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PROPRIETARY INFORMATION – WITHHOLD UNDER 10 CFR 2.390

10 CFR 50.90

September 9, 2011

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

Peach Bottom Atomic Power Station, Unit 3
Renewed Facility Operating License No. DPR-56
NRC Docket No. 50-278

Subject: Response to Request for Additional Information - License Amendment Request Concerning Safety Limit Minimum Critical Power Ratio Change

References:

1) Letter from M. D. Jesse (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request - Safety Limit Minimum Critical Power Ratio Change," dated June 8, 2011

2) Letter from J. D. Hughey (U.S. Nuclear Regulatory Commission) to M. J. Pacilio (Exelon Generation Company, LLC), "Peach Bottom Atomic Power Station, Unit 3 - Request for Additional Information Regarding License Amendment Request for Safety Limit Minimum Critical Power Ratio Change (TAC NO. ME6931)," dated August 11, 2011

3) Letter from M. D. Jesse (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information - License Amendment Request Concerning Safety Limit Minimum Critical Power Ratio Change," dated August 19, 2011

4) Letter from J. D. Hughey (U.S. Nuclear Regulatory Commission) to M. J. Pacilio (Exelon Generation Company, LLC), "Peach Bottom Atomic Power Station, Unit 3 - Request for Additional Information Regarding License Amendment Request for Safety Limit Minimum Critical Power Ratio Change (TAC NO. ME6931)," dated September 8, 2011

In the Reference 1 letter, Exelon Generation Company, LLC (Exelon) requested a proposed change to modify Technical Specification (TS) 2.1.1 ("Reactor Core SLs"). Specifically, this change incorporates revised Safety Limit Minimum Critical Power Ratios (SLMCPRs) due to the cycle specific analysis performed by Global Nuclear Fuel for Peach Bottom Atomic Power Station (PBAPS), Unit 3, Cycle 19.

**Attachment 2 transmitted herewith contains Proprietary Information.
When separated from Attachment 2, this document is decontrolled.**

References 2 and 3 concerned a previous request for additional information. In the Reference 4 letter, the U.S. Nuclear Regulatory Commission requested additional information. Attached is our response to this request.

Attachment 1 contains the Exelon response to RAI-11 and RAI-12. Attachment 2 contains the Global Nuclear Fuel's response to the remainder of the questions.

Attachment 2 contains information proprietary to Global Nuclear Fuel. Global Nuclear Fuel requests that the document be withheld from public disclosure in accordance with 10 CFR 2.390. Attachment 3 contains a non-proprietary version of the Global Nuclear Fuel document. An affidavit supporting this request is also contained in Attachment 3.

There are no commitments contained within this letter.

Should you have any questions concerning this letter, please contact Tom Loomis at (610) 765-5510.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 9th day of September 2011.

Respectfully,

Michael D. Jesse
Director, Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Attachments: 1) Response to RAI-11 and RAI-12
2) Proprietary Version of Global Nuclear Fuel Letter (Charles F. Lamb (Global Nuclear Fuel) to Jim Tusar (Exelon Generation Company, LLC), dated September 9, 2011 - CFL-EXN-HE3-11-115)
3) Non-Proprietary Version of Global Nuclear Fuel Letter and Affidavit

cc: USNRC Region I, Regional Administrator
USNRC Senior Resident Inspector, PBAPS
USNRC Project Manager, PBAPS
R. R. Janati, Commonwealth of Pennsylvania
S. T. Gray, State of Maryland

Attachment 1

Response to RAI-11 and RAI-12

Question:

RAI-11: Explain why the backup stability protection depicted in the power flow operation map contained in Attachment 6 of the June 8, 2011, submittal extends beyond the applicable region.

Response:

The power-flow map generally depicts a "natural circulation" flow line and a "maximum rod line." The Backup Stability Protection (BSP) region boundaries are calculated based on points on the natural circulation line and the maximum rod line and the BSP regions are depicted as areas between the maximum rod line, the natural circulation line and the BSP region boundaries in the high-power, low-flow region of the map. However, the natural circulation line is approximate and the core flow measurement uncertainty is larger at low flow conditions. In the past, this has resulted in operating conditions in which the indicated power-flow condition was below (to the left of) the natural circulation line on the power-flow map. Also, industry operational experience has identified conditions in which operation above the maximum rod line has occurred. To address these situations, an operational decision was made to conservatively extend operating boundaries (e.g., maximum rod line, stability regions, etc.) back to "zero flow" and extend the BSP boundaries above the maximum rod line. These operational enhancements to the power-flow map have been made to provide additional guidance for the unlikely, but possible circumstance of operating at those conditions.

Question:

RAI-12: Provide the backup stability protection for single loop operation in the power/flow map presented in Attachment 6 of the June 8, 2011 submittal.

