



CHIEF FINANCIAL
OFFICER

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

August 21, 2024

Zachary S. Harper, Senior Manager
Licensing Engineering
Westinghouse Electric Company
1000 Westinghouse Drive, Building 1
Cranberry Township, PA 16066

SUBJECT: RESPONSE TO WESTINGHOUSE ELECTRIC COMPANY'S REQUEST FOR A FEE EXEMPTION FOR TOPICAL REPORT WCAP-18850-P/-NP, "ADAPTATION OF THE FULL SPECTRUM™ LOCA EVALUATION METHODOLOGY TO PERFORM ANALYSIS OF CLADDING RUPTURE FOR HIGH BURNUP"

Dear Zachary Harper:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am responding to your letter dated May 22, 2024, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML24143A147), requesting a fee exemption under Title 10 of the *Code of Federal Regulations* (10 CFR) 170.11(a)(1)(ii) for the NRC staff's review of the Westinghouse Electric Company (WEC) Topical Report WCAP-18850-P/-NP, "Adaptation of the FULL SPECTRUM M LOCA (FSLOCA™) Evaluation Methodology to Perform Analysis of Cladding Rupture for High Burnup Fuel' (Proprietary/Non-Proprietary)." On February 29, 2024, WEC submitted WCAP-18850-P/-NP to the NRC for review and approval (ML24060A161).

The NRC has established regulations for the granting of fee exemptions under 10 CFR 170.11 "Exemptions." An interested person may apply for an exemption under 10 CFR 170.11 in accordance with 10 CFR 170.5, "Communications."¹ The NRC staff reviewed your request based on the regulations in 10 CFR 170.11(a)(1)(ii) and 10 CFR 170.11(d).

Section 170.11(a)(1)(ii) states:

No application fees, license fees, renewal fees, inspection fees, or special project fees shall be required for: (1) A special project that is a request/report submitted to the NRC— . . . (ii) When the NRC, at the time the request/report is submitted, plans to use the information to assist the NRC in generic regulatory improvements or efforts (e.g., rules, regulatory guides, regulations, policy statements, generic letters, or bulletins).

Section 170.11(d) states:

All fee exemption requests must be submitted in writing to the Chief Financial

¹ 10 CFR 170.5 provides that "All communications concerning the regulations in this part should be addressed to the NRC's Chief Financial Officer, either by mail to the U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; by hand delivery to the NRC's offices at 11555 Rockville Pike, Rockville, Maryland; or, where practicable, by electronic submission, for example, via Electronic Information Exchange, or CD-ROM."

Officer in accordance with § 170.5, and the Chief Financial Officer will grant or deny such requests in writing.

Based on the NRC's staff review, I am granting your fee exemption request for the review of the WCAP-18850-P/-NP because it will assist the NRC in generic regulatory improvements or efforts to address direction from the Commission to address fuel fragmentation, relocation, and dispersal (FFRD) as part of a rulemaking effort to facilitate efficient licensing of high burnup fuel.

Your letter states that WCAP-18850-P/-NP can be used in conjunction with the Electric Power Research Institute's (EPRI) submittal of Technical Report 3002028673 "Loss-of-Coolant-Accident-Induced Fuel Fragmentation, Relocation and Dispersal with Leak-Before-Break Credit: Alternative Licensing Strategy" (ML24121A203). More specifically, EPRI's Technical Report 3002028675 uses the updated analytical methodology from WCAP-18850-P/NP to present composite, bounding modeling approaches to generically demonstrate cladding rupture would likely not occur for small-break and intermediate-break LOCAs assuming specific Westinghouse fuel and reactor designs. Thus, you state that WCAP-18850-P/-NP provides a methodology that can be used to conservatively predict margin to rod rupture, thereby supporting efforts to analyze and address FFRD as part of the overall strategy for licensing high burnup fuel.

In the "Project Plan to Prepare the U.S. Nuclear Regulatory Commission for Efficient and Effective Licensing of Accident Tolerant Fuels," Version 1.2, dated September 2021 (ML21243A298), the NRC committed to enabling the safe use of new technologies, especially those that can make NRC-regulated facilities safer. The U.S. nuclear industry, assisted by the U.S. Department of Energy, plans to deploy batch loads of fuels with higher burnup levels in the operating fleet on an aggressive timeline. To ensure the NRC was ready to review the batch loads of higher burnup fuels, as well as other options (near-term technologies, coated cladding, doped pellets, iron-chromium-aluminum cladding and increased enrichment), the NRC staff evaluated the regulatory framework and determined the framework is capable of reviewing higher burnup fuels without changes to the current regulations and guidance through the use of existing processes. However, the NRC staff continues to assess the need to update guidance to support the efficient reviews of such applications.

Additionally, the NRC is currently undertaking a rulemaking to facilitate the use of light-water reactor (LWR) fuel containing uranium enriched to greater than 5.0 and less than 20.0 weight percent uranium-235 (U-235) (referred to as the Increased Enrichment Rulemaking). On March 16, 2022, the Commission approved the staff's plan to initiate this rulemaking and directed that the regulatory basis for this rulemaking appropriately address and analyze FFRD issues relevant to fuels of higher enrichment and burnup levels (ML22075A103). Consistent with that direction, the NRC staff published "Increased Enrichment of Conventional and Accident Tolerant Fuel Designs for Light-Water Reactors, RIN Number: 3150-AK79, NRC Docket ID: NRC-2020-0034, Regulatory Basis Document for Public Comment" dated September 2023 (ML23032A504). The regulatory basis assesses five possible alternatives to address FFRD issues, and it consider the impact of each possible alternative.

The NRC staff plans to use the information in WCAP-18850-P/-NP to assist the NRC efforts to address FFRD issues relevant to fuels of higher enrichment and burnup levels as part of the Increased Enrichment Rulemaking. EPRI Report 3002028673—which uses the updated analytical methodology from WCAP-18850-P/NP—presents a similar approach to Alternative 5 for FFRD issues in the regulatory basis document. Therefore, review and potential approval of WCAP-18850-P/-NP will assist the staff in considering Alternative 5 as the rulemaking progresses. Further, these topical reports could form part of the regulatory framework supporting implementation of a version of Alternative 5.

Additionally, as noted in the regulatory basis, LOCA analyses to date have not accounted for the new phenomenology associated with fuel dispersal. While the analytical approach in WCAP-18850-P/-NP is specific to Westinghouse fuel assembly designs and materials, review and potential approval of this topical report will assist the NRC staff in analyzing the likelihood for potential for cladding rupture during a LOCA and what, if any, changes are needed to address such a likelihood in developing the Increased Enrichment Rulemaking and associated guidance documents. As such, WCAP-18850-P/-NP, in conjunction with EPRI Report 3002028673, constitutes part of the "proof of concept" demonstration for a successful licensing pathway to HBU fuel, which will assist the NRC staff in addressing Commission direction to address and analyze FFRD for high enrichment or high burnup fuel as part of the Increased Enrichment Rulemaking.

If you have any technical questions regarding this matter, please contact Ekaterina Lenning at 301-415-3151. Please contact Jo Jacobs, of my staff, at 301-415-8388 for any fee-related questions.

Sincerely,



Signed by Barwell, Owen
on 08/21/24

Owen F. Barwell
Chief Financial Officer

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