17th Meeting of the „European MELCOR and MACCS User Group“ (EMUG)

will be organized by the VTT Technical Research Centre of Finland

In support of the Cooperative Severe Accident Research Programme (CSARP)

The 17th EMUG will be held in

Helsinki, Finland on

20th – 24th April, 2026

With special thanks to EMUG’s permanent stakeholders:

United States Nuclear Regulatory Commission (US NRC)
Sandia National Laboratories (SNL)
Paul Scherrer Institute (PSI)

Announcement and Call for Presentations

Deadline for registration to the meeting (including indication of presentation(s) title(s) and duration, technical visit confirmation)	**20th March 2026**
Presentation(s) in PowerPoint or in PDF format up to	**16th April 2026**

On-line information is available at

https://www.psi.ch/emug/

1. ORGANIZATION AND HOST

The 17th Meeting of the European MELCOR and MACCS User Group will be held at the **VTT Centre for Nuclear Safety, Kivimiehentie 3, Espoo, Finland, Conference room Einstein (ground floor), on 20th to 24th April 2026.**

- The meeting will start on Monday 20th April.
- **(PRELIMINARILY)**, the **first** day will be devoted to EMUG introduction and MACCS
- The **second** and the **fourth** days will be available for MELCOR user presentations and topical sessions.
- The **third** day will be MELCOR technical workshop presentations (SNL and NRC)
- **(OPTIONALLY)** If number of presentations from participants will be much higher than usual there is a chance to add one more technical session on Friday morning.
- There is a limited number of in-person participants. Maximum 50 people, the order of registration will be decisive.
- The 24th April (morning) will be a technical visit to VTT's laboratories and hot cells.

Final details and a final draft agenda will be sent to registered participants shortly before the meeting.

2. BACKGROUND OF THE MEETING

The MELCOR and MACCS severe accident and consequence codes have been developed by Sandia National Laboratories (SNL) for the U.S. Nuclear Regulatory Commission (NRC) in the USA, and are provided to various European organizations through bilateral agreements under the 'Cooperative Severe Accident Research Program' "CSARP" between US-NRC and the European organizations. The codes have been used for many reactor safety applications by these organizations. Some of these organizations also continuously assessing the codes with data available from severe accident research programs. A few organizations have also developed models for certain critical issues, which appear in local versions of MELCOR for testing and with the goal of implementation in future releases from SNL.

The main interests in establishing the user group are to foster experience and information exchange among European organizations through organized annual meetings and to establish common needs on further model and correctional development of MELCOR and MACCS. The first meeting of the EMUG hosted by PSI was held in December 2008. PSI is acting as coordinator of the group.

AIMS OF EUROPEAN MELCOR and MACCS USER GROUP

- To provide a forum for the presentation and discussion of the experience gained by:
    - MELCOR assessment using integral and separate-effect tests leading to presentation of performance of models and related issues, including sensitivity to selected model parameters and model uncertainties;
    - Model development efforts;
    - Application of MELCOR for plant safety studies, including Level 2 PSA, which demonstrates strengths and weaknesses of MELCOR models in reproducing the individual severe accident phenomena, and interactions between them occurring in the nuclear part and balance of plant systems, and the effect of operator actions on the accident progression through user input as introduced in the code input models;
    - Application of MACCS for accident consequence calculations including Level 3 PSA;
    - Use of codes with different compilers and operating systems.
- Prioritization of user error correction and model development needs, to be transmitted to the code developers and the US NRC.
- To minimize the efforts required to obtain an adequate knowledge of optimum use of MELCOR and

MACCS, through sharing of experience.

- To support the gaining of MELCOR and MACCS knowledge and experience, particularly concerning the younger and less experienced users.

3. SCOPE, CONTENT AND OUTLINE OF THE MEETING

One day of the meeting will be devoted to MACCS code and two days to MELCOR code. Both parts of the meeting (MELCOR and MACCS) are divided into two sections:

1. NRC and SNL Presentations

About one day will be devoted to presentations from NRC and SNL / MACCS developers, and about one day will be devoted to presentations from NRC and SNL / MELCOR developers. Each of the following four topics could be given by one presentation for each code:

- NRC MELCOR / MACCS Activities
  - Code applications
  - Code perspectives, possibility of distribution to international partners, status and future areas of CSARP program
  - New considerations of code development
- MELCOR / MACCS input
  - New features of input conversion
  - New input capabilities in MELCOR 2.2
- Current MELCOR / MACCS development thrust areas
  - Quality assurance
    - Code assessment work and regression testing
    - Code distribution and issue management
  - New MELCOR / MACCS Models – discussion of new modelling and experience using new models
  - Current code development
- Applications
  - MELCOR / MACCS best practices
  - Guidance for plant applications

2. User Presentations

About one day will be devoted to presentations from all European organizations for MELCOR and MACCS. For those who would like to present their experience in plant applications of MELCOR 1.8.6, MELCOR 2.2 and MACCS, the organizers of the meeting express their wish to see presentations not only on specific aspects of the plant applications evaluating safety aspects of the plants in interest but also the experience in the use of the models, input parameters, nodalization aspects which have a certain bearing on the performance of the code, as well as the quality of the code estimates.

Presentations will be **possibly** grouped into the following 4 sessions for MELCOR:

- Group 1: User experience with nodalization regarding simulation of different issues with preference to focus on RCS, core and RN inventory and release modelling;
- Group 2: Modelling features (early and late phase core degradation, corium pool formation, lower head behaviour, RN release, SFP, etc), new modelling efforts and nuclear fusion application;
- Group 3: Model development and assessment, integral assessment, sensitivity studies, code to code comparison (different MELCOR versions or comparison to other codes), plant applications (link to uncertainty analysis, PSA Level 2 and PSA Level 3, etc.);
- Group 4: Post-processing of results (including the possibility of sharing of tools developed by users), run time performance.

A **special session** is planned **(to be confirmed)** for European **MACCS users** to exchange knowledge with colleagues from other institutes.

A **second special session** is planned **(to be confirmed)** for European **MELCOR users for fusion** application to exchange knowledge with colleagues from other institutes.

Discussion of all participants

- Feedback from the participants – user suggestions to further code development (it could be included in presentations) and organizational aspects: next meeting(s)

4. PRACTICAL ARRANGEMENTS

Participants:

Participation at the meeting is open to experts of the European organizations actively using the MELCOR or MACCS code in any of its versions. EMUG meeting is by invitation only open to European CSARP members. Also note that in order to attend either of the code user workshops, you need to be an authorized user of that specific computer code. The success of the meeting is very much dependent on the active participation of those present, especially by presentations on their own experience with the code.

Registration:

All the participants should fill in the **Meeting Registration Form** that is attached to this document, including the title(s) of presentation(s), and send it **before the 20th March 2026** to:

E-mail: **tuomo.sevon@vtt.fi**

And

E-mail: **mateusz.malicki@psi.ch**

A registration fee will not be required. The participants bear the cost of travel and accommodation.

The organizers will graciously host coffee breaks with snacks. For lunch and dining options participants will pay by themselves, various restaurants are located just outside the building.

Language:

All presentations and discussions will be in English.

Presentations:

Presentations (in MS PowerPoint or Acrobat pdf format), should be sent to tuomo.sevon@vtt.fi and mateusz.malicki@psi.ch, at the latest on 16th April. The presentations will be uploaded to the EMUG group website after the meeting with the permission of the participants.

NOTE: If you do not want to or cannot publish your presentation online, you are obliged to mention it clearly during your registration.

Passport and Visa:

For non-EU participants: A valid passport is required to enter Finland. Please ensure that your passport is valid for the duration of your stay.

Visa Requirements: Participants from countries that require a Finland entry visa must apply for one in advance. It is advisable to check with the Finnish Embassy or Consular Office that covers your country for specific visa requirements and application procedures.

Assistance with Visa Application: If you require a visa to enter Finland, please get in touch with us for assistance. We will provide an official invitation letter for the visa application process at the Finnish Embassy if required.

