

From: Michael Mahoney
Sent: Tuesday, August 20, 2024 7:09 PM
To: Mack, Jarrett
Subject: Turkey Point Nuclear Generating Unit Nos. 3 and 4 - Request for Additional Information - SFP LAR (L-2023-LLA-0142)
Attachments: RAIs - Turkey Point SFP LAR - Public Version_Redacted.pdf

Hi Jarrett,

By letter L-2023-077, dated October 11, 2023 (Agencywide Documents Access and Management System (ADAMS) Accession Package No. ML23285A035), Florida Power and Light Company (FPL) submitted a license amendment request (LAR) to revise the Turkey Point Nuclear Generating Unit Nos. 3 and 4 (Turkey Point) Technical Specifications (TS). Specifically, the proposed amendments revise the Turkey Point TSs by incorporating changes to TS 3.7.13, "Fuel Storage Pool Boron Concentration," TS 3.7.14, "Spent Fuel Storage," and TS 4.3, "Fuel Storage" to allow for an updated spent fuel pool criticality safety analysis which accounts for the impact on the spent fuel from a proposed transition to 24-month fuel cycles.

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing your submittal and has identified areas where additional information is needed to complete its review. The attached version of the request for additional information (RAI) is a redacted non-proprietary public version. The proprietary non-public version has been sent to you via BOX.

As discussed, response to the attached RAIs is requested no later than 30 business days from today's date.

The NRC staff considers that timely responses to RAIs help ensure sufficient time is available for staff review and contribute toward the NRC's goal of efficient and effective use of staff resources. If circumstances result in the need to revise the requested response date, please contact me.

Once this email is added to ADAMS, I will provide the accession number.

Thanks

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Subject: Turkey Point Nuclear Generating Unit Nos. 3 and 4 - Request for Additional Information - SFP LAR (L-2023-LLA-0142)
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From: Michael Mahoney

Created By: Michael.Mahoney@nrc.gov

Recipients:
"Mack, Jarrett" <Jarrett.Mack@fpl.com>
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MESSAGE	1786	8/20/2024 7:08:42 PM
RAIs - Turkey Point SFP LAR - Public Version_Redacted.pdf		539486

Options
Priority: Normal
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:

REQUEST FOR ADDITIONAL INFORMATION
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
REGARDING LICENSE AMENDMENT REQUEST TO
UPDATED SPENT FUEL POOL CRITICALITY ANALYSIS
TO SUPPORT 24-MONTH FUEL CYCLES
FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT NUCLEAR GENERATING STATION, UNITS 3 AND 4
FLORIDA POWER AND LIGHT COMPANY
DOCKET NOS. 50-250 AND 50-251
EPID NO. L-2023-LLA-0142

Background

By letter L-2023-077, dated October 11, 2023 (Agencywide Documents Access and Management System (ADAMS) Accession Package No. ML23285A035), Florida Power and Light Company (FPL, the licensee) submitted a license amendment request (LAR) to revise the Turkey Point Nuclear Generating Unit Nos. 3 and 4 (Turkey Point) Technical Specifications (TS). Specifically, the proposed amendments revise the Turkey Point TSs by incorporating changes to TS 3.7.13, "Fuel Storage Pool Boron Concentration," TS 3.7.14, "Spent Fuel Storage," and TS 4.3, "Fuel Storage" to allow for an updated spent fuel pool criticality safety analysis which accounts for the impact on the spent fuel from a proposed transition to 24-month fuel cycles.

Note that proprietary information is marked as inside bold double brackets **[[]]**.

NRC Staff Requests for Additional Information (RAIs)

1. Section 4.1.2.2.6 of WCAP-18830-P for the Turkey Point Nuclear Generating Units 3 and 4 fuel storage criticality analysis for 24 months discusses burnable absorber usage and its consideration in the criticality analysis. With regard to wet annular burnable absorber (WABA) considerations, Section 4.1.2.2.6 states WABA was used in Pre-EPU operation, which is covered by Criticality Fuel Designs 1 and 2, and it is assumed that all conservative Post-EPU (e.g., 148 integral fuel burnable absorber (IFBA) at 1.25X) input is bounding of Pre-EPU operation with WABA. However, no justification is provided to support this assumption.

The NRC staff understands that no Post-EPU operation fuel contains WABA and future fuel will be Criticality Fuel Design 3, but until such time as Pre-EPU operation fuel containing WABA is removed from the spent fuel pool (SFP) for long term storage, a combination of Pre-EPU WABA and Post-EPU fuels will exist in the SFP. 10 CFR 50.68(b)(4) requires licensees demonstrate, when taking credit for soluble boron, the

effective neutron multiplication factor (k-effective) of the SFP storage racks loaded with fuel of the maximum fuel assembly reactivity does not exceed 0.95 if flooded with borated water and remains below 1.0 when flooded with unborated water. Therefore, analyses should give consideration to the residual reactivity of Pre-EPU operation fuel containing WABA and to Post-EPU operation fuel to ensure the SFP k-effective remains below the specified requirements.

Provide justification (e.g., sensitivity analyses, explicit reactivity comparisons, etc.) that Post-EPU operation fuel is bounding of Pre-EPU operation fuel with WABA. Conversely, please provide updated Criticality Fuel Design analyses that consider Pre-EPU operation fuel with WABA.

2. Section 5.7.2 of WCAP-18830-P for the Turkey Point Nuclear Generating Units 3 and 4 fuel storage criticality analysis for 24 months discusses the usage of soluble boron for accident conditions. Section 5.7.2 states that the multiple misload accident [REDACTED] bounds all other accidents listed in Section 4.2.9 of WCAP-18830-P. However, no justification is provided to support this statement. 10 CFR 50.68(b)(4) requires licensees demonstrate the effective neutron multiplication factor (k-effective) of the SFP storage racks loaded with fuel of the maximum fuel assembly reactivity must not exceed 0.95 if flooded with borated water.

Provide justification showing that [REDACTED] is bounding of all other accidents listed in Section 4.2.9. Conversely, please provide the results of the criticality calculations for all other accidents listed in Section 4.2.9.

3. Appendix A of WCAP-18830-P for the Turkey Point Nuclear Generating Units 3 and 4 fuel storage criticality analysis for 24 months discusses the validation of SCALE 6.2.4, and Table A-21 details the validation area of applicability for the criticality analysis. NRC staff noted the selected critical experiments do not consider [REDACTED]

The guidance provided in Section A.1.1 of NEI 12-16 for the range of parameters to be validated for criticality codes states, with regard to isotopic content, "Experiments should cover materials representative of the rack structure... and others if... used in the criticality analysis." As indicated in Section 4.2.1 of WCAP-18830-P, the [REDACTED] is necessary to maintain multiple fresh and SFP storage arrays subcritical in unborated conditions. Section 4.2.3 of WCAP-18830-P indicates [REDACTED] are conservatively modeled, but it is not clear from the submittal what the approximate magnitude is of the introduced conservatism. Consistent with NEI 12-16, the influence [REDACTED] have on neutronic behavior should be appropriately captured and considered with respect to quantified biases and uncertainties.

Provide the approximate magnitude (e.g., via sensitivity analyses, explicit reactivity comparisons, etc.) of the reactivity conservatism that is introduced by the modeling approach chosen for [REDACTED].