Response:

The Backup Stability Protection (BSP) region boundaries are calculated based on a specified core decay ratio per the approved stability methodology described in GESTAR (Section S.4.2.2, pg. US-38). The core decay ratio is a function of principal reactor core parameters (e.g., power and power distribution, flow, subcooling, fuel design, etc.). The core decay ratio is independent of the core flow mode – it is the same for two loop operation and single loop operation. Therefore, the calculated BSP regions are bounding and applicable for both two loop operation and single loop operation.

Attachment 3

Non-Proprietary Version of Global Nuclear Fuel Letter and Affidavit

ENCLOSURE 2

CFL-EXN-HE3-11-115

Response to NRC RAIs for Peach Bottom Unit 3 Cycle 19 SLMCPR Submittal

Non-Proprietary Information – Class I (Public)

INFORMATION NOTICE

This is a non-proprietary version of CFL-EXN-HE3-11-115 Enclosure 1, which has the proprietary information removed. Portions of the document that have been removed are indicated by white space inside an open and closed bracket as shown here [[ ]].

REQUEST FOR ADDITIONAL INFORMATION RELATED TO
LICENSE AMENDMENT REQUEST FOR TECHNICAL SPECIFICATION CHANGES
TO SAFETY LIMIT MINIMUM CRITICAL POWER RATIO VALUES
PEACH BOTTOM ATOMIC POWER STATION – UNIT 3
DOCKET NO. 50-278

By letter to the Nuclear Regulatory Commission (NRC) dated June 8, 2011,[1] as supplemented by letter dated August 19, 2011,[2] Exelon Generation Company, LLC, (Exelon) submitted a License Amendment Request for Peach Bottom Atomic Power Station, Unit 3. The submittal seeks to revise Technical Specification 2.1.1, "Reactor Core SLs [safety limits]" to reflect revised Safety Limit Minimum Critical Power Ratio (SLMCPR) values for operating cycle 19. The NRC staff has reviewed Exelon's response to the NRC Request for Additional Information (RAI) dated August 19, 2001,[2] and determined that additional information, as described below, is needed to complete the review.

RAI-08: Identify the sections/pages of Reference 02-1: Global Nuclear Fuel, "General Electric Standard Application for Reactor Fuel (GESTAR II)," NEDE-24011P-A-18 and NEDE-24011P-A-18-US, April 2011, that are applicable to the inputs identified in the response to RAI-02.[2] In addition, provide a quantitative range for the referenced thermal limit margins and the reactivity margins.

GNF Response: While GESTAR II is the umbrella regulatory document for reload activities from a safety criteria and work scope standpoint; it does not specify all design considerations or parameters. Therefore, a one-to-one correspondence with the cycle "design" considerations as listed in the RAI-02 response does not exist.

GESTAR II, NEDE-24011P-A-18, Section 3.1 (Page 3-1) includes the safety criteria to be met by the core design:

> 3.1.1 Reactivity Basis
> The nuclear design shall meet the following basis: The core shall be capable of being made subcritical at any time or at any core condition with the highest worth control rod fully withdrawn.
>
> 3.1.2 Overpower Bases
> The Technical Specification limits on Minimum Critical Power Ratio (MCPR), the Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) and the Linear Heat Generation Rate (LHGR) are determined such that the fuel will not exceed required licensing limits during abnormal operational occurrences or accidents.

Table 3-1 of GESTAR II (Page 3-12) contains more details of the thermal limits applied to nuclear designs.

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[1] Agencywide Documents Access and Management System (ADAMS) Accession No. ML111600180.
[2] ADAMS Accession No. ML112340236.

The design considerations as listed in the RAI-02 response relate to customer specified parameters for the cycle design. Each reload design must meet the GESTAR II safety criteria. These criteria are reflected in the plant technical specifications and are monitored for compliance. The design considerations do not affect the requirement to meet the safety criteria or the methodology used in the analysis.

Based on customer input, the following quantitative design values were applied to the Peach Bottom Atomic Power Station (PBAPS) Unit 3 Cycle 19 core design:

- Cycle Energy Requirement
  - [[
    ]]
- Thermal Limit Margins
  - [[
    ]]
- Reactivity Margins
  - [[
    ]]
- Discharge Exposure Limitations
  - [[
    ]]
- Desired Control Rod Patterns
  - Collaborative decision making process with Exelon based on core management philosophy
- Channel Distortion Minimization
  - Collaborative decision making process with Exelon based on fuel channel to control blade interference monitoring philosophy

The determination of the SLMCPR, which is the subject of the Tech Spec License Amendment Request (LAR), is performed in the same manner regardless of the specified core design requirements and margins.

RAI-09: Identify the sections/pages of Reference 03-1: Global Nuclear Fuel, "General Electric Standard Application for Reactor Fuel (GESTAR II)," NEDE-24011P-A-18 and NEDE-24011P-A-18-US, April 2011, that describe the SLMCPR calculation related to GNF2 fuel assemblies as discussed in the response to RAI-03.[2]

GNF Response: There appears to be some clarification needed in the parsing of this statement in the RAI-03 response:

> "In addition to the explanation provided in this section, Table 6 of Attachment 4 provides a list of the GEXL critical power uncertainties determined in accordance to the NRC-approved methodology contained in NEDE-24011-P-A along with the values actually used."

