Regulatory Frameworks and Technical Approaches to Ensure Appropriate Qualification and Through-Life Performance of Materials in Advanced Reactors: Call for Abstracts

- The NEA Working Group on New Technologies (WGNT) is developing a report on qualification and through-life performance.
- This report will summarize established regulatory frameworks (e.g., regulations, approved guidance) and technical approaches (e.g., methods and models), establish best practice attributes, and identify key areas for future consideration to ensure appropriate qualification and through-life performance of materials in advanced non-water-cooled reactors. Technical approaches include work conducted by vendors and Technical Support Organizations to provide regulators reasonable assurance of adequate protection regarding structural integrity of materials. Successful communication pathways with regulators are also within the scope of this report.
    - Qualification comprises efforts to inform the design of structures, systems, and components (SSCs).
    - Through-life performance comprises efforts to ensure that operation occurs within the design envelope once SSCs go into service.
- The focus is on approaches with high technical maturation that have seen successful regulatory engagement or have a robust plan for regulatory engagement. Traditional light-water reactor approaches with principles that can be applied to advanced non-water-cooled reactors are also within scope.
- The development of this report will occur in three phases:
    - Phase 1 – Subject matter experts (SMEs) from regulatory authorities, vendors, and technical support organizations will submit a paper on established regulatory practices or technical approaches. These submissions, selected after review of submitted abstracts, will be incorporated directly into the report similar to a conference proceeding.
    - Phase 2 –During the workshop, SMEs will present the information they submitted. Discussion will follow to establish best practice attributes and identify key areas for future consideration to ensure appropriate qualification and through-life performance.
    - Phase 3 – The WGNT will use the information gathered in Phase 1 and Phase 2 to develop the report. The report will be published and made available to the public. The tentative format for the report is attached.
- The working language of this effort will be English. No simultaneous interpretation will be provided during the workshop.

Topics

1. General qualification (Q-Gen)
2. Qualification of advanced manufacturing technologies (Q-A)
3. Qualification of graphite (Q-G)
4. Qualification of composites (Q-C)
5. General through-life performance (T-Gen)
6. Through-life performance of advanced manufacturing technologies (T-A)
7. Through-life performance of graphite (T-G)
8. Through-life performance of composites (T-C)

Timeline

- March 10, 2025 – Abstract submission
- May 5, 2025 – Registration deadline (all participants)
    - *https://www.oecd-nea.org/jcms/pl_99118*
- May 12, 2025 – Submission of full-length paper for review
- May 28, 2025 – Presentation submission
- June 3-5, 2025 – Workshop where participants will present their paper submission
- June 23, 2025 – Feedback provided on paper submission
- July 21, 2025 – Final paper submission
- July 21, 2025 – Submission of copyright form
- 2026/2027 – Report published

Workshop

- The workshop will be a hybrid event from June 3-5, 2025. In-person participation is encouraged.
- The workshop will be located at the U.S. Nuclear Regulatory Commission's Headquarters in Rockville, MD.
- Workshop attendees will primarily be the authors of accepted papers.
- No registration fee is charged to participants.
- Workshop attendees are responsible for any costs they accrue associated with their participation in this activity. Participants must make their own travel and accommodation arrangements.
- Hotel and travel information are attached.

Working Languages(s)

The working language of this effort will be English.

Call for abstracts

To submit an abstract, use the following link: https://forms.office.com/g/sykbmBTqS3. The template for the papers will be provided to the corresponding author of accepted abstracts.

Contact Information

For more information, please send an email to Ryann.Bass@nrc.gov and Wendy.Reed@nrc.gov.