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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 263 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-29 AND AMENDMENT NO. 258 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-30

EXELON GENERATION COMPANY, LLC

AND

MIDAMERICAN ENERGY COMPANY

QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2

DOCKET NOS. 50-254 AND 50-265

Proprietary information pursuant to Title 10 of Code of Federal Regulations (10 CFR) Section 2.390 has been redacted from this document. Redacted information is identified by blank space enclosed within double brackets as shown here: **[[ ]]**

1.0 INTRODUCTION

By letter to the U.S. Nuclear Regulatory Commission (NRC, the Commission) dated December 14, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15348A396), as supplemented by letters dated March 9 and June 1, 2016 (ADAMS Accession Nos. ML16069A217 and ML16153A084), Exelon Generation Company, LLC (the licensee) requested changes to the Renewed Facility Operating License Nos. DPR-29 and DPR-30 for Quad Cities Nuclear Power Station (QCNPS), Unit Nos. 1 and 2, to allow the use of a new Criticality Safety Assessment (CSA) fuel channel bow/bulge methodology for performing criticality safety evaluations for the new ATRIUM 10XM fuel design in the spent fuel pool (SFP). The licensee plans to transition from Westinghouse SVEA-96 Optima2 fuel to the new AREVA A10XM fuel design at QCNPS in the spring of 2017. The new methodology addresses fuel channel bow/bulge for fuel stored in the SFP storage racks at QCNPS, Units 1 and 2.

The proposed methodology would support technical specifications (TS) requirement 4.3.1.1.c, which limits the reactivity of fuel assemblies for storage in the SFP to ensure compliance with NRC regulatory requirements. Use of this methodology would allow the licensee to extend their existing approved nuclear criticality safety (NCS) analysis methodology to qualify ATRIUM 10XM fuel assemblies for storage in the SFP.

A notice of consideration of issuance and proposed finding of no significant hazards consideration was published in the *Federal Register* on May 3, 2016, (81 FR 26586).

The March 9, 2016, submittal corrected a deficiency in the Holtec affidavit submitted in Reference 1 and did not change the NRC staff's proposed finding of no significant hazards consideration. The June 1, 2016, supplement contained clarifying information and did not change the staff's initial proposed finding of no significant hazards consideration.

2.0 REGULATORY EVALUATION

2.1 Regulatory Requirements

Section 50.36(c)(4) of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 requires, "Design features. Design features to be included are those features of the facility such as materials of construction and geometric arrangements, which, if altered or modified, would have a significant effect on safety and are not covered in categories described in paragraphs (c) (1), (2), and (3) of this section."

Section 50.68(b)(1) of 10 CFR, requires that, "Plant procedures shall prohibit the handling and storage at any one time of more fuel assemblies than have been determined to be safely subcritical under the most adverse moderation conditions feasible by unborated water."

Paragraph 50.68(b)(4) of 10 CFR requires, in part, that:

> [i]f no credit for soluble boron is taken, the k-effective of the spent fuel SFP racks loaded with fuel of the maximum fuel assembly reactivity must not exceed 0.95, at a 95 percent probability, 95 percent confidence level, if flooded with unborated water.

Consistent with the design of the QCNPS SFP, the safety analysis does not take credit for soluble boron for normal operating conditions; therefore, paragraph 50.68(b)(4) of 10 CFR is the applicable subcriticality requirement.

The construction permits for QCNPS, Units 1 and 2, predate the formal issuance of the current Appendix A, General Design Criteria (GDC), to 10 CFR, Part 50. During the construction permit licensing process, Units 1 and 2, were evaluated against the Comment Draft of 70 Criteria, which was issued on July 10, 1967. The design bases of each QCNPS unit were reevaluated at the time of initial final safety analysis report preparation against the draft of the 70 Criteria current at the time of operating license application.

As stated in Section 3.1 of the updated final safety analysis report, based on the understanding of the intent of the proposed criteria current at the time of operating license application, QCNPS conforms with the intent of the Atomic Energy Commission GDC for nuclear power plant construction permits. As the GDCs were finalized, the requirements were placed in Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR, Part 50, "Domestic Licensing of Production and Utilization Facilities."

