



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

June 25, 2010

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

SUBJECT: LIMERICK GENERATING STATION, UNIT NOS. 1 AND 2 - REQUEST FOR
ADDITIONAL INFORMATION REGARDING MEASUREMENT UNCERTAINTY
RECAPTURE POWER UPRATE (TAC NOS. ME3589 AND ME3590)

Dear Mr. Pacilio:

By letter dated March 25, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML100850380), Exelon Generation Company, LLC (Exelon) submitted a license amendment request (LAR) proposing to revise the operating license and technical specifications for Limerick Generating Station (LGS), Units 1 and 2. This LAR proposes to implement an increase of approximately 1.65% in rated thermal power from the current licensed thermal power limit of 3458 megawatts thermal.

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 June 7, 2010, to Mr. Kevin Borton, 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 June 14, 2010. It was agreed that a response to this RAI would be submitted by July 23, 2010.

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

Sincerely,

A handwritten signature in cursive script that reads "Peter Bamford".

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

Docket Nos. 50-352 and 50-353

Enclosure:
As stated

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION
LIMERICK GENERATING STATION, UNITS 1 AND 2
MEASUREMENT UNCERTAINTY RECAPTURE
POWER UPRATE REQUEST
DOCKET NOS. 50-352 AND 50-353

By letter dated March 25, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML100850380), Exelon Generation Company, LLC (Exelon) submitted a license amendment request (LAR) proposing to revise the operating license and technical specifications for Limerick Generating Station (LGS), Units 1 and 2. This LAR proposes to implement an increase of approximately 1.65% in rated thermal power from the current licensed thermal power limit of 3458 megawatts thermal. The increase would be based on the improved thermal power measurement accuracy, which would be achieved through the utilization of the Cameron International (formerly Caldon) CheckPlus™ leading edge flowmeter (LEFM) ultrasonic flow measurement instrumentation. The Nuclear Regulatory Commission (NRC) staff has been reviewing the submittal and has determined that additional information is needed to complete its review.

- (1) Attachment 1 to the application letter dated March 25, 2010, states that the scope and content of the evaluations performed and described in the LAR are consistent with the guidance of NRC Regulatory Issue Summary (RIS) 2002-03, "Guidance on the Content of Measurement Uncertainty Recapture Power Uprate Applications." RIS 2002-03, Attachment I, Section I, Item D.1 asks licensees to discuss maintenance and calibration procedures for the LEFM CheckPlus™ system. Please provide a brief discussion regarding how the LEFM CheckPlus™ will be incorporated into the LGS preventive maintenance program.
- (2) RIS 2002-03, Attachment I, Section I, Item F asks that licensees provide information related to calibration and maintenance procedures that affect the power calorimetric calculation. Please provide a brief discussion related to how LGS will control the hardware and software configuration of the Cameron LEFM CheckPlus™ equipment.
- (3) A 72-hour Allowable Outage Time (AOT) has been requested for LGS, Units 1 and 2, to remain above the current licensed thermal power (i.e., 3458 MWt) up to the requested uprated power (i.e., 3515 MWt) in the event that the Cameron LEFM CheckPlus™ is declared non-operational. In support of this request, please provide information on the following:
 - a. Please provide a description of what level of degradation or system alert would render the Cameron LEFM CheckPlus™ to be declared non-operational at LGS, Units 1 and 2.

Enclosure

- b. If the power level is below the current licensed thermal power at the time the Cameron LEFM CheckPlus™ is declared non-operational or if the power level drops below the current licensed thermal power during the AOT, will power be raised above the current licensed thermal power prior to the Cameron LEFM CheckPlus™ becoming operational? If so, please provide justification. If not, please identify how these scenarios would be operationally controlled.
 - c. Has there been any recent evidence of feedwater nozzle fouling at either LGS unit?
 - d. Are there plant-specific feedwater flow nozzle measurement drift data for the LGS units? If so, is this data consistent with the measurement drift errors cited from Caldon Topical Report ER-80P, "Improving Thermal Power Accuracy and Plant Safety While Increasing Operating Power Level Using the LEFM \sqrt{TM} System," Rev. 0, dated March 1997¹?
- (4) The LAR, Attachment 1, Section 3.4.4 states that the LGS setpoint methodology, as documented in CC-MA-103-2001, is "consistent" with NEDC-31336P-A, "General Electric Instrument Setpoint Methodology," dated September 1996². Has CC-MA-103-2001 been previously reviewed by the NRC? If so, please provide a reference for that review. If not, please summarize the technical differences and deviations (if any) between CC-MA-103-2001 and NEDC-31336P-A.
- (5) In LAR Attachment 11 (LE-0113, Rev 0), page 63, a 0.347% total reactor core thermal power uncertainty is calculated. Applying the 0.347% thermal power uncertainty to the proposed 3515 MWt licensed power level results in a maximum possible power level of 3527.197 MWt. This exceeds 102% of the current licensed thermal power level (3458 * 1.02 = 3527.16 MWt) by a small amount. Please confirm that the new maximum possible power level, with uncertainties included, would remain bounded by the plant safety analyses, and provide the necessary documentation to support that conclusion.
- (6) In LAR Attachment 1, Section 3.2.3 points to Attachment 11 for the thermal power uncertainty calculation. However, Attachment 11 (LE-0113, Rev 0) only identifies itself as applicable to Unit 1. Given the equivalent mass flow rate uncertainties provided for both units, are there any plant-specific features of Unit 2 that would result in a different total thermal power uncertainty calculation? Is it intended that the calculation in Attachment 11 be applicable to both Limerick units?

NRC Note Relating to RAI 5:

In LAR Attachment 11, Section 8.0, page 64 - containing the Reactor Core Thermal Power Uncertainty Calculation – the statement is made that "the Core Thermal Power (CTP) uncertainty

¹ A non-proprietary version of Caldon Topical Report ER-80P, designated as Caldon Topical Report ER-80, with the same title, can be found at ADAMS Accession No. 9703120207.

² A non-proprietary version of General Electric Topical Report NEDC-31336P-A, designated as General Electrical Topical Report NEDO-31336-A, with the same title, can be found at ADAMS Accession No. ML073450560.

of 0.347% allows the original 2% margin to be reduced to 1.653% ($2\% - 0.347\% = 1.653\%$), which is conservatively rounded down to 1.65%.” The statement is repeated in LAR Attachment 1, Section 3.1, page 6. This statement is not entirely accurate and may be misleading to future users of LE-0113. The percentages in this calculation cannot be added to reconstitute the original 2% uncertainty, because the new 0.347% uncertainty is applied to the new uprated power value, not the current licensed thermal power. To be more specific, $100\% * 1.01653 * 1.00347 = 102.006\%$. The requested uprate (i.e., 3458 MWt to 3515 MWt) is a 1.648% increase (i.e., approximately 1.65% as stated in the LAR). The licensee should consider updating LE-0113 to eliminate the statement that 1.653% would be an acceptable increase for the uprated power limit.

June 25, 2010

Mr. Michael J. Pacilio
President and Chief Nuclear Officer
Exelon Nuclear
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Please contact me at 301-415-2833, if you have any questions.

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

Docket Nos. 50-352 and 50-353
Enclosure: As stated
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ADAMS Accession Number: ML101580338

* concurrence via memo

OFFICE	LPLI-2/PM	LPLI-2/LA	EICB/BC	LPL1-2/BC
NAME	PBamford	ABaxter	WKemper*	HChernoff
DATE	6/15/2010	6/15/2010	05/24/2010	6/25/2010

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