subject: Response to Request for Additional Information for the GNF3 Fuel Transition  
License Amendment Request

- References:
1. Letter from P.R. Simpson (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Request for Licensing Amendment Regarding Transition to GNF3 Fuel," dated September 14, 2021 (ML21257A419)
  2. Letter from P.R. Simpson (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Response to Supplemental Request for Information Related to Request for Licensing Amendment Regarding Transition to GNF3 Fuel," dated November 3, 2021 (ML21307A444)
  3. Email from B. Venkataraman (U.S. Nuclear Regulatory Commission) to R. Steinman (Exelon Generation Company, LLC), Subject: Request For Additional Information: Quad Cities 1 & 2 License Amendment Request Re: Transition To GNF3 Fuel (EPID: L-2021-LLA-0159), dated December 8, 2021 (ML21342A384)

In the Reference 1 letter, Exelon Generation Company, LLC, (EGC) requested an amendment to Renewed Facility Operating License Nos. DPR-29 for Quad Cities Nuclear Power Station (QCNPS), Unit 1 and DPR-30 for QCNPS, Unit 2. The proposed changes support the transition from Framatome (formerly AREVA) ATRIUM 10XM fuel to Global Nuclear Fuel – Americas, LLC (GNF-A) GNF3 fuel at QCNPS. One aspect of the fuel transition is the use of the GEXL98 correlation for modeling ATRIUM 10XM using General Electric Company (GE) safety analysis methodologies.

**Attachment 4 contains Proprietary Information. Withhold from public disclosure under 10 CFR 2.390. When separated from Attachment 4, this document is decontrolled.**

Attachment 1 contains the response to the GEXL98 correlation related request for additional information (RAI) in Reference 3. Attachments 4a and 4b contain information proprietary to GNF-A and Framatome, respectively. These data tables are proprietary in their entirety. Redacted versions of these documents would not be meaningful; therefore, no redacted versions are provided. This document is supported by signed affidavits from the owners of the information, which are included in Attachments 2 and 3, respectively. Each affidavit sets forth the basis on which the corporation's information may be withheld from public disclosure by the NRC and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR 2.390, "Public inspections, exemptions, requests for withholding." Accordingly, it is respectfully requested that the information, which is proprietary to GNF-A and Framatome be withheld from public disclosure.

EGC has reviewed the information supporting the finding of no significant hazards consideration, and the environmental consideration that were previously provided to the NRC in References 1 and 2. The additional information provided in this submittal does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration. In addition, the information provided in this submittal does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.


EGC is notifying the State of Illinois of this supplement to a previous application for a change to the operating license by sending a copy of this letter and its attachments to the designated State Official in accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b).

There are no regulatory commitments contained within this letter.

Should you have any questions concerning this letter, please contact Ms. Rebecca L. Steinman at (630) 657-2831.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 11<sup>th</sup> day of January 2022.

Respectfully,



Patrick Simpson  
Sr Manager Licensing  
Exelon Generation Company, LLC

Attachments:

1. Response to NRC Request for Additional Information
2. GNF-A 10 CFR 2.390 Affidavit for Withholding for Attachment 4a
3. Framatome 10 CFR 2.390 Affidavit for Withholding for Attachment 4b

4. Tabular Summary of GEXL98 Uncertainty Data
  - a. GNF Document No. 006N9118 (142 pages) (**Proprietary version**)
  - b. GNF Document No. 006N9119 (142 pages) (**Proprietary version**)

cc: NRC Regional Administrator, Region III  
NRC Senior Resident Inspector, Quad Cities Nuclear Power Station  
Illinois Emergency Management Agency – Division of Nuclear Safety

**ATTACHMENT 1**  
**Response to NRC Request for Additional Information**

**Regulatory Basis**

General Design Criterion (GDC) 10, "Reactor design," in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, is the principal regulation associated with this report. This criterion introduces the concept of specified acceptable fuel design limits (SAFDLs). In essence, SAFDLs are those limits placed on certain variables to ensure that the fuel does not fail. One such SAFDL is associated with critical power performance. Because the decrease in heat transfer following critical power could result in fuel failure, a SAFDL is used to demonstrate that critical power does not occur during normal operation and anticipated operational occurrences (AOOs). Therefore, fuel failure is precluded during normal operation and AOOs.