1st: Table 6 of Attachment 4 includes the list of uncertainties and actual values used for the PBAPS Unit 3 Cycle 19 SLMCPR LAR.

2nd: The NRC-approved methodologies are contained in GESTAR II as well as being documented in Attachment 4. The plant and product line specific parameters are not contained in GESTAR II.

An overview of the SLMCPR process is presented in Section 1.1.5 of GESTAR II, NEDE-24011P-A-18 (Page 1-4). Sections 4.3.1, 4.3.1.1, 4.3.1.1.1 and 4.3.1.1.2 (Pages 4-7 and 4-8) contain more details on the calculational method to derive the SLMCPR.

As described in GESTAR II Section 4.3.1.1.1, further details on the procedure are presented in Appendix IV of GESTAR II Reference 4-9 and Section 4 of GESTAR II Reference 4-36. The uncertainties used for the PBAPS Unit 3 cycle-specific statistical analyses are presented in GESTAR II Reference 4-37, as well as Table 4, Table 5 and Table 6 of Attachment 4 to the original LAR.

GESTAR II provides the approved SLMCPR process and methodology references; therefore, there is no specific mention of the GNF2 product line. The GNF2 fuel product was licensed via the provisions of GESTAR II Section 1.1, Fuel Licensing Acceptance Criteria, which culminated in the Compliance Report for GNF2, NEDC-33270P. Revision 0 of NEDC-33270P was submitted in March 2007 and was subsequently audited by the NRC. As noted in Section 2.5 of the LAR Attachment 4, the NRC has reviewed the applicability of GNF2 to the SLMCPR process and audit report ML081630579, Section 3.4.2.2.1 page 59 states:

> "The NRC staff finds that the calculational methods, evaluations and applicability of the OLMCPR and SLMCPR are in accordance with existing NRC-approved methods and thus valid for use with GNF2 fuel."

References:

GESTAR II Reference 4-9: *General Electric BWR Thermal Analysis Basis (GETAB): Data, Correlation and Design Application*, NEDE–10958–PA and NEDO–10958–A, January 1977.

GESTAR II Reference 4-36: *Methodology and Uncertainties for Safety Limit MCPR Evaluation*, NEDC–32601P–A, August 1999.

GESTAR II Reference 4-37: *Power Distribution Uncertainties for Safety Limit MCPR Evaluations*, NEDC–32694P–A, August 1999.

RAI-10: Provide the calculation details requested in RAI-05.1[2] that justify the results listed in Table 3 of Attachment 4 from the June 8, 2011, submittal.[3]

GNF Response to RAI-10: Please see Enclosure 3 of this document, which contains an overview of the core design process. Note that this attachment is a modified presentation that was provided to the NRC on August 10, 2010 in response to an NRC Audit on the Fitzpatrick Cycle 20 SLMCPR Technical Specifications change letter. Slight modifications were made to the presentation in order to include data specific to the PBAPS Unit 3 Cycle 19 core design.

[2] ADAMS Accession No. ML112340236.
[3] Note that the "Attachment 4" referenced in RAI-10 is the non-publicly available, proprietary version of Attachment 5 associated with the submittal dated June 8, 2011 (ADAMS Accession No. ML111600180).

ENCLOSURE 4

CFL-EXN-HE3-11-115

Affidavit

Global Nuclear Fuel – Americas

AFFIDAVIT

I, Atul A. Karve, state as follows:

(1) I am Engineering Manager, Methods, 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 Enclosures 1 and 3 of GNF's letter, CFL-EXN-HE3-11-115, C. Lamb (GNF-A) to J. Tusar (Exelon Nuclear), entitled "GNF Response to NRC RAIs for Peach Bottom Unit 3 Cycle 19 SLMCPR Submittal," dated September 9, 2011. GNF-A proprietary information in Enclosure 1, which is entitled "Response to NRC RAIs for Peach Bottom Unit 3 Cycle 19 SLMCPR Submittal," is identified by a dotted underline inside double square brackets. [[This sentence is an example.{3}]] A "[[" marking at the beginning of a table, figure, or paragraph closed with a "]]" marking at the end of the table, figure or paragraph is used to indicate that the entire content between the double brackets is proprietary. The information in Enclosure 3, which is entitled "Supporting Attachments," is proprietary in its entirety. The header of each page in this enclosure carries the notation "GNF Proprietary Information – Class III (Confidential){3}." 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, 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. Access to such documents within GNF-A 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 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 affidavit and the matters stated therein are true and correct to the best of my knowledge, information, and belief.

Executed on this 9th day of September 2011.

Atul Karve
Engineering Manager, Methods
Global Nuclear Fuel – Americas, LLC