Exelon Nuclear
200 Exelon Way
Kennett Square, PA 19348

www.exeloncorp.com

Exelon SM
Nuclear

10 CFR 50.90

November 21, 2002

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

Limerick Generating Station, Unit 2
Facility Operating License No. NPF-85
NRC Docket No. 50-353

SUBJECT: License Amendment Request 02-00643
Safety Limit Minimum Critical Power Ratio (SLMCPR) Change

Dear Sir/Madam:

Pursuant to 10 CFR 50.90 Exelon Generation Company, LLC (Exelon), hereby requests the following amendment to the Technical Specifications (TS), Appendix A of Operating License No. NPF-85 for Limerick Generating Station (LGS), Unit 2. This proposed change will revise Technical Specification (TS) Section 2.1. This Section will be revised to incorporate revised Safety Limit Minimum Critical Power Ratios (SLMCPRs) due to the cycle specific analysis performed by Global Nuclear Fuel for LGS, Unit 2, Cycle 8, which will include the use of the GE-14 fuel product line. This information is being submitted under unsworn declaration.

Information supporting this License Amendment Request is contained in Attachment 1 to this letter, and the proposed marked up TS pages and final TS pages are contained in Attachments 2 and 3, respectively. Attachment 4 (letter from T. G. Orr (Global Nuclear Fuel) to K. Donovan (Exelon Generation Company, LLC), dated October 2, 2002) specifies the new SLMCPRs for LGS, Unit 2. Attachment 4 contains information proprietary to Global Nuclear Fuel. Global Nuclear Fuel requests that the document be withheld from public disclosure in accordance with 10 CFR 2.790(a)(4). An affidavit supporting this request is also contained in Attachment 4. Attachment 5 contains a non-proprietary version of the Global Nuclear Fuel document.

In order to support the upcoming refueling outage at LGS, Unit 2, Exelon requests approval of the proposed amendment by February 24, 2003.

Once approved, this amendment shall be implemented within 30 days of issuance.

Additionally, there are no commitments contained within this letter.

A001

A copy of this License Amendment Request, including the reasoned analysis about a no significant hazards consideration, is being provided to the appropriate Pennsylvania State official in accordance with the requirements of 10 CFR 50.91(b)(1).

If you have any questions or require additional information, please contact Dave Helker at (610) 765-5525.

I declare under penalty of perjury that the foregoing is true and correct.

Respectfully,

11-21-02
Executed on

Michael P. Gallagher
Director, Licensing and Regulatory Affairs
Mid Atlantic Regional Operating Group

Attachments: 1-Licensee's Evaluation
2-Markup of Technical Specification Pages
3-Camera Ready Technical Specification Pages
4-Proprietary Global Nuclear Fuels Letter
5-Non-proprietary Version of Global Nuclear Fuels Letter

cc: H. J. Miller, Administrator, Region I, USNRC
A. L. Burritt, USNRC Senior Resident Inspector, LGS
S. Wall, Project Manager, USNRC
R. R. Janati, Commonwealth of Pennsylvania

ATTACHMENT 1

LIMERICK GENERATING STATION
UNIT 2

DOCKET NO. 50-353

LICENSE NO. NPF-85

LICENSE AMENDMENT REQUEST 02-00643

"Revision of SLMCPRs"

ATTACHMENT 1 CONTENTS

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1.0 Introduction

Exelon Generation Company, LLC, Licensee under Facility Operating License No. NPF-85 for Limerick Generating Station (LGS), Unit 2, requests that the Technical Specifications (TS) contained in Appendix A to the Operating License be amended to revise TS 2.1 to reflect a change in the Safety Limit Minimum Critical Power Ratios (SLMCPRs) due to the cycle specific analysis performed by Global Nuclear Fuel for LGS, Unit 2, Cycle 8, which includes the use of the GE-14 fuel product line. The marked up Technical Specification pages and final Technical Specification pages are contained in Attachments 2 and 3, respectively. Also included in Attachments 2 and 3 are the associated Bases changes, which are being supplied to you for your information. Attachment 4 (letter from T. G. Orr (Global Nuclear Fuel) to K. Donovan (Exelon Generation Company, LLC), dated October 2, 2002) specifies the new SLMCPRs for LGS, Unit 2, Cycle 8.

