Proprietary Notice
Enclosure 1 of this letter contains proprietary information. Upon the removal of Enclosure 1, the balance of the letter may be considered non-proprietary.

Kimberly O'Connor
GNF Customer Project Manager

Global Nuclear Fuel
Global Nuclear Fuel – Americas, LLC
Castle Hayne Road
Wilmington, NC 28401

KGO-ENO-LD1-18-120

September 13, 2018

Mr. Don Lomax
Entergy Operations, Inc.
1340 Echelon Parkway
Jackson, MS 39213

cc: Brian Holman
Frank Philpott
Kristin Bennett
Chris Kmiec

Subject: Revised Proprietary Identification for GNF Pre-Submittal Meeting Presentation on River Bend Station Spent Fuel Pool Criticality Analysis of Boraflex Storage Racks with NETCO-SNAP-IN® Rack Inserts

Reference:
1. Entergy Nuclear Operations, Inc. Fixed Services Agreement No. 10134078 for the Supply of Fuel and Fuel Related Work to RBS with Global Nuclear Fuel, as amended ("Fuel Contract").
2. Entergy Nuclear Operations, Inc. Contract Order 10495761.

Dear Mr. Lomax,

This letter transmits a revised version of the Global Nuclear Fuel – Americas, LLC (GNF-A) presentation on the River Bend Station spent fuel pool criticality analysis of Boraflex storage racks with NETCO-SNAP-IN® rack inserts that was presented during the August 23, 2018 pre-submittal meeting with NRC staff. The revised version reflects the identification of specific information that is proprietary to GNF-A.

Please note that Enclosure 1 contains information which is considered proprietary by GNF-A and should be protected in accordance with the provisions for such information pursuant to the Entergy/General Electric Company proprietary agreement. In support of Entergy's use of the enclosed information with the NRC, the affidavit contained in Enclosure 2 identifies that the information contained in Enclosure 1 has been handled and classified as proprietary to GNF-A. GNF-A hereby requests that Entergy request that the NRC withhold the information contained in Enclosure 1 from public disclosure in accordance with the provisions of 10 CFR 2.390 and 9.17. GNF-A requests that any transmittal of this proprietary information to the NRC be accompanied by the enclosed affidavit and proprietary notice. In order to maintain the applicability of the affidavit and to meet the requirements of 10 CFR 2.390, the transmittal to the NRC should:

1) Faithfully reproduce the proprietary information,
2) Preserve the proprietary annotations, and
3) Include the words similar to "GNF Proprietary Information" at the top of first page and each page containing the proprietary information.

Further, 10 CFR 2.390 requires that the proprietary information be incorporated, as far as possible into a

separate paper. Therefore, Enclosure 1 contains the proprietary information, and the non-proprietary information is provided in Enclosure 2.

Based on past discussions with the NRC, GNF-A has been encouraged to request its customers to provide a paragraph similar to the following paragraph in the customer letters transmitting proprietary information to the NRC in order to clearly indicate the proprietary nature of the information and to document the source of the proprietary information as indicated in the GNF-A affidavit.

> "The enclosed documents contain proprietary information as defined by 10 CFR 2.390. GNF-A, as the owner of the proprietary information, has executed the enclosed affidavit, which identifies that the enclosed proprietary information has been handled and classified as proprietary, is customarily held in confidence, and has been withheld from public disclosure. The proprietary information was provided to Entergy in a GNF-A transmittal that is referenced by the affidavit. The proprietary information has been faithfully reproduced in the enclosed such that the affidavit remains applicable. GNF-A hereby requests that the enclosed proprietary information be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 9.17. Information that is not considered proprietary is provided in a separate enclosure."

Please contact me if you have any questions.

Sincerely,

Kimberly O'Connor

Kimberly O'Connor
GNF-A Customer Project Manager

Enclosures:
1. River Bend Station Spent Fuel Pool Criticality Analysis of Boraflex Storage Racks with NETCO-SNAP-IN® Rack Inserts, GNF Proprietary Information – Non-Public
2. River Bend Station Spent Fuel Pool Criticality Analysis of Boraflex Storage Racks with NETCO-SNAP-IN® Rack Inserts, Non-Proprietary Information
3. GNF-A Affidavit for Enclosure 1

004N9640 R1

ENCLOSURE 2

KGO-ENO-LD1-18-120

River Bend Station Spent Fuel Pool Criticality Analysis of Boraflex Storage Racks with NETCO-SNAP-IN® Rack Inserts

