



IAEA

International Atomic Energy Agency

Atoms for Peace and Development

Technical Meeting on Compatibility Between Coolants and Materials for Fusion Facilities and Advanced Fission Reactors

IAEA Headquarters, Vienna, Austria
and virtual participation via Cisco Webex

30 October–3 November 2023

Ref. No.: EVT2205016

Information Sheet

Introduction

The International Atomic Energy Agency aims to support and strengthen its Member States' capabilities in the field of technology development of nuclear fission and fusion for energy production.

The operating conditions of the DEMO plants are particularly hostile to materials, as the burning plasma generates a high flux of neutrons and high power densities on the walls, requiring the development of new materials and technologies. Different coolant options for future fusion facilities and advanced fission reactors have been considered, revealing a strong synergy between the two areas of study. An important aspect to be considered is the compatibility between coolants and materials, which is one of the key elements characterizing the harsh operating conditions of a material in fusion power plants and fission advanced reactors.

Member States and stakeholders will benefit from better understanding of the compatibility between coolants and materials for Fusion Facilities and Advanced Fission Reactors; they will also get acquainted of the status of cooperation between the two communities.

Objectives

The purpose of the event is to present, review and discuss the state of the art of research on compatibility between coolants and structural materials used or proposed for use in fusion experimental facilities and future thermonuclear reactors for energy production; and to determine the applicability of the technology and materials used in advanced fission reactors to future fusion systems.

Specific objectives of the event are:

- Promote and facilitate the exchange of information on compatibility between coolants and materials for both fusion and fission;
- Summarize the current status of research into the topic of coolants and materials;
- Identify needs and challenges on the topic;
- Document the discussions and major findings among subject matter experts to support Member States in better understanding and benefiting from research into coolant-material compatibility.

The resulting TECDOC will provide insight on the challenges affecting compatibility between coolants and materials for both advanced fission and fusion facilities. The TECDOC will document the current status of research and the R&D needs.

Target Audience

The meeting is open to all Member States involved or interested in the research area of coolant-material compatibility with fission and/or fusion technology, including government organizations (policymakers, analysts, regulators, and R&D agencies) and industry stakeholders (vendors, engineering companies, plant operators and technology developers).

Working Language(s)

English.

Expected Outputs

The expected outputs are:

- Recommendations to the IAEA on how to enhance relevant research between Member States on the topic of coolant-material compatibility;
- A first draft (maximum full paper maximum length of 10 pages) per topic to develop the IAEA TECDOC describing the current status and research challenges on the topic.

Topics

The event will consist of presentations and discussions at technical sessions. All contributions will be categorized based on the following topics:

1. Material coolant interaction: experiments and modelling
 - 1.1. Corrosion and mass transfer, codes for mass transfer simulation
 - 1.2. Corrosion mitigation strategy
 - 1.3. Impact on material behaviour
2. Irradiation effects in cooling environments
3. Chemistry and coolant quality control, in-service online monitoring
4. Thermal-hydraulics, magnetic field, and other effects on material behaviour
 - 4.1. Thermal-hydraulics
 - 4.2. Magnetic field
5. Tools for characterization of materials behaviour: corrosion, mechanical behaviour, effect of neutrons-ions
 - 5.1. Devices for corrosion, loops for mass transfer, corrosion test standardization
 - 5.2. Mechanical tests, small-scale specimen testing
 - 5.3. Irradiation capability and hot labs for testing and characterization
 - 5.4. Advanced characterization for corrosion kinetics and interface reaction
 - 5.5. Codes and standards to support design
6. Behaviour and characterization of additive manufacturing (Additive Manufacturing materials presence of harsh environment).

Participation and Registration

All persons wishing to participate in the event have to be designated by an IAEA Member State or should be members of organizations that have been invited to attend.

In order to be designated by an IAEA Member State, participants are requested to send the **Participation Form (Form A)** to their competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) for onward transmission to the IAEA by **15 May 2023**. Participants who are members of an organization invited to attend are requested to send the **Participation Form (Form A)** through their organization to the IAEA by above deadline.

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 is collected solely for the purpose(s) of reviewing and assessing the application and to complete logistical arrangements where required. The IAEA may also use the contact details of Applicants 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.

Papers and Presentations

The IAEA encourages participants to give presentations on the work of their respective institutions that falls under the topics listed above.

Participants who wish to give presentations are requested to submit an abstract of their work. The abstract will be reviewed as part of the selection process for presentations. The abstract should be in A4 page format, should extend to no more than two pages (including figures and tables) and should not exceed 500 words. It should be submitted electronically via the [Technical Meeting INDICO website](#), not later than **15 May 2023**. Authors will be notified of the acceptance of their proposed presentations by **31 May 2023** and provided with peer-review feedback. The authors will then be requested to submit full paper by **15 July 2023**.

In addition, participants have to submit the abstract together with the Participation Form (Form A) and the attached Form for Submission of a Paper (Form B) to their competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) or their organization for onward transmission to the IAEA not later than **15 May 2023**.

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 in 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.

The application for financial support should be made using the **Grant Application Form (Form C)**, which has to be stamped, signed and submitted by the competent national authority to the IAEA together with the **Participation Form (Form A)** by **15 May 2023**.

Venue

The event will be held at the Vienna International Centre (VIC), where the IAEA's Headquarters are located. Optionally, virtual participation via Cisco Webex will be provided. Participants must make their own travel and accommodation arrangements.

General information on the VIC and other practical details, such as a list of hotels offering a reduced rate for IAEA participants, are listed on the following IAEA web page: www.iaea.org/events.

Participants 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.

Key Deadlines and Dates

ACTION	DATE
ABSTRACT SUBMISSION DEADLINE / START OF PEER REVIEW	15 May 2023
SUBMISSION OF FORM A, B, C	
NOTIFICATION OF ACCEPTANCE OF ABSTRACTS (IAEA)	31 May 2023
FULL PAPER SUBMISSION DEADLINE	15 July 2023
PEER REVIEW OF THE FULL PAPER; COMMENTS SENT TO AUTHORS	15 September 2023
FINAL REVISION OF THE FULL PAPER IMPLEMENTING REVIEWERS' COMMENTS	15 October 2023
TECHNICAL MEETING	30 October – 3 November 2023

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

Enclosure: Form for Submission of a Paper (Form B)