2.0 Description and Background of the Proposed Change

The proposed change involves revising the Safety Limit Minimum Critical Power Ratio (SLMCPR) values contained in TS 2.1 for two recirculation loop operation and single recirculation loop operation. The SLMCPR values are being revised for LGS, Unit 2 based on the reload core design for Cycle 8, which will use the second reload of the GE-14 fuel product line. GE-14 fuel has previously been loaded at the Limerick Generating Station in Unit 2 for Cycle 7. The SLMCPRs have been determined in accordance with NRC approved methodology described in "General Electric Standard Application for Reactor Fuel," NEDE-24011-P-A-14 (GESTAR-II), and U. S. Supplement, NEDE-24011-P-A-14-US, June, 2000, which incorporates Amendment 25. Amendment 25 provides the methodology for determining the cycle specific MCPR safety limits that replace the former generic fuel type dependent values. Amendment 25 is used for determining the upcoming Cycle 8 SLMCPRs. Future SLMCPRs determined in accordance with Amendment 25 will not need prior NRC approval for each cycle unless the value changes. The NRC safety evaluation approving Amendment 25 is contained in a letter from the NRC to General Electric Company, dated March 11, 1999 (F. Akstulewicz (NRC) to G. A. Watford (GE), "Acceptance for Referencing of Licensing Topical Reports NEDC-32601P, *Methodology and Uncertainties for Safety Limit MCPR Evaluations;* NEDC-32694P, *Power Distribution Uncertainties for Safety Limit MCPR Evaluation;* and Amendment 25 to NEDE-24011-P-A on Cycle Specific Safety Limit MCPR," (TAC Nos. M97490, M99069 and M97491)). The SLMCPRs have been calculated using power distribution uncertainties from the revised methodology of NEDC-32601P-A as shown in Table 2 of Attachment 4.

Global Nuclear Fuel has designed GE-14 fuel to be in compliance with Amendment 22 incorporated in "General Electric Standard Application for Reactor Fuel," NEDE-24011-P-A-14 (GESTAR-II), and U. S. Supplement, NEDE-24011-P-A-14-US, June, 2000. Amendment 22 was the basis for compliance for GE-13, which is currently installed at LGS, Units 1 and 2.

3.0 Technical Analysis

The proposed TS change will revise TS 2.1 to reflect the changes in the cycle specific analysis performed by Global Nuclear Fuel for LGS, Unit 2, Cycle 8, which includes the use of the GE-14 fuel product line.

The new SLMCPRs are calculated using NRC approved methodology described in "General Electric Standard Application for Reactor Fuel," NEDE-24011-P-A-14 (GESTAR-II), and U.S. Supplement, NEDE-24011-P-A-14-US, June, 2000, which incorporates Amendment 25. Amendment 25 is used for determining the upcoming Cycle 8 SLMCPRs. Future SLMCPRs determined in accordance with Amendment 25 will not need prior NRC approval for each cycle unless a value changes. The NRC safety evaluation approving Amendment 25 is contained in a letter from the NRC to General Electric Company, dated March 11, 1999.

Global Nuclear Fuel has designed GE-14 fuel to be in compliance with Amendment 22 to "General Electric Standard Application for Reactor Fuel," NEDE-24011-P-A-14 (GESTAR-II), and U. S. Supplement, NEDE-24011-P-A-14-US, June, 2000. Amendment 22 was the basis for compliance for GE-13.

The SLMCPR analysis establishes SLMCPR values that will ensure that greater than 99.9% of all fuel rods in the core avoid transition boiling if the limit is not violated. The SLMCPRs are calculated to include cycle specific parameters which include: 1) the actual core loading, 2) conservative variations of projected control blade patterns, 3) the actual bundle parameters (e.g., local peaking), and 4) the full cycle exposure range. The new SLMCPRs at LGS, Unit 2, Cycle 8 are 1.07 (two-loop operation) and 1.09 (single-loop operation) as shown in Attachment 4. Additional information regarding the 1.07 and 1.09 cycle specific SLMCPRs for LGS, Unit 2 Cycle 8 are contained in the Attachment 4 letter.

4.0 Information Supporting a Finding of No Significant Hazards

We have concluded that the proposed change to the LGS, Unit 2 Technical Specifications (TS), which will revise TS 2.1, does not involve a Significant Hazards Consideration. In support of this determination, an evaluation of each of the three (3) standards set forth in 10 CFR 50.92(c) is provided below.

1. The proposed TS change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The derivation of the cycle specific Safety Limit Minimum Critical Power Ratios (SLMCPRs) for incorporation into the Technical Specifications (TS), and their use to determine cycle specific thermal limits, has been performed using the methodology discussed in "General Electric Standard Application for Reactor Fuel," NEDE-24011-P-A-14 (GESTAR-II), and U.S. Supplement, NEDE-24011-P-A-14-US, June, 2000, which incorporates Amendment 25. Amendment 25 was approved by the NRC in a March 11, 1999 safety evaluation report.

