Program of the ESTE Workshop, Prague, October 20-21, 2025

20.10.2025 (Monday)	13:00-14:00	| Arrival of participants, registration
	14:00	| Welcome by organizers
	14:10 - 15:30	| Nuclear weapons Case Study
	16:00 - 17:30	| CBRN Case study
	18:30	| Hospitality event at the invitation of ABmerit

14:10 Nuclear Weapons Case Study:

14:10 - 15:30 Michal **Marčišovský**, Ľudovít **Lipták**, Eva **Fojcíková,** Peter **Čarný** (ABmerit):

Case Study 1 *(conducted by ABmerit, with interactive discussion, all participants)*
Scenario: Event with application of nuclear weapon. Example of real calculation of dispersion and radiological consequences in the affected territories at great distances from the epicenter, under assumption of various parameters and characteristics of nuclear explosion.
Description of approach and models of ESTE for source term after nuclear explosion.
Discussion of AT&D models in upper atmospheric layers; model parameters applied; transport and dispersion after nuclear weapon explosion.
Discussion of the outputs needed to manage the radiological response.

15:30 -16:00 coffee break

16:00 CBRN Case Study:

16:00 - 17:30 Ľudovít **Lipták,** Michal **Marčišovský**, Eva **Fojcíková**, Peter **Čarný** (ABmerit):

Case Study 2 *(conducted by ABmerit, with interactive discussion, all participants)*
Scenario: Event with application of radiological dispersion device in an urban environment. Example of real calculation.
Description and discussion on assumed source terms in radiological dispersion device.
Hypotheses on potential source terms / radionuclides applied in ESTE.
3D Geodata for urban dispersion models.
Description of AT&D modelling in urban environment. Wind field data in urban environment, discussion on approaches to urban wind field data management.
Atmospheric Dispersion and Transfer models applied. Discussion on model parameters.
Discussion on dosimetry models applied (exposure from air, from deposit, inhalation, deposit on walls, deposit on roofs, air activity in different levels above the ground, assessment of radiation doses to affected people).

20.10.2025 (Monday) 18:30 Hospitality event at the invitation of ABmerit, place: **Loft ONE** located on the 9th floor of the hotel.

21.10.2025 (Tuesday)	09:00 - 12:00	| EIA for SMR Case Studies
	13:00 - 16:00	| ESTE4Space, analyses for safety reports of future space missions
	16:00	| End of the workshop

09:00 EIA for SMR. Assessment of impacts of routine discharges to human and non-human biota.

09:00 – 10:15 Peter **Čarný**, Ľudovít **Lipták**, Eva **Fojcíková,** Monika **Krpelanová** (ABmerit):

Case Study 3 *(conducted by ABmerit, with interactive discussion, all participants)*
Approach, methodology and algorithms applied by ESTE demonstrated on hypothetical scenario which does not concern a specific reactor or a specific location. Regulatory requirements and recommendations of the IAEA related to analyses of projected radiological impacts of annual routine discharges. Explanation of projected annual discharges to atmosphere and to hydrosphere as applied by ESTE. Identification of nuclides, which are main contributors to the dose to representative person or to the exposition of reference animal or plant. Example of meteorological and hydrological data needed for analyses. Example of consumption baskets and geodata needed for radiological impacts analyses. Explanation of conceptual scheme applied for calculations; model for atmospheric dispersion, models for dispersion in rivers and lakes. Explanation of concept of representative person and concept of reference animal and plant as applied in ESTE approach.
Identification and discussion of parameters, which are most relevant for the results of the EIA:
- Nuclides, which are main contributors to the dose to representative person or to the exposition of reference animal or plant;
- Height of ventilation stack;
- Water flow in a river that receives liquid discharges;
- Distance and position of the nearest dwellings;
- Drinking water wells near riverbank or direct use of river water for water supply systems;
- Fishing in the area of liquid discharge point.

10:15 -10:45 coffee break

10:45 EIA for SMR. Assessment of radiological consequences of accidents, including transboundary impacts.

10:45 – 12:15 Peter **Čarný**, Ľudovít **Lipták**, Eva **Fojcíková,** Monika **Krpelanová** (ABmerit):

Case Study 4 *(conducted by ABmerit, with interactive discussion, all participants)*
Approach, methodology and algorithms applied by ESTE demonstrated on hypothetical scenario which does not concern a specific reactor or a specific location. WENRA requirements, national regulatory requirements, EC directive criteria, and examples of differences in various countries. Explanation of approach to analyses applied by ESTE. Deterministic analyses (one sequence of meteo data) and probabilistic analyses of radiological consequences (large set of meteo sequences applied/large set of results statistically processed by ESTE).
Example of large sets of meteorological data need for analyses. Example of consumption baskets by age categories and geodata need for radiological impacts analyses.
Explanation and discussion of the source terms, the most important nuclides, height and duration of the release.
Discussion of behaviors of representative persons. Vegetation/non-vegetation period.

Example and discussion of results of analyses as they are available at the outputs of ESTE:
Criteria for urgent protective measures: Probability of exceeding criterial values for evacuation/sheltering/iodine prophylaxis.
Criteria for relocation or resettlement: Probability of exceeding criterial values, assumptions applied.
Criteria for concentrations in foodstuff or feedstuff: Probability of exceeding criterial values in different food products or feedstuff, by distance, by nuclides, as limited by EC directive.
Probability of area of crop fields prohibited because of radionuclide concentration in the crops.

12:15 -13:00 coffee break and small snack

13:00 ESTE4Space, demonstration of analyses and discussion of radiological consequences for the needs of safety documentation for approval process of future space missions.
This topic, and the ESTE4Space tool itself, is demonstrated on hypothetical scenarios, which do not concern a specific space mission or a specific lunch pad location.

13:00 – 16:00 (with a short coffee break 14:30 - 14:50), Michal **Marčišovský**, Ľudovít **Lipták**, Eva **Fojcíková,** Monika **Krpelanová,** Mária **Marčišovská,** Peter **Čarný** (ABmerit):

Case Study 5 *(conducted by ABmerit, with interactive discussion, all participants)*
1) Introduction to the topic. Explanation of nuclear power sources (NPS) already applied or planned for future space missions. Spacecraft information of all known nuclear and radioisotope sources already in space or projected for future launches is implemented in ESTE4Space. Nuclear inventories of space objects are updated and re-calculated.
Short resume of requirements on the nuclear safety launch approval process.

2) An accidental event with the release of radioactive material into the environment could happen during any stage of the mission. Presented and discussed in this Case Study are three general scenarios:
- accidents occurring on the launch pad,
- accidents occurring after launch but before leaving the atmosphere,
and finally, reentry events when the spacecraft is reentering from space into the Earth atmosphere.

3) Modelling approaches, input data and initial hypothesis for analyses performed by ESTE4Space will be explained and discussed:
Applied atmospheric and marine dispersion models: LPM;
Applied numerical weather prediction data, global for the whole Earth or local for given launch pad area;
Applied marine current data (historical daily data for the whole year or numerical model marine data).

4) Impacts of assumption about the release (the source term), including aerodynamic equivalent diameter (AED) of the released particles, and the release type (continuous, instantaneous, burn-up, or intact impact), on radiological consequences will be presented and discussed.

All on the base of three scenarios: explosion on the launch pad, neutralization (commanded explosion) of launcher and re-entering to atmosphere from Lunar Transfer Orbit.

Location of the ESTE Workshop:
Prague, Hotel Diplomat (Vienna House by Wyndham Diplomat Prague, Evropská 15, Prague, Czech Republic)