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

March 15, 2016

Mr. Bryan C. Hanson
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: LIMERICK GENERATING STATION, UNIT 1 - ISSUANCE OF AMENDMENT RE: SAFETY LIMIT MINIMUM CRITICAL POWER RATIO CHANGE (CAC NO. MF7101)

Dear Mr. Hanson:

The Commission has issued the enclosed Amendment No. 221 to Renewed Facility Operating License No. NPF-39 for the Limerick Generating Station (LGS), Unit 1. This amendment consists of changes to the technical specifications (TSs) in response to your application dated November 19, 2015.

The amendment revises the TSs related to the safety limit minimum critical power ratios. The proposed changes result from a cycle-specific analysis performed to support the operation of LGS, Unit 1, in the upcoming Cycle 17.

A copy of our safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

Richard B. Ennis, Senior Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-352

Enclosures:
1. Amendment No. 221 to NPF-39
2. Safety Evaluation

cc w/enclosures: Distribution via Listserv

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

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-352

LIMERICK GENERATING STATION, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 221
Renewed License No. NPF-39

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Exelon Generation Company, LLC (the licensee), dated November 19, 2015, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-39 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 221, are hereby incorporated into this renewed license. Exelon Generation Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented prior to startup from the spring 2016 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

Thomas J. Wengert for

Douglas A. Broaddus, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical Specifications
and Renewed Facility Operating License

Date of Issuance: March 15, 2016

ATTACHMENT TO LICENSE AMENDMENT NO. 221

RENEWED FACILITY OPERATING LICENSE NO. NPF-39

DOCKET NO. 50-352

Replace the following page of the Renewed Facility Operating License with the revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

Remove	Insert
Page 3	Page 3

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Remove	Insert
2-1	2-1

(2) Pursuant to the Act and 10 CFR Part 70, to receive, possess and to use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;

(3) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

(4) Pursuant to the Act and 10 CFR Parts 30, 40, 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

(5) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility, and to receive and possess, but not separate, such source, byproduct, and special nuclear materials as contained in the fuel assemblies and fuel channels from the Shoreham Nuclear Power Station.

C. This renewed license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I (except as exempted from compliance in Section 2.D. below) and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

Exelon Generation Company is authorized to operate the facility at reactor core power levels not in excess of 3515 megawatts thermal (100% rated power) in accordance with the conditions specified herein and in Attachment 1 to this license. The items identified in Attachment 1 to this renewed license shall be completed as specified. Attachment 1 is hereby incorporated into this renewed license.

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 221, are hereby incorporated into this renewed license. Exelon Generation Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

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 1.10 for two recirculation loop operation and shall not be less than 1.14 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 1.10 for two recirculation loop operation or less than 1.14 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: OPERATIONAL 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 the reactor coolant system pressure less than or equal to 1325 psig within 2 hours and comply with the requirements of Specification 6.7.1.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 221 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-39

EXELON GENERATION COMPANY, LLC

LIMERICK GENERATING STATION, UNIT 1

DOCKET NO. 50-352

1.0 INTRODUCTION

By application dated November 19, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15323A257), Exelon Generation Company, LLC (the licensee), submitted a license amendment request (LAR) for Limerick Generating Station (LGS), Unit 1. The proposed amendment would revise the technical specifications (TSs) related to the safety limit minimum critical power ratios (SLMCPRs). The proposed changes result from a cycle-specific analysis performed to support the operation of LGS, Unit 1, in the upcoming Cycle 17.

2.0 REGULATORY EVALUATION

Background

Fuel design limits can be exceeded if the fuel produces heat equal to or greater than critical power. In a boiling-water reactor (BWR), heat produced by the fuel causes the water to partially vaporize in a stable process called nucleate boiling. As the amount of heat produced by the fuel increases, more of the water is vaporized, and the vapor production changes the way the water boils. At a certain point, the efficiency of heat removal is impeded by vapor production, and the temperature of the fuel cladding rises disproportionately to the heat generated. Critical power is a term used for the power at which the fuel departs from nucleate boiling and enters a transition to film boiling. For BWRs, the critical power may be predicted using a correlation known as the General Electric (GE) critical quality boiling length correlation, better known as the GEXL correlation. Due to core-wide and operational variations, the margin to boiling transition is most easily described in terms of a critical power ratio (CPR), which is defined as the rod critical power, as calculated by GEXL, divided by the actual rod power. The more a CPR value exceeds 1.0, the greater the margin to boiling transition is. The SLMCPR is calculated using a statistical process that takes into account operating parameters and uncertainties. The operating limit minimum critical limit power ratio (OLMCPR) is equal to the SLMCPR plus a CPR margin for transients. At the OLMCPR, at least 99.9 percent of the rods avoid boiling transition during steady-state operation and transients caused by a single operator error or equipment malfunction.