GDC 62, "Prevention of Criticality in Fuel Storage and Handling," requires, "Criticality in the fuel storage and handling system shall be prevented by physical systems or processes, preferably by use of geometrically safe configurations." Demonstrating compliance with 10 CFR 50.68 is sufficient to show that this GDC is satisfied.

2.2 Regulatory Guidance

Specific review criteria are contained in Standard Review Plan (SRP) Section 9.1.1, "Criticality Safety of Fresh and Spent Fuel Storage and Handling," Revision 3, and SRP Section 9.1.2, "New and Spent Fuel Storage," Revision 4.

The NRC staff issued a memorandum dated August 19, 1998 (Reference 4), also known as the "Kopp memo", containing staff guidance for performing the review of SFP NCS analyses. This guidance supports determining compliance with GDC 62 and existing SRP Sections 9.1.1 and 9.1.2. The principal objective of this guidance is to clarify and document staff positions that may have been incompletely or ambiguously stated in previously issued SEs and other staff documents. A second purpose is to state staff positions on a number of strategies used in SFP NCS analyses to allow for the storage of more reactive fuel assemblies without violating the regulatory limit.

The Division of Safety System (DSS) Interim Staff Guidance (ISG) DSS-ISG-2010-01 (Reference 5) provides updated guidance to address the increased complexity of recent SFP nuclear criticality analyses and operations. The guidance is intended to reiterate existing

guidance, clarify ambiguity in existing guidance, and identify lessons learned based on recent submittals. Similar to the Kopp memorandum, this guidance supports determining compliance with GDC 62 and following the guidance described in SRP, NUREG-0800, Sections 9.1.1 and 9.1.2.

2.3 Method of Review

This SE involves a review of the data provided by the licensee to support their channel bow/bulge assumptions, the uncertainties/biases associated with the reference ATRIUM 10XM fuel assembly design, and a general assessment of any other reactivity impacts due to the use of ATRIUM 10XM fuel that may not be captured by the methodology previously approved in Amendment Nos. 253/248 for QCNPS, Units 1 and 2 respectively, by letter dated December 31, 2014 (Reference 3). The review was performed consistent with Sections 9.1.1 of NUREG-0800 (Reference 6), and existing guidance on SFP NCS analyses captured by the Kopp memorandum (Reference 4), and DSS-ISG-2010-01 (Reference 5). While Section 9.1.2 of NUREG-0800 is applicable, it does not concern itself directly with criticality safety considerations in fuel storage, therefore, Section 9.1.1 contains the primary SRP guidance for reviewing the proposed changes in the license amendment request as supplemented.

2.4 Compliance with the Technical Specifications

No new TS changes are being proposed. However, in order to qualify the ATRIUM 10XM fuel assembly design for storage in the QCNPS SFP, the licensee must evaluate the reactivity impacts related to the transition to ATRIUM 10XM specific fuel assembly design features, including the fuel channel bowing/bulging. The NRC staff previously reviewed and approved the addition of TS 4.3.1.1.c in Amendments 253 and 248 for QCNPS, Units 1 and 2 (Reference 3). The current licensing basis supporting the TS 4.3.1.1.c limit used to verify compliance for storage of fuel assemblies in the SFP did not include a methodology to address fuel channel bowing/bulging. The licensee submitted their fuel bulging/bowing evaluation methodology for NRC review (Reference 1) to request an update to their licensing basis.

In addition, during a pre-application meeting held on May 11, 2015, the NRC staff questioned the uncertainties and biases calculated for the licensee's reference ATRIUM 10XM fuel lattice. The public meeting summary is available in ADAMS at Accession No. ML15149A363. The licensee provided the total uncertainties and biases for an ATRIUM 10XM fuel assembly with a slightly higher reactivity relative to the design basis SVEA-96 Optima2 fuel lattice used as the current analysis of record (Reference 3). The reactivity of the design basis SVEA-96, Optima2, fuel lattice was used to establish the TS 4.3.1.1.c limit, so this information was necessary to confirm that the TS limit would remain bounding for the ATRIUM 10XM fuel lattice.