   The basis of the SLMCPR calculation is to ensure that greater than 99.9% of all fuel rods in the core avoid transition boiling if the limit is not violated. The new SLMCPRs preserve the existing margin to transition boiling. The GE-14 fuel is in compliance with Amendment 22 to "General Electric Standard Application for Reactor Fuel," NEDE-24011-P-A-14 (GESTAR-II), and U. S. Supplement, NEDE-24011-P-A-14-US, June, 2000, which provides the fuel licensing acceptance criteria. The probability of fuel damage will not be increased as a result of this change. Therefore, the proposed TS change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. The proposed TS change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

   The SLMCPR is a TS numerical value, calculated to ensure that transition boiling does not occur in 99.9% of all fuel rods in the core if the limit is not violated. The new SLMCPRs are calculated using NRC approved methodology discussed in "General Electric Standard Application for Reactor Fuel," NEDE-24011-P-A-14 (GESTAR-II), and U.S. Supplement, NEDE-24011-P-A-14-US, June, 2000, which incorporates Amendment 25. Additionally, the GE-14 fuel is in compliance with Amendment 22 to "General Electric Standard Application for Reactor Fuel," NEDE-24011-P-A-14 (GESTAR-II), and U. S. Supplement, NEDE-24011-P-A-14-US, June, 2000, which provides the fuel licensing acceptance criteria. The SLMCPR is not an accident initiator, and its revision will not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed TS change does not involve a significant reduction in a margin of safety.

   There is no significant reduction in the margin of safety previously approved by the NRC as a result of the proposed change to the SLMCPRs, which includes the use of GE-14 fuel. The new SLMCPRs are calculated using methodology discussed in "General Electric Standard Application for Reactor Fuel," NEDE-24011-P-A-14 (GESTAR-II), and U.S. Supplement, NEDE-24011-P-A-14-US, June, 2000, which incorporates Amendment 25. The SLMCPRs ensure that greater than 99.9% of all fuel rods in the core will avoid transition boiling if the limit is not violated when all uncertainties are considered, thereby preserving the fuel cladding integrity. Therefore, the proposed TS change will not involve a significant reduction in the margin of safety previously approved by the NRC.

Based on the above, Exelon Generation Company, LLC, concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

5.0 Information Supporting an Environmental Assessment

An environmental assessment is not required for the proposed change to the SLMCPR limits since the proposed change conforms to the criteria for "actions eligible for categorical exclusion" as specified in 10 CFR 51.22(c)(9). The proposed change will have no impact on the environment. The proposed change does not involve a significant hazards consideration as discussed in the preceding section. The proposed change does not involve a significant change in the types or significant increase in the amounts of any effluents that may be released offsite. In addition, the proposed change does not involve a significant increase in individual or cumulative occupational radiation exposure.

6.0 Precedence

In a letter dated February 1, 2001 (letter from J. A. Hutton (Exelon Generation Company, LLC) to U. S. Nuclear Regulatory Commission), Exelon Generation Company, LLC, submitted Technical Specifications Change Request No. 01-03-2 for Limerick Generating Station, Unit 2. This submittal incorporated the revised dual- and single-loop SLMCPR values into the Technical Specifications for LGS, Unit 2 Cycle 7 in a similar manner that this submittal is

requesting to incorporate the revised values for SLMCPR in the Technical Specifications for LGS, Unit 2 Cycle 8. This Technical Specifications Change Request was approved in a Safety Evaluation Report dated April 12, 2001 (letter from C. Gratton (U. S. Nuclear Regulatory Commission) to O. D. Kingsley (Exelon Generation Company, LLC)). The revised SLMCPR values for LGS, Unit 2 Cycle 8 were calculated using the methodology discussed in "General Electric Standard Application for Reactor Fuel," NEDE-24011-P-A-14 (GESTAR-II), and U.S. Supplement, NEDE-24011-P-A-US, June, 2000, as were the SLMCPR values for LGS, Unit 2 Cycle 7.

ATTACHMENT 2

LIMERICK GENERATING STATION
UNIT 2

DOCKET NO. 50-353

LICENSE NO. NPF-85

LICENSE AMENDMENT REQUEST 02-00643

"Revision of SLMCPRs"

MARKED UP TECHNICAL SPECIFICATION PAGES

UNIT 2

Page 2-1
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2.0 SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS

2.1 SAFETY LIMITS

THERMAL POWER, Low Pressure or Low Flow

2.1.1 THERMAL POWER shall not exceed 25% of RATED THERMAL POWER with the reactor vessel steam dome pressure less than 785 psig or core flow less than 10% of rated flow.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2.

ACTION:

With THERMAL POWER exceeding 25% of RATED THERMAL POWER and the reactor vessel steam dome pressure less than 785 psig or core flow less than 10% of rated flow, be in at least HOT SHUTDOWN within 2 hours and comply with the requirements of Specification 6.7.1.

THERMAL POWER, High Pressure and High Flow

2.1.2 The MINIMUM CRITICAL POWER RATIO (MCPR) shall not be less than ~~1.09~~ 1.07 for two recirculation loop operation and shall not be less than ~~1.11~~ 1.09 for single recirculation loop operation with the reactor vessel steam dome pressure greater than 785 psig and core flow greater than 10% of rated flow.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2.

ACTION:

With MCPR less than ~~1.09~~ 1.07 for two recirculation loop operation or less than ~~1.11~~ 1.09 for single recirculation loop operation and the reactor vessel steam dome pressure greater than 785 psig and core flow greater than 10% of rated flow, be in at least HOT SHUTDOWN within 2 hours and comply with the requirements of Specification 6.7.1.

