



FRP 2024-014

Ref. Docket Number #9 902021

April 26, 2024

Attention: James Delosreyes
Document Control Desk
U. S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Subject: Request for NRC Review of EPRI's Alternative Licensing Strategy (ALS), described herein, which addresses PWR LOCA-Induced Fuel Fragmentation, Relocation, and Dispersal

- Reference: [1] *Loss-of-Coolant-Accident-Induced Fuel Fragmentation, Relocation, and Dispersal with Leak-Before-Break Credit – Alternative Licensing Strategy*. EPRI, Palo Alto, CA: 2024. 3002028673.
- [2] *Materials Reliability Program: xLPR Estimation of PWR Loss-of-Coolant Accident Frequencies* (MRP-480). EPRI, Palo Alto, CA: 2024. 3002023895.
- [3] *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*. EPRI, Palo Alto, CA: 2024. 3002028674.
- [4] *LOCA Analysis of Fuel Fragmentation, Relocation and Dispersal for Westinghouse 2-Loop, 3-Loop and 4-Loop Plants – Non-Proprietary, Evaluation of Cladding Rupture in High Burnup Fuel Rods Susceptible to Fine Fragmentation*. EPRI, Palo Alto, CA: 2024. 3002028675.
- [5] EPRI letter #FRP 2024-013, "Request for Exemption of NRC Review Fees for Electric Power Research Institute (EPRI) - Analysis of PWR LOCA Induced Fuel Fragmentation Relocation and Dispersal (FFRD) for Fuel Operating to Extended Burnup: Alternative Licensing Strategy," dated April 26, 2024.
- [6] EPRI Affidavit Docket Number#99902021, "Request for Withholding of the following Proprietary Document: 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. 3002028674," dated April 4, 2024.

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Enclosed for your review is a copy of EPRI's Alternative Licensing Strategy (ALS) topical report. ALS demonstrates acceptable performance for LOCA induced Fuel Fragmentation, Relocation and Dispersal phenomena in high burnup PWR fuel. References [1-3] describe the ALS analysis and the associated methods. Reference [5] provide a non-proprietary version of reference [4].

Reference [1] describes the overall analysis framework, which is based in part on results from references [2] and [3]. Reference [1] includes a discussion of the safety benefits of the ALS approach, a defense-in-depth assessment, and evaluations of non-piping reactor coolant system components. The evaluation of large break Loss of Coolant Accidents (LOCA) applies risk insights based on an extremely low likelihood of occurrence determination. This determination is based in part on the application of the Leak-Before-Break (LBB) concepts and supported by fracture mechanics analysis of piping systems [2]. The application of the LBB concept to Emergency Core Cooling Systems (ECCS) is discussed in reference [1]. It is one of the alternatives under consideration in the NRC's on-going increased enrichment rulemaking initiative ("Increased Enrichment of Conventional and Accident Tolerant Fuel Designs for Light-Water Reactors," September 2023. (ML23032A504)). Similar LBB applications have been adopted but current NRC policy limits ECCS applications. Revisions to the NRC's existing LBB policies would incorporate valuable risk insights into ECCS applications and provide a more uniform regulatory framework for the use of LBB. Revisions to the existing LBB policy statement were invited by the NRC Commission when the current policy was adopted ("Policy Statement on Additional Applications of Leak-Before-Break Technology," 54 CFR 18649 5/2/89). Since that time the LBB concept has matured, and the understanding of piping system performance has progressed, providing new insights into LBB applications.

Reference [2] describes the application of probabilistic fracture mechanics (xLPR) to RCS piping systems, with a focus on primary loop piping. The report includes comparisons to NUREG-1829 results and provides an evaluation of the time between the occurrence of detectable leakage and a potential large break LOCA.

Reference [3] evaluates cladding rupture in Westinghouse-fueled plants under small-break and intermediate-break LOCA conditions and results show that fuel cladding rupture would not occur. The analyzed plant configurations include the plant most likely to adopt ALS in the short term. Reference [1] provides supplemental analysis requirements for extending the applicability of ALS to other PWR plants on a plant class or a site-specific basis.