General Design Criteria

Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants," Criterion 10 (GDC-10) states, in part, that the reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits (SAFDLs) are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences.

Technical Specification Requirements

In 10 CFR 50.36, "Technical specifications," the U.S. Nuclear Regulatory Commission (NRC) established its regulatory requirements related to the content of TSs. Pursuant to 10 CFR 50.36, TSs are required to include items in the following five specific categories: (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation; (3) surveillance requirements; (4) design features; and (5) administrative controls. The regulation does not specify the particular requirements to be included in a plant's TSs.

As discussed in 10 CFR 50.36(c)(1), safety limits for nuclear reactors are limits upon important process variables that are found to be necessary to reasonably protect the integrity of certain of the physical barriers that guard against the uncontrolled release of radioactivity. If a safety limit is exceeded, the reactor must be shut down. TS 2.1 specifies the safety limits for LGS, Unit 1. The LAR (Reference 1) would change the SLMCPR values in TS 2.1.2 as follows:

Parameter	Current SLMCPR Value	Proposed SLMCPR Value
Two Recirculation Loop Operation	≥ 1.09	≥ 1.10
Single Recirculation Loop Operation	≥ 1.12	≥ 1.14

3.0 TECHNICAL EVALUATION

3.1 Cycle 17 Core

LGS, Unit 1, is a GE BWR/4 design. This LAR supports the core design for the upcoming LGS, Unit 1, Cycle 17, which would start after the spring 2016 refueling outage. The Cycle 17 core loading will consist entirely of Global Nuclear Fuel (GNF) GNF2 fuel as follows: 268 fresh GNF2 fuel bundles, 272 once-burnt GNF2 fuel bundles, and 224 twice-burnt GNF2 fuel bundles.

3.2 Methodology

GNF developed the LGS, Unit 1, Cycle 17 SLMCPR values using the following NRC-approved methodologies and uncertainties:

1. NEDC-32601P-A, Revision 0, "Methodology and Uncertainties for Safety Limit MCPR Evaluations" (Reference 2).

2. NEDC-32694P-A, Revision 0, "Power Distribution Uncertainties for Safety Limit MCPR Evaluations" (Reference 3).

3. NEDC-32505P-A, Revision 1, "R-Factor Calculation Method for GE11, GE12, and GE13 Fuel" (Reference 4).

4. NEDE-24011P-A, Revision 21, "General Electric Standard Application for Reactor Fuel" (referred to as GESTAR II) (Reference 5).

Plant-specific use of these methodologies must adhere to certain restrictions as discussed below.

3.2.1 Methodology Restrictions

Based on the review of Topical Reports NEDC-32601P-A, NEDC-32694P-A, Amendment 25 to NEDE-24011P-A, and NEDC-32505P-A, the NRC staff identified the following restrictions for use of these Topical Reports:

(1) The TGBLA (lattice physics code) fuel rod power calculational uncertainty should be verified when applied to fuel designs not included in the benchmark comparisons of Table 3.1 of NEDC-32601P-A, since the changes in fuel design can have a significant effect on calculation accuracy.

(2) The effect of the correlation of rod power calculation uncertainties should be reevaluated to insure the accuracy of R-Factor uncertainty when the methodology is applied to a new fuel lattice.

(3) In view of the importance of minimum critical power ratio (MCPR) important parameters (MIP) criterion and its potential sensitivity to changes in fuel bundle designs, core loading, and operating strategies, the MIP criterion should be reviewed periodically as part of the procedural review process to insure that the specific value recommended in NEDC-32601P-A is applicable to future designs and operating strategies.

(4) The 3D-MONICORE bundle power calculational uncertainty should be verified when applied to fuel and core designs not included in the benchmark comparisons in Tables 3.1 and 3.2 of NEDC-32964P-A.