3.0 TECHNICAL EVALUATION

3.1 SFP NCS Analysis Method

There is no comprehensive, NRC-approved generic methodology for performing NCS analyses for fuel storage and handling. Most of the methods used for the NCS analysis for fuel in the QCNPS SFP are described in the documents submitted to support the previous NRC review and approval of the QCNPS SFP criticality licensing basis (Reference 3). Except as indicated in this evaluation, the findings of the previous review remain valid. In particular, certain configurations (i.e., reconstituted fuel) were not comprehensively addressed as part of the previous methodology, nor did the licensee submit a methodology to do so as part of this LAR.

As a result of the previously approved precedent (Reference 3), the NRC staff review was limited to the specific features of the licensee's LAR that constitute a change from the previously approved methodologies.

3.2 Fuel Channel Bulge/Bow Methodology

The licensee submitted information as part of Attachment 2 to Reference 1 that was used to demonstrate that no geometry changes are expected to occur for the ATRIUM 10XM fuel design at the exposures for which peak reactivity occurs (about 10-15 GWd/MTU). The attachment provides channel bow and bulge statistics along with a recommendation for how to reasonably bound the observed population of channels for each exposure range. The NRC staff notes that Section 4.4 of the AREVA report states that the data presented is intended to provide statistics that will reasonably bound the observed population of channels for each exposure range. The statistics provided for the exposure range of interest does not indicate a non-zero channel bulge/bow. Therefore, NRC the staff requested additional information from the licensee to clarify how the licensee concluded from the submitted data that no bowing/bulging was expected.

The licensee responded by letter dated June 1, 2016 (Reference 2), that the bounding values indicated by the referenced data was used as the basis for determining the channel geometry uncertainty in the criticality analysis. Based on a review of the information submitted in References 1 and 2, the NRC staff determined that the information provides bounding statistics which would be expected to capture the impact of any variations in fuel channel geometry for different burnup ranges. Geometry changes due to burnup would not result in reactivity impacts that are randomly distributed around the nominal channel dimensions, so some component of the reactivity changes should be applied as a bias rather than as an uncertainty. The licensee did not provide enough information for the staff to determine the probable magnitude of the reactivity bias for this SFP configuration.

To address this, the NRC staff considered a recently approved NCS analysis (Reference 7), addressed channel bow/bulging for the same ATRIUM 10XM fuel design at another boiling-water reactor (BWR) SFP at a site licensed and operated by the licensee. This analysis modeled a BWR SFP rack with similar analysis parameters. However, the neutron-absorbing

material in the Reference 7 analysis has a significantly higher minimum credited areal density. Therefore, the reactivity impact due to variations in the fuel geometry cannot be directly applied from the Reference 7 analysis. Since the same fuel assembly design (ATRIUM 10XM) is used in both analyses, the use of the total reactivity impact due to fuel tolerances is a consistent basis for evaluating the relative difference in fuel-related reactivity impacts due to the difference in SFP configuration. The staff applied an adjustment based on the assumption that the proportional difference in the reactivity impact due to a single fuel-related parameter between the two analyses would be approximately equal to the proportional difference in the total reactivity impact due to fuel tolerances in the two analyses. Applying this assumption, the staff estimates that a bounding estimate of the reactivity bias due to channel bowing/bulging would be no more than 0.0012 Δk. This can be accommodated by the available margin to the regulatory limit, as discussed in Section 3.4.

The staff considered the above evaluation and estimated the potential reactivity impact of fuel channel bowing/bulging. Therefore, the staff finds that the reactivity impact due to fuel channel bowing/bulging is not expected to challenge the regulatory limit. Therefore, the staff finds that the analysis will continue to meet the regulatory requirement of 10 CFR 50.68 and the intent of GDC 62.