REACTOR COOLANT SYSTEM PRESSURE

2.1.3 The reactor coolant system pressure, as measured in the reactor vessel steam dome, shall not exceed 1325 psig.

APPLICABILITY: OPERATION CONDITIONS 1, 2, 3, and 4.

ACTION:

With the reactor coolant system pressure, as measured in the reactor vessel steam dome, above 1325 psig, be in at least HOT SHUTDOWN with reactor coolant system pressure less than or equal to 1325 psig within 2 hours and comply with the requirements of Specification 6.7.1.

2.1 SAFETY LIMITS

BASES

2.0 INTRODUCTION

The fuel cladding, reactor pressure vessel and primary system piping are the principle barriers to the release of radioactive materials to the environs. Safety Limits are established to protect the integrity of these barriers during normal plant operations and anticipated transients. The fuel cladding integrity Safety Limit is set such that no fuel damage is calculated to occur if the limit is not violated. Because fuel damage is not directly observable, a step-back approach is used to establish a Safety Limit such that the MCPR is not less than ~~1.09~~ 1.07 for two recirculation loop operation and ~~1.11~~ 1.09 for single recirculation loop operation. MCPR greater than ~~1.09~~ 1.07 for two recirculation loop operation and ~~1.11~~ 1.09 for single recirculation loop operation represents a conservative margin relative to the conditions required to maintain fuel cladding integrity. The fuel cladding is one of the physical barriers which separate the radioactive materials from the environs. The integrity of this cladding barrier is related to its relative freedom from perforations or cracking. Although some corrosion or use related cracking may occur during the life of the cladding, fission product migration from this source is incrementally cumulative and continuously measurable. Fuel cladding perforations, however, can result from thermal stresses which occur from reactor operation significantly above design conditions and the Limiting Safety System Settings. While fission product migration from cladding perforation is just as measurable as that from use related cracking, the thermally caused cladding perforations signal a threshold beyond which still greater thermal stresses may cause gross rather than incremental cladding deterioration. Therefore, the fuel cladding Safety Limit is defined with a margin to the conditions which would produce onset of transition boiling, MCPR of 1.0. These conditions represent a significant departure from the condition intended by design for planned operation.

2.1.1 THERMAL POWER, Low Pressure or Low Flow

The use of the (GEXL) correlation is not valid for all critical power calculations at pressures below 785 psig or core flows less than 10% of rated flow. Therefore, the fuel cladding integrity Safety Limit is established by other means. This is done by establishing a limiting condition on core THERMAL POWER with the following basis. Since the pressure drop in the bypass region is essentially all elevation head, the core pressure drop at low power and flows will always be greater than 4.5 psi. Analyses show that with a bundle flow of 28 x 10^3 lb/hr, bundle pressure drop is nearly independent of bundle power and has a value of 3.5 psi. Thus, the bundle flow with a 4.5 psi driving head will be greater than 28 x 10^3 lb/hr. Full scale ATLAS test data taken at pressures from 14.7 psia to 800 psia indicate that the fuel assembly critical power at this flow is approximately 3.35 MWt. With the design peaking factors, this corresponds to a THERMAL POWER of more than 50% of RATED THERMAL POWER. Thus, a THERMAL POWER limit of 25% of RATED THERMAL POWER for reactor pressure below 785 psig is conservative.

ATTACHMENT 3

LIMERICK GENERATING STATION
UNIT 2

DOCKET NO. 50-353

LICENSE NO. NPF-85

LICENSE AMENDMENT REQUEST 02-00643

"Revision of SLMCPRs"

CAMERA-READY TECHNICAL SPECIFICATION PAGES

UNIT 2

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2.0 SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS

2.1 SAFETY LIMITS

THERMAL POWER, Low Pressure or Low Flow

2.1.1 THERMAL POWER shall not exceed 25% of RATED THERMAL POWER with the reactor vessel steam dome pressure less than 785 psig or core flow less than 10% of rated flow.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2.

ACTION:

With THERMAL POWER exceeding 25% of RATED THERMAL POWER and the reactor vessel steam dome pressure less than 785 psig or core flow less than 10% of rated flow, be in at least HOT SHUTDOWN within 2 hours and comply with the requirements of Specification 6.7.1.

THERMAL POWER, High Pressure and High Flow

2.1.2 The MINIMUM CRITICAL POWER RATIO (MCPR) shall not be less than 1.07 for two recirculation loop operation and shall not be less than 1.09 for single recirculation loop operation with the reactor vessel steam dome pressure greater than 785 psig and core flow greater than 10% of rated flow.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2.

ACTION:

With MCPR less than 1.07 for two recirculation loop operation or less than 1.09 for single recirculation loop operation and the reactor vessel steam dome pressure greater than 785 psig and core flow greater than 10% of rated flow, be in at least HOT SHUTDOWN within 2 hours and comply with the requirements of Specification 6.7.1.

REACTOR COOLANT SYSTEM PRESSURE

2.1.3 The reactor coolant system pressure, as measured in the reactor vessel steam dome, shall not exceed 1325 psig.

APPLICABILITY: OPERATION CONDITIONS 1, 2, 3, and 4.