3.2.2 Restrictions (1), (2), and (4)

GESTAR II (i.e., NEDE-24011P-A) provides a fuel design and core reload process that allows an applicant to modify fuel assembly designs without undergoing formal NRC submittal and review, as long as they provide written notification to the NRC outlining the new design and acknowledging compliance with the requirements of GESTAR II. By letter dated March 14, 2007 (Reference 6), GNF sent the NRC the aforementioned notification and generic compliance report for the GNF2 fuel assembly design, since this fuel design had not previously been approved under the GESTAR II process.

In an audit report dated September 25, 2008 (Reference 7), the NRC staff reviewed the GESTAR II compliance report for the GNF2 fuel design. As part of the audit, the analysis and

evaluation of the GNF2 fuel design was verified by the NRC staff to have been evaluated in accordance with the technical issues addressed in Restrictions (1), (2), and (4).

By letters dated March 5, 2010, and May 27, 2010 (ADAMS Accession Nos. ML100700464 and ML101481067, respectively), GNF submitted Amendment 33 to GESTAR II, which, in part, documented the completion of the requirements for the new GNF2 fuel design per the criteria defined in GESTAR II. On August 30, 2010, the NRC issued a safety evaluation (ADAMS Accession No. ML102280591), which found Amendment 33 to GESTAR II acceptable.

Based on the above discussion, the NRC staff concludes that Restrictions (1), (2), and (4) have been addressed for the GNF2 fuel design. Therefore, use of the GESTAR II methodology by the licensee for the LGS, Unit 1, LAR is acceptable with respect to Restrictions (1), (2), and (4).

3.2.3 Restriction (3)

When determining SLMCPR values, power peaking and power distribution have a direct impact on which fuel bundles may be limiting with respect to boiling transition. While the pin power peaking is incorporated by the use of R-Factors, the bundle power distributions are affected by the loading pattern and rod patterns used during core operation. GNF tracks this behavior for specific statepoints through the MIP parameter, which is proportional to the probability of boiling transition for a given rod, if all bundles had the same pin power distribution. The value allows for checking how the SLMCPR power distribution compares to previous evaluations, and how limiting the power distribution is to the nominal power distribution.

Restriction (3) requires reviewing the MIP criterion for new fuel designs, core loading, and operating strategies. The NRC staff found in Reference 7 that the GNF2 fuel design was in compliance with Restriction (3). In Section 3.0 of Attachment 3 of the LAR (Reference 1), GNF states that the SLMCPR is calculated in accordance with NEDE-24011P-A, which has methodologies for analyzing core loading patterns and making sure there is no change in approved core design. Since the energy plan, thermal margins, and reactivity margins drive the core design, the SLMCPR is calculated after the core design process is essentially complete. After reviewing the core description in Attachment 3 of the licensee's submittal, the NRC staff concludes that there is no significant departure from operating strategies and core loading patterns. Thus, the NRC finds that the rod patterns used to produce a limiting MCPR distribution should reasonably bound the MCPR distributions expected during operation of LGS, Unit 1, Cycle 17.

In summary, the NRC staff concludes that the licensee has adequately addressed Restriction (3).

3.3 Major Contributors to SLMCPR Change

In general, the calculated safety limit is dominated by two key parameters: (1) flatness of the core bundle-by-bundle MCPR distribution and (2) flatness of the bundle pin-by-pin power/R-Factor distribution. Greater flatness in either parameter yields more rods susceptible to boiling transition and thus a higher calculated SLMCPR. Therefore, the calculated SLMCPR may change whenever there are changes to the core configuration or to the fresh fuel designs. The plant-cycle specific SLMCPR methodology accounts for these factors. The current cycle

core design is similar to the previous cycle core design in terms of reload batch size and type, arrangement of the batches in the core, and operating strategy.

For the minimum core flow two loop operation (TLO) case, the current cycle fresh fuel pin-by-pin power/R-Factor distribution is flatter than the previous cycle fresh fuel pin-by-pin power/R-Factor distribution while the core bundle-by-bundle MCPR distribution is similar between the two cycles. Since the current cycle core bundle-by-bundle MCPR distribution is similar but the fresh pin-by-pin power/R-Factor distribution flatter, the resulting SLMCPR calculations will tend to be slightly greater than the previous cycle.