Arriving in Helsinki:

By plane

Helsinki–Vantaa Airport – the international airport serving Helsinki. The airport is located in the neighbouring city of Vantaa, 17 km north of Helsinki city centre and 22 km from VTT Centre for Nuclear Safety.

Local transport in Helsinki region:

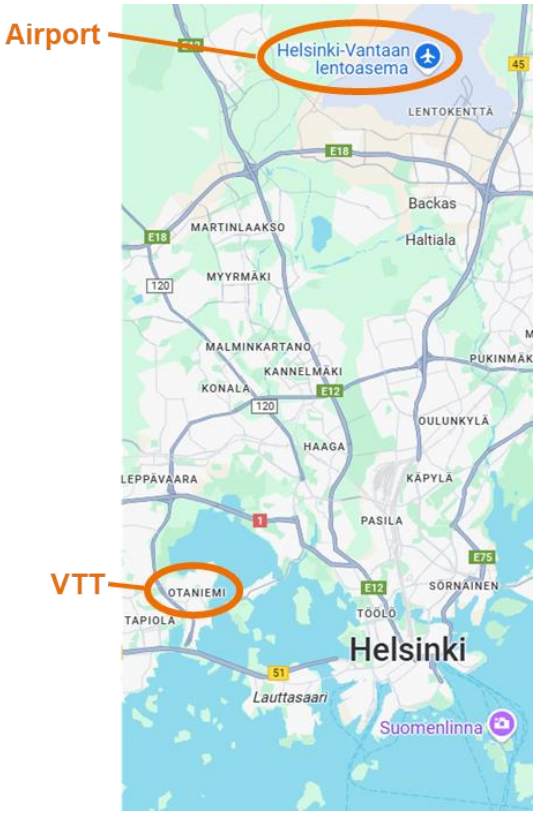
Once in Helsinki, you can use HSL services (metro, buses, trams, and trains) to get around. Instructions can be found at https://www.hsl.fi/en/travelling/visitors . The Journey Planner finds the best route for you: https://www.hsl.fi/en

The region is divided into four fare zones: A, B, C, and D. The Helsinki city center is at zone A, VTT is at zone B, and the airport is at zone C. Note that single-zone tickets do not exist, but you can buy AB, BC, or ABC tickets. The easiest way to buy a ticket is the contactless payment with a debit or credit card: https://www.hsl.fi/en/tickets-and-fares/contactless-payment

How to arrive to VTT

The VTT Centre for Nuclear Safety is located in the city of Espoo, the neighbouring city of Helsinki, at the Otaniemi campus area of Aalto University. The street address is Kivimiehentie 3, Espoo.

There is a train connection from the airport to Helsinki city centre. The journey takes about 30 min. The best way to reach VTT from Helsinki city centre is by metro, getting off at Aalto University station. The journey takes 11 min, and the walking distance from the metro station to the Centre for Nuclear Safety is 600 m.



Walking route from Aalto University metro station to VTT:

Accommodation

A list of hotels close to VTT in Otaniemi can be found here: https://www.vttresearch.com/en/how-get-vtt#espoo

Staying in the Helsinki city centre is another option.

The Conference Venue:

VTT Centre for Nuclear Safety

Address: Kivimiehentie 3, Espoo

The meeting will take place at conference room Einstein at ground floor.

General information:

Time zone:	GMT + 2 hours (daylight-saving time)
Weather in Helsinki in April	Average daytime temperature is 10 °C.
Currency and payment	The currency is euro. Paying by card is possible everywhere. Some restaurants may not accept cash.
Electricity supply	230 V, 50 Hz Finland uses Type F sockets (known as "Schuko", used widely in Germany and across Europe).
Water	Tap water in Finland is safe to drink and is considered among the highest quality in the world. It is not only safe but also delicious and recommended over bottled water.

Meeting organization

Tuomo Sevón
VTT Technical Research Centre of Finland
Email: tuomo.sevon@vtt.fi https://www.vttresearch.com/en
Phone: +358 40 591 2739

Dr. Mateusz Malicki
Paul Scherrer Institut (PSI)
Email: mateusz.malicki@psi.ch www.psi.ch