3.3 ATRIUM 10XM Lattice Specific Analysis Aspects

A side-by-side comparison of the NCS analysis approaches was provided by the licensee in Table 1 of the license amendment request (LAR) submittal (Reference 1). This analysis shows that the fuel assembly tolerances evaluated for the ATRIUM 10XM fuel lattice included all of the previously evaluated tolerances for the SVEA-96 Optima2 fuel lattice. The sub-bundle pitch and the combined channel width dimensions had not been previously evaluated due to the difference in geometry between the SVEA-96 Optima2 and the ATRIUM 10XM fuel lattices. The NRC staff verified that the necessary fuel manufacturing tolerances were evaluated for the ATRIUM 10XM lattice. The licensee's analysis used an ATRIUM 10XM lattice that is more reactive than that allowed by the TS 4.3.1.1.c limit which would be expected to maximize the reactivity sensitivity of the lattice to the variations due to manufacturing tolerances. This ATRIUM 10XM lattice is only being used to evaluate ATRIUM 10XM specific uncertainties, and not to qualify a more reactive fuel lattice for storage in the QCNPS SFP than allowed by the TS 4.3.1.1.c limit. As a result, the reactivity of the lattice used in the licensee's analysis is only relevant insofar as the resulting values for the ATRIUM 10XM specific uncertainties are expected to bound those which would be calculated using an ATRIUM 10XM fuel lattice that is compliant with the TS 4.3.1.1.c limit. Therefore, the NRC staff determined that the licensee's calculated uncertainties and biases based on this lattice are appropriate for determining whether the ATRIUM 10XM fuel design is bounded by the previous calculation using the SVEA-96 Optima2 fuel design.

The NRC staff compared the list provided by the licensee for the calculated ATRIUM 10XM fuel design uncertainties and biases against the comparable list provided in Table 7.11 of the analysis provided as part of the previous SFP storage amendment (Reference 3). The two lists were similar, with one exception; the ATRIUM 10XM specific list appeared to be missing the

reactivity bias due to **[[** **]]**. The NRC staff requested additional information to clarify why this information was omitted in the LAR submittal (Reference 1). The licensee responded by letter dated June 1, 2016 (Reference 2), clarifying that significant fuel assembly geometry changes are not expected to occur at burnups corresponding to peak reactivity. However, sections 4.2 and 4.3 in attachment 2 to Reference 1 provide maximum values expected due to fuel rod growth and cladding creep for burnups between 10 and 20 GWd/MTU.

Based on information from a recently approved SFP NCS analyses that were based on ATRIUM 10XM fuel (Reference 7), the magnitude of the reactivity change due to cladding creep is significant relative to the magnitude of the fuel manufacturing tolerances. While the minimum clad thickness is less than the maximum thinning indicated in Attachment 2 to Reference 1, the reactivity impact is primarily due to changes to the outer diameter of the cladding (which affects the fuel-to-moderator ratio). The thinning would be expected to occur uniformly, thus, the reduction to the outer diameter would be about half of the thinning due to cladding creep. A bounding estimate of the reactivity bias due to cladding thinning was developed based on the calculation of the reactivity effect due to the minimum cladding thickness tolerance from the previously approved NCS analysis (Reference 7). The licensee did not give information to this level of detail in proposed amendment request as supplemented, so values from that analysis were not available for use. The NRC staff performed a confirmatory calculation by adjusting the value in the NCS analysis in Reference 7 to account for the difference in clad thickness between the manufacturing tolerance value and the maximum change due to cladding creep, resulting in a bounding estimate of 0.003 Δk. This calculation also incorporated a similar adjustment to that discussed in paragraph 3 of Section 3.2 to account for the fact that the criticality analysis in Reference 7 is not modeling the exactly same SFP configuration found in the QCNPS SFP. This increase can be accommodated by the available margin to the regulatory limit and, therefore, is acceptable to the staff, as discussed in Section 3.4.

The NRC staff does not expect the fuel rod growth to result in a reactivity increase because the fuel pellet outer diameter has been shown to have a minimal impact on reactivity, and any change to the clad dimensions due to fuel rod growth would not be expected to reduce the outer diameter. Therefore, any reactivity impact would be minimal or negative. However, the licensee did not specifically address the potential reactivity impacts for fuel rod bowing. The NCS analysis previously reviewed by the NRC did address fuel rod bowing for the ATRIUM 10XM fuel for a similar SFP configuration. The NCS analysis was extremely conservative since it applied the maximum depletion related fuel rod pitch positive tolerance as a bias (Reference 7). The NRC staff expects that the actual bias due to depletion-related fuel rod bowing would be related to the difference in the fuel rod pitch tolerance between fresh and burned fuel, which is much less than the maximum fuel rod pitch tolerance for burned fuel. The NRC staff considered the difference in the calculated k-effective between the fuel rod bowing case and the fuel rod pitch tolerance case, and making a similar adjustment to that discussed in Paragraph 3 of Section 3.2, the staff estimated the reactivity bias to be no more than 0.0035 Δk. This increase can be accommodated by the available margin to the regulatory limit and is therefore acceptable to the staff, as discussed in Section 3.4.