For the rated core flow TLO case, the current cycle fresh fuel pin-by-pin power/R-Factor distribution is flatter than the previous cycle fresh fuel pin-by-pin power/R-Factor distribution, while the core bundle-by-bundle MCPR distribution is more peaked than the previous cycle. This situation tends to result in a similar number of rods susceptible to boiling transition for both cycles. The single loop operation (SLO) values are greater than the TLO values, as expected, due to the increase in uncertainties used for the SLO case.

3.4 Departures from the NRC-Approved Methodology

No departures from the NRC-approved methodologies were identified by the NRC staff's review of the LAR.

3.5 Departures from the NRC-Approved Calculational Uncertainties

3.5.1 R-Factor

The R-Factor is an input into the GEXL correlation used to describe the local pin-by-pin power distribution and the fuel assembly and channel geometry on the fuel assembly critical power. The R-Factor uncertainty analysis includes an allowance for power peaking modeling uncertainty, manufacturing uncertainty, and channel bow uncertainty. GNF has generically increased the GEXL R-Factor uncertainty to account for an increase in channel bow, due to the emerging phenomenon called control blade shadow corrosion-induced channel bow, which is not accounted for in the channel bow uncertainty component of the approved R-Factor uncertainty found in NEDC-32694P-A. The LGS, Unit 1, Cycle 17 analysis shows that the expected channel bow uncertainty is bounded by the increase in R-Factor uncertainty as technically justified in Reference 6. The NRC staff finds that the use of the GEXL R-Factor uncertainty adequately accounts for the expected control blade shadow corrosion-induced channel bow for LGS, Unit 1, Cycle 17.

3.5.2 Core Flow Rate and Random Effective Traversing In-Core Probe (TIP) Reading

In a letter dated September 29, 2004 (Reference 8), GE Nuclear Energy discussed potential non-conservatisms in the determination of the SLMCPR due to impacts when a lower flow condition at rated power has a more limiting SLMCPR than the rated flow condition. As a result of this issue, GNF has modified the process for determination of the SLMCPR. Specifically, as discussed in Section 4.2.2 of Attachment 3 to the LAR (Reference 1), GNF now performs analyses at the rated core power and minimum licensed core flow point, in addition to analyses

at the rated core power and rated core flow point. The NRC-approved SLMCPR methodology is applied at each statepoint that is analyzed.

GNF stated that for the TLO calculations performed at 82.9 percent core flow, the NRC-approved uncertainty values for the core flow rate (2.5 percent) and the random effective TIP reading (1.2 percent) are conservatively adjusted by dividing them by 82.9/100.

GNF further stated that the core flow and random TIP reading uncertainties used in the SLO minimum core flow SLMCPR analysis remain the same as in the rated flow SLO SLMCPR because these uncertainties (which are substantially larger than used in the TLO analysis) already account for the effects of operating at reduced core flow.

As discussed in Section 4.1 of Attachment 3 to the LAR, the current cycle change in the Monte Carlo SLO SLMCPR from the previous cycle is consistent with the Monte Carlo TLO SLMCPR change between the two cycles. The SLO values are greater than the TLO values as expected due to the increase in uncertainties used for the SLO case.

The NRC staff finds that this increase in the uncertainty bounds the original non-flow dependent uncertainties and, therefore, the NRC staff finds it acceptable for LGS, Unit 1, Cycle 17.

3.5.3 Flow Area Uncertainty

GNF calculated the flow area uncertainty for GNF2 using the process described in Section 2.7 of NEDC-32601P-A. The flow area uncertainty for GNF2 conservatively bounds the value found in NEDC-32601P-A. The bounding value was used in the SLMCPR calculations.

The NRC staff finds that the impact of flow area uncertainty is captured by the use of a bounding uncertainty value. Therefore, the proposed SLMCPR limits adequately address the uncertainties in channel flow areas for the fuel design used in the LGS, Unit 1, Cycle 17 core.

3.5.4 Local Power Range Monitor (LPRM) Update Interval and Calculated Bundle Power

GNF addressed the LPRM update/calibration interval in the Limerick, Unit 1, TS by increasing the LPRM update uncertainty in the SLMCPR analysis for Cycle 17. The NRC-approved uncertainty values for the contribution to bundle power uncertainty due to the LPRM update and the resulting total uncertainty in calculated bundle power are conservatively increased. The total bundle power uncertainty is a function of the LPRM update uncertainty as detailed in Section 3.2 of NEDC-32694P-A.

