

Who should attend?

For early-career scientists/engineers (advanced PhD candidates, postdoctoral scientists and engineers affiliated to European research institutions) in the field of monitoring in relation with the geological disposal. The total number of participants is limited to 20.

Priority is given to Junior scientists/engineers enrolled in **Waste Management Organisation**. The detailed selection criteria in case of over-subscription to the school will be posted on the Modern2020 website (www.modern2020.eu).

Courses fees and grants

- ▶ The Modern2020 Monitoring School participation is free of charge to the selected participants including accommodation, local transportation from designated hotels to the training location or laboratory, daily lunches/dinners, and coffees during the school.
- ▶ The participants are responsible for their own travel to and from Oskarshamn.

Accommodation

A family-friendly stay in Oskarshamn awaits you at First Camp Gunnarso, 3.4 km from central Oskarshamn, 76 km from Kalmar airport and 40 km from the Äspö HRL. Highlights a sauna, and in-room kitchenettes.



Cottage in the First camp Gunnarso

Application

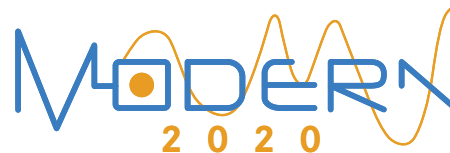
- ▶ **Application will be open until February, 28th 2019.**
- ▶ A cover letter should describe your motivation and the relation of the training to your work and studies.
- ▶ The **application form** is available on the Modern2020 website (www.modern2020.eu). Information required: full name, date of birth, gender, organisation, address, post code, email, telephone (+ country code), dietary restrictions.

Special requirement for the participants

- ▶ Each individual needs to be able to move unassisted and carry out hands-on exercises underground.
- ▶ Each individual needs to have insurance coverage against injuries and illness for the duration of their stay at the workshop. Please check the sufficiency of your insurance coverage prior participation. Proof of sufficient insurance coverage may be requested by the organiser.
- ▶ To inform the organiser at the time of registration of any dietary restrictions that may apply.

For more information

For more information about the Modern2020 training school and its details visit the www.modern2020.eu or contact johan.bertrand@andra.fr



Development and Demonstration of monitoring strategies and technologies for geological disposal



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TRAINING SCHOOL ABOUT MONITORING IN GEOLOGICAL DISPOSAL OF RADIOACTIVE WASTE

Organised by the Modern2020 Project
"Monitoring strategies, technologies and public involvement"

Aspö Hard Rock Laboratory

19-26 May
2019
Sweden

A WEEK PROGRAMME IN ASPÖ (SWEDEN)

Registration
deadline:
28 February
2019

Increase your knowledge
in monitoring technologies
and techniques

Provide basic knowledge
on monitoring system design,
installation and operation

Discuss social aspects
of geological disposal
monitoring

Contact: Johan BERTRAND
Johan.bertrand@andra.fr



MODERN 2020

Development and Demonstration of monitoring strategies
and technologies for geological disposal



Orientation map:
Sweden - Stockholm Äspö HRL



A successful strategy for radioactive waste disposal should address both technical and societal needs, and monitoring has the potential to contribute to both of these aspects. Monitoring during repository operations can be used to build further understanding of the processes occurring in the repository during operational phase (construction, waste emplacement, backfilling and closure) and early post-closure phase.

Monitoring can also contribute to public and stakeholder understanding of processes occurring in the repository, and hence, it can respond to public concerns and be used to build further confidence in geological disposal in addition to that achieved during licensing. Monitoring can therefore play a role in enabling waste management organisations to work towards the safe and accepted implementation of geological disposal.

The Äspö Hard Rock Laboratory is situated in the Misterhult Archipelago close to the Oskarshamn nuclear power plant



The Äspö Laboratory is a unique research facility and there are only a few like it in the rest of the world. Almost 500 metres underground, we conduct experiments in collaboration with Swedish and international experts. This research means that we can study the interaction of bentonite clay and copper canisters with the rock in realistic conditions. Here experiments are made to identify the role of the rock as a barrier. This can, for instance, concern how the rock slows down the movement of radioactive substances or how microbes affect conditions at this depth.

Learning Outcomes

The Modern2020 Training School is targeted to offer an overview of monitoring aspects in the field of geological disposal (in crystalline and clay host rocks) and methodology to conduct a monitoring strategy. The training school aims to provide participants a set of competences based on the work inside the Modern2020. Through lectures, practical works and field demonstration activities, the participants will improve their understanding of:

Preliminary programme

All classes, lectures and visits will be held in English

The Modern2020 Training School starts on Sunday evening 19 May 2019 at 7:30 p.m. in Oskarshamn (Sweden) and continues until 2 p.m. on Sunday 26 May 2019. The Training School comprises some practical exercises. The length of the individual days varies due to logistics and activities, in general, with exception of the first and the last day, the training days extend from 8:30 a.m. to 6:30 p.m. with evening social events.

Day 1

- 6:00 p.m.: Transport from Airport (Kalmar)
- Welcome dinner: Tour de table, introduction and organisation of training

Day 2

- Introduction
- General considerations on radioactive waste (nuclear cycle, waste, disposal)
- Deep geological disposal concepts in crystalline and clay host rocks
- General monitoring aspects (Rationale, context, definition, state of the art)

Day 3

- Monitoring of the excavated damaged zone
- Monitoring of engineered barrier systems
- Instruction for practical work / division to group for the week
- Visit of the Central Interim Storage Facility for Spent Nuclear Fuel
- Visit of the Äspö underground research laboratory

Day 4

- Generic methodology for parameters screening process
- Monitoring technologies – Part I
- Practical works (monitoring technologies)
- Contribution of monitoring to decision making
- Examples of monitoring system

Please note that changes to the order of the content and individual programme details may apply

Day 5

- Citizen stakeholders and monitoring + practical exercises
- Monitoring technologies – Part II
- Data management (Examples of Data Acquisition System)
- Practical works (monitoring technologies)
- Monitoring test case exercises

Day 6

- Participants' evaluation
- Feedback from participants

Day 7

- Excursion to Blue Maiden Island (where witches go to roam)

Day 8

- 2:00 p.m.: Transport to Airport (Kalmar)



Blå Jungfrun (the Blue Maiden), view from the Oskarshamn coast

1. Nuclear fuel cycle and radioactive waste types
2. Relevant processes for the geological disposal during operational phases and early post-closure phase
3. Role of monitoring for geological disposal during operational phases and early post-closure phase
4. Methodology to select monitoring parameters
5. Monitoring sensors and technologies
6. Monitoring system design, installation and operation
7. Contribution of monitoring data to decision making
8. Expectations from different stakeholders