



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

April 16, 2024

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

SUBJECT: SUMMARY REPORT – 713th MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, MARCH 6-7, 2024

Dear Chair Hanson:

During its 713th meeting, March 6-7, 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 Raymond V. Furstenau, Acting Executive Director for Operations (EDO), U.S. Nuclear Regulatory Commission (NRC) from Walter L. Kirchner, Chair, ACRS:

- Final Draft Revision 9 of Standard Review Plan Branch Technical Position (BTP) 7-19, "Guidance for Evaluation of Defense in Depth and Diversity to Address Common-Cause Failure Due to Latent Defects in Digital Safety Systems," dated March 22, 2024, Agencywide Documents Access and Management System (ADAMS) Accession No. ML24075A286.

MEMORANDUM

Memorandum to Raymond V. Furstenau, Acting 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 March 2024, dated March 14, 2024, ADAMS Accession No. ML24072A291.

HIGHLIGHTS OF KEY ISSUES

- a. Final Draft Revision 9 of Standard Review Plan BTP 7-19

The Committee heard from the NRC staff and issued the March 22, 2024, letter report, with the following conclusions and recommendations:

1. After incorporation of one clarification to Section B.3.4.4 as discussed in the subject letter, the draft revision to BTP 7-19 will more completely reflect Commission Policy as promulgated in SRM-SECY-22-0076, and it can be issued.
2. The staff should develop a plan to complete an integrated staff guidance document for digital instrumentation and control defense-in-depth and diversity assessments to maintain consistency across all reactor types.
3. Longer term suggestions to improve assessments of defense in depth and diversity are discussed further in the letter.

Member March-Leuba abstained from the vote on approving this letter.

b. Review of NRC Research Program – Artificial Intelligence and Machine Learning in Non-Destructive Examination and In-Service Inspection Activities

The Committee heard from representatives of the NRC's Office of Regulatory Research about the activities ongoing in the use of artificial intelligence and machine learning in non-destructive examination and in-service inspections. This session was conducted to support the Committee's eventual triennial report on the NRC's Research Program.

c. Discussions at the Planning and Procedures Session

1. The Committee discussed the Full Committee and Subcommittee schedules through August 2024 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 February 2024. The Executive Director documented this activity in a memorandum dated March 14, 2024, ADAMS Accession No. ML24072A291.
3. There were no regulatory guides (RG) discussed at this Full Committee meeting.
4. Vice Chair Halnon led a discussion of the planned trip to Region II sites for the week of July 22, 2024. This visit will include a visit to the Technical Training Center, a Tennessee Valley Authority operating plant (most likely Sequoyah), and Region II offices including a Plant Operations Subcommittee meeting while at Region II. Additional logistical information will be provided to members in the future.
5. Chair Kirchner led a discussion about the plan for ACRS review of the NuScale standard design approval application including an upcoming meeting on March 19, 2024, of the NuScale Design-Centered Subcommittee. It is planned that the Subcommittee will discuss Chapters 2, 10, 11, 13, 17, and 19.4. On August 22, 2024, the NuScale Design-Centered Subcommittee will review the staff's safety evaluation reports for standard design approval Chapters 7, 8, 9, 12, and 18.

6. Member Roberts led a discussion about pursuing a Subcommittee meeting with the staff to discuss possible additional guidance on the assumptions used in accident analyses that support emergency planning and site population considerations. It was agreed that Members Roberts, Martin, and Halnon (and any other interested members) would pursue this issue with the staff in a future Accident Analysis Subcommittee meeting.
7. Update of JEXU-1041-1008, Safety System Digital Platform - MELTAC [Mitsubishi Electric Total Advanced Controller] Topical Report (TR).

Member Brown led a discussion on this topic.

The TRs in the digital instrumentation and control (I&C) area have not been reviewed by the ACRS. Specifically, the process has been to review mainly those TRs that define the system architecture for plant implementation.

The original MELTAC platform TR was reviewed and approved by the NRC staff in May 2019. In particular, the Mitsubishi Electric Company (Melco) as the applicant asked NRC staff to review this updated platform in two phases:

- Phase 1: For this Phase 1, the applicant submitted only the basic or conceptual design information of proposed changes which are briefly summarized below. The detailed design and implementation for the proposed changes, such as new and modified modules, has not been completed. The documents submitted in the reactor protection System (RPS) system are for Phase 1, the conceptual design. Currently, the NRC staff is performing an evaluation only on the conceptual design information of proposed changes submitted for this Phase 1. NRC plans to issue the safety evaluation (SE) in May if the applicant provides RAI responses on time.
- Phase 2: The applicant will submit the information on the detailed design and implementation, such as design and equipment qualification (EQ) testing for the proposed changes. The review of Phase 2 detail information is currently scheduled in early 2026 and will be conducted separately by the NRC staff.

The main changes/updates to the TR include:

- Use of alternate International Electrotechnical Commission (IEC) testing standards for the Electromagnetic Interference(EMI)/ Radio Frequency Interference (RFI) qualification allowed in RG 1.180.
- Some new and updated modules which include the power interface module, power supply module, repeater module, alarm signal input module, digital input module, digital output module, distribution module, module chassis, and excore nuclear instrumentation unit.
- Added communication capability for the control network. There is no major change to the I&C architecture included in the original TR.
- Use of updated versions of regulatory guides and standards, such as RG 1.89, RG 1.100, RG 1.105, RG 1.164, RG 1.180, Institute of Electrical and Electronics Engineers (IEEE) Std. 323, IEEE Std. 344, etc.

Last year Melco submitted an updated version of this MELTAC platform to support the pre-application (and potential application) activities for the Holtec SMR-160 reactor design which selected the MELTAC as its digital I&C platform. The specific timeline for the submission of the Holtec-160 application is unknown.

Specifically, the internal workings and detail of the MELTAC platform are not being changed. The most critical feature is the presence of hardware watchdog timer (WDT). It has multiple WDTs as noted in Section 4.1.5.2.1 Central Processing Unit (CPU) Module. WDT-1 is the overall cycle monitor and is stated to be hardware based. There are multiple additional timers that check various other internal operations as shown in Figure 4.1.5.3 of the TR.

Member Brown recommended no review of this TR since the internal operation that we are interested in is a hardware-based watch dog timer, which it has.

The focus is on ensuring that the architecture framework and the fundamental principles are met.

The Committee agreed with Member Brown's recommendation.

8. Technical Assistant Rob Krsek led a discussion of preparations for the Committee's presentations to the Commission at the June 7, 2024, Commission Meeting. The next step is for the Committee to approve topics and presenters for that meeting. Chair Kirchner proposed several topics and presenters to include in the proposed scheduling note including:
 - Kirchner – Overview
 - Greg Halnon - ACRS Improvements to Effectiveness and Efficiency
 - Dave Petti - Practical Applications of Committee Improvements in Recent Reviews
 - Matt Sunseri – Reports on the Safety Aspects of Recent License Renewal and Subsequent License Renewal Application Reviews of St. Lucie Plant, Units 1 and 2; Commanche Peak Nuclear Power Plant, Units 1 and 2; and Monticello Nuclear Generating Plant, Unit 1
 - Ron Ballinger - Low Level Radioactive Waste Disposal Proposed Rule (Part 61)

The Committee approved the presenters and topics. Rob Krsek will forward the proposed draft scheduling note to the Office of the Secretary (SECY).

9. Review of Limerick Digital License Amendment Request and Staff SE

Member Brown led a discussion on this topic.

The proposed amendment request would change both the design and technical specifications to permit the use of a new single digital I&C system to replace analog instrumentation of the reactor protection system, analog nuclear steam supply shutoff system, emergency core cooling system, reactor core isolation cooling system, and end-of-cycle recirculation pump trip at Limerick. In addition, the proposed amendments would change the classification of the redundant reactivity control system from safety-related to non-safety-related, eliminate the automatic redundant reactivity control system feedwater runback function, eliminate the automatic isolation function for the

turbine enclosure main steam line tunnel temperature high indication, eliminate several surveillance requirements, and allow the use of automated operator aids (or automated controls) from the main control room.

The NRC staff is planning to complete its review and safety evaluation by July 18, 2024. On the current schedule, the staff is planning on sending the ACRS a copy of the safety evaluation prior to branch chief concurrence. If there are no delays in the review schedule, the NRC staff would complete this review (including receipt of no legal objection from the Office of the General Counsel) in early September 2024 and inform the Commission of their intent to issue the decision on this amending request by mid-September 2024. This amendment is considered a significant licensing action, so the staff must give the Commission five-day notice prior to issuance.

10. Executive Director Moore led a discussion of the one reconciliation for this month regarding the draft white paper entitled Response to the Advisory Committee On Reactor Safeguards Letter, "Draft White Paper, 'Micro-Reactor Licensing and Deployment Considerations: Fuel Loading and Operational Testing at a Factory,'" ADAMS Accession No. ML23296A197. No further action by the Committee was recommended and agreed to.

d. Scheduled Topics for the 714th ACRS Meeting

The following topics are on the agenda for the 714th ACRS meeting scheduled for April 3-4, 2024:

- Research topic – Non-light-water reactor code development, and
- NuScale standard design approval application topics.

Sincerely,



Signed by Kirchner, Walter
on 04/16/24

Walter L. Kirchner
Chair

April 16, 2024

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