The NRC staff finds that the proposed SLMCPR limits adequately address the LPRM update interval and calculated bundle power for the fuel design used in the Limerick, Unit 1, Cycle 17 core.

3.5.5 Fuel Axial Power Shape Penalty

The GEXL correlation for critical power uncertainty and bias are established for each fuel product line according to a process described in NEDE-24011P-A. GNF determined that higher uncertainties and non-conservative biases in the GEXL correlations for certain types of axial

power shapes could exist relative to the NRC-approved methodology values. The GNF2 product line is potentially affected in this manner only by Double-Hump (D-H) axial power shapes. The D-H power shapes did not occur on any of the limiting bundles in the current and/or prior cycle limiting cases. Therefore, no power shape penalties were applied to the calculated Limerick, Unit 1, Cycle 17 SLMCPR values.

The NRC staff finds that the licensee adequately considered the potential for a higher SLMCPR value resulting from non-conservatisms in the GEXL correlation due to certain axial power shapes within limiting bundles. Therefore, the use of no axial power shape penalties is acceptable.

3.6 Technical Evaluation Conclusion

Based on the discussion in Sections 3.1 through 3.5 of this safety evaluation, the NRC staff concludes that the proposed amendment is acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (81 FR 275). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

7.0 REFERENCES

1. Exelon Generation Company, LLC Letter to the NRC, "License Amendment Request – Safety Limit Minimum Critical Power Ratio Change," dated November 19, 2015 (ADAMS Accession No. ML15323A257).

2. General Electric Nuclear Energy Licensing Topical Report NEDC-32601P-A, Revision 0, "Methodology and Uncertainties for Safety Limit MCPR Evaluations," dated August 1999 (ADAMS Accession Nos. ML003740145 (non-public) and ML14093A216 (public)).

3. NRC Letter to General Electric, "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 Evaluations; and Amendment 25 to NEDE-24011P-A on Cycle-Specific Safety Limit MCPR," dated March 11, 1999 (ADAMS Accession No. ML993140059).

4. GE Nuclear Energy, Licensing Topical Report NEDC-32505P-A, Revision 1, "R-Factor Calculation Method for GE11, GE12 and GE13 Fuel," dated July 1999 (ADAMS Accession No. ML060520634).

5. Global Nuclear Fuel, Licensing Topical Report NEDE-24011P-A, Revision 21, "General Electric Standard Application for Reactor Fuel (GESTAR II, Main)," dated May 2015 (ADAMS Package Accession No. ML15121A211).

6. Global Nuclear Fuel Letter to the NRC, "GNF2 Advantage Generic Compliance with NEDE-24011-P-A (GESTAR II), NEDC-33270P, March 2007; and GEXL17 Correlation for GNF2 Fuel, NEDC-33292P, March 2007," dated March 14, 2007 (ADAMS Accession No. ML070780333).

7. NRC Memorandum, "Audit Report for Global Nuclear Fuels GNF2 Advanced Fuel Assembly Design GESTAR II Compliance Audit," dated September 25, 2008 (ADAMS Package Accession No. ML082690382).

8. GE Nuclear Energy Letter to the NRC, "Part 21 Final Report: Non-conservative SLMCPR," dated September 29, 2004 (ADAMS Accession No. ML042800267).

Principal Contributors: M. Hardgrove
R. Ennis

Date: March 15, 2016

March 15, 2016

Mr. Bryan C. Hanson
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: LIMERICK GENERATING STATION, UNIT 1 - ISSUANCE OF AMENDMENT RE: SAFETY LIMIT MINIMUM CRITICAL POWER RATIO CHANGE (CAC NO. MF7101)

Dear Mr. Hanson:

The Commission has issued the enclosed Amendment No. 221 to Renewed Facility Operating License No. NPF-39 for the Limerick Generating Station (LGS), Unit 1. This amendment consists of changes to the technical specifications (TSs) in response to your application dated November 19, 2015.

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A copy of our safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,
/RA/
Richard B. Ennis, Senior Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
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Docket No. 50-352

Enclosures:
1. Amendment No. 221 to NPF-39
2. Safety Evaluation

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