The ATRIUM 10XM biases in Reference 1 included a bias for "eccentric positioning and fuel assembly channel reactivity effect bias." Based on similar SFP NCS analyses previously reviewed by the NRC, the staff requested the licensee to confirm that this bias was determined using the most limiting combination of fuel assembly positioning within the SFP rack cell and whether the fuel assembly was channeled or not. The licensee confirmed this inference in the request for additional information response dated June 1, 2016 (Reference 2). Therefore, the staff has reasonable assurance that the licensee has accounted for potential synergistic effects between the positioning of fuel within the SFP cell and whether the fuel was channeled or not were conservatively captured in the SFP NCS analysis.

The only other difference between the NCS analysis performed for the ATRIUM 10XM fuel and the Reference 3 analysis for QCNPS, Amendment Nos. 253/248, was that the storage rack interfaces were not explicitly analyzed for the ATRIUM 10XM fuel. The Reference 3 analysis explicitly evaluated the interface between the storage rack cells and the SFP wall for the possibility that there was a positive reactivity effect due to the lack of neutron-absorbing rack insert material between the fuel assemblies stored in cells along two edges of the SFP and the concrete SFP walls. The reactivity effect was found to be minimal and negative. The NRC staff finds that the reactivity characteristics of the ATRIUM 10XM fuel are similar enough to the SVEA-96 Optima2 fuel that the conclusions of the Reference 3 analysis of the storage rack interface remain valid. Therefore, the NRC staff concludes that the analysis continues to meet the requirements of 10 CFR Section 50.68.

Other than the above discussed analysis aspects, the remainder of the NCS analysis methodology provided in Reference 3 was used to evaluate an appropriately limiting ATRIUM 10XM fuel lattice and confirm that the TS 4.3.1.1.c limit will continue to ensure that the NRC subcriticality requirement in 10 CFR 50.68 is met. The staff determined that there were no other aspects of the NCS analysis methodology that may need to be re-assessed due to the change in fuel assembly design and transition to ATRIUM 10XM fuel.

Based on the above evaluation, the NRC staff has determined that the licensee used the previously approved NCS analysis methodology from Reference 3 correctly to evaluate the ATRIUM 10XM fuel design, and that all ATRIUM 10XM fuel design specific aspects of the analysis are dispositioned appropriately. Therefore, the conclusion from the evaluation is that ATRIUM 10XM fuel assemblies stored in the SFP will be bounded by the NCS analysis of record, provided that they meet the TS 4.3.1.1.c limit, is acceptable and the NRC staff concludes that TS 4.3.1.1.c continues to ensure that the 10 CFR 50.36(c)(4) requirement is met.

3.4 Margin Analysis and Comparison with Remaining Uncertainties

Several potentially nonconservative assumptions were identified as part of the NRC staff review of this LAR and in Reference 3. A bounding estimate of the reactivity impact for each assumption is listed in the below table, based on staff calculations or studies. In addition, any extra margins to the applicable 10 CFR 50.68(b)(4) regulatory limit identified during the review of the NCS analysis are listed.	Estimated Reactivity Impact (Δk)
Nonconservatisms	
[[ ]]	[[ ]]
Neglecting water gaps between SFP racks	~0.0*
Limited evaluation of power history effects	0.002
Use of a 95/95 threshold value as a bounding value	0.003
Neglecting [[ ]]	0.0012
Neglecting [[ ]]	0.003
Neglecting [[ ]]	0.0035
Total reactivity impact of nonconservatisms	[[ ]]
Conservatisms	
Margin to 10 CFR 50.68 regulatory limit (from Reference 3 analysis)	0.0153
Large fission product validation uncertainty applied	0.001
Difference in total uncertainty calculated for current LAR vs. Reference 3 analysis	[[ ]]
Total reactivity impact of conservatisms	[[ ]]

*This assumption is conservative for the ATRIUM 10XM design basis fuel lattice used in this analysis. This may not be true for other fuel lattice designs that are undermoderated, but the reactivity impact would not be expected to be significant due to the very small size of the water gap.

