

RS-12-030

10 CFR 50.90

February 13, 2012

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

LaSalle County Station, Unit 1  
Facility Operating License No. NPF-11  
NRC Docket No. 50-373

**Subject:** Supplemental Information Supporting the January 30, 2012, Response to NRC RAI-03-1 (TAC No. ME7331)

- References:**
1. Letter from D. M. Gullott (Exelon Generation Company, LLC (EGC)) to U. S. NRC, "Request for Technical Specification Change for Minimum Critical Power Ratio Safety Limit," dated October 12, 2011
  2. Letter from U. S. NRC to Mr. Michael J. Pacilio (EGC), "LaSalle County Station, Unit 1 -Request for Additional Information Regarding Proposed Technical Specification Safety Limit Minimum Critical Power Ratio Changes (TAC No. ME7331)," dated January 19, 2012
  3. Letter from D. M. Gullott (Exelon Generation Company, LLC (EGC)) to U. S. NRC, "Supplemental Information Supporting the Request for Technical Specification Change for Minimum Critical Power Ratio Safety Limit (TAC No. ME7331)," dated January 30, 2012

In Reference 1, Exelon Generation Company, LLC (EGC) requested an amendment to Appendix A, Technical Specifications (TS), of Facility Operating License No. NPF-11 for LaSalle County Station (LSCS), Unit 1. The proposed change revises the value of the safety limit minimum critical power ratios (SLMCPs) in TS Section 2.1.1, "Reactor Core SLs." These changes are needed to support the upcoming cycle of operation (i.e., Cycle 15) for LSCS, Unit 1. In Reference 2, the NRC requested that EGC provide additional information in support of their review of Reference 1. In Reference 3 EGC responded to the NRC's Reference 2 request. Following the submittal of Reference 3 EGC determined that additional information is required to supplement its Reference 3 response to NRC RAI-03-1. The supplemental information is contained in the Attachment to this letter.

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The information provided in this letter does not affect the No Significant Hazards Consideration or the Environmental Consideration provided in Attachment 1 of the original license amendment request as described in the Reference 1 submittal.

In accordance with 10 CFR 50.91(b), "State consultation," EGC is providing the State of Illinois with a copy of this letter and its attachment to the designated State Official.

This letter contains no new regulatory commitments. If you have any questions concerning this letter, please contact Mr. Mitchel A. Mathews at (630) 657-2819.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 13th day of February, 2012.

Respectfully,

A handwritten signature in black ink, appearing to read 'D M Gullott', with a long horizontal line extending to the right.

David M. Gullott  
Manager – Licensing  
Exelon Generation Company, LLC

Attachment: Supplemental Information Supporting the January 30, 2012, Response to NRC  
RAI-03-1

**Attachment**

Supplemental Information Supporting the January 30, 2012, Response to NRC RAI-03-1

## Supplemental Information Supporting the January 30, 2012, Response to NRC RAI-03-1

In a letter dated January 19, 2012, the NRC requested that Exelon Generation Company, LLC (EGC) provide additional information in support of their review of EGC's October 12, 2011, license amendment request (i.e., ML112860068) to modify the LaSalle County Station (LSCS), Unit 1 Technical Specifications (TS), Section 2.1.1, "Reactor Core SLs." One of the NRC's requests was as follows:

3. ***GNF2 fuel deviates from traditional 10x10 design through the introduction of a partial length rod configuration, the use of higher linear power, and the use of mixing vanes. The NRC staff considers this a new fuel design with regards to the four restrictions identified in the safety evaluation of General Electric (GE) Licensing Topical Reports NEDC-32601P, NEDC-32694, and Amendment 25 to NEDE-24011-P-A. Given that LSCS, Unit 1, Cycle 15, uses a core loading pattern which includes GNF2 fuel, provide the following: (1) an evaluation of the four restrictions in NEDC-32601P, NEDC-32694 and Amendment 25 to NEDE-24011-P-A and the applicability to mixed core with ATRIUM 10 fuel;***

A portion of EGC's response to this question included the following discussion of how the four restrictions were addressed:

*The four restrictions applied specifically to the mixed core were addressed during the transition from ATRIUM-10 to GNF2 fuel. These limitations were addressed for ATRIUM-10 as follows:*

- (1) The TGBLA fuel rod power calculational uncertainty for ATRIUM-10 was determined and verified.*
- (2) The rod power calculation uncertainties were used to reevaluate and confirm the R-factor uncertainty for ATRIUM-10.*
- (3) The applicability of the Minimum Critical Power Ratio (MCPR) Importance Parameter (MIP) criterion was previously reevaluated through the inclusion of plants containing ATRIUM-10 fuel in the data contained in Figure 5 of Attachment 5.*
- (4) The bundle power uncertainty associated with the core monitoring system was verified by Exelon as applied to ATRIUM-10.*

### **Supplemental Information Related to NRC RAI-03-1**

In addition to the previous EGC response to NRC RAI-03-1, please note the following supplemental information regarding the analysis to address four restrictions on the use of NEDC-32601P-A, "Methodology and Uncertainties for Safety Limit MCPR Evaluations," and NEDC-32694 P-A, "Power Distribution Uncertainties for Safety Limit MCPR Evaluations," for ATRIUM-10 fuel:

- (1) The TGBLA fuel rod power calculational uncertainty for ATRIUM-10 was verified through extensive comparisons of TGBLA and MCNP. Comparisons included lattice  $k_{\infty}$  values and lattice pin power peaking at different exposure, temperature, and control conditions. The

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comparisons included comparisons to TGBLA accuracy for Global Nuclear Fuel (GNF) 10x10 fuel designs to demonstrate that TGBLA accuracy had not been degraded for ATRIUM-10 fuel in comparison to the accuracy of analyses for standard GNF fuel product offerings. This analysis is documented in GNF's internal design record file (eDRF) Section 0000-0015-4032 Rev. 0 and applies to ATRIUM-10 fuel in LSCS, Unit 1 Cycle 15. GNF then received confirmation from EGC that the standard GNF manufacturing uncertainties were bounding when compared to the uncertainties associated with the manufacture of ATRIUM-10 fuel as documented in GNF eDRF Section 0000-0130-2044. This information, when combined with uncertainties inherent in GNF methodologies, confirmed that the standard rod power calculational uncertainty described in NEDC-32601 P-A, Section 3.1 is applicable to ATRIUM-10 fuel.

- (2) The rod power calculation uncertainties were used to reevaluate and confirm the R-factor uncertainty for ATRIUM-10. The above uncertainty, combined with uncertainties inherent in GNF methodologies, demonstrated that the R-Factor uncertainty contained in NEDC-32601 P-A, Section 3 is applicable to ATRIUM-10 fuel. This analysis is documented in GNF eDRF Section 0000-0136-9407 Rev. 0.
- (3) The applicability of the minimum critical power ratio (MCPR) Importance Parameter (MIP) criterion was evaluated through the inclusion of plants containing ATRIUM-10 fuel in the data contained in Figure 5 of Attachment 5 of the referenced letter. The following points in the table supplied in response to RAI-05 contain ATRIUM-10 fuel: the 1st, 4th, and 5th points. This can be seen from the table as the combined GE14 and GNF2 batch fractions for these points do not add up to 100%; the remaining fuel for these points is ATRIUM-10 fuel. As can be seen by locating these points on the plot in Figure 5 of Attachment 5, each one is above the MIP correlation, demonstrating the continued generic conservatism of this correlation. Additionally, Section 2.6 of Attachment 5 of the referenced letter demonstrates that if limiting SLMCPR case for LSCS 1 Cycle 15 were plotted on Figure 5, it would also lie above the MIP correlation line, demonstrating the conservatism of this correlation for this specific application.
- (4) Initially, GNF provided EGC with a proposed effective bundle power uncertainty for use in the LSCS, Unit 1 Cycle 15 SLMCPR analysis. In response to an EGC request, AREVA provided information related to the characteristics of ATRIUM-10 fuel to EGC to in a letter from A. W. Will (Framatome ANP, Inc) to F. W. Trikur (EGC), "Assembly Power Distribution and MCPR Uncertainties for LaSalle ATRIUM-10 Fuel," dated April 18, 2003. EGC compared the value proposed by GNF to the value that had been provided by AREVA for use with ATRIUM-10 fuel in the POWERPLEX-III core monitoring system that is used at LSCS, Unit 1. EGC concluded that the value proposed by GNF bounded the value provided by AREVA; therefore, the GNF-proposed effective bundle power uncertainty was found to be appropriate for use in the LSCS, Unit 1 Cycle 15 SLMCPR analysis.

### **Reference**

Letter from D. M. Gullott (Exelon Generation Company, LLC (EGC)) to U. S. NRC, "Request for Technical Specification Change for Minimum Critical Power Ratio Safety Limit," dated October 12, 2011 (ML112860068)