



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

February 4, 2011

Mr. Michael J. Pacilio  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: LIMERICK GENERATING STATION, UNIT 2 - REQUEST FOR ADDITIONAL  
INFORMATION REGARDING PROPOSED TECHNICAL SPECIFICATION  
SAFETY LIMIT MINIMUM CRITICAL POWER RATIO CHANGES (TAC NO.  
ME5182)

Dear Mr. Pacilio:

By letter dated December 15, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML103500180), Exelon Generation Company, LLC submitted a license amendment request proposing to modify the safety limit minimum critical power ratios contained in Section 2.1 of the Technical Specifications at Limerick Generating Station (LGS), Unit 2. The basis for the proposed revision was a cycle-specific analysis performed to support operation of LGS Unit 2, in the upcoming Cycle 12.

The Nuclear Regulatory Commission staff has been reviewing the response and has determined that additional information is needed to complete its review. The specific questions are found in the enclosed request for additional information (RAI). The questions were sent via electronic transmission on February 2, 2011, to Mr. Thomas Loomis, of your staff. The draft questions were sent to ensure that the questions were understandable, the regulatory basis for the questions was clear, and to determine if the information was previously docketed. The draft questions were discussed in a teleconference with your staff on February 4, 2011. It was agreed that a response to this RAI would be submitted by February 28, 2011.

Please contact me at 301-415-2833, if you have any questions.

Sincerely,

A handwritten signature in cursive script, reading "Peter Bamford", is positioned above the typed name.

Peter Bamford, Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-353

Enclosure: As stated

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REQUEST FOR ADDITIONAL INFORMATION  
LIMERICK GENERATING STATION, UNIT 2  
LICENSE AMENDMENT REQUEST REGARDING SAFETY LIMIT  
MINIMUM CRITICAL POWER RATIO CHANGE  
DOCKET NO. 50-353

By letter dated December 15, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML103500180), Exelon Generation Company, LLC (Exelon, the licensee) submitted a license amendment request (LAR) proposing to modify Technical Specification (TS) 2.1, "Safety Limits," for Limerick Generating Station (LGS), Unit 2. The requested change involves revised Safety Limit Minimum Critical Power Ratios (SLMCPRs) calculated as a result of the cycle-specific analysis performed Global Nuclear Fuel (GNF) to support operation in the upcoming LGS, Unit 2, Cycle 12. The Nuclear Regulatory Commission (NRC) staff has been reviewing the submittal and has determined that additional information is needed to complete its review.

1. Please provide: (1) the number of fuel assemblies for each fuel type in Figures 1 and 2 for Cycle 12 and Cycle 11, including Cycle 11 (thrice-burn) through Cycle 12 (fresh fuel), and; (2) a core map to show those bundles experiencing the 0.1% boiling transition criterion for single-loop operation (SLO) and two-loop operation (TLO).
2. Core design is an iterative process designed to develop an optimal configuration that meets operational requirements. Please provide: (1) the details of a final core loading pattern as shown in Figure 1, including core design procedures, guidelines, criteria, and approved methodologies used for this Cycle 12 analysis; and (2) a description of the core design process used for Cycle 12, including the Quality Assurance and Quality Control procedures to assure that the final design meets the SLMCPR limits for the fuel used in the core.
3. The NRC staff considers GNF2 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. All of these topical reports are referenced in the application. Given that LGS, Unit 2, Cycle 12 uses a core loading pattern which includes GNF2 fuel, please provide the following: (1) an evaluation of the four restrictions in NEDC-32601P, NEDC-32694 and Amendment 25 to NEDE-24011-P-A; (2) a description that explains under what conditions the methodologies listed in Section 1.0 of the LAR, Attachment 4<sup>1</sup> are applied to the LGS, Unit 2, Cycle 12 analysis; (3) the reason why GNF2 has much higher critical power uncertainty than that of GE14 as shown in Table 6 of Attachment 4; and (4) a clarification for the statement "no new GNF fuel designs are being introduced in Limerick [Unit] 2 Cycle 12" in Section 2.5 of the LAR, Attachment 4.

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<sup>1</sup> Attachment 4 to the LAR dated December 15, 2010, is a proprietary document titled, "GNF Additional Information Regarding the Requested Changes to the Technical Specification SLMCPR, Limerick 2 Cycle 12." A non-proprietary version of this document can be found as Attachment 5 to the LAR dated December 15, 2010, same title (ADAMS Accession No. ML103500180).

Enclosure

4. Please provide an approximation of the correlation for MCPR Importance Parameter (MIP) and R-Factor Importance Parameter (RIP), including applicable fuel-related coefficients and constants, leading to the results of "TLO SLMCPR Estimate using the MIPRIP Correlation," shown in Table 3.
5. In Section 2.1 "Major Contributors to SLMCPR Changes," it states that "Table 3 presents estimated impacts on the TLO SLMCPR due to methodology deviations, penalties, and/or uncertainty deviations from approved values." Please provide: (1) calculation details and justification that the results listed in Table 3 are conservative related to "methodology deviations, penalties, and/or uncertainty deviations from approved values;" and (2) justification that all affected factors, including any fuel-related issues under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21, are included in Table 3.
6. Please identify how many of the 10x10 (GE14, GNF2) data points shown in new Figure 5 reflect GNF2 data, because new Figure 5 only shows combined data points for GE14 and GNF2.
7. Is the LGS, Unit 2, Cycle 12 operation with GNF2 fuel impacted by the bent spacer wing operating experience (see 10 CFR Part 21 report number 2010-19-00, ADAMS Accession No. ML101370065)? If so, please identify the impacts of such operation on fuel thermal performance and evaluation.
8. Please provide an updated version of the power/flow map for Cycle 12 operation including stability Option III features of the scram region and controlled entry region.

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Sincerely,

/ra/

Peter Bamford, Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-353

Enclosure: As stated

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ADAMS Accession Number: ML110340173

\* via email \*\*via memo

OFFICE	LPLI-2/PM	LPLI-2/LA	SBPB/BC	LPL1-2/BC
NAME	PBamford	ABaxter *	AUises**	HChernoff
DATE	02/04/2011	2/4/11	02/04/2011	02/04/2011

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