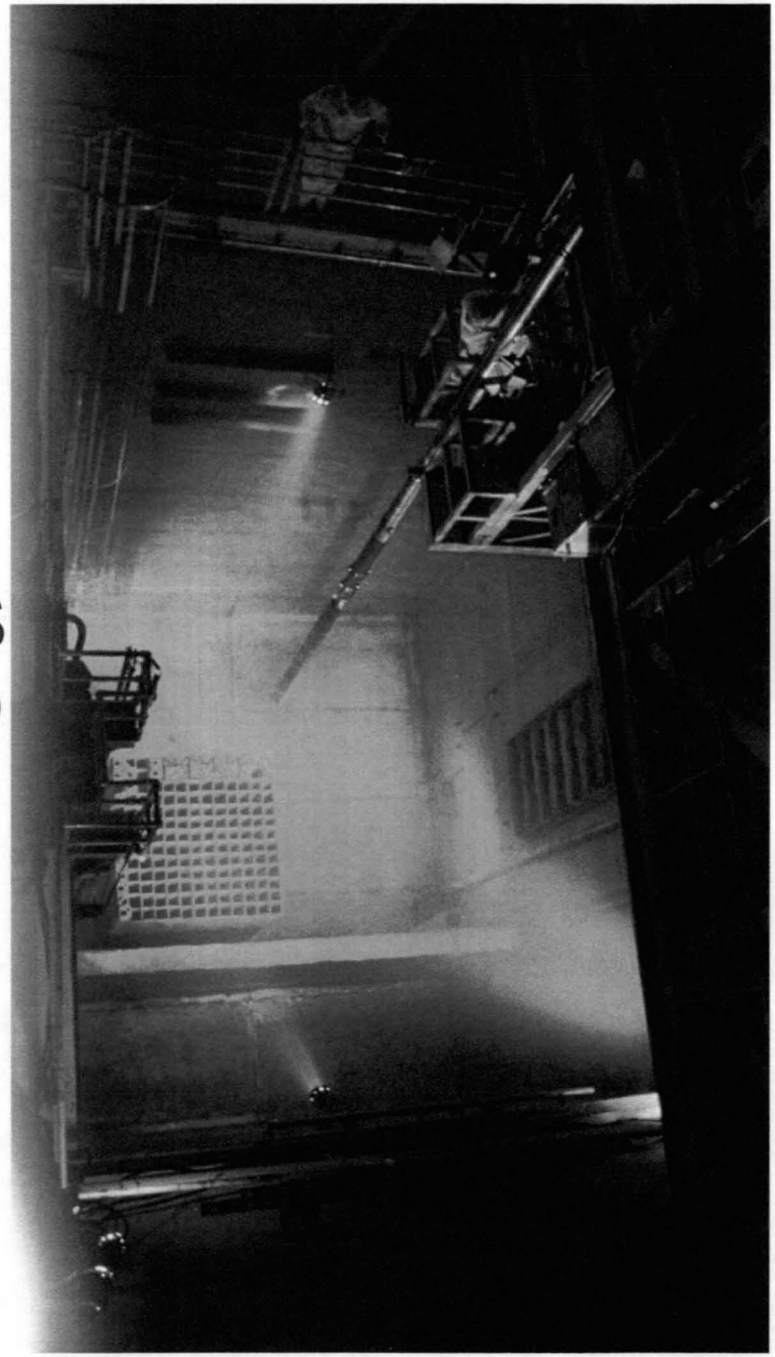
Non-Proprietary Information

IMPORTANT NOTICE

This is a non-proprietary version of Enclosure 1, from which the proprietary information has been removed. Portions of the enclosure that have been removed are indicated by an open and closed bracket as shown here [[ ]].

Global Nuclear Fuel

River Bend Station Spent Fuel Pool Criticality Analysis of Boraflex Storage Racks with NETCO-SNAP-IN® Rack Inserts



GNF

Global Nuclear Fuel

Regulatory Requirements

10 CFR 50.68 (b) (4)

"The k-effective of the spent fuel storage racks loaded with fuel of the maximum fuel assembly reactivity must not exceed 0.95, at a 95 percent probability, 95 percent confidence level, if flooded with unborated water."

$$K_{\max(95/95)} \leq 0.95$$

General Design Criterion 62, Appendix A to 10 CFR 50

"Criticality in the fuel storage and handling system shall be prevented by physical systems or processes, preferably by use of geometrically safe configurations."

Methodology Overview

- Consistent with NEI 12-16 Revision 3, "Guidance for Performing Criticality Analyses of Fuel Storage at Light-Water Reactor Power Plants."
- Peak reactivity analysis with most limiting (bounding) lattice in every rack cell location.
- No credit for the Boraflex neutron absorber (modeled as water).
- B-10 areal density used for rack insert analysis (0.0115 g B-10/cm^2) is 10% less than the certified minimum areal density (0.0129 g B-10/cm^2).
- Quantification of credible normal and abnormal conditions with consideration of biases, rack/fuel tolerances and computational uncertainties.
- Covers current and future (GNF3) fuel product lines at River Bend Station.