The total reactivity impact due to the nonconservatisms is 0.0002 Δk greater than the total reactivity impact due to the conservatisms, but: (1) this reactivity increment is insignificant, and (2) a number of the staff's bounding estimates include components that would more correctly be evaluated as uncertainties rather than as part of the biases (which would reduce the reactivity impacts). Therefore, based on the above comparison, the staff concludes that the available margins offset the potential nonconservatisms.

3.5 Technical Conclusions

The general NCS analysis methodology used to analyze the QCNPS, Units 1 and 2, SFP racks was reviewed in Reference 3, while this LAR extends the methodology to ATRIUM 10XM fuel and channels. The NRC staff review, as documented in Reference 3 and the above SE, identified some nonconservative items. Those items were evaluated against the margin to the regulatory limit and what the NRC considers an appropriate amount of margin attributable to conservatisms documented in the analyses.

As a result of the safety findings from these two reviews, the NRC staff concludes that there is a reasonable assurance that the QCNPS, Units 1 and 2, SFP fuel storage racks meet the

applicable NCS regulatory requirements for storage of new ATRIUM 10XM fuel assemblies that meet the TS 4.3.1.1c criticality requirement, in addition to the SVEA-96, Optima2, fuel and legacy fuel designs already bounded by the prior NRC review (Reference 3).

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change the requirements with respect to installation or use of a facility's components 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 Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (May 3, 2016; 81 FR 26586). Accordingly, the amendments meet 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 amendments.

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 amendments 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 RS-15-326, from P. Simpson, Manager, Licensing, Exelon Generation Company, LLC to USNRC document control desk, re: "Request for License Amendment Regarding Spent Fuel Storage Pool Criticality Methodology for Fuel Channel Bow/Bulge," December 14, 2015 (ADAMS Accession No. ML15348A396).

2. Exelon Generation Company, LLC letter RS-16-131, from P. Simpson, Manager, Licensing, Exelon Generation Company, LLC to USNRC document control desk, re: "Additional Information Regarding License Amendment Request for Spent Fuel Storage Pool Criticality Methodology for Fuel Channel Bow/Bulge," June 1, 2016 (ADAMS Accession No. ML16153A084).

3. NRC letter from B. Mozafari, Project Manager, Plant Licensing Branch III-2, Division of Operating Reactor Licensing, Office of Nuclear Reactor Regulation to M. Pacilio, Exelon Generation Company, LLC, "Quad Cities Nuclear Power Station, Units 1 and 2 – Issuance of Amendments Regarding NETCO Inserts (TAC Nos. MF2489 and MF2490)(RS-13-148)," December 31, 2014 (ADAMS Accession No. ML14346A306).

4. NRC Memorandum from L. Kopp to T. Collins, "Guidance on the Regulatory Requirements for Criticality Analysis of Fuel Storage at Light-Water Reactor Power Plants," August 19, 1998 (ADAMS Accession No. ML11088A013).

5. NRC Division of Safety Systems Interim Staff Guidance DSS-ISG-2010-01, Rev. 0, "Staff Guidance Regarding the Nuclear Criticality Safety Analysis for Spent Fuel Pools," October 13, 2011 (ADAMS Accession No. ML110620086).

6. 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 ML070570006).

7. NRC letter from E. Brown, Project Manager, Plant Licensing Branch III-2, Division of Operating Reactor Licensing, Office of Nuclear Reactor Regulation to B. Hanson, Exelon Generation Company, LLC, "Dresden Nuclear Power Station, Units 2 and 3 – Issuance of Amendments to Amend Renewed Facility Operating License Nos. DPR-19 and DPR-25 to Support Use of a New Nuclear Criticality Safety Analysis Methodology (CAC Nos. MF5734 and MF5735)," April 29, 2016 (ADAMS Accession No. ML15343A126).

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