

From: Kuntz, Robert
Sent: Monday, September 12, 2022 12:49 PM
To: rebecca.steinman@constellation.com; Taken, Jason C.:(Exelon Nuclear)
Cc: Purnell, Blake; patrick.simpson@constellation.com
Subject: Request for Additional Information RE: LaSalle County Station, Units 1 and 2 and Quad Cities Nuclear Power Station, Units 1 and 2 License Amendments Related to Fuel Storage

By applications dated June 30 and October 25, 2021 (Agencywide Document Access and Management System (ADAMS) Accession Nos. ML21183A169 and ML21298A168), Exelon Generation Company, LLC, submitted similar license amendment requests (LARs) for LaSalle County Station, Units 1 and 2 (LaSalle), and Quad Cities Nuclear Power Station, Units 1 and 2 (Quad Cities) respectively. The LaSalle LAR was supplemented by letters dated November 4, 2021 (ML21312A457) and June 17, 2022 (ML22172A175). The Quad Cities LAR was supplemented by letters dated November 3, 2021 (ML22194A086), and July 13, 2022 (ML22194A085). On February 1, 2022 (ADAMS Accession No. ML22032A333), Exelon Generation Company, LLC was renamed Constellation Energy Generation, LLC (the licensee). The proposed amendments would allow the licensee to use a new criticality safety analysis (CSA) methodology for GNF3 and legacy fuel types in the spent fuel pool. The proposed amendments would also change the CSA for the new fuel vault (NFV) to use the GESTAR II methodology for the storage of new GNF3 fuel in the NFV racks. The NRC staff has determined additional information is required to complete its review. The following is the NRC staff's Request for Additional Information (RAI). During a clarification discussion held on September 12, 2022 a 30 day response was agreed upon to so the NRC staff expects a response on or before October 12, 2022.

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REQUEST FOR ADDITIONAL INFORMATION
TO SUPPORT REVIEW OF CRITICALITY SAFETY ANALYSIS THAT SUPPORT
LICENSE AMENDMENT REQUESTS FOR
LASALLE COUNTY STATION, UNITS 1 AND 2, AND
QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2
DOCKET NOS. 50-373, 50-374, 50-254, AND 50-265

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On August 2, 2022 (ML22214A004) the NRC issued a plan for the audit of the LaSalle and Quad Cities, as well as a similar amendment submitted by letter dated June 8, 2002 (ML22159A310) for Dresden Nuclear Power Station, Units 2 and 3. The audit was conducted to increase the NRC staff's understanding of the criticality information. The audit was conducted via virtual discussions and the use of an online portal from August 4 through September 2, 2022.

RAI-SFNB-8

Regulatory Requirements

Paragraph 50.68(a) of Title 10 of the *Code of Federal Regulations* (10 CFR) requires "each holder of a construction permit or operating license for a nuclear power reactor issued under this part or a combined license for a nuclear power reactor issued under Part 52 of this chapter, shall comply with either 10 CFR 70.24 of this chapter or the requirements in paragraph (b) of this section." The licensee has chosen to comply with 10 CFR 50.86(b).

Paragraph 50.68(b)(2) of 10 CFR states: "The estimated ratio of neutron production to neutron absorption and leakage (k-effective) of the fresh fuel in the fresh fuel storage racks shall be calculated assuming the racks are loaded with fuel of the maximum fuel assembly reactivity and flooded with unborated water and must not exceed 0.95, at a 95 percent probability, 95 percent confidence level. This evaluation need not be performed if administrative controls and/or design features prevent such flooding or if fresh fuel storage racks are not used."

Paragraph 50.68(b)(3) of 10 CFR states: "If optimum moderation of fresh fuel in the fresh fuel storage racks occurs when the racks are assumed to be loaded with fuel of the maximum fuel assembly reactivity and filled with low-density hydrogenous fluid, the k-effective corresponding to this optimum moderation must not exceed 0.98, at a 95 percent probability, 95 percent confidence level. This evaluation need not be performed if administrative controls and/or design features prevent such moderation or if fresh fuel storage racks are not used."

Background

In Section 2.3 of the LARs, the licensee states that the LaSalle and Quad Cities updated final safety analysis reports (UFSARs) will be updated as part of implementation of the amendments. The licensee stated that these updates would include changes to reflect the proposed revisions to the NFV CSA.

By emails dated May 18 (ML22172A175) and June 13 (ML22164A785), 2022, the NRC staff requested, in part, that the licensee provide the following information for LaSalle and Quad Cities, respectively:

- NfV criticality safety analysis methodology used in the analysis.
- Criticality safety analysis that sets the limits for the NFVs.
- Criticality safety analysis that demonstrates GNF3 meets the limits for the NFVs.

The licensee's June 17 and July 13, 2022, letters provided additional information regarding the analysis performed to support the license amendment requests but did not provide the CSA methodology or the CSAs. During the regulatory audit, the NRC staff identified that information needed to support the review was included in a GNF3 fuel design specific NFV criticality safety analysis.

Request

Provide the GNF3 fuel design specific NFV criticality safety analyses that would apply to LaSalle and Quad Cities. Confirm that proposed changes to the UFSARs include incorporating these CSAs (e.g., by reference).

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