



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

June 25, 2024

Aylin Kucuk
Program Manager, Nuclear Fuels
Electric Power Research Institute
3420 Hillview Avenue
Palo Alto, CA 94304-1338

SUBJECT: ACCEPTANCE AND WITHHOLDING DETERMINATION FOR ELECTRIC POWER RESEARCH ALTERNATIVE LICENSING STRATEGY WHICH ADDRESSES PRESSURIZED WATER REACTOR LOSS-OF-COOLANT-ACCIDENT-INDUCED FUEL FRAGMENTATION, RELOCATION, AND DISPERSAL (EPID NOS. L-2024-TOP-0015, L-2024-TOP-0016, AND L-2024-TOP-0018)

Dear Aylin Kucuk:

By letter dated April 26, 2024 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML24121A203), Electric Power Research Institute (EPRI) submitted the following reports to the U.S. Nuclear Regulatory Commission (NRC) for review and approval:

- (1) EPRI Report 3002028673, "Loss-of-Coolant-Accident (LOCA)-Induced Fuel Fragmentation, Relocation and Dispersal (FFRD) with Leak-Before-Break (LBB) Credit - Alternative Licensing Strategy (ALS)"
- (2) EPRI Report 3002028675 (NP)/3002028674 (P), "LOCA Analysis of Fuel Fragmentation, Relocation, and Dispersal for Westinghouse 2-Loop, 3-Loop and 4-Loop Plants – Proprietary, Evaluation of Cladding Rupture in High Burnup Fuel Rods Susceptible to Fine Fragmentation"
- (3) EPRI Report 3002023895, "Materials Reliability Program: xLPR Estimation of PWR [Pressurized Water Reactor] Loss-of-Coolant Accident Frequencies (MRP-480),"

Collectively these three topical reports (TRs) are referred to as ALS for LOCA Analysis of FFRD. The ALS for LOCA Analysis for FFRD purports to demonstrate acceptable performance for LOCA-Induced FFRD phenomena in high burnup PWR fuel.

The purpose of this letter is to provide the results of the NRC staff's acceptance review of this request. The acceptance review was performed to determine if there is sufficient technical information in scope and depth to allow the NRC staff to complete its detailed technical review. The NRC staff has found that the material presented in the package is sufficient to begin the review.

As noted above, the ALS for LOCA Analysis of FFRD consists of three TRs submitted by EPRI under the same package. The overarching TR is EPRI Report 3002028673 which is supported by EPRI Report 3002028675(NP)/3002028674(P) and MRP-480.

An additional support TR, WCAP-18850-P/NP, Revision 0, "Adaptation of the FULL SPECTRUM™ LOCA (FSLOCA™) Evaluation Methodology to Perform Analysis of Cladding Rupture for High Burnup Fuel," was submitted by Westinghouse Electric Company on February 29, 2024 (ADAMS Package Accession No. ML24060A160) and accepted for review by the NRC staff on May 9, 2024 (ADAMS Accession No. ML24123A057). All four of these TRs are being reviewed separately based on the technical topics. Also, each of the four TRs will have its own schedule, safety evaluation (SE), and fee exemption determination.

EPRI Report	MRP-480	Report 3002028674/5	Report 3002028673
Audit Dates	November/ December 2024	December 2024/ January 2025	January/ February 2025
Request for Additional Information (RAIs) Issuance	January 10, 2025	February 12, 2025	March 22, 2025
Draft SE Issuance	October 17, 2025	December 12, 2025	February 17, 2026
Review Hours	1500	1500	1500
ADAMS Accession No. for TR Completeness Determination Form	ML24170A902	ML24170A891	ML24170A857

Following issuance of the draft SE for vendor review and prior to issuance of the final SE, the NRC staff anticipates that the Advisory Committee for Reactor Safeguards (ACRS) will hold subcommittee and full committee meetings to review these TRs.

Although the NRC staff determined that the TRs contain sufficient technical information in both scope and depth to conduct a detailed technical review, there are other regulatory activities that may impact the TR review schedule. For example, the NRC staff noted the generic applicability of the methodology appears to depend upon the establishment of an alternative regulatory interpretation concerning the postulation of piping ruptures and the consideration of associated dynamic effects. While there is ongoing rulemaking activity to address fuel dispersal as part of the increased enrichment rulemaking, uncertainty exists on the exact nature of the rule that this TR would be used to demonstrate compliance with and any associated impacts of the rulemaking effort.

The level of effort could change once the NRC staff delves into matters of technical and policy matters during the detailed safety review of the TRs. Similarly, the schedule could change if additional rounds of RAIs are needed. If there are emergent complexities or challenges in our review that would cause changes to the initial forecasted completion date or significant changes in the forecasted hours, the reasons for the changes, along with the new estimates, will be communicated during the routine interactions with the assigned project manager.

By letter dated April 26, 2024, EPRI submitted a fee exemption request to the NRC Chief Financial Officer (ADAMS Accession No. ML24121A209). The response and decision for the fee exemption request will be communicated in a separate letter from the NRC's Office of the Chief Financial Officer.

Finally, in the April 26, 2024, submittal, EPRI submitted a proprietary version (EPRI Report 3002028674) of report entitled “LOCA Analysis of Fuel FFRD for Westinghouse 2-Loop, 3-Loop and 4-Loop Plants – Evaluation of Cladding Rupture in High Burnup Fuel Rods Susceptible to Fine Fragmentation,” along with a request under Title 10 the *Code of Federal Regulation* Paragraph 2.390, “Public inspections, exemptions, requests for withholding,” that proprietary information be withheld from public disclosure. As required by regulations, EPRI also submitted a non-proprietary or public version of the report EPRI Report 3002028675 which can be found in ADAMS at Accession No. ML24121A208. The NRC has completed its withholding determination and enclosed NRC Form 897, “Topical Report Withholding Determination.”

If you have questions regarding this matter, please contact Lois James via email at Lois.James@nrc.gov or James Delosreyes via email at James.Delosreyes@nrc.gov.

Sincerely,

/RA/

Gerond A. George, Branch Chief
Licensing Project Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Enclosures:

1. Form 898, Completeness Determination of EPRI Report 3002028673
2. Form 898, Completeness Determination of EPRI Report 3002028674/5
3. Form 898, Completeness Determination of EPRI Report MRP-480
4. Form 897, Withholding Determination of EPRI Report 3002028674/5

Docket No: 99902021

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