ACTION:

With the reactor coolant system pressure, as measured in the reactor vessel steam dome, above 1325 psig, be in at least HOT SHUTDOWN with reactor coolant system pressure less than or equal to 1325 psig within 2 hours and comply with the requirements of Specification 6.7.1.

2.0 INTRODUCTION

The fuel cladding, reactor pressure vessel and primary system piping are the principle barriers to the release of radioactive materials to the environs. Safety Limits are established to protect the integrity of these barriers during normal plant operations and anticipated transients. The fuel cladding integrity Safety Limit is set such that no fuel damage is calculated to occur if the limit is not violated. Because fuel damage is not directly observable, a step-back approach is used to establish a Safety Limit such that the MCPR is not less than 1.07 for two recirculation loop operation and 1.09 for single recirculation loop operation. MCPR greater than 1.07 for two recirculation loop operation and 1.09 for single recirculation loop operation represents a conservative margin relative to the conditions required to maintain fuel cladding integrity. The fuel cladding is one of the physical barriers which separate the radioactive materials from the environs. The integrity of this cladding barrier is related to its relative freedom from perforations or cracking. Although some corrosion or use related cracking may occur during the life of the cladding, fission product migration from this source is incrementally cumulative and continuously measurable. Fuel cladding perforations, however, can result from thermal stresses which occur from reactor operation significantly above design conditions and the Limiting Safety System Settings. While fission product migration from cladding perforation is just as measurable as that from use related cracking, the thermally caused cladding perforations signal a threshold beyond which still greater thermal stresses may cause gross rather than incremental cladding deterioration. Therefore, the fuel cladding Safety Limit is defined with a margin to the conditions which would produce onset of transition boiling, MCPR of 1.0. These conditions represent a significant departure from the condition intended by design for planned operation.

2.1.1 THERMAL POWER, Low Pressure or Low Flow

The use of the (GEXL) correlation is not valid for all critical power calculations at pressures below 785 psig or core flows less than 10% of rated flow. Therefore, the fuel cladding integrity Safety Limit is established by other means. This is done by establishing a limiting condition on core THERMAL POWER with the following basis. Since the pressure drop in the bypass region is essentially all elevation head, the core pressure drop at low power and flows will always be greater than 4.5 psi. Analyses show that with a bundle flow of 28 x 10^3 lb/hr, bundle pressure drop is nearly independent of bundle power and has a value of 3.5 psi. Thus, the bundle flow with a 4.5 psi driving head will be greater than 28 x 10^3 lb/hr. Full scale ATLAS test data taken at pressures from 14.7 psia to 800 psia indicate that the fuel assembly critical power at this flow is approximately 3.35 MWt. With the design peaking factors, this corresponds to a THERMAL POWER of more than 50% of RATED THERMAL POWER. Thus, a THERMAL POWER limit of 25% of RATED THERMAL POWER for reactor pressure below 785 psig is conservative.

ATTACHMENT 4

LIMERICK GENERATING STATION
UNIT 2

DOCKET NO. 50-353

LICENSE NO. NPF-85

LICENSE AMENDMENT REQUEST 02-00643

Letter from T. G. Orr (Global Nuclear Fuel) to K. Donovan (Exelon Generation Company, LLC),
Dated October 2, 2002

PROPRIETARY VERSION

Global Nuclear Fuel

Tammy G. Orr
Exelon Account Leader

A Joint Venture of GE, Toshiba, & Hitachi
Global Nuclear Fuel – Americas, LLC
Castle Hayne Road, Wilmington, NC 28401
(910) 675-5752, Fax (910) 362-5752
Tammy Orr@gnf com

October 2, 2002
TGO:02-025

Kevin Donovan
Nuclear Fuel Services
Exelon Nuclear

REFERENCE: "Additional Information Regarding the Cycle Specific SLMCPR for Limerick Unit 2 Cycle 8", prepared by Anghel Enica and verified by Jim Fawks, dated September 27, 2002.

SUBJECT: **Limerick Unit 2 Cycle 8 Safety Limit MCPR**

Dear Kevin:

GNF proposes that the Limerick Unit 2 Cycle 8 SLMCPR use the bounding values of 1.07 for dual loop operation and 1.09 for single loop operation as provided in the referenced attachment. These results are based on Monte Carlo calculations done at beginning of cycle, middle of cycle and near end of rated condition.

Enclosed for your information and use is the referenced additional information regarding the Limerick Unit 2 Cycle 8 cycle specific SLMCPR. Please note that the referenced attachment contains Global Nuclear Fuel Proprietary Information contained within the double brackets and should be handled in accordance with the proprietary information provisions contained in the Fuel Contract. An affidavit has been prepared and is included to support submittal to the NRC.

In addition, a non-proprietary version is also included.

If you have any questions regarding this information, please contact myself or Anghel Enica at (910) 675-5772.

