

From: Venkataraman, Booma
Sent: Wednesday, December 8, 2021 1:19 PM
To: Steinman, Rebecca L:(Exelon Nuclear)
Subject: REQUEST FOR ADDITIONAL INFORMATION: QUAD CITIES 1 & 2 LICENSE AMENDMENT REQUEST RE:TRANSITION TO GNF3 FUEL (EPID: L-2021-LLA-0159)
Attachments: FINAL SFNB RAI - Quad Cities Fuel Transition LAR .pdf
Expires: Sunday, February 6, 2022 12:00 AM

Ms. Steinman,

By application dated September 14, 2021, (Agencywide Document Access and Management System (ADAMS) Accession No. ML21257A419) as supplemented by letter dated November 3, 2021(ADAMS Accession No. ML21307A444), Exelon Generation Company, LLC (EGC, or the licensee) submitted a license amendment request (LAR) with a proposed change that supports the transition from Framatome ATRIUM 10XM fuel to GNF3 fuel at Quad Cities Nuclear Power Station, Units 1 and 2. Part of that LAR included the review and approval of the licensee's report in Attachment 9 of the licensee's LAR, "NEDC-33930P, Revision 0, "GEXL98 Correlation for ATRIUM 10XM Fuel (report)." The NRC staff issued a proprietary determination of this report on November 10, 2021 (ADAMS Accession No. ML21301A220).

A DRAFT request for information (RAI) was sent to you on December 3, 2021. A clarification call was conducted on December 8, 2021, between the NRC staff and the licensee. The final RAI version is attached to this email. On the clarification call, you agreed to respond to the attached RAI with a supplement by January 11, 2022.

Please treat this e-mail as transmittal of formal RAIs. If circumstances result in the need to revise the requested response date, please contact me at (301) 415-2934, or via email at Booma.Venkataraman@nrc.gov.

Sincerely, Booma
Booma Venkataraman
Project Manager, NRR/DORL/LPL3
Office of Nuclear Reactor Regulation
Booma.Venkataraman@nrc.gov
301.415.2934

Hearing Identifier: NRR_DRMA
Email Number: 1447

Mail Envelope Properties (BY5PR09MB52818CC0D5763551CC24DF20866F9)

Subject: REQUEST FOR ADDITIONAL INFORMATION: QUAD CITIES 1 & 2 LICENSE AMENDMENT REQUEST RE:TRANSITION TO GNF3 FUEL (EPID: L-2021-LLA-0159)
Sent Date: 12/8/2021 1:18:39 PM
Received Date: 12/8/2021 1:18:00 PM
From: Venkataraman, Booma

Created By: Booma.Venkataraman@nrc.gov

Recipients:
"Steinman, Rebecca L:(Exelon Nuclear)" <Rebecca.Steinman@exeloncorp.com>
Tracking Status: None

Post Office: BY5PR09MB5281.namprd09.prod.outlook.com

Files	Size	Date & Time
MESSAGE	1565	12/8/2021 1:18:00 PM
FINAL SFNB RAI - Quad Cities Fuel Transition LAR .pdf		114079

Options
Priority: Normal
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date: 2/6/2022

REQUEST FOR ADDITIONAL INFORMATION

LICENSE AMENDMENT REQUEST RE: TRANSITION TO GNF3 FUEL

EXELON GENERATION COMPANY, LLC.

QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2

DOCKET NO. 50-254 AND 50-265

By application dated September 14, 2021, (Agencywide Document Access and Management System (ADAMS) Accession No. ML21257A419) as supplemented by letter dated November 3, 2021(ADAMS Accession No. ML21307A444), Exelon Generation Company, LLC (EGC, or the licensee) submitted a license amendment request (LAR) with a proposed change that supports the transition from Framatome ATRIUM 10XM fuel to GNF3 fuel at Quad Cities Nuclear Power Station, Units 1 and 2. Part of that LAR included the review and approval of the licensee's report in Attachment 9 of the licensee's LAR, "NEDC-33930P, Revision 0, "GEXL98 Correlation for ATRIUM 10XM Fuel (report)." The NRC staff issued a proprietary determination of this report on November 10, 2021 (ADAMS Accession No. ML21301A220).

The NRC staff has determined that additional information is needed to complete the review regarding the report.

Background

The report summarizes the development of the ATRIUM 10XM GEXL98 correlation. The ATRIUM 10XM GEXL98 correlation will be used to determine the critical power performance of the Framatome ATRIUM 10XM fuel in a mixed core of ATRIUM 10XM and GNF fuel. This report describes the process used in the development of the GEXL98 correlation for prediction of critical power for the ATRIUM 10XM fuel and the determination of the overall uncertainty of that correlation in prediction of the ATRIUM 10XM critical power performance.

Regulatory Basis

General Design Criterion (GDC) 10, "Reactor design," in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, is the principal regulation associated with this report. This criterion introduces the concept of specified acceptable fuel design limits (SAFDLs). In essence, SAFDLs are those limits placed on certain variables to ensure that the fuel does not fail. One such SAFDL is associated with critical power performance. Because the decrease in heat transfer following critical power could result in fuel failure, a SAFDL is used to demonstrate that critical power does not occur during normal operation and anticipated operational occurrences (AOO)s. Therefore, fuel failure is precluded during normal operation and AOOs.

NRC staff Standard Review Plan (NUREG 0800, Section 4.4) includes the SAFDLs used in accounting for the uncertainties involved in developing and predicating critical power performance model and ensuring that fuel failure is precluded:

At least 99.9 percent of the fuel rods in the core will not experience a critical power during normal operation or AOOs.

In order to determine that the GEXL98 correlation for ATRIUM 10XM can satisfy the associated SAFDL, the NRC staff requests the following additional information.

SFNB-GEXL-RAI-1

Provide the data used to determine the GEXL98 uncertainty in tabular form. This data should include all relevant inputs (e.g., pressure, mass flux, inlet subcooling, R-factor, thermal diameter, boiling length, annular length) as well as all relevant outputs (e.g., GEXL calculated Critical Power, ACE-Calculated Critical Power).