IAEA
International Atomic Energy Agency
Atoms for Peace and Development

Technical Meeting on Absorbers for Current and Advanced Water-cooled Reactors: Development, Qualification and Operational Experience

IAEA Headquarters, Vienna, Austria
Hybrid event (in-person and remote participation)

22–25 March 2027

Ref. No.: EVT2603288

Information Sheet

Introduction

Absorbers, including burnable absorbers and absorber rods, are established components of reactivity management in water-cooled reactors. They compensate for excess reactivity, help manage power distribution and contribute to fuel cycle optimization. Longer operating cycles, higher discharge burnup and increased fuel enrichment, together with the requirements of some water-cooled small modular reactor (SMR) designs, create a need to review established technologies and emerging approaches. Relevant considerations include absorber materials and geometries, fabrication, irradiation behaviour, modelling, qualification, licensing and operational experience.

The International Atomic Energy Agency (IAEA) has previously addressed absorber technologies in publications including Characteristics and Use of Urania-Gadolinia Fuels, IAEA-TECDOC-844 (1995); Advances in Control Assembly Materials for Water Reactors, IAEA-TECDOC-813 (1995); Safe Core Management with Burnable Absorbers in WWERs, IAEA-TECDOC-858 (1996); and Control Assembly Materials for Water Reactors: Experience, Performance and Perspectives, IAEA-TECDOC-1132 (2000). Since 2000, developments in fuel and absorber designs, fabrication capabilities and computational methods have expanded the options for reactivity management. Longer operating cycles and the pursuit of higher discharge burnup and increased fuel enrichment place greater demands on the management of excess reactivity and power distribution throughout the fuel cycle. In parallel, some water-cooled SMR concepts envisage reduced reliance on soluble boron or boron-free operation, increasing the importance of

coordinated burnable absorber and control rod strategies. These developments call for absorber designs with suitable depletion characteristics and demonstrated irradiation performance, supported by validated modelling methods and qualification evidence relevant to the intended operating conditions. More than two decades after the most recent of IAEA's publications, is timely to consolidate accumulated operational experience, assess emerging technologies and identify the data and qualification needs associated with these evolving applications. An updated exchange of information will help Member States assess current practice, development trends and remaining knowledge gaps in current and advanced water-cooled reactors.

To support this exchange, the IAEA is organizing the Technical Meeting on Absorbers for Current and Advanced Water-cooled Reactors: Development, Qualification and Operational Experience at its Headquarters in Vienna, Austria, from 22 to 25 March 2027. The meeting will be held in hybrid format, with presentations delivered in person only. It will bring together research, industrial, operational and regulatory perspectives on the use of absorbers in water-cooled reactors, including relevant SMR concepts.

Objectives

The purpose of the meeting is to review the status and recent developments in absorber materials, components and deployment strategies for current and advanced water-cooled reactors. It will facilitate the exchange of technical information and operational experience on absorber design, fabrication, modelling, irradiation behaviour, qualification and licensing, identify remaining technical challenges and knowledge gaps, and provide recommendations for future international cooperation and IAEA activities.

Target Audience

The event is intended for specialists from fuel vendors, utilities, reactor and core designers, research and development organizations, technical support organizations, regulatory bodies and academia working on absorbers for water-cooled reactors, including SMRs.

Participants should be actively involved in absorber material or component development, fuel and absorber fabrication, neutronic or fuel performance modelling, irradiation testing, qualification, licensing, core design or reactor operation, and be able to contribute relevant technical information, research results or operating experience.

The technical scope covers absorber applications in pressurized water reactors, WWERs, boiling water reactors and relevant advanced water-cooled reactor concepts. It includes integral fuel absorbers, absorber coatings, discrete absorber rods and inserts, advanced geometries and combined deployment strategies, together with associated fuel cycle considerations.

Member States are strongly encouraged to identify suitable women participants.

Working Language

English.

Expected Outputs

The meeting is expected to produce a meeting report summarizing the technical information, development status, qualification approaches and operating experience and lessons learned shared by Member States, identifying priority knowledge and data gaps related to absorber materials, fabrication, irradiation behaviour, modelling, qualification and deployment in current and advanced water-cooled reactors, The meeting will also formulate recommendations for potential IAEA activities, including updates to existing publications, development of shared databases or coordinated research activities, as appropriate.

Topics

Presentations and discussions will address the development, qualification and operational experience of absorbers for current and advanced water-cooled reactors. Contributions are invited on the following topics:

- Operational experience and lessons learned with established absorber technologies, including their role in reactivity control, power distribution management and fuel cycle optimization;
- Development of absorber materials, fuel-integrated absorbers, coatings, discrete rods and inserts, advanced geometries and combined deployment strategies,
- Fabrication and quality assurance including absorber material production, homogeneity and distribution of absorber materials in fuel, manufacturing of absorber coatings, quality control and industrial scalability and supply-chain considerations;
- Neutronic and fuel performance modelling, nuclear data, depletion behaviour, uncertainty assessment, experimental validation and validation of core design methods;
- Qualification of materials and fuel designs, irradiation testing and post-irradiation examination, licensing experience and evidence needed for deployment;
- Requirements arising from longer cycles, higher burnup, increased enrichment and reduced-boron or boron-free water-cooled SMR concepts, including interfaces with spent fuel management and priorities for future research and cooperation;
- Safety analysis, licensing implications and deployment.

