EMUG

The 15th Meeting of the
„European MELCOR and MACCS User Group"

Organised by Sapienza University of Rome

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

will be held in
Rome, Italy
15th – 18th April, 2024

SAPIENZA
Università di Roma

DEPARTMENT OF ASTRONAUTICAL, ELECTRICAL, AND ENERGY ENGINEERING

With special thanks to EMUG's permanent stakeholders:

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

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Sandia National Laboratories

PAUL SCHERRER INSTITUT
PSI

Announcement and Call for Presentations

Deadline for registration to the meeting (including indication of presentation(s) title(s) and duration)	**31st March 2024**
Presentation(s) in PowerPoint or in PDF format up to	**14th April 2024**

On-line information is available at

https://web.uniroma1.it/nucleareducation/15th-european-melcor-user-group

or

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

1. ORGANIZATION AND HOST

The 15th Meeting of the European MELCOR and MACCS User Group will be held at Sapienza University of Rome, C.so Vittorio Emanuele II 244, 00186 Rome, Room Spinelli (2nd floor), on 15th to 18th April 2024.

- The meeting will start on Monday 15th April. The first three days will be devoted to MELCOR technical (SNL and NRC) and user presentations.

- The last day (18th April) will be devoted to MACCS technical presentations.

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 will be offered for the European MACCS users to exchange knowledge with their colleagues from other institutes. The MACCS presentations will be scheduled on 18th April.

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 31st March 2024** to:

E-mail: **matteo.donorio@uniroma1.it**

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 a lunch buffet. For more dining options, various restaurants are located just outside the building.

Language:

All presentations and discussions will be in English.

Presentations:

Presentations (in MS power point or Acrobat pdf format), should be sent to matteo.donorio@uniroma1.it and mateusz.malicki@psi.ch, at the latest on 14th April. The presentations will be uploaded to the EMUG group website after the meeting with the permission of the participants.

Passport and Visa:

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

Visa Requirements: Participants from countries that require an Italian entry visa must apply for one in advance. It is advisable to check with the Italian 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 Italy, please get in touch with us for assistance. We will provide an official invitation letter for the visa application process at the Italian Embassy if required.

Arriving in Rome:

By plane

Leonardo da Vinci Airport - Fiumicino (FCO): Rome's primary international airport, located about 30 km from the city center. It offers extensive international flight connections. You can reach the city center by:

- Leonardo Express Train: A direct train to Termini Station, which runs every 15 minutes during the day.

- Regional FL1 Trains: Connect to other major stations in Rome, including Roma San Pietro, Roma Trastevere etc.

- Buses: Various bus services link the airport to central Rome.

- Taxis or Car Rentals: Available at the airport.

Ciampino Airport (CIA): Mainly serves low-cost airlines and is about 15 km from the city center. Reach the city by:

- Buses: Several bus lines connect to the city center and metro stations.

- Taxis or Car Rentals: Available at the airport.

By train

Rome is well-connected by train with other major cities in Italy and Europe.

- **Termini Station:** The main railway station, offering a vast array of national and international connections. It's also well-connected to local public transport for easy access to the city.

- **Tiburtina Station:** Another major station serving high-speed trains and regional services.

By bus

Rome can be accessed by long-distance buses from other cities and countries. Buses usually terminate at Tiburtina Station or at specific bus terminals like Anagnina.

By car

A ring road encircling Rome called the GRA (Grande Raccordo Anulare) connects to various highways.

Driving in the city center can be challenging due to traffic and limited parking. Using parking facilities at the city's outskirts and public transportation to get into the center is recommended.

Local transport in Rome:

Once in Rome, you can use ATAC services (buses, trams, metro, and some trains) to get around. Tickets are valid across the whole network.

Taxis are available but ensure to use official taxi services.

ATAC info on ATAC web site https://www.atac.roma.it/

ATAC is the company that manages public transportation in Rome. They offer various ticket options to suit different travel needs. Here are some details about the ticket types and prices (please note that prices may change, so it's always a good idea to check the latest information on the official ATAC website):

1. BIT (Biglietto Integrato a Tempo) - Single Ticket:

- Price: €1.50

- Validity: 100 minutes from validation, allowing unlimited transfers between buses and trams within the timeframe.

- Note: You can use it once on the metro or urban railway within the duration.

2. Roma 24H (Daily Ticket):

- Price: €7.00

- Validity: 24 hours from validation, offering unlimited travel on buses, trams, metro, and urban railways within Rome.

