



Training course on radioactive waste disposal

SCK•CEN (Mol, Belgium)

Objective

This training course will give a comprehensive overview of different aspects involved in the stepwise implementation of a radioactive waste disposal facility. The course will focus on international best practices and regulations, national and international state-of-the-art, different R&D activities related to radioactive waste disposal, and hands-on practical exercises related to safety and performance assessments of disposal facilities.

Target audience

This training course is intended to attract scholars and professionals in radioactive waste disposal.

Learning outcomes

In terms of Knowledge

- List and describe the different aspects (from implementer, regulator and R&D point of view) which come into play in the planning, licensing and implementation of a radioactive waste disposal site;
- Identify and discuss the different safety functions, and their relative importance, adhering to a radioactive waste disposal facility;
- Describe and justify the different R&D aspects which are linked to the different safety functions;
- Describe and interpret (what it is and what it isn't) a safety and performance evaluation.
- Integrate the phenomenological knowledge into the relevant spatial and temporal scales;
- Evaluate the relevance of processes at given times acting on given components;
- Evaluate key features of the safety concept;
- Identify, interpret and justify the importance of uncertainties.
- Integrate and conceptualize selected processes and events to construct base (reference, expected) scenario;
- Construct approaches for uncertainty treatment;
- Evaluate and judge on safety margins;
- Justify the choice of uncertainty treatment.

Topics

This training course contains the following modules:

- National and international regulations
- Safety principles and strategies
- Disposal concepts and disposal projects, state-of-the-art



- RD&D related to radioactive waste disposal, within the framework of the multi-barrier concept and including laboratory visits
- Elements in a safety assessment + exercise on phenomenological evolution
- Performance, scoping and screening calculations + exercise on scenario development
- Safeguards aspects and monitoring of a repository
- Public participation approaches
- Review of the safety evaluation by the safety authority

A technical visit to the Underground Research Facility [HADES](#) (Mol) and surface disposal facility site [cAt](#) (Dessel) can be included in the training course.

Language

This course is organised in English.

Duration

This intensive one and a half week training course is provided from 09h00 to 17h00, including two coffee breaks and lunch.

Registration

Registration is only available online on <http://academy.sckcen.be/en/Upcoming-events>.

Contact and venue

The course is held at the [Lakehouse](#) of the Belgian Nuclear Research Centre, Boeretang 201, BE-2400 Mol, Belgium.

Rooms can be booked at the [Lakehouse hotel](#) or at the [Alauda Hotel](#) in Dessel.

Further information is available via academy@sckcen.be or + 32 14 33 21 57.

<http://academy.sckcen.be>



Training course on radioactive waste disposal

SCK•CEN Lakehouse

Programme

Week 1 |

Day 1 |

09:00 – 09:30 h	Welcome & introduction to the course
09:30 – 11:00 h	General regulations for disposal on national and international level
11:00 – 11:15 h	Break
11:15 – 12:30 h	Inventory of waste: types, volumes, origin
12:30 – 13:30 h	Lunch
13:30 – 14:15 h	Safety principles, strategies and regulatory expectations on the safety case
14:15 – 15:00 h	Regulatory expectations on monitoring
15:00 – 15:30 h	Break
15:30 – 17:00 h	Monitoring in practice



Day 2 |

09:00 – 11:00 h	Back end of the fuel cycle and Disposal concepts
11:00 – 11:15 h	Break
11:15 – 12:15 h	Scientific aspects regarding site selection and site characterisation
12:15 – 13:15 h	Lunch
13:15 – 14:15 h	Scientific aspects regarding site selection and site characterisation continued
14:15 – 15:15 h	Durability and properties of the various barriers 1 (container, waste form)
15:15 – 15:30 h	Break
15:30 – 16:30 h	Durability and properties of the various barriers 1 (container, waste form) continued

Day 3 |

09:00 – 10:30 h	Durability and properties of the various barriers 2 (clay, concrete / cement)
10:30 – 10:45 h	Break
10:45 – 12:15 h	Durability and properties of the various barriers 2 (clay, concrete / cement) continued
12:15 – 13:30 h	Lunch
13:30 – 16:30 h	Laboratory visit: testing of durability



Week 2 |

Day 4 |

09:00 – 10:30 h	Elements in a safety assessment (phenomenological evolution, FEP, uncertainty treatment, conservatism)
10:30 – 10:45 h	Break
10:45 – 12:15 h	Elements in a safety assessment (phenomenological evolution, FEP, uncertainty treatment, conservatism) continued
12:15 – 13:30 h	Lunch
13:30 – 16:30 h	Exercise 1 Development of phenomenological evolution (for a particular disposal concept), FEP analysis and selection of FEPs, using these values in PA

Day 5 |

09:00 – 10:30 h	Calculation chain (geo/bio), performance and safety indicators, safety, performance, scoping, screening calculations and scenario development
10:30 – 10:45 h	Break
10:45 – 12:15 h	Calculation chain (geo/bio), performance and safety indicators, safety, performance, scoping, screening calculations and scenario development continued
12:15 – 13:30 h	Lunch
13:30 – 16:30 h	Exercise 2: Development of scenarios (based on Exercise 1) (expected evolution scenario, penalising scenarios)



Day 6 |

09:00 – 10:30 h	Expectations of the Safety Authority towards the safety analysis
10:30 – 10:45 h	Break
10:45 – 12:00 h	Review of the safety analysis by the Safety Authority
12:00 – 13:15 h	Lunch
13:15 – 13:30 h	Transport to EURIDICE
13:30 – 16:30 h	Technical visit to EURIDICE (the underground laboratory HADES)

Day 7 |

09:00 – 10:00 h	Disposal projects: overview of current and considered disposal projects (worldwide, with focus on Europe)
10:00 – 10:30 h	Break
10:30 – 12:00 h	Disposal projects: overview of current and considered disposal projects (worldwide, with focus on Europe) continued
12:00 – 13:00 h	Lunch
13:00 – 13:15 h	Transport to cAt site
13:15 – 16:30 h	Technical visit to the cAt site NIRAS



Day 8 |

09:00 – 10:30 h	Safeguards aspects and monitoring: introduction and specific aspects of safeguarding a geological repository
10:30 – 10:45 h	Break
10:45 – 12:15 h	Public participation in radioactive waste disposal in Belgium and mutual influence of social and technical aspects
12:15 – 13:30 h	Lunch