Very truly yours,

Tammy G. Orr
Exelon Account Leader

Affidavit

I, Glen A. Watford, state as follows:

(1) I am Manager, Fuel Engineering Services, Global Nuclear Fuel – Americas, L.L.C. ("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 the attachment, "Additional Information Regarding the Cycle Specific SLMCPR for Limerick Unit 2 Cycle 8," September 27, 2002.

(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 2.790(a)(4) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information," and some portions 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 cost or price information, production capacities, budget levels, or commercial strategies of GNF-A, its customers, or its suppliers;

d. Information which reveals aspects of past, present, or future GNF-A customer–funded development plans and programs, of potential commercial value to GNF-A;

e. 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) 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. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in (6) and (7) following. 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.

(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 the methods used in these analyses, along with the testing, development and approval of the supporting methodology was achieved at a significant cost, on the order of several million dollars, to GNF-A or its licensor.

(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 fuel design and licensing methodology 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 or its licensor.

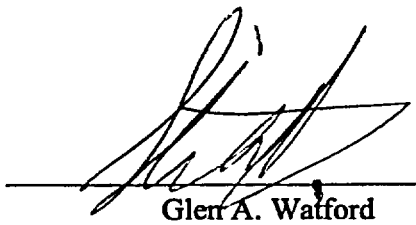
The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

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 at Wilmington, North Carolina, this 2nd day of October, 2002.



Glen A. Watford
Global Nuclear Fuel – Americas, LLC

ATTACHMENT 5

LIMERICK GENERATING STATION
UNIT 2

Docket No. 50-353

License No. NPF-85

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NON-PROPRIETARY VERSION

Attachment **Additional Information Regarding the Cycle Specific SLMCPR for Limerick Unit 2 Cycle 8** **September 27, 2002**

References

[1] Letter, Frank Akstulewicz (NRC) to Glen A. Watford (GE), "Acceptance for Referencing of Licensing Topical Reports NEDC-32601P, *Methodology and Uncertainties for Safety Limit MCPR Evaluations*; NEDC-32694P, *Power Distribution Uncertainties for Safety Limit MCPR Evaluation*; and Amendment 25 to NEDE-24011-P-A on Cycle Specific Safety Limit MCPR," (TAC Nos. M97490, M99069 and M97491), March 11, 1999.

[2] Letter, Thomas H. Essig (NRC) to Glen A. Watford (GE), "Acceptance for Referencing of Licensing Topical Report NEDC-32505P, Revision 1, *R-Factor Calculation Method for GE11, GE12 and GE13 Fuel*," (TAC No. M99070 and M95081), January 11, 1999.

[3] *General Electric BWR Thermal Analysis Basis (GETAB): Data, Correlation and Design Application*, NEDO-10958-A, January 1977.

[4] Letter, Glen A. Watford (GNF-A) to U. S. Nuclear Regulatory Commission Document Control Desk with attention to R. Pulsifer (NRC), "Confirmation of 10x10 Fuel Design Applicability to Improved SLMCPR, Power Distribution and R-Factor Methodologies", FLN-2001-016, September 24, 2001.

[5] Letter, Glen A. Watford (GNF-A) to U. S. Nuclear Regulatory Commission Document Control Desk with attention to J. Donoghue (NRC), "Confirmation of Applicability of the GEXL14 Correlation and Associated R-Factor Methodology for Calculating SLMCPR Values in Cores Containing GE14 Fuel", FLN-2001-017, October 1, 2001.

[6] Letter, Glen A. Watford (GNF-A) to U. S. Nuclear Regulatory Commission Document Control Desk with attention to J. Donoghue (NRC), "Final Presentation Material for GEXL Presentation – February 11, 2002", FLN-2002-004, February 12, 2002.

Comparison of Limerick Unit 2 SLMCPR Values for Cycles 7 and 8

Table 1 summarizes the relevant input parameters and results of the SLMCPR determination for the Limerick Unit 2 Cycle 7 and 8 cores. The SLMCPR evaluations were performed using NRC-approved methods and uncertainties[1], supplemented with Limerick Unit 2 specific uncertainties as indicated in Table 2. These calculations use the GEXL14 correlation for GE14 fuel and GEXL09 for the GE13 fuel. The GEXL14 bias and uncertainty values used in confirming the DLO and SLO SLMCPR values for Cycle 8 of Limerick Unit 2 are the higher values indicated on sheet 35 of the presentation materials attached to Reference [6]. The current SLMCPR uses the revised methodology documented in NEDC-32694P-A[1] whereas the previous cycle evaluation used the GETAB[3] methodology. The current evaluation yields lower SLMCPR values than those calculated previously primarily because the revised methodology eliminates the artificial correlating of the four bundles surrounding a TIP string that occur with the GETAB methodology. (See Section 4.3 of NEDC-32601P-A[1] for more detail). The quantities that have been shown to have some impact on the determination of the safety limit MCPR (SLMCPR) are provided.

In general, the calculated safety limit is dominated by two key parameters: (1) flatness of the core bundle-by-bundle MCPR distributions and (2) flatness of the bundle pin-by-pin power/R-factor distributions. Greater flatness in either parameter yields more rods susceptible to boiling transition and thus a higher calculated SLMCPR.

[[.]]

Pin-by-pin power distributions are characterized in terms of R-factors using the NRC approved methodology[2]. [[]]

Compared to cycle 7, [[]] results in 0.02 lower SLMCPR in Cycle 8 compared to Cycle 7.

Summary

[[]] have been used to compare quantities that impact the calculated SLMCPR value. The calculated 1.07 Monte Carlo SLMCPR for Limerick Unit 2 Cycle 8 is consistent with what one would expect [[.]]

Based on all of the facts, observations and arguments presented above, it is concluded that the calculated SLMCPR value of 1.07 for the Limerick Unit 2 Cycle 8 core is appropriate.

For single loop operations (SLO) the calculated safety limit MCPR for the limiting case is 1.09 as determined by specific calculations for Limerick Unit 2 Cycle 8.

Supporting Information

The following information is provided in response to NRC questions on similar submittals regarding changes in Technical Specification values of SLMCPR. NRC questions pertaining to how GE14 applications satisfy the conditions of the NRC SER[1] have been addressed in Reference [4]. Other generically applicable questions related to application of the GEXL14 correlation and the applicable range for the R-factor methodology are addressed in References [5] and [6]. Only those items that require a plant/cycle specific response are presented below since all the others are contained in the references that have already been provided to the NRC.

The core loading information for Limerick Unit 2 Cycles 7 and 8 are provided in Figures 1 and 2, respectively. The impact of the fuel loading pattern differences on the calculated SLMCPR is correlated to the values of [[.]]

The power and non-power distribution uncertainties that are used in the analyses are indicated in Table 2. The referenced document numbers have previously been reviewed and approved by the NRC.

Prepared by:

A. Enica
Technical Program Manager

Verified by:

J. E. Fawks
Technical Program Manager

Table 1

Comparison of the Limerick Unit 2 Cycles 7 and 8 SLMCPR Data

QUANTITY, DESCRIPTION	Limerick Unit 2 Cycle 7	Limerick Unit 2 Cycle 8
Number of Bundles in Core	764	764
Limiting Cycle Exposure Point	EOR	EOR
Cycle Exposure at Limiting Point [MWd/MTU]	13545	14500
Reload Fuel Type	GE14	GE14
Latest Reload Batch Fraction [%]	35.1%	36.6%
Latest Reload Average Batch Weight % Enrichment	4.03%	4.17%
Batch Fraction for GE14	35.1%	71.7%
Batch Fraction for GE13	52.9%	28.3%
Batch Fraction for GE6	12.0%	0.0%
Core Average Weight % Enrichment	3.85%	4.11%
Core MCPR (for limiting rod pattern)	1.34	1.39
[[		]]
[[		]]
Power distribution uncertainty	See Table 2, Column 1	See Table 2, Column 2
Non-power distribution uncertainty	See Table 2, Column 1	See Table 2, Column 2
Calculated Safety Limit MCPR	**1.09**	**1.07**

Table 2

Comparison of the Limerick Unit 2 Cycles 7 and 8 SLMCPRs

[[

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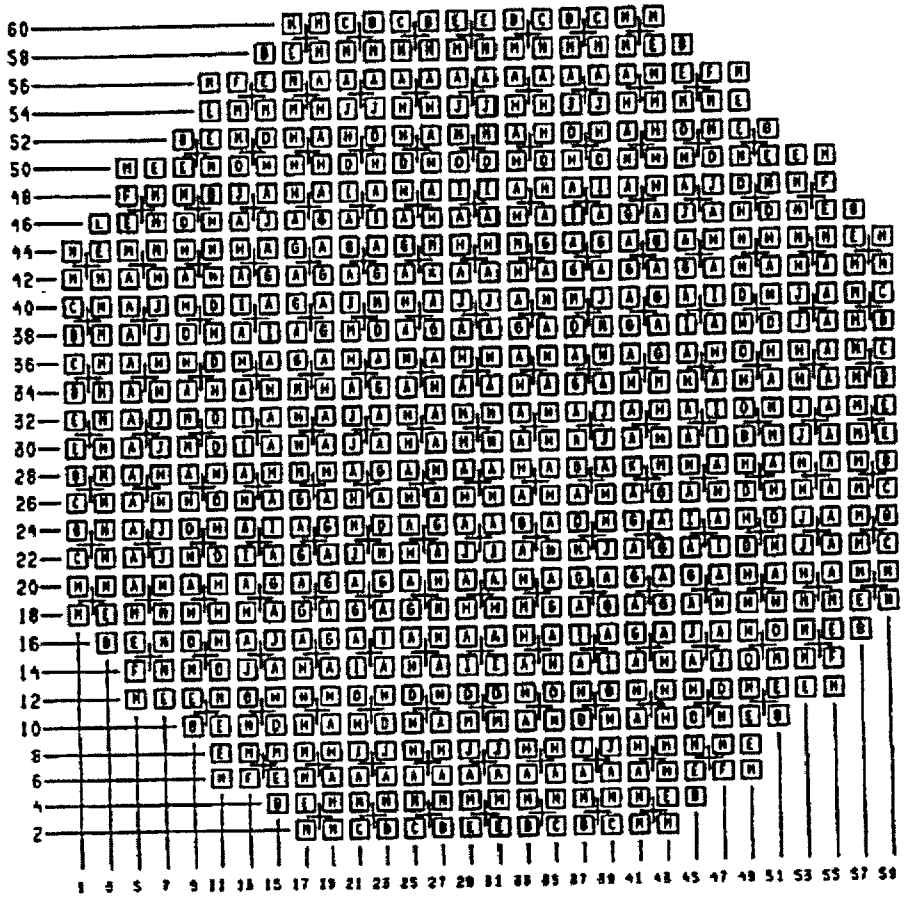
Figure 1