3. Roma 48H (2-Day Ticket):

- Price: €12.50

- Validity: 48 hours from validation, with the same conditions as the daily ticket.

4. Roma 72H (3-Day Ticket):

- Price: €18.00

- Validity: 72 hours from validation, with the same conditions as the daily ticket.

5. CIS (Carta Integrata Settimanale) - Weekly Ticket:

- Price: €24.00

- Validity: 7 days from validation, offering unlimited travel within Rome.
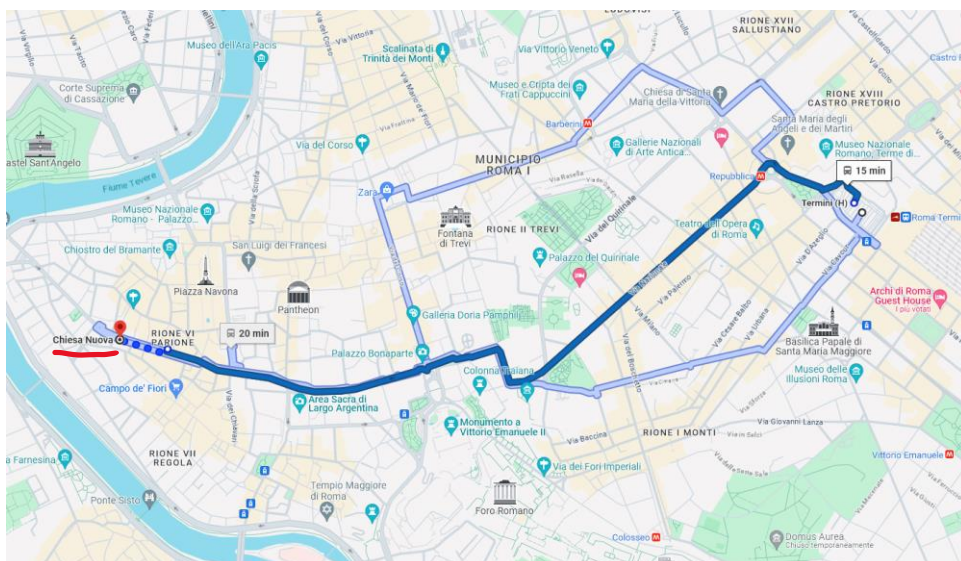
Important Points to Note:

- Tickets must be validated at the start of your first trip and kept until the end of your journey.

- Tickets are valid across the entire public transportation network in Rome (buses, trams, metro, and some railway lines).

- You can purchase tickets at metro stations, newsstands, tobacco shops (recognizable by a black T sign outside it), and some bars. Not every bus is provided with machines to pay by card, so it is recommended to buy tickets before getting on one.

