



Technical Meeting on the Development of a Phenomena Identification and Ranking Table and a Validation Matrix, and Performing a Benchmark for In-Vessel Melt Retention

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

16–20 June 2025

Ref. No.: EVT2404337

Information Sheet

Introduction

In-Vessel Melt Retention (IVMR) is a severe accident mitigation strategy for nuclear power plants (NPP) consisting of cooling the melted reactor core material from outside the reactor vessel in order to avoid reactor vessel failure and retain the corium in the reactor vessel. The safety demonstration of IVMR aims at justifying with the necessary robustness that this strategy effectively retains the corium inside the reactor pressure vessel (RPV), hence preventing the RPV failure which helps to ensure the containment integrity and the confinement of radioactive materials. In 2020, the IAEA launched a four-year coordinated research project (CRP) on IVMR, engaging 23 organizations from 15 Member States. The project provides a collaborative platform to address critical aspects of integrating IVMR into mid- to high-power reactors.

The aim of the CRP is to progress the understanding and modelling and simulation of major physical phenomena occurring in the strategy of IVMR, which may be adopted for mitigating the consequences of a severe accident with core melting. Participants developed a Phenomena Identification and Ranking Table (PIRT) and a validation matrix for IVMR. Subsequently, the CRP started a series of benchmarks, involving a comparison of modelling and simulation results with experimental data representative of reactors implementing IVMR, to mainly address: the corium properties and stratification in the lower plenum of the RPV; heat transfer in stratified corium pools; the external reactor vessel cooling; and the mechanical

resistance of the ablated RPV wall. Reactor designs and accident scenarios for integral benchmarks were selected and first analysis were completed.

Objectives

The purpose of the meeting is to disseminate the findings of the coordinated research project (CRP) entitled "Developing a Phenomena Identification and Ranking Table (PIRT) and a Validation Matrix, and Performing a Benchmark for In-Vessel Melt Retention" to stakeholders, including researchers, policymakers and industry representatives, with the aim of maximizing the impact and application of the CRP's outcomes.

Another key objective of the meeting is to invite Member States not involved in this CRP to present their activities related to in-vessel melt retention for high-power reactors. This will facilitate an exchange of insights, foster discussions on results, and explore opportunities for future collaboration.

Specific objectives of the meeting are as follows:

- Share knowledge on current and emerging projects, disseminate the outcomes of the IAEA's CRP on IVMR, including advancements in understanding the physical phenomena involved, highlight ongoing and emerging projects and developments in IVMR technologies across Member States.
- Discuss the critical drivers such as safety enhancements and regulatory demands.
- Examine challenges in demonstrating safety when implementing IVMR strategies, including technological challenges, such as heat transfer optimization, material performance, and operational integration, share lessons learned from existing implementations and experimental validations.
- Identify opportunities for further development in water cooled reactor (WCR) technology by integrating new materials and advanced systems designed to improve IVMR performance.
- Evaluate potential future research needs, directions and collaboration opportunities, assess gaps in current research and propose directions for future investigations, foster international collaboration, and explore potential co-development projects.

The event will also provide a platform for participants to engage in interactive discussions, contribute to event summaries, share key insights, and propose future initiatives to the IAEA.

Target Audience

The event is open to representatives of nuclear power organizations in Member States that are considering, planning or expanding nuclear power programme, as well as those from Member States with extensive expertise in the topics covered by the event, including government organizations (policy makers, analysts, national regulators, technical support organizations and R&D organizations), and industry (vendors, engineering companies, plant operators and technology developers).

Working Language(s)

English.

Topics

Presentations are invited to address key challenges, and lessons learned in relation to the IVMR technology development. The topics to be discussed in the meeting encompass a wide range of areas, including outcomes and insights from the IVMR CRP, advancements in modelling, simulation, and validation of IVMR strategies; technological challenges, including material behaviour under extreme conditions and heat transfer mechanisms; advancements in development of WCR structures, systems and components; investigating advanced materials and cooling techniques to enhance strategy effectiveness; extending IVMR techniques to various reactor types, including small modular reactors.

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 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 **15 April 2025**, 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 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) 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: The application for financial support should be made, together with the submission of the application, by **15 April 2025**.

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 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. Further information can be found in the [Data Processing Notice](#) concerning IAEA InTouch+ platform.

Papers and Presentations

The IAEA encourages participants to submit technical papers and 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 a technical paper or an extended abstract of their work. All contributions will be reviewed as part of the selection process for presentations. The manuscript should be in A4 page format, should be at least two pages for the extended abstracts, and should extend to no more than 12 pages for the technical papers (including figures and tables). The abstracts and technical papers should be sent electronically to Mr Alexei Miassoedov and Ms Tania Veneau, the Scientific Secretaries of the event (see contact details below), not later than **15 April 2025**. Authors will be notified of the acceptance of their proposed abstracts and papers by **30 April 2025**.

In addition to the registration already submitted through the InTouch+ platform, participants have to submit the abstract, together with the Form for Submission of a Paper (Form B), to the competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) or organization for onward transmission to the IAEA not later than **15 April 2025**.

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, together with the submission of the application, by **15 April 2025**.

Venue

The event will be held at the Vienna International Centre (VIC), where the IAEA's Headquarters are located. 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.

IAEA Contacts

Scientific Secretaries:

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

Form for Submission of a Paper

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To be completed by the participant and sent to the competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA, or National Atomic Energy Authority) of his/her country for subsequent transmission to the International Atomic Energy Agency (IAEA) either by email to: Official.Mail@iaea.org or by fax to: +43 1 26007 (no hard copies needed). Please also send a copy by email to the Scientific Secretary A.Miassoedov@iaea.org, and t.veneau@iaea.org and to the Administrative Secretary h.gauna-nunez@iaea.org.

Participants who are members of an invited organization can submit this form to their organization for subsequent transmission to the IAEA.

Deadline for receipt by IAEA through official channels: 15 April 2025

Title of the paper:		
If applicable: Abstract ID in IAEA-INDICO:		
Family name(s) and first name(s) of all author(s) (same as in passport(s):	Scientific establishment(s) in which the work has been carried out	City/Country
1.		
2.		
3.		
Family name(s) and first name(s) of author presenting the paper (same as in passport):	Mr/Ms:	
Mailing address:		
Tel. (Fax):		
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I plan to attend virtually:

Yes ☐ No ☐

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Date:

Signature of main author: