



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

November 18, 2016

Mr. Bryan C. Hanson
Senior Vice President
Exelon Generation Company, LLC
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

**SUBJECT: LASALLE COUNTY STATION, UNITS 1 AND 2 – ISSUANCE OF
AMENDMENTS RE: HIGH BURNUP ATRIUM-10 PARTIAL LENGTH FUEL
RODS (CAC NOS. MF8442 AND MF8443)**

Dear Mr. Hanson:

The U.S. Nuclear Regulatory Commission (NRC or Commission) has issued the enclosed Amendment No. 221 to Renewed Facility Operating License No. NPF-11 and Amendment No. 207 to Renewed Facility Operating License No. NPF-18 for the LaSalle County Station (LSCS), Units 1 and 2, respectively. The amendments revise the licensing basis in response to your application dated September 30, 2016, as supplemented by letter dated November 8, 2016.

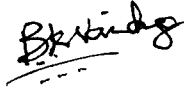
The amendments revise the LSCS licensing basis related to the reference Alternate Source Term Analysis in the Updated Final Safety Analysis Report to allow operation with and movement of irradiated ATRIUM-10 fuel bundles containing partial length rods (PLRs) that have been in operation above 62,000 megawatt days per metric ton of uranium (MWD/MTU), which is the current rod average burnup limit specified in Footnote 11 of NRC Regulatory Guide (RG) 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors." In addition, the change allows use of the release fractions listed in Table 1 of RG 1.183 for these ATRIUM-10 PLRs that are currently in the LSCS, Unit 2, Cycle 16, reactor core for the remainder of the current operating cycle.

B. Hanson

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

Sincerely,

A handwritten signature in black ink, appearing to read "B. Vaidya", with a horizontal line underneath.

Bhalchandra K. Vaidya, Project Manager
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-373 and 50-374

Enclosures:

1. Amendment No. 221 to NPF-11
2. Amendment No. 207 to NPF-18
3. Safety Evaluation

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

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-373

LASALLE COUNTY STATION, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

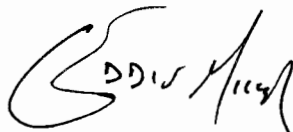
Amendment No. 221
License No. NPF-11

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by the Exelon Generation Company, LLC (the licensee), dated September 30, 2016, as supplemented by letter dated November 8, 2016, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's 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 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 set forth in 10 CFR Chapter I;
 - 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.

Enclosure 1

2. Accordingly, by Amendment No. 221, Renewed Facility Operating License No. NPF-11 is hereby amended to revise the LSCS licensing basis with the new evaluation for the consequences of Design Basis Accidents using Alternate Source Term methodology to allow movement of irradiated Atrium-10 fuel bundles containing partial length rods that have been in operation above 62,000 megawatt days per metric ton of uranium (MWD/MTU), as described in License Amendment Request dated September 30, 2016, as supplemented by letter dated November 8, 2016.
3. This license amendment is effective as of the date of its issuance and shall be implemented within 10 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read "G. Edward Miller", is written over the printed name.

G. Edward Miller, Acting Chief
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Date of Issuance: November 18, 2016



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

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-374

LASALLE COUNTY STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

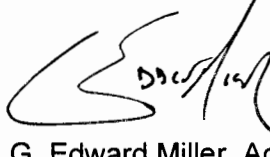
Amendment No. 207
License No. NPF-18

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by the Exelon Generation Company, LLC (the licensee), dated September 30, 2016, as supplemented by letter dated November 8, 2016, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's 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 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 set forth in 10 CFR Chapter I;
 - 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.

Enclosure 2

2. Accordingly, by Amendment No. 207, Renewed Facility Operating License No. NPF-18 is hereby amended to revise the LSCS licensing basis with the new evaluation for the consequences of Design Basis Accidents using Alternate Source Term methodology to allow movement of irradiated Atrium-10 fuel bundles containing partial length rods that have been in operation above 62,000 megawatt days per metric ton of uranium (MWD/MTU), as described in License Amendment Request dated September 30, 2016, as supplemented by letter dated November 8, 2016. In addition, the change allows use of the release fractions listed in Table 1 of RG 1.183 for these Atrium-10 partial length rods that are currently in the LSCS, Unit 2, Cycle 16, reactor core for the remainder of the current operating cycle.
3. This license amendment is effective as of the date of its issuance and shall be implemented within 10 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read 'G. Edward Miller', is written over a horizontal line.

G. Edward Miller, Acting Chief
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Date of Issuance: November 18, 2016



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-11

AND

AMENDMENT NO. 207 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-18

EXELON GENERATION COMPANY, LLC

LASALLE COUNTY STATION, UNITS 1 AND 2

DOCKET NOS. 50-373 AND 50-374

1.0 INTRODUCTION

By application dated September 30, 2016 (Reference 1), as supplemented by letter dated November 8, 2016 (Reference 2), Exelon Generation Company, LLC (EGC or the licensee), requested changes to the licensing bases for the LaSalle County Station (LSCS), Units 1 and 2.

The amendments revise the LSCS licensing basis related to the reference Alternate Source Term Analysis in the Updated Final Safety Analysis Report to allow operation with and movement of irradiated ATRIUM-10 fuel bundles containing partial length rods (PLRs) that have been in operation above 62,000 megawatt days per metric ton of uranium (MWD/MTU), which is the current rod average burnup limit specified in Footnote 11 of the U.S. Nuclear Regulatory Commission Regulatory Guide (RG) 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors" (Reference 3). In addition, the change allows use of the release fractions listed in Table 1 of RG 1.183 for these ATRIUM-10 PLRs that are currently in the LSCS, Unit 2, Cycle 16, reactor core for the remainder of the current operating cycle.

The supplement dated November 8, 2016, provided additional information that clarified the application but did not expand the scope of the application.

As discussed in the licensee's application dated November 8, 2016, EGC requested that the proposed amendments be processed by the U.S. Nuclear Regulatory Commission (NRC) on an exigent basis in accordance with the provisions in Title 10 of the *Code of Federal Regulations*

(10 CFR) Section 50.91(a)(6). The NRC's evaluation regarding the exigent circumstances is discussed below in safety evaluation (SE) Section 4.0.

Under the provisions in 10 CFR 50.91 (a)(6), the NRC notifies the public in one of two ways: (1) by issuing a *Federal Register* notice providing an opportunity for hearing and allowing at least 2 weeks from the date of the notice for prior public comments; or (2) by using local media to provide reasonable notice to the public in the area surrounding the licensee's facility. In this case, the NRC used the second approach and published a public notice in a newspaper local to LSCS, *The Ottawa Times*, on November 15, 2016, and November 16, 2016.

Background

When most currently operating nuclear power plants, including LSCS, obtained their initial licenses, part of their design basis included an evaluation of the radiological consequences of design-basis accidents (DBAs). These evaluations were typically based on source terms described in Technical Information Document (TID) 14844, "Calculation of Distance Factors for Power and Test Reactor Sites" (Reference 4). Subsequent advances in understanding the timing, magnitude, and chemical form of fission product releases from severe nuclear power accidents led to the rule documented in 10 CFR Section 50.67, "Accident source term." This new rule established requirements that licensees could use to revise the source term used in their design basis radiological analyses.

RG 1.183, issued in July 2000, established NRC guidance for an acceptable accident source term (AST) methodology to meet the requirements of 10 CFR Section 50.67. The existing approach using the TID-14844 source term was evaluated and found to be adequate, so licensees were not required to reanalyze their current licensing basis. However, licensees had the option of adopting the guidance in RG 1.183 to reanalyze some or all of their DBAs. Section 3 of RG 1.183 describes an AST that is acceptable to the NRC staff and clearly indicates that after the NRC has approved an implementation of an AST, subsequent changes will require NRC staff review under 10 CFR 50.67.

LSCS elected to implement an AST only for their loss-of-coolant accident (LOCA) and fuel-handling accident (FHA). The NRC approved implementation of the AST for these DBAs by License Amendment Nos. 197 and 184 in 2010 (Reference 5). This implementation included adoption of the release fractions provided in Tables 1 and 3 of RG 1.183 (Section 3.2). Both tables contain notes indicating, among other things, that the acceptability of the release fractions are limited to "currently approved Light-Water Reactor fuel with a peak burnup up to 62,000 MWD/MTU." The term "peak burnup" is not explicitly defined in RG 1.183, but NUREG/CR-6703 (Reference 6), completed shortly after RG 1.183 was finalized, makes it clear that the NRC staff has generally interpreted this term to mean the maximum average fuel rod burnup.

Units 1 and 2 of LSCS contain a number of ATRIUM-10 fuel assemblies with PLRs that have or are projected to exceed an average fuel rod burnup of 62,000 MWD/MTU. The license amendment request (LAR) reviewed provides a technical basis for a conclusion that the RG 1.183 release fractions will continue to be valid for LSCS.

2.0 REGULATORY EVALUATION

The NRC staff review was performed consistent with Section 15.0.1 (Revision 0) to the Standard Review Plan (SRP) (Reference 7). The applicable regulations as described in the SRP are listed below, along with their applicability to LSCS.

Section 50.67 of 10 CFR presents requirements that must be met for reevaluations of the consequences of DBAs with the AST. RG 1.183 provides an AST that would be acceptable to the NRC staff to use in meeting the requirements of 10 CFR 50.67, which the licensee committed to adopting in its AST implementation.

Section 50.67 of 10 CFR also requires that:

The NRC may issue the amendment only if the applicant's analysis demonstrates with reasonable assurance that:

- (i) An individual located at any point on the boundary of the exclusion area for any 2-hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 0.25 Sv (25 rem)² total effective dose equivalent (TEDE).
- (ii) An individual located at any point on the outer boundary of the low population zone, who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage), would not receive a radiation dose in excess of 0.25 Sv (25 rem) total effective dose equivalent (TEDE).
- (iii) Adequate radiation protection is provided to permit access to and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 0.05 Sv (5 rem) total effective dose equivalent (TEDE) for the duration of the accident.

A number of other regulatory requirements are potentially applicable if there is a change in the radiological consequences of the DBAs being evaluated with the AST (see Section II of SRP 15.0.1 for a list). The licensee provided an evaluation to demonstrate that the two parameters used to characterize the radiological source term, the available radioisotope inventory for release, and the release fractions, are bounded by the inputs used in the current radiological consequence analyses of record. No other inputs to the radiological consequence analyses are affected by the proposed change to operations at LSCS. Since the limiting radiological consequences are unchanged, there is no need for the NRC staff to repeat the evaluation for those regulatory requirements that were performed for the initial AST implementation.

3.0 TECHNICAL EVALUATION

The licensee provided an evaluation that demonstrates that the release fractions, radioisotope inventories, and dose consequences are bounded by the current radiological consequences analyses of record. As a result, no further analyses or reviews of the radiological consequences

would need to be performed. Therefore, the NRC staff's review focused on the licensee's justification for its conclusion that the aforementioned key inputs to the radiological consequence analyses do not need to use higher (more conservative) values. Since the licensee only utilizes the AST methodology for the LOCA and FHA analyses, these were the only DBAs considered by the staff.

3.1 Potential Impacts of Proposed Change

Increasing the burnup of a fuel rod has several impacts that may affect the release fractions and/or the radioisotope inventory during different phases of a DBA. They include:

- (1) An increase in the cumulative number of fissions that have occurred in the fuel rod, which results in more fission products. This directly increases the total amount of radioisotope inventory available for release.
- (2) Changes in the fuel pellet geometry, which may result in a change in the percentage of noble gasses, iodine, and cesium produced by fission that migrate from the fuel matrix to the gap. This affects the release fraction for these isotopes during the gap release phase of a DBA.
- (3) Increased fragmentization of the fuel pellet geometry, which may result in the potential for ejection of fuel fragments when the cladding fails. This affects the release fraction for the gap release phase of a DBA.
- (4) An increase in fuel rod pressure, which may increase the probability of failure. This would affect the quantity of radioisotopes assumed to have been released.

Each of these possible impacts to the release fractions and/or radioisotope inventory for the two DBAs are evaluated in the following subsections.

3.2 LOCA Radiological Consequences

The LAR submittal (Reference 2) included an analysis of the impact to the radiological consequences due to a LOCA as Attachment 3. In summary, the licensee performed a cycle-specific evaluation for LSCS, Unit 2, Cycle 16, which applies a multiplier to the calculated dose attributable to the batch of ATRIUM-10 and ATRIUM-10XM fuel. This multiplier was determined in a way to effectively treat all PLRs in the ATRIUM-10 fuel assembly as full length fuel rods (FLRs). There are 91 fuel rods in the ATRIUM-10 fuel assembly, 8 of which are PLRs. The licensee determined that the number of equivalent FLRs in the ATRIUM-10 fuel assembly was 87.83, based on the active fuel length of the PLRs compared to the FLRs. Thus, the multiplier applied to the ATRIUM-10 contribution to the total dose for LSCS, Unit 2, Cycle 16, was $91/87.83$, or 1.036. The licensee used the Table 1 release fractions in RG 1.183 for this evaluation, with the justification that the axial burnup distributions for the PLRs were equivalent to the lower 2/3 of the FLRs. Therefore, if the PLRs are treated as FLRs, the lower burnup upper portion of the FLRs would bring the average rod burnup below the 62,000 MWd/MTU limit.

The current design-basis LOCA radiological consequences analysis for LSCS, consistent with RG 1.183, assumes a maximum hypothetical accident in which all fuel rods are assumed to fail. RG 1.183 indicates that the core average inventory should be used, given that the assumed operating conditions at the time of the accident will bound allowed operation to end of cycle (including emergency core cooling system evaluation uncertainties). PLRs exceeding a burnup of 62,000 MWD/MTU would not result in a significant change in the available radioisotope inventory for release, because the inventory available in the PLRs would be included in the total calculation of the core radioisotope inventory. The licensee's cycle-specific dose evaluation performed for the radiological consequences due to a LOCA may incorporate additional conservatism, but it was not necessary to support a safety determination on the proposed LSCS, Unit 2, Cycle 16, operation. Therefore, the NRC staff did not perform a detailed review of the dose evaluation provided by the licensee in Attachment 3 to Reference 2.

Fuel pellet geometry changes as a result of burnup are the primary motivation behind the 62,000 MWD/MTU burnup limit on use of the release fractions in RG 1.183. NUREG/CR-6703 was published shortly after RG 1.183 was issued and investigated release fractions for high burnup fuel. The findings supported the acceptability of the RG 1.183 release fractions for fuel with peak rod burnups of up to 62,000 MWD/MTU. At this time, the regulatory guidance did not consider the use of PLRs in boiling-water reactor fuel assemblies. Fuel pellet geometry changes are strongly dependent on local burnup characteristics. Attachment 2 of Reference 2 provided an evaluation demonstrating that the local burnup characteristics of the PLRs that will exceed the 62,000 MWD/MTU regulatory limit are bounded by the local burnup characteristics of adjacent FLRs. Therefore, the finding in NUREG/CR-6703 supporting use of the release fractions remains applicable, especially given the modest burnup increment (< 849 MWD/MTU) for the PLRs above the 62,000 MWD/MTU limit.

After issuance of NUREG/CR-6703, some experiments raised a concern about the potential for fuel fragment dispersion through a breach in the cladding, aided by increased fragmentation of the fuel pellets at high burnups and fuel fragment relocation due to ballooning of the cladding prior to failure. NUREG-2121 (Reference 8) reviewed the available data on this phenomenon and addressed the potential impact on release fractions, and concluded that the existing NRC guidance was acceptable. Since this phenomenon would also be correlated with local burnup characteristics, the discussion in the prior paragraph would be equally applicable to support use of the release fraction in RG 1.183 for the PLRs in LSCS, Unit 2, Cycle 16.

Finally, an increased probability for cladding failure during a LOCA due to higher internal rod pressure would not change the conclusions of the LSCS evaluation since its methodology already assumes that all fuel fails. Therefore, the licensee's evaluation bounds any increase in probability for cladding failure due to higher internal rod pressure.

The NRC staff finds that the licensee has demonstrated that: (1) the intent of the 62,000 MWD/MTU peak rod burnup limit for applicability of the release fractions is met for the PLRs, given that they are bounded by adjacent FLRs and the modest nature of the burnup increment beyond the limit; and (2) the core inventory available for release during the postulated LOCA event is determined, based on the average core exposure, which remains bounded by the analysis of record. Therefore, the proposed operation of LSCS, Unit 2, Cycle 16, with PLRs exceeding a peak rod burnup limit of 62,000 MWD/MTU, as described in Reference 2, is acceptable with respect to the postulated radiological consequences from a LOCA.

3.3 FHA Radiological Consequences

The LAR submittal (Reference 2) included an analysis of the impact to the radiological consequences due to an FHA as Attachment 2. The licensee provided a similar evaluation to that described in the first paragraph of Section 3.2 of this SE, but instead of applying the multiplier to the predicted dose, the licensee applied it to the damaged core fraction used to determine the inventory release from an FHA. The licensee determined that when the aforementioned multiplier is combined with the damaged core fraction and peaking factor for ATRIUM-10, based on fuel drop analyses and limiting radial peaking powers, the resulting fraction of the core inventory is bounded by the fraction used in the analysis of record, which is based on General Electric (GE)12 and GE14 fuel.

The multiplier used by the licensee effectively increases the inventory release for the FHA by 3.6 percent relative to the actual available inventory for the ATRIUM-10 fuel with PLRs, which is more than sufficient to bound any increase in the total inventory for the few fuel assemblies affected by the FHA due to the higher average rod burnup of the PLRs.

The discussion in paragraphs 3 and 4 of Section 3.2 of this SE also applies to an FHA. The probability of increased release due to fuel fragment dispersion through a cladding breach was not explicitly considered in NUREG-2121 for the FHA. The failure mechanism is different in that the cladding would not be expected to balloon prior to failure; thus, the ability of the fuel to undergo axial relocation is more limited. Therefore, the findings in NUREG-2121 are applicable to an FHA.

Finally, the mechanism for fuel damage during an FHA is mechanical failure due to the impact force of the fuel assembly being dropped on top of other fuel assemblies. This mechanism is not strongly affected by the rod internal pressure as long as it remains within the mechanical design limits for the ATRIUM-10 fuel assembly design. Therefore, the small potential increases in internal rod pressure expected for the proposed rod average burnups on the PLRs would have no impact on the probability of fuel rod failure due to an FHA. The licensee continues to be responsible for ensuring that the mechanical design limits for the ATRIUM-10 fuel assembly design are met.

The NRC staff finds that the licensee has demonstrated that: (1) the intent of the 62,000 MWD/MTU peak rod burnup limit is met for the PLRs, given that they are bounded by adjacent FLRs and the modest nature of the burnup increment beyond the limit, and (2) the total available inventory for release from an FHA involving ATRIUM-10 fuel is bounded by an FHA involving GE12 or GE14 fuel. Therefore, the proposed operation of LSCS, Unit 2, Cycle 16, with PLRs exceeding a peak rod burnup limit of 62,000 MWD/MTU, as described in Reference 2, is acceptable with respect to the postulated radiological consequences from an FHA.

3.4 Technical Conclusions

As discussed in this section, the licensee provided an evaluation in Reference 2 to demonstrate the acceptability of allowing PLRs to exceed the 62,000 MWD/MTU burnup limit provided in RG 1.183 for use of the data in Tables 1 and 3. Since the licensee had committed to RG 1.183 as part of its AST implementation, NRC approval is required to exceed the area of applicability

described in this RG. Based on the discussion provided in Sections 3.2 and 3.3 of this SE, the NRC staff finds that the licensee has demonstrated that its current radiological analyses of record for the LOCA and the FHA bound the potential radiological consequences resulting from the proposed increase in the average rod burnup for PLRs. Therefore, the current radiological analyses of record for LSCS continue to demonstrate that the requirements of 10 CFR 50.67 are met.

The demonstration is limited to ATRIUM-10 fuel for the FHA, and LSCS, Unit 2, Cycle 16, for the LOCA. Thus, NRC approval of these license amendments will allow for movement of the affected ATRIUM-10 fuel assemblies, as well as continued operation of LSCS, Unit 2, Cycle 16. In its submissions, the licensee stated that 12 ATRIUM-10 assemblies are expected to exceed the burnup limit by November 22, 2016. Therefore, the NRC staff did not generically evaluate the possibility of similar situations occurring in the future.

4.0 EXIGENT CIRCUMSTANCES

4.1 Background

The NRC's regulations contain provisions for issuance of amendments when the usual 30-day public comment period cannot be met. These provisions are applicable under exigent circumstances. Consistent with the requirements in 10 CFR 50.91(a)(6), exigent circumstances exist when: (1) a licensee and the NRC must act quickly, (2) time does not permit the NRC to publish a *Federal Register* notice allowing 30 days for prior public comment, and (3) the NRC determines that the amendment involves no significant hazards consideration. As discussed in the licensee's supplemental submission dated November 8, 2016, the licensee requested that the proposed amendment be processed by the NRC on an exigent basis.

Under the provisions in 10 CFR 50.91 (a)(6), the NRC notifies the public in one of two ways: (1) by issuing a *Federal Register* notice providing an opportunity for hearing and allowing at least 2 weeks from the date of the notice for prior public comments, or (2) by using local media to provide reasonable notice to the public in the area surrounding the licensee's facility. In this case, the NRC used the second approach and published a public notice in a newspaper local to LSCS, *The Ottawa Times*, on November 15, 2016, and November 16, 2016.

4.2 Licensee's Basis for Exigent Circumstances

The licensee is basing exigent circumstances on the following considerations:

EGC requests NRC approval of the proposed change on an exigent basis in accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (a)(6), because time does not permit the NRC to publish a *Federal Register* notice allowing 30 days for prior public comment, as discussed below.

As discussed with the NRC during a conference call on October 27, 2016, EGC's interpretation of the Reference 1 release fractions, and associated footnotes, was that release fractions for the LOCA, listed in Table 1 of Reference 1, could be used if individual fuel rods exceed a peak burnup of 62,000 MWD/MTU. This interpretation was based, in part, on the fact that EGC's LOCA dose consequence analysis applies release fractions uniformly to the entire core, and the

core average exposure is not projected to exceed the 62,000 MWD/MTU burnup limit. However, during the conference call, the NRC clarified that this limit is established in Reference 1 as an upper boundary to the applicability of the release fractions provided in Tables 1 and 3, and the limit applied to peak rod exposures, regardless of the core average exposure. As a result, EGC determined that the LSCS, Unit 2, Cycle 16, core design was based on a misinterpretation of Footnote 10, and the core design was nonconforming with the LSCS licensing basis. This nonconforming condition was entered into EGC's Corrective Action Program. EGC evaluated the nonconforming condition and its impact on continued plant operation in accordance with EGC procedures that implement guidance contained in NRC Inspection Manual Chapter 0326, "Operability Determinations & Functionality Assessments for Conditions Adverse to Quality or Safety," and determined operability was supported. However, based on additional discussions with the NRC staff on November 8, 2016, the NRC staff expressed that evaluation of the nonconforming condition under EGC's operability determination process could not be used for this situation and that NRC approval of the proposed change described herein was needed prior to exceeding the burnup limit of 62,000 MWD/MTU.

Current projections show that at the end of the current operating cycle for LSCS, Unit 2, 12 Atrium-10 PLRs will exceed the 62,000 MWD/MTU burnup limit. To date, none of the PLRs has exceeded the burnup limit. However, projections show that the limit will be exceeded on November 22, 2016. Therefore, EGC is requesting NRC approval of the proposed change by November 21, 2016, to support continued plant operation for LSCS, Unit 2.

4.3 NRC Staff Conclusion

Based on the above circumstances, the NRC staff concludes that the licensee made a timely application for the proposed amendments following identification of the issue. In addition, the NRC staff concludes that the licensee could not avoid the exigency without violating the operating license or by putting the plant in a higher risk configuration. Based on these findings, and the determination that the amendments involve no significant hazards consideration as discussed in this SE, Section 6.0, the NRC staff has determined that a valid need exists for issuance of the license amendments using the exigent provisions of 10 CFR 50.91(a)(6).

5.0 PUBLIC COMMENTS

As discussed in this SE, Section 4.1, the NRC staff published a public notice concerning the proposed amendments in a newspaper local to LSCS, *The Ottawa Times*, on November 15, 2016, and November 16, 2016. The notice included the NRC staff's proposed no significant hazards consideration determination. The notice also provided an opportunity for public comment until 4:15 p.m. on November 18, 2016, regarding the staff's proposed no significant hazards consideration determination.

There were no comments received regarding the proposed amendments.

6.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION

The NRC's regulations in 10 CFR 50.92 state that the NRC may make a final determination that a license amendment involves no significant hazards consideration if operation of the facility in accordance with the amendment, would not: (1) involve a significant increase in the probability

or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

As required by 10 CFR Section 50.91(a), the licensee, in its supplemental submission, dated November 8, 2016, provided its analysis of the issue of no significant hazards consideration, using the standards in 10 CFR 50.92. The NRC staff's evaluation of the issue of no significant hazards consideration is presented below.

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The proposed change revises the LSCS licensing basis to allow movement of irradiated Atrium-10 fuel bundles containing part length rods that have been in operation above 62,000 MWD/MTU. In addition, the proposed change allows use of the release fractions listed in Table 1 of NRC Regulatory Guide 1.183 for these Atrium-10 part length rods that are currently in the Unit 2 Cycle 16 reactor core for the remainder of the current operating cycle. The proposed change does not involve any physical changes to the plant design and is not an initiator of an accident. The proposed change does not adversely affect accident initiators or precursors, and does not alter the design assumptions, conditions, or configuration of the plant or the manner in which the plant is operated or maintained. Therefore, the proposed change does not affect the probability of a loss-of-coolant accident. In addition, the proposed change does not affect the probability of a fuel handling accident because the method and frequency of fuel movement activities are not changing. Analyses have been performed that demonstrate that the power and burnup for an Atrium-10 part length rod is bounded by the power and burnup in the same axial portion of neighboring full length rods. Therefore, since the full length rod operating characteristics bound the part length rod, and since the power and burnup of the full length rods comply with the limits specified in Footnotes 10 and 11 of NRC Regulatory Guide 1.183, the Atrium-10 part length rods may operate beyond the 62,000 MWD/MTU burnup limit and meet the intent of NRC Regulatory Guide 1.183. There are no changes in the dose consequences of the analyses of record for the fuel handling accident and loss-of-coolant accident.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed change revises the LSCS licensing basis to allow movement of irradiated Atrium-10 fuel bundles containing part length rods that have been in operation above 62,000 MWD/MTU. In addition, the proposed change allows use of the release fractions listed in Table 1 of NRC Regulatory Guide 1.183 for these Atrium-10 part length rods that are currently in the Unit 2 Cycle 16 reactor core for the remainder of the current operating cycle. The proposed change does not introduce any changes or mechanisms that create the possibility of a new or different kind of accident. The proposed change does not install any new or different type of equipment, and installed equipment is not being operated in a new or different manner. No new effects on existing equipment are created nor are any new malfunctions introduced.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

The proposed change revises the LSCS licensing basis to allow movement of irradiated Atrium-10 fuel bundles containing part length rods that have been in operation above 62,000 MWD/MTU. In addition, the proposed change allows use of the release fractions listed in Table 1 of NRC Regulatory Guide 1.183 for these Atrium-10 part length rods that are currently in the Unit 2 Cycle 16 reactor core for the remainder of the current operating cycle. Analyses have been performed that demonstrate that the power and burnup for an Atrium-10 part length rod is bounded by the power and burnup in the same axial portion of neighboring full length rods. There is no change in the dose consequences of the fuel handling accident or loss-of-coolant accident analyses of record. The margin of safety, as defined by 10 CFR 50.67 and NRC Regulatory Guide 1.183, has been maintained.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above evaluation, the NRC staff concludes that the three standards of 10 CFR 50.92(c) are satisfied. Therefore, the NRC staff has made a final determination that no significant hazards consideration is involved for the proposed amendments and that the amendments should be issued as allowed by the criteria contained in 10 CFR 50.91.

7.0 STATE CONSULTATION

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

8.0 ENVIRONMENTAL CONSIDERATION

The amendments change 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 amendments involve 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 NRC staff published a public notice concerning the proposed amendments, in a newspaper local to LSCS, *The Ottawa Times*, on November 15, 2016, and November 16, 2016. The notice included the NRC staff's proposed no significant hazards consideration determination. The notice also provided an opportunity for public comment until 4:15 p.m. on November 18, 2016, regarding the NRC staff's proposed no significant hazards consideration determination, and there has been no public comment on such finding. Therefore, the Commission has made a final determination that no significant hazards consideration is involved for the proposed amendments as discussed above in this SE, Section 6.0. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR Section 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 amendments.

9.0 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.

10.0 REFERENCES

1. Exelon Generation letter RS-16-198, from David M. Gullott, Manager, Licensing, Exelon Generation, to USNRC Document Control Desk Re: "Request for License Amendment Regarding High Burnup Atrium-10 Partial Length Fuel Rods," September 30, 2016 (ADAMS Accession No. ML16274A237).
2. Exelon Generation letter RS-16-225, from Patrick R. Simpson, Manager, Licensing, Exelon Generation, to USNRC Document Control Desk Re: "Revised Request for License Amendment Regarding High Burnup Atrium-10 Partial Length Fuel Rods and Request for Exigent Review," dated November 8, 2016 (ADAMS Accession No. ML16313A617).
3. NRC Regulatory Guide 1.183, Revision 0, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," July 2000 (ADAMS Accession No. ML003716792).
4. U.S. Atomic Energy Commission (now U.S. NRC) Technical Information Document 14844, "Calculation of Distance Factors for Power and Test Reactors," March 23, 1962 (non-public).

5. USNRC letter from Christopher Gratton, Senior Project Manager, Plant Licensing Branch III-2, Division of Operating Reactor Licensing, to Michael J. Pacilio, President and Chief Nuclear Officer, Exelon Nuclear, Re: "LaSalle County Station, Units 1 and 2 – Issuance of Amendments Re: Application of Alternative Source Term (TAC Nos. ME0068 and ME0069), September 6, 2010 (ADAMS Accession No. ML101750625).
6. NUREG/CR-6703, "Environmental Effects of Extending Fuel Burnup Above 60 GWd/MTU," published January 2001 (ADAMS Accession No. ML010310298).
7. NUREG-0800, "USNRC Standard Review Plan," Section 9.1.1, Rev. 3, "Criticality Safety of Fresh and Spent Fuel Storage and Handling Review Responsibilities," March 2007 (ADAMS Accession No. ML070570006).
8. NUREG-2121, "Fuel Fragmentation, Relocation, and Dispersal During the Loss-of-Coolant Accident," published March 2012 (ADAMS Accession No. ML12090A018).

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Date of Issuance: November 18, 2016

B. Hanson

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

Sincerely,

/RA/

Bhalchandra K. Vaidya, Project Manager
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-373 and 50-374

Enclosures:

1. Amendment No. 221 to NPF-11
2. Amendment No. 207 to NPF-18
3. Safety Evaluation

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