Analysis Uncertainty Quantification

$$k_{\max(95/95)} = \Delta k_{Nominal} + \Delta k_{Bias} + \Delta k_{Tolerance} + \Delta k_{Uncertainty}$$

The contribution from the biases are:

$$\Delta k_{Bias} = \sum_{i=1}^{n} \Delta k_{B_i}$$

The contribution from the tolerances are:

$$\Delta k_{Tolerance} = \sqrt{\sum_{i=1}^{n} \Delta k_{T_i}^2}$$

The contribution from the uncertainties are:

$$\Delta k_{Uncertainty} = \sqrt{\sum_{i=1}^{n} \Delta k_{U_i}^2}$$

Computer Code Calculations

TGBLA06 [a]

- NRC-approved lattice physics code (NEDE-30130-P-A).
- TGBLA solves Two-Dimensional (2D) diffusion equations with diffusion parameters corrected by transport theory to provide system multiplication factors and perform burnup (depletion) calculations.
- Uses ENDF/B-V cross-section data.
- Performs coarse-mesh, broad-group, diffusion theory calculations; including thermal neutron scattering with hydrogen using an S(α,β) light water thermal scattering kernel.

MCNP-05P [b]

- Monte Carlo N-Particle code used for in rack reactivity (keff) calculations.
- Uses point-wise (i.e., continuous) ENDF/B-VII cross-section library, and all reactions in a given cross-section evaluation are considered.
- [[

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- [[

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a) [[

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b) MCNP-05P is the GNF controlled production version of the Los Alamos National Laboratory code MCNP5.

Boraflex Rack Cell Model with Inserts

[[

- No credit taken for Boraflex neutron absorber.
- [[

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- Assumes every rack cell contains a design basis bundle with the worst rack reactivity suppression capability (i.e., highest rack efficiency) [[

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- [[

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- Stainless steel rack modeled.
- B-10 areal density used in the rack insert model is 10% lower than the certified minimum (95/95).
- [[

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]]

Design Basis Bundle

[[

- [[

]] bounds current and future fuel types at River Bend Station.

- Design basis bundle is selected to be the bundle with the worst rack reactivity suppression capability (i.e., highest rack efficiency) [[

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- The design basis bundle is used to:
  - Define the nominal in rack k_{eff} result.
  - Used for performing all biases, manufacturing tolerances, computational uncertainty calculations, and all credible abnormal/accident condition calculations.

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Fuel Storage Conditions Analyzed

Credible Normal Conditions

- [[

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- No inserts along the rack periphery

Credible Abnormal Conditions

- Dropped/Damaged assembly
- Misloaded or mislocated fuel assembly
- Missing insert

Analyzed Tolerances and Biases

Bundle and Rack Tolerances

- [[

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- Rack pitch
- [[

]]

Fuel Depletion Bias

- [[

]]

Analysis Uncertainties

- [[

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Summary

- Analysis complies with requirements in 10 CFR 50.68 and GDC 62.
- Follows guidance in NEI 12-16 Revision 3.
- Consideration given to all credible abnormal conditions, manufacturing tolerance implications, and computational uncertainties in determining maximum in-rack eigenvalue.
- The analysis resulted in a storage rack maximum k-effective less than the 0.95 limit from 10 CFR 50.68 for normal and credible abnormal operation with tolerances and computational uncertainties taken into account.

ENCLOSURE 3

KGO-ENO-LD1-18-120

Affidavit for Enclosure 1

Global Nuclear Fuel – Americas

AFFIDAVIT

I, Lisa K. Schichlein, state as follows:

(1) I am a Senior Project Manager, NPP/Services Licensing, 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 Enclosure 1 of GNF letter KGO-ENO-LD1-18-120, Kimberly O'Connor (GNF) to Don Lomax (Entergy), entitled "Revised Proprietary Identification for GNF Pre-Submittal Meeting Presentation on River Bend Station Spent Fuel Pool Criticality Analysis of Boraflex Storage Racks with NETCO-SNAP-IN® Rack Inserts," dated September 13, 2018. The proprietary information in Enclosure 1, which is entitled "River Bend Station Spent Fuel Pool Criticality Analysis of Boraflex Storage Racks with NETCO-SNAP-IN® Rack Inserts", is identified by a dotted underline inside double square brackets. [[This sentence is an example.{3}]] GNF proprietary information in figures and large objects is identified with double square brackets before and after the object. In each case, the superscript notation {3} refers to Paragraph (3) of this affidavit, which 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, 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 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), above, is classified as proprietary because it contains details of GNF-A's criticality analysis methodology. The development of this methodology, along with the testing, development and approval was achieved at a significant cost to GNF-A or its licensor.

The development of the criticality analysis methodology along with the interpretation and application of the analytical results is derived from the 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 September 2018.

Lisa K. Schichlein

Lisa K. Schichlein
Senior Project Manager, NPP/Services Licensing
Regulatory Affairs
Global Nuclear Fuel – Americas, LLC
3901 Castle Hayne Road
Wilmington, NC 28401
Lisa.Schichlein@ge.com