



EMUG

The 12th Meeting of the
„European MELCOR and MACCS User Group“

Organized by NUBIKI - Nuclear Safety Research Institute, Hungary as a virtual meeting
In Support of the Cooperative Severe Accident Research Programme (CSARP) will be held
12th – 16th April 2021

 **NUCLEAR SAFETY RESEARCH INSTITUTE**

With special thanks to EMUG's permanent stake holders:

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)

12th March 2021

Presentation(s) in PowerPoint or in PDF format up to

8th April 2021

On-line information is available at
<http://www.nubiki.hu/>
or
<http://www.psi.ch/emug/>

1. ORGANIZATION AND HOST

The 12th Meeting of the European MELCOR and MACCS User Group will be held on 12th to 16th April 2021. The platform of the on-line meeting will be WEBEX. The invitation E-mails will be sent one day before the meeting.

- The meeting will start on 12th April. The first 2 days (12-13) will be devoted to MACCS workshop including technical presentations from European MACCS users.
- On 14th April the meeting will continue with 2 days (14-15) of MELCOR WS and some of the MELCOR technical presentations.
- On 16th April a half-day will be devoted to rest of MELCOR technical presentations.

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

2. BACKGROUND OF THE MEETING

The MELCOR and MACCS severe accident and consequence codes are 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 assess 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 exchanges among the 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

The five (half) days MELCOR / MACCS meeting is divided into two sections for MELCOR and MACCS:

1. NRC and SNL Presentations

One day will be devoted to presentations from NRC/MELCOR developers and one day will be devoted to presentations from NRC/MACCS developers. Each of the following four topics could be given by one presentation:

- NRC MELCOR Activities
 - Code applications
 - Code perspectives, possibility of distribution to international partners, status and future areas of CSARP program
 - New considerations of code development
- MELCOR input
 - New features of input conversion
 - New input capabilities in M2.1/2.2
- Current MELCOR development thrust areas
 - Quality assurance
 - Code assessment work and regression testing
 - Code distribution and issue management
 - New MELCOR Models – discussion of new modelling and experience using new models
 - Current code development
- MACCS Activities
 - Status of code development
 - Code perspectives and best practices
 - Code applications
- Applications
 - MELCOR best practices
 - Guidance for plant applications

2. User Presentations

One day will be devoted to presentations from all of the European organizations each for MELCOR and for MACCS. For those who would like to present their experience in plant applications of MELCOR 1.8.6 and MELCOR 2.1/2.2, 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 use of the MELCOR models, input parameters, nodalization aspects which have certain bearing on the performance of the code, as well as the quality of the code estimates.

MELCOR presentations will be roughly grouped into the following 4 sessions:

- Group 1: User experience with nodalization regarding simulation of different issues with preference to focus on RCS, core and RN inventory and release modeling.
- Group 2: Modelling features (early and late phase core degradation, corium pool formation, lower head behavior, 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: Post-processing of results (including possibility of sharing of tools developed by users), run time performance

Discussion of all participants

- Feedback from the participants – user suggestions to further code development (it could be

- included in presentation)
- o Organizational aspects: next meeting(s)

3. Preliminary Agenda

Mon April 12: MACCS workshop

14:00 – 14:15	Registration opens	15 min
14:15 – 15:15	Overview of MACCS Status and Development	60 min
15:15 – 16:15	MACCS Near-field ATD Updates	60 min
16:15 – 16:30	Coffee break	15 min
16:30 – 17:30	Development of Technical Bases for Consequence Analysis using MACCS	60 min
17:30 – 18:30	Advanced Reactor Consequence Analysis	60 min
18:30	Adjourn	

Tues April 13: MACCS workshop (cont.)

14:00 – 16:00	MACCS technical presentations	120 min
16:00 – 16:15	Coffee break	15 min
16:15 – 18:30	MACCS technical presentations	135 min
18:30	Adjourn	

Wed April 14: MELCOR workshop on MELCOR visualization by Larry Humphries

14:00 – 14:45	MELCOR Introduction	45 min
14:45 – 15:30	SNAP: Introduction	45 min
15:30 – 16:15	SNAP: Input Examples	45 min
16:15 – 16:30	Coffee Break	15 min
16:30 – 15:15	SNAP: Building Animations	45 min
15:15 – 16:00	SNAP: Use of Dakota for UA	45 min
16:00 - 18:00	MELCOR technical presentations	
18:00 - 18:30	Discussion	
18:30	Adjourn	

Thu April 15: MELCOR workshop on MELCOR visualization by Larry Humphries

14:00 – 14:30	SNAP: Recent updates	30 min
14:30 – 15:15	MELCOR HTML Output	45 min
15:15 – 15:30	Coffee Break	15 min
15:30 – 16:15	MELCOR I/O tools	45 min
16:15 – 17:00	QWIN MELCOR	45 min
17:00 - 18:00	MELCOR technical presentations	
18:00 – 18:30	Discussion	
18:30	Adjourn	

Fri April 16: MELCOR/accident progression technical presentations

14:00	18:00	MELCOR technical presentations
18:00	18:30	Discussion
18:30		Adjourn

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 12th March, 2021 to:

E-mail: horvathlg@nubiki.hu
Email: mateusz.malicki@psi.ch

A registration fee will not be required.

General information:

Time zone: GMT + 1:00 hour

Language:

All presentations and discussions will be in English.

Meeting organization

Dr. Gábor L. Horváth
Tel: +36 1 392 2222 # 2109 or +36 30 497 8410
Email: horvatlg@nubiki.hu

Dr. Mateusz Malicki
Paul Scherrer Institut
Email: mateusz.malicki@psi.ch

NUBIKI
www.nubiki.hu
nubiki@nubiki.hu

PSI
WWW.PSI.CH