

Trial Run of Final Disposal

A unique opportunity to participate Posiva's Trial Run and gain learnings to benefit waste management organization's own DGR program

The Trial Run of Final Disposal is significant!

The Trial Run of Final Disposal is the final phase of Posiva's preparing for the operation of the deep geological repository.

Successful execution of the test plays an essential role in the future commissioning of the encapsulation plant and the underground final disposal facility.

The Trial Run of Final Disposal provides a demonstration to multiple stakeholders that Posiva can manage the entire final disposal process and is able to start the industrial operation of ONKALO[®].



Visualisation of the encapsulation plant in 2023



Unique opportunity to see the future of your DGR project and learn how to get there in the best way!

Trial Run of Final Disposal

- gives to each participant clearer picture of the targets of his/her area of responsibility
- helps him/her to achieve these targets in an optimal way: safest, most cost-efficient and fastest.



Turning our experience into your benefit

The participant sees:

- how the different parts of the final disposal system work together
- how this result has been achieved by developing, organising and iteratively putting together different parts of the final disposal system

The participant *learns* what went well and what should have been done differently by

- seeing things happen in reality and hearing presentations
- having discussions with our experts, who openly explain the process and how the targets were achieved and what they learned and recommend

Regardless of the differences of planned disposal systems in different countries every WMO *can directly apply* the experiences into their project and

- avoid mistakes and difficulties we have experienced
- of course apply the great ideas and learnings we have discovered!



The Trial Run of Final Disposal in a nutshell

Encapsulation and final disposal test is carried out with the facilities, machinery, organisation and procedures, which will be used in the operation phase:

- fuel transports
- encapsulation
- final disposal
- retrieval of a damaged canister

Comprises four canisters and about 70 m of deposition tