



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001**

November 20, 2024

The Honorable Christopher T. Hanson
Chair
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

SUBJECT: SUMMARY REPORT – 719th MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, OCTOBER 2-3, 2024

Dear Chair Hanson:

During its 719th meeting, October 2 through 3, 2024, which was conducted in person and virtually, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters. The ACRS completed the following correspondence:

LETTER

Letter to Dr. Mirela Gavrilas, Executive Director for Operations, U.S. Nuclear Regulatory Commission (NRC), from Walter L. Kirchner, Chair, ACRS:

- Draft Safety Evaluation for Topical Report PWROG-18068-NP, "Use of Direct Fracture Toughness for Evaluation of Reactor Pressure Vessel Integrity," Revision 1, dated October 18, 2024, Agencywide Documents Access and Management System (ADAMS) Accession No. [ML24282A953](#).

MEMORANDA

Memoranda to Dr. Mirela Gavrilas, Executive Director for Operations, U.S. Nuclear Regulatory Commission (NRC), from Scott W. Moore, Executive Director, ACRS:

- Documentation of Receipt of Applicable Official NRC Notices to the Advisory Committee on Reactor Safeguards for October 2024, dated October 17, 2024, ADAMS Accession No. [ML24289A162](#), and
- Regulatory Guides (RGs), dated October 18, 2024, ADAMS Accession No. [ML24289A158](#).

HIGHLIGHTS OF KEY ISSUES

- a. Draft Safety Evaluation for Topical Report PWROG-18068-NP, "Use of Direct Fracture Toughness for Evaluation of Reactor Pressure Vessel Integrity," Revision 1

The Committee heard from representatives of the Pressurized Water Reactor Owners Group (PWROG) and NRC staff, and it issued an October 18, 2024, letter, with the following conclusions and recommendation:

1. The use of direct fracture toughness data, proposed in PWROG-18068-NP, Revision 1, represents a significant improvement in the methodology for estimating reactor pressure vessel (RPV) embrittlement.
2. The proposed methodology provides embrittlement predictions more consistent with data and with reduced uncertainty, leading to increased confidence of RPV integrity at anticipated fluences expected during the period of extended operation for subsequent license renewal.
3. The proposed methodology also leads to more accurate Pressurized Thermal Shock evaluation and Pressure-Temperature limit curve determination, providing for more flexible operation.
4. The safety evaluation should be issued.

b. Palisades Restart Information Briefing

The Committee heard from representatives of Holtec, the licensee of the Palisades Nuclear Plant and NRC staff from the Office of Nuclear Reactor Regulation (NRR) and Region II, including inspectors, about the process for potential restart of the facility.

The staff's and Holtec's presentations may be found at ADAMS Accession No. [ML24319A182](#).

The Committee discussed the desire to have further interactions on this topic in the future.

c. Discussions during the Planning and Procedures Session

1. The Committee discussed the Full Committee (FC) and Subcommittee (SC) schedules through March 2025 as well as the planned agenda items for Full Committee meetings.
2. The ACRS Executive Director led a discussion of significant notices issued by the Agency since the last FC meeting in September 2024. The Executive Director documented this activity in a memorandum dated October 17, 2024, ADAMS Accession No. [ML24289A162](#).
3. The Executive Director also led a discussion of two draft RGs regarding possible review by the Committee. The Executive Director documented this activity in a memorandum dated October 18, 2024, ADAMS Accession No. [ML24289A158](#).
4. Member Roberts led a discussion on the Framatome topical report (TR), ANP-10357P, Revision 0, TXS Compact Platform.

Framatome requested NRC review and approval of TR ANP-10357P, Revision 0, "TXS COMPACT PLATFORM Topical Report," for referencing in licensing actions. This report presents the generic application of the TXS COMPACT which has been developed as platform based on Field-Programmable Gate Array (FPGA) technology that can be

integrated with different modules from the TXS portfolio to implement safety instrumentation and control (I&C) systems.

This TR of the Framatome TELEPERM XS (TXS) COMPACT FPGA is a list of individual module parts and some descriptions on how they could be assembled to form applications.

Member Roberts recommends that a review by the Committee is not warranted. The ACRS digital I&C focus is validating that the architecture framework and the fundamental principles are met. A discussion of the platform pieces does not provide sufficient information to conduct such an assessment. ACRS review should be considered for the first application that uses the TXS platform pieces in an application. The Committee agreed with the recommendation.