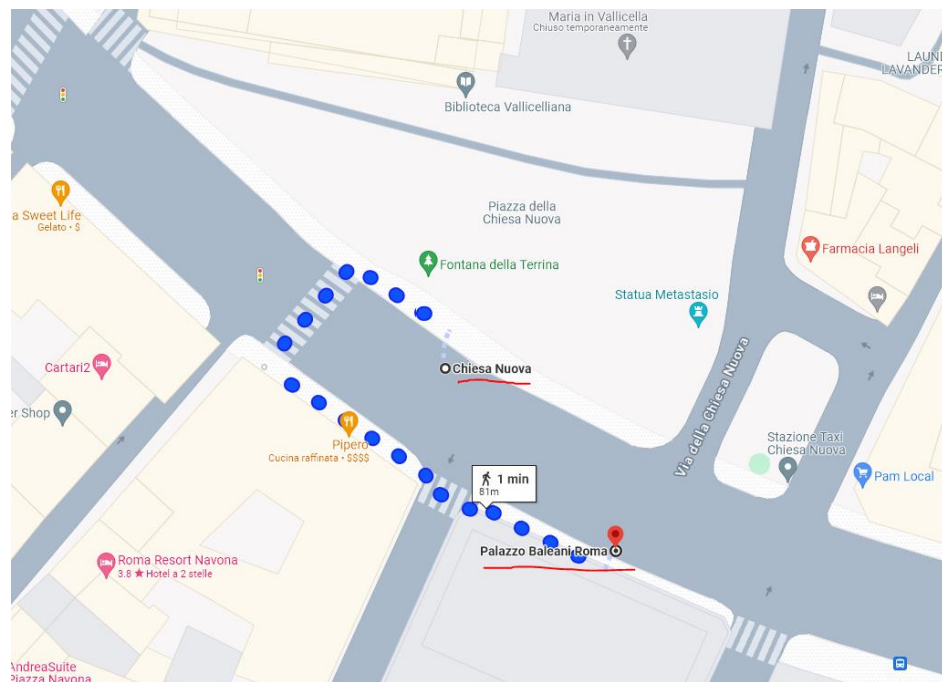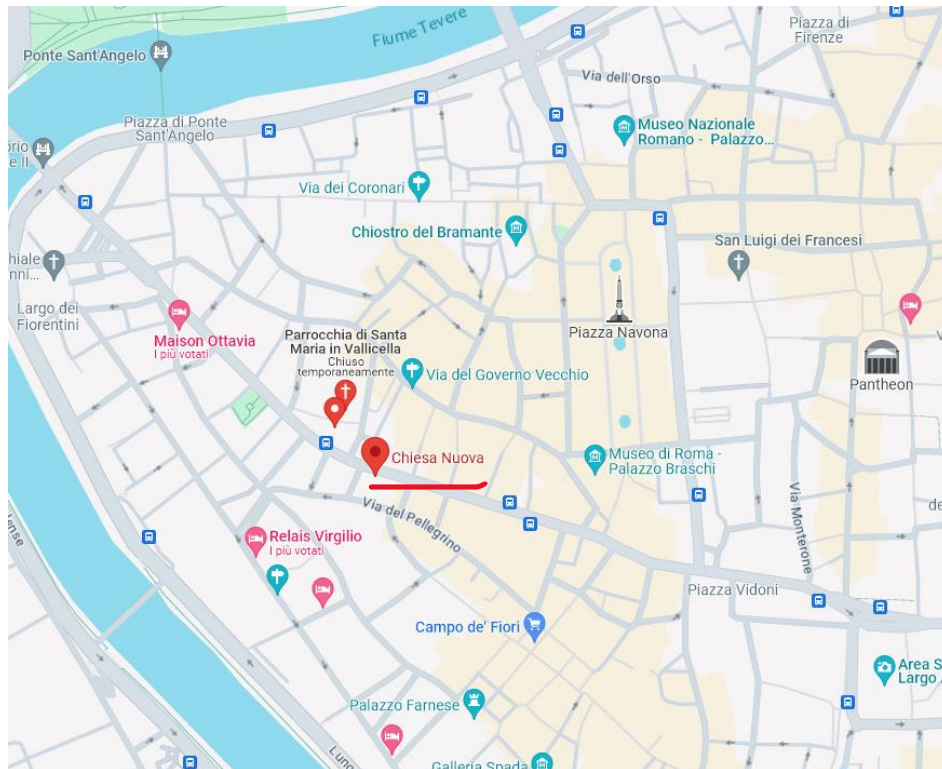- Be aware of ticket inspectors and always have your validated ticket with you while traveling.

How arrive to "Palazzo Baleani" (C.so Vittorio Emanuele II, 244)

Arriving at "Palazzo Baleani" on Corso Vittorio Emanuele II, 244 in Rome, can be conveniently done using public transportation.

The nearest bus stop is "Chiesa Nuova":

Numerous buses pass through the "Chiesa Nuova" stop. You can use bus lines such as 40, 46, 62, 64, 70, 87, 119, 492, and 628, among others. These buses connect various parts of the city with the area around Corso Vittorio Emanuele II.

Depending on your starting point, you can get on the bus from different locations in Rome. Utilize ATAC's official website or a mobile app like Probus or Google Maps to find the best bus route from your location.

The Conference Venue:

Palazzo Baleani - Sapienza University of Rome

Address: C.so Vittorio Emanuele II, 244, 00186 Rome

The meeting will take place at 2nd floor, Room Spinelli

General information:

Time zone:	GMT + 1:00 hour
Weather in Rome in April	Average temperatures range from a low of around 8°C (46°F) in the early mornings and nights to a high of around 19°C (66°F) during the day.
Currency	EURO
Electricity supply	230 V, 50 Hz
	Italy primarily uses two types of plug sockets: type F (also known as "Schuko", common in Germany and other European countries) and type L (three-prong Italian standard plug). Type L sockets are unique to Italy, but type F plugs can be used in type L sockets.
Water	Tap water is drinkable throughout the country

Meeting organization

Dr. Matteo D'Onorio
Tel: +39 06 4991 8608
Email: matteo.donorio@uniroma1.it

Sapienza Univ. of Rome

https://www.uniroma1.it/

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

PSI

www.psi.ch