NRC staff Standard Review Plan (NUREG 0800, Section 4.4) includes the SAFDLs used in accounting for the uncertainties involved in developing and predicating critical power performance model and ensuring that fuel failure is precluded:

At least 99.9 percent of the fuel rods in the core will not experience a critical power during normal operation or AOOs.

In order to determine that the GEXL98 correlation for ATRIUM 10XM can satisfy the associated SAFDL, the NRC staff requests the following additional information.

**SFNB-GEXL-RAI-1**

Provide the data used to determine the GEXL98 uncertainty in tabular form. This data should include all relevant inputs (e.g., pressure, mass flux, inlet subcooling, R-factor, thermal diameter, boiling length, annular length) as well as all relevant outputs (e.g., GEXL calculated Critical Power, ACE-Calculated Critical Power).

**Response to SFNB-GEXL-RAI-1**

The requested data has been organized by the vendor into two attachments to facilitate separation of fuel vendor proprietary content. In both cases the numerical values associated with each parameter/case combination are proprietary.

Attachment 4a contains the following information.

Case:	Case identification number [#], and for each case:
Rf:	GEXL R-factor
ECPR:	Ratio of GEXL calculated to ACE calculated critical power
BL:	Boiling length [inches]
ANL:	Annular flow length [inches]
Xc:	GEXL calculated critical quality
MTML:	GEXL calculated minimum thermal margin location [inches]

**ATTACHMENT 1**  
**Response to NRC Request for Additional Information**

LimitingRod: Fuel rod that is predicted to experience dryout at the fuel assembly critical power by GEXL correlation [#]<sup>1</sup>

Database: Identifier for data usage

- 1 - GEXL98 statistical database
- 2 - very low mass flux database, excluded from GEXL98 statistics
- 3 - part length rod database, excluded from GEXL98 statistics

The geometric inputs (Thermal Diameter, Hydraulic Diameter, Active Channel Flow Area, Heated Length) for all cases are those documented in NEDC-33930P Table 2-2, "ATRIUM 10 XM Modeling Dimensions."

Attachment 4b contains the following information.

Case: Case identification number [#], and for each:

Press: Exit pressure [kPa]

MFlow: Inlet flow rate [kg/s]

SubC: Inlet subcooling [kJ/kg]

APS: Label identifying bundle axial power shape

- C – Cosine Peaked
- B – Bottom Peaked
- T – Top Peaked
- D – Double-Humped Peaked

Qc: ACE calculated critical power [kW]

ReqRod: Fuel rod that the specific pin peaking map was designed to peak [#]<sup>1</sup>

LimitingRod: Fuel rod that is predicted to experience dryout at the fuel assembly critical power by ACE correlation [#]<sup>1</sup>

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<sup>1</sup> Rod identification consistent with NEDC-33930P Figure 2-1, "ATRIUM 10XM Assembly Rod Numbering System."

**ATTACHMENT 2**

**GNF-A 10 CFR 2.390 Affidavit for Withholding for Attachment 4a**

# Global Nuclear Fuel – Americas

## AFFIDAVIT

I, **Kent Halac**, state as follows:

- (1) I am a Senior Engineer, Regulatory Affairs, Global Nuclear Fuel – Americas, LLC (GNF-A), 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 Revision 1 of Attachment 1 of “Response to SFNB-GEXL-RAI-1” dated January 11, 2022. The content of Attachment 1 is proprietary in its entirety. The header of each page carries the notation “GNF Proprietary Information – Non-Public.” Paragraph (3) of this affidavit provides the basis for the proprietary determination.
- (3) In making this application for withholding of proprietary information of which it is the owner or licensee, GNF-A 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), and 2.390(a)(4) for “trade secrets” (Exemption 4). The material for which exemption from disclosure is here sought 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, 975 F2d 871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704 F2d 1280 (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 GNF-A’s competitors without license from GNF-A 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 aspects of past, present, or future GNF-A customer-funded development plans and programs, resulting in potential products to GNF-A;
  - d. 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 paragraphs (4)a. and (4)b. above.