Presentations will be followed by technical discussions to review the current status, identify priority gaps in the evidence base and formulate recommendations for future IAEA work.

Participation and Registration

All persons wishing to participate in the event must be designated by an IAEA Member State or be members of an organization invited to attend.

In order to be designated by an IAEA Member State or invited organization, participants are requested to submit their application via the InTouch+ platform (https://intouchplus.iaea.org) to the competent national authority (Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) or organization for onward transmission to the IAEA by **30 January 2027**, following the registration procedure in InTouch+:

1. Access the InTouch+ platform (https://intouchplus.iaea.org):
   - Persons with an existing NUCLEUS account can sign in to the platform with their username and password;
   - Persons without an existing NUCLEUS account can register here.

2. Once signed in, prospective participants can use the InTouch+ platform to:
   - Complete or update their personal details under 'Complete Profile' and upload the relevant supporting documents;
   - Search for the relevant event under the 'My Eligible Events' tab;
   - Select the Member State or invited organization they want to represent from the drop-down menu entitled 'Designating Authority' (if an invited organization is not listed, please contact InTouchPlus.Contact-Point@iaea.org);
   - If applicable, indicate whether an abstract is being submitted and complete the relevant information; submit the abstract separately as described under 'Papers and Presentations';
   - If applicable, indicate whether financial support is requested and complete the relevant information (this is not applicable to participants from invited organizations);
   - Based on the data input, the InTouch+ platform will automatically generate the Participation Form (Form A), Form for Submission of a Paper (Form B) and/or the Grant Application Form (Form C);
   - Submit their application.

Once submitted through the InTouch+ platform, the application, together with the auto-generated form(s), will be transmitted automatically to the required authority for approval. If approved, the application, together with the applicable form(s), will automatically be sent to the IAEA through the online platform.

Note: Requests for financial support should be submitted with the participation application by **30 January 2027.**

For additional information on how to apply for an event, please refer to the InTouch+ Help page. Any other issues or queries related to InTouch+ can be sent to InTouchPlus.Contact-Point@iaea.org.

Selected participants will be informed in due course on the procedures to be followed with regard to administrative and financial matters.

Participants are hereby informed that the personal data they submit will be processed in line with the Agency's Personal Data and Privacy Policy and will be collected solely for the purposes of reviewing and assessing the application and completing logistical arrangements where required. The IAEA may also use applicants' contact details to inform them of the IAEA's scientific and technical publications, or the latest employment opportunities and current open vacancies at the IAEA. These secondary purposes are consistent with the IAEA's mandate.

Further information can be found in the Data Processing Notice concerning the IAEA InTouch+ platform.

Papers and Presentations

The IAEA encourages participants to present work from their institutions that addresses the topics listed above.

Participants wishing to give a presentation are requested to submit an extended abstract of their work. Extended Abstracts will be reviewed as part of the presentation selection process and published as part of the meeting report. Each extended abstract should be prepared in A4 format using the IAEA template and should be **2–6** pages long, including figures, tables and references. Extended Abstracts should be submitted through the event's **INDICO** page [https://conferences.iaea.org/event/513/], no later than **30 January 2027**. Authors will be notified of the acceptance of their proposed presentations by **5 February 2027.**

Submission of a paper should be confirmed, by submitting of Form B (Form for submission of a paper), together with the submission of the main application via the InTouch+ platform, by **30 January 2027**.

Expenditures and Grants

No registration fee is charged to participants.

The IAEA is generally not in a position to bear the travel and other costs of participants to the event. The IAEA has, however, limited funds at its disposal to help meet the cost of attendance of certain participants. Upon specific request, such assistance may be offered to normally one participant per country, provided that, in the IAEA's view, the participant will make an important contribution to the event.

Requests for financial support should be submitted with the participation application by **30 January 2027**.

Venue

The event will be held in hybrid format, with in-person participation at the Vienna International Centre (VIC), where the IAEA's Headquarters are located, and remote participation. Participants attending in person must make their own travel and accommodation arrangements.

The meeting will take place in meeting room M6 at the VIC and will start at 9:00 a.m. Vienna local time each day. Remote participation will be facilitated through Microsoft Teams; however, presenters must attend in person. Connection links will be shared with participants after registration has been completed.

General information on the VIC and other practical details, including a list of hotels offering reduced rates for IAEA participants, are available on the following IAEA web page:

www.iaea.org/events.

Participants attending in person are advised to arrive at Checkpoint 1/Gate 1 of the VIC one hour before the start of the event on the first day in order to allow for timely registration. Participants will need to present an official photo identification document in order to be admitted to the VIC premises.

Visas

Participants who require a visa to enter Austria should submit the necessary application to the nearest diplomatic or consular representative of Austria at least four weeks before they travel to Austria. Since Austria is a Schengen State, persons requiring a visa will have to apply for a Schengen visa. In States where Austria has no diplomatic mission, visas can be obtained from the consular authority of a Schengen Partner State representing Austria in the country in question.

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Subsequent correspondence on scientific matters should be sent to the Scientific Secretary and correspondence on other matters related to the event to the Administrative Secretary.

Event Web Page

The event web page will be added once its address has been confirmed.

https://www.iaea.org/events/evt2603288

INDICO Webpage for Paper submission: https://conferences.iaea.org/event/513/