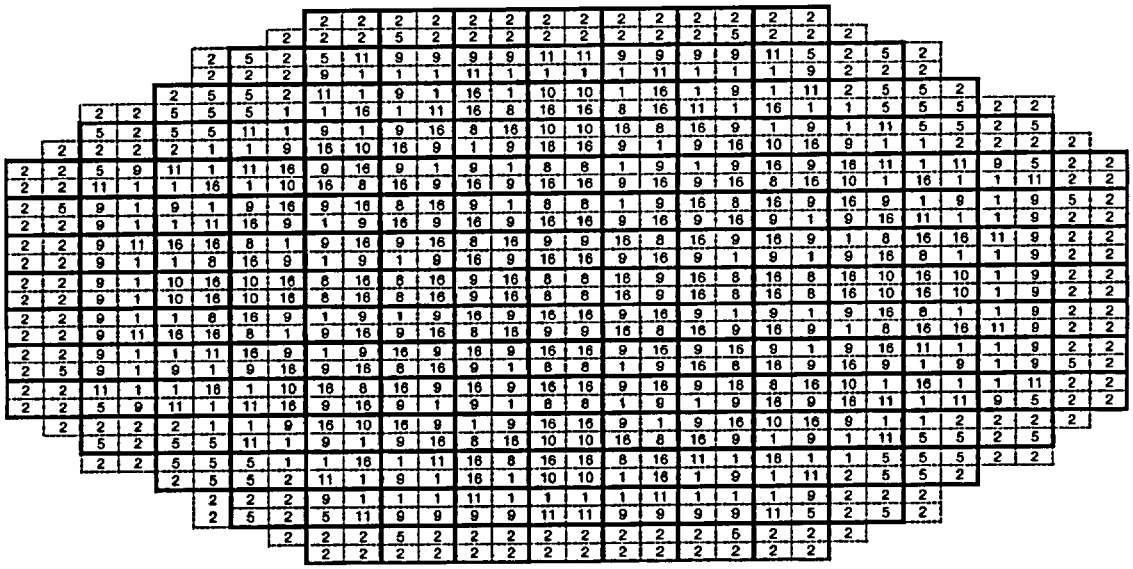
Reference Core Loading Pattern – Limerick 2 Cycle 7



FUEL TYPE	
A = GE13-P9CTB412-13GZ1-100T-146-T	H = GE14-P10CNAB403-16GZ-100T-150-T-2421
B = P8CIB219-4GZ-80M-150-T	I = GE14-P10CNAB403-16GZ-100T-150-T-2422
C = P8CIB176-4GZ-80M-150-T	J = GE14-P10CNAB403-16GZ-100T-150-T-2421
D = GE13-P9CTB412-13GZ2-100T-146-T	K = GE14-P10CNAB403-16GZ-80U4SR-150-T-4002
E = P8CIB219-4GZ-100M-150-T	L = P8CIB219-4GZ-80M-150-T
F = P8CIB176-4GZ-100M-150-T	M = GE13-P9CTB418-15GZ-100T-146-T
G = GE14-P10CNAB403-16GZ-100T-150-T-2422	

Figure 2

Reference Core Loading Pattern – Limerick 2 Cycle 8



Channel Number		BUNDLE NAME	Number in Core	Cycle Loaded
1		GE14-P10CNAB417-14GZ-100T-150-T6-2593	136	8
2		GE13-P9CTB412-13GZ1-100T-146-T6	164	6
5		GE13-P9CTB412-13GZ2-100T-146-T6	52	6
8		GE14-P10CNAB403-16GZ-100T-150-T6-3957	48	7
9		GE14-P10CNAB403-16GZ-100T-150-T6-3956	152	7
10		GE14-P10CNAB403-16GZ-100T-150-T6-3957	24	7
11		GE14-P10CNAB403-16GZ-100T-150-T6-3956	44	7
16		GE14-P10CNAB417-15GZ-100T-150-T6-2594	144	8