



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

July 21, 2023

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

**SUBJECT: SUMMARY REPORT – 706<sup>th</sup> MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, JUNE 7-8, 2023**

Dear Chair Hanson:

During its 706<sup>th</sup> meeting, June 7-8, 2023, which was conducted in person and virtually, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters. The Committee completed its agenda early and adjourned on June 8, 2023.<sup>1</sup> During its 706<sup>th</sup> meeting, the ACRS completed the following correspondence:

**LETTER**

Letter Report to Daniel H. Dorman, Executive Director for Operations (EDO), U.S. Nuclear Regulatory Commission (NRC) from Joy L. Rempe, Chairman, ACRS:

- General Atomics Topical Report, “Fast Modular Reactor Principal Design Criteria,” Revision 2, dated June 20, 2023, Agencywide Documents Access and Management System (ADAMS) Accession No. ML23166A446.

**MEMORANDA**

Memoranda to Daniel H. Dorman, EDO, NRC, from Scott W. Moore, Executive Director, ACRS:

- Documentation of Receipt of Applicable Official NRC Notices to the Advisory Committee on Reactor Safeguards for June 2023, dated June 26, 2023, ADAMS Accession No. ML23172A065, and
- Regulatory Guides, dated June 26, 2023, ADAMS Accession No. ML23172A058.

**HIGHLIGHTS OF KEY ISSUES**

- a. General Atomics Topical Report, “Fast Modular Reactor Principal Design Criteria,”

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<sup>1</sup> Although not part of the 706<sup>th</sup> meeting, the Committee did meet with the Commission on June 9, 2023.

Revision 2

The Committee heard from the NRC staff and General Atomics (GA) representatives and issued its letter dated June 20, 2023, with the following conclusions and recommendations:

1. The proposed Fast Modular Reactor Principal Design Criteria (FMR-DCs) provide an adequate basis to guide ongoing GA design decisions and the staff review.
2. The staff safety evaluation report should be issued.

b. Discussions at the Planning and Procedures (P&P) Session

1. The Committee discussed the Full Committee and Subcommittee schedules through October 2023 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 Full Committee meeting in May 2023 (this activity is documented in a memorandum dated June 26, 2023).
3. The ACRS Executive Director led a discussion of two regulatory guides that the Committee was asked about regarding interest in review. The Executive Director documented the Committee's decision in a memorandum dated June 26, 2023.
4. Member Halnon led a discussion about the planned visit to Region IV in July 2023. Activities will include a visit to the Abilene Christian University (ACU) NEXT Lab, Comanche Peak Nuclear Power Plant, and Region IV offices (including a Plant Operations Subcommittee meeting). A visit to the ACU NEXT Lab is scheduled for Tuesday, July 25, 2023; a visit to Region IV headquarters for Wednesday, July 26, 2023; and a site visit to Comanche Peak Nuclear Power Plant on Thursday, July 27, 2023. Although the Committee will not be reviewing the ACU molten salt research reactor application, the ACU trip is included to provide members an introduction to this technology. ACU researchers will provide presentations and laboratory tours to inform members about various coolants, hazards, support equipment and instrumentation associated with molten salt technologies using solid and liquid fuels. This information will assist members in their review of molten salt reactor applications scheduled for submittal in the latter part of 2023 and during 2024. Member Halnon and ACRS staff are continuing to work with the Committee members and Region IV staff to arrange logistics for the visit.
5. Member Bier led a discussion regarding next steps on the Artificial Intelligence (AI) topic. She proposed inviting Dr. Missy Cummings, George Mason University, to provide her perspectives on AI at a joint Digital I&C and Plant Operations Subcommittee on November 15, 2023, in conjunction with the staff's update briefing on the *Artificial Intelligence (AI) Strategic Plan FY 2023-2027*. The goal is to gain her perspective about possible safety concerns, and potential safety benefits, of AI in the more distant future (e.g., making safety-critical decisions in real time). Dr. Cummings indicated she is willing to participate. It was agreed that Member Bier should invite Dr. Cummings to discuss goals for her presentation and confirm scheduling.

6. Executive Director Moore led a discussion about maintaining wellness for Committee meetings and highlighted that if any Committee Members, as well as ACRS staff, or NRC staff, are not feeling well, they should take precautions such as participating remotely with a goal to maintain a healthy meeting atmosphere.
7. Member Ballinger and an ACRS staff member attended the NEI Used Fuel Management Conference March 25 – 27, 2023, in Las Vegas, NV. The conference focused on a wide range of issues, from consent-based siting of ultimate storage to implementation of Title 10 to the *Code of Federal Regulations* (10 CFR) 72.48, “Changes, tests and experiments“. Member Ballinger’s focus was to obtain an update on storage (Part 72) and transportation (Part 71) issues related to canister reliability. There are, and have been, extensive research programs under way for many years that deal with canister reliability. These programs have been largely focused on the physics of canister failure mechanisms - the most recent being canister breach due to chloride-induced stress corrosion cracking (SCC). ACRS has been following these efforts. While the Committee has agreed that the extensive “1st principals” research has been informative, there are now over 4000 canisters in service without a single incident of leakage from a welded canister. Given this history, ACRS has questioned (see letter report, dated April 20, 2016), the added usefulness of continued, expensive, experimental programs and suggested a complete “consequence analysis” would show that the dose consequences of a canister breach would be extremely low. Industry organizations and the Department of Energy, as well as the staff, have acknowledged the importance of understanding the consequences. However, Member Ballinger noted that he believed industry and staff have been very slow in performing such a consequence analysis. None-the-less, progress has been made. Recent MELCOR and GOTHIC results, using experimental data, have suggested that canister leakage through an SCC crack is so small and of such a short duration, as to be of no dose consequence. (See “Measurement of Aerosol Transmission Through a Stress Corrosion Crack-Like Geometry” Durbin, et. al., EPRI Extended Storage Collaboration Program, November 9, 2022). The consensus at the NEI conference is now that, indeed, the dose consequences of a canister leak are insignificant. Several of the presentations at the conference demonstrated this. This is the case even when making extremely conservative assumptions. Yet the focus of the industry is still heavily focused on experimental research.

In addition to the consequence issue, there are significant issues related to the interface between the regulations related to storage (Part 72) and transportation (Part 71) that will need to be reconciled to smooth the path to long term storage-or even allow transportation of some SMRs after use. The ACRS is currently in the initial stages of considering some SMR applications for which such transportation will be required. Incorporating risk-informed insights, of which a consequence analysis would be a significant part, will be an important part this process. To support this effort, Member Ballinger and ACRS staff are working with a summer intern to identify a complete list of phenomena that should be considered in such a consequence analysis.

Member Ballinger and the ACRS staff will continue to follow the efforts of the staff related to the results of their on-going consequence analysis. Member Ballinger and ACRS staff are interfacing with the NRC staff in this area and expect to schedule a SC briefing at an appropriate time. In addition, a SC meeting has been scheduled on the transportation part of the Pele submittal near the end of the year (November 2023).


8. Chairman Rempe led a discussion of follow-up items from the international activity effort. She now has all the comments from the international and US participants incorporated into the draft report. ACRS staff is working to identify the proper format of the document for posting on the ACRS website. Once she receives this input, she will send out a copy for concurrence. She noted that she expected to have a one paragraph transmittal letter for member review and approval. Then, the report will be posted on the ACRS website.
9. There was a closed session of the P&P to discuss proprietary Committee Engagement Plans and sensitive administrative and personnel issues.

c. Scheduled Topics for the 707<sup>th</sup> ACRS Meeting

The following topic is on the agenda for the 706<sup>th</sup> ACRS meeting scheduled for July 12-14, 2023:

- EPRI Data Validation Topical Report,
- Vogtle License Amendment Request Involving Loading Lead Test Assemblies with Increased Enrichment
- Framatome Topical Report on ARITA/ARTEMIS/RELAP Integrated Transient Analysis Methodology
- LANCR02 Lattice Physics Model Description Topical Report

Sincerely,



Signed by Rempe, Joy  
on 07/21/23

Joy L. Rempe  
Chairman

July 21, 2023

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<b>OFFICE</b>	ACRS	SUNSI Review	ACRS
<b>NAME</b>	LBurkhart	LBurkhart	JRempe
<b>DATE</b>	7/11/23	7/11/23	7/21/23

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