- (5) To address 10 CFR 2.390 (b) (4), the information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GNF-A, 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 GNF-A, 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, or subject to the terms under which it was licensed to GNF-A.
- (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 GNF-A 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) is classified as proprietary because it contains details of GNF-A's fuel design and licensing methodology. The development of this methodology, along with the testing, development and approval was achieved at a significant cost to GNF-A.

The development of the fuel design and licensing methodology along with the interpretation and application of the analytical results is derived from an extensive experience database that constitutes a major GNF-A asset.

- (9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GNF-A's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GNF-A'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 GNF-A.



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.

GNF-A's competitive advantage will be lost if its competitors are able to use the results of the GNF-A 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 GNF-A 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 GNF-A of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing and obtaining these very valuable analytical tools.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 11th day of January 2022.

A handwritten signature in black ink, appearing to read "Kent Halac". The signature is written in a cursive, somewhat stylized font.

Kent Halac  
Senior Engineer, Regulatory Affairs  
Global Nuclear Fuel - Americas, LLC  
3901 Castle Hayne Road  
Wilmington, NC 28401  
Kent.Halac@ge.com

**ATTACHMENT 3**

**Framatome 10 CFR 2.390 Affidavit for Withholding for Attachment 4b**

## AFFIDAVIT

1. My name is Morris Byram. I am Product Manager, Licensing & Regulatory Affairs for Framatome Inc. (Framatome) and as such I am authorized to execute this Affidavit.

2. I am familiar with the criteria applied by Framatome to determine whether certain Framatome information is proprietary. I am familiar with the policies established by Framatome to ensure the proper application of these criteria.

3. I am familiar with the Framatome information contained in Attachment 4 to Exelon letter RS-22-005 dated January 11, 2022, with subject "Response to Request for Additional Information for the GNF3 Fuel Transition License Amendment Request" and referred to herein as "Document." Information contained in this Document has been classified by Framatome as proprietary in accordance with the policies established by Framatome for the control and protection of proprietary and confidential information.

4. This Document contains information of a proprietary and confidential nature and is of the type customarily held in confidence by Framatome and not made available to the public. Based on my experience, I am aware that other companies regard information of the kind contained in this Document as proprietary and confidential.

5. This Document has been made available to the U.S. Nuclear Regulatory Commission in confidence with the request that the information contained in this Document be withheld from public disclosure. The request for withholding of proprietary information is made in accordance with 10 CFR 2.390. The information for which withholding from disclosure is requested qualifies under 10 CFR 2.390(a)(4) "Trade secrets and commercial or financial information."

6. The following criteria are customarily applied by Framatome to determine whether information should be classified as proprietary:

- (a) The information reveals details of Framatome's research and development plans and programs or their results.
- (b) Use of the information by a competitor would permit the competitor to significantly reduce its expenditures, in time or resources, to design, produce, or market a similar product or service.
- (c) The information includes test data or analytical techniques concerning a process, methodology, or component, the application of which results in a competitive advantage for Framatome.
- (d) The information reveals certain distinguishing aspects of a process, methodology, or component, the exclusive use of which provides a competitive advantage for Framatome in product optimization or marketability.
- (e) The information is vital to a competitive advantage held by Framatome, would be helpful to competitors to Framatome, and would likely cause substantial harm to the competitive position of Framatome.

The information in this Document is considered proprietary for the reasons set forth in paragraphs 6(c), 6(d), and 6(e) above.

7. In accordance with Framatome's policies governing the protection and control of information, proprietary information contained in this Document has been made available, on a limited basis, to others outside Framatome only as required and under suitable agreement providing for nondisclosure and limited use of the information.

8. Framatome policy requires that proprietary information be kept in a secured file or area and distributed on a need-to-know basis.

9. The foregoing statements are true and correct to the best of my knowledge, information, and belief.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: (1/11/2022)

**BYRAM Morris** Digitally signed by BYRAM Morris  
Date: 2022.01.11 11:57:06 -08'00'

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(NAME)  
morris.byram@framatome.com