EPRI requests that the NRC review the ALS analysis, (References 1-3) on a fee exempt basis. A separate EPRI letter to the NRC Chief Financial Officer (CFO) (Reference [5]) is enclosed requesting a fee exemption.

Reference [3] contains information proprietary to Westinghouse Electric Company LLC ("Westinghouse"), and it is supported by an attached Affidavit (CAW-24-006) signed by

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Westinghouse, the owner of the information The Affidavit sets forth the basis on which the information may be withheld from public disclosure by the Nuclear Regulatory Commission ("Commission") and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations. Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations.

Correspondence with respect to the proprietary aspects or the supporting Westinghouse Affidavit should reference CAW-24-020 and should be addressed to Camille T. Zozula, Manager, Global Nuclear Regulatory Affairs.

Reference [3] also contains information owned by Electric Power Research Institute ("EPRI"). It is requested under 10 CFR Section 2.390(a)(4) that the Commission withhold from public disclosure the information identified in the enclosed Affidavit (Steve Swilley, April 4, 2024) [6] consisting of the proprietary information owned by EPRI. The Affidavit supporting this request is enclosed. EPRI welcomes any discussions and /or questions relating to the information enclosed. In case the NRC rejects this affidavit for protection for any reason, EPRI request that the NRC contact the EPRI project manager (fsmith@epri.com) and the EPRI Order Center (vvaughn@epri.com) with an offer of an opportunity for EPRI to withdraw this submittal. Any questions on this topic should be directed to EPRI personnel as described in the Affidavit.

If you have any questions on this subject, please contact the ALS project manager, Fred Smith, by telephone at 601.832.9637 or by e-mail at fsmith@epri.com.

Sincerely,



Dr. Aylin Kucuk
Program Manager, Nuclear Fuels

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c: Joe Donoghue, NRR

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Andrea Kock, NMSS
Kimberly Webber, RES
Lois James, NRC
James Delosreyes, NRC

NRC Document Control Desk

Commonwealth of Pennsylvania:

County of Butler:

- (1) I, Anthony Schoedel, Mgr, Advanced Reactors Licensing, have been specifically delegated and authorized to apply for withholding and execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse).
- (2) I am requesting the proprietary portions of EPRI report 3002028674, Revision 0, "LOCA Analysis of Fuel Fragmentation, Relocation, and Dispersal for Westinghouse 2-Loop, 3-Loop, and 4-Loop Plants: Evaluation of Cladding Rupture in High Burnup Fuel Rods Susceptible to Fine Fragmentation (Proprietary Version)," be withheld from public disclosure under 10 CFR 2.390.
- (3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged, or as confidential commercial or financial information.
- (4) Pursuant to 10 CFR 2.390, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.
 - (i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse and is not customarily disclosed to the public.
 - (ii) The information sought to be withheld is being transmitted to the Commission in confidence and, to Westinghouse's knowledge, is not available in public sources.
 - (iii) Westinghouse notes that a showing of substantial harm is no longer an applicable criterion for analyzing whether a document should be withheld from public disclosure. Nevertheless, public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar technical evaluation justifications and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

- (5) Westinghouse has policies in place to identify proprietary information. Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:
- (a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.
 - (b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage (e.g., by optimization or improved marketability).
 - (c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.
 - (d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.
 - (e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.
 - (f) It contains patentable ideas, for which patent protection may be desirable.
- (6) The referenced document is bracketed and marked to indicate the bases for withholding. The justification for withholding is indicated in both versions by means of lower-case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower-case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (5)(a) through (f) of this Affidavit.

I declare that the averments of fact set forth in this Affidavit are true and correct to the best of my knowledge, information, and belief. I declare under penalty of perjury that the foregoing is true and correct.

Executed on: 4/1/2024

Anthony J. Schoedel

Signed electronically by

Anthony Schoedel