5. Member Harrington led a discussion of NEDC 33934, BWRX-300 Safety Strategy TR.

The TR defines the BWRX-300 Safety Strategy which applies “a Defense-in-Depth (D-in-D) design approach to achieve an internationally deployable design with an inherent high level of safety.” The stated purpose of the TR submittal is to obtain US regulatory approval for “the use of Defense Line (DL) functions in mitigating Anticipated Operational Occurrences (AOOs), Design Basis Accidents (DBAs), and Design Extension Conditions (DECs), and the use of the safety classification process for Structures, Systems, and Components (SSCs) as they relate to DLs, including seismic classification requirements.” The described approach is intended to broadly satisfy existing regulatory requirements in the U.S. for these design and licensing elements but does so in ways that variously deviate from existing U.S. NRC regulatory guidance, and thus requires approval. The consideration for the described approach to so broadly satisfy the requirements of a range of international regulatory jurisdictions is also noteworthy.

Whether a design center is applying the licensing modernization project (LMP) principles for a new reactor type or implementing a novel approach to define the licensing basis for an LWR, their understanding of and approach to the associated tasks lie at the core of the Committee’s purpose. Therefore, member Harrington recommends that this TR be reviewed by the Committee and suggests there be a predisposition that such fundamental “safety strategy” submittals from other design centers similarly be reviewed.

The Committee agreed with the Subcommittee recommendations.

6. Member Ballinger led a discussion of the ACRS activities associated with the increased enrichment draft rulemaking package to include:
 - a. November 19, 2024, Subcommittee meeting on RG 1.183, revision 2, topics: pathway specific source term using MELCOR (Electric Power Research Institute Modular Accident Analysis Program (MAAP) runs), and updated to 2023 source term presentation,
 - b. December 17 and 18, 2024, Subcommittee meeting on draft rule language and package;

- c. December 19, 2024, Subcommittee meeting on entire RG 1.183, revision 2,
 - d. January 2025 Subcommittee meeting on transition break size, fuel fragmentation, relocation and dispersal guidance documents, and
 - e. Letter report on draft rule language during February 2025 FC meeting.
7. Chair Kirchner led a discussion and review of chapter memorandum for the NuScale US460 standard design approval application.

The Committee also reviewed and provided input for the following chapter review:

- Chapter 18, “Human Factors Engineering” (Member Bier lead).
8. Member-At-Large Petti led a discussion of the plans to produce the report on the triennial review of NRC’s safety research program including lead member assignments as follows:

The report is scheduled for deliberation during the November 2024 full committee meeting.

Topic	SC/FC mtg date	ACRS Member Lead
Integration of Source Term Activities in Support of Advanced Reactor Initiatives	SC: February 17, 2022 FC: March 2-4, 2022 ACRS Letter: April 4, 2022	Petti
Digital Twins Information Briefing	FC: May 4, 2022	Bier
Update on NRC Materials Harvesting Activities	FC: October 6, 2022	Sunseri
Level 3 Probabilistic Risk Assessment	SC: June 22, 2022, and October 19, 2023 FC: November 1, 2023	Dimitrijevic
Implementing the NRC’s Artificial Intelligence (AI) Strategic Plan Fiscal Years 2023-2027	SC: November 15, 2023	Bier
High Burnup Fuel Source Term Accident Analysis	SC: November 16, 2023	Petti
Research Information Letter on Fuel Fragmentation, Relocation and Dispersal at High Burnup	FC: December 1, 2021	Ballinger
Advanced Manufacturing	FC: July 6, 2022	Sunseri

How machine learning is influencing Non-Destructive Examination and Inservice Inspection	FC: March 6, 2024	Ballinger
Non-Light Water Reactor code development update	FC: April 3, 2024	Martin
High Energy Arc Faults	FC: March 7, 2024	Roberts
Risk assessment and human factors for non-light water reactors	FC: July 10, 2024	Dimitrijevic and Bier

9. Executive Director Moore led discussion of one reconciliation on the subject of the Safety Evaluation of the Kairos Non-power Reactor Hermes 2 Construction Permit Application.

No further action was decided on this topic.

10. There was a closed portion of the meeting to discuss proprietary and administrative topics.

11. The following topics are on the agenda of the 720th ACRS FC meeting which will be held on November 6 through 8, 2024:

- Draft White Paper, "Nth-of-a-Kind Micro-Reactor Licensing and Deployment Considerations,"
- Triennial Review and Evaluation of NRC Safety Research Program/Preparation of Reports, and
- TerraPower Sodium Topical Report on Plume Exposure Pathway.

Sincerely,



Signed by Kirchner, Walter
on 11/20/24

Walter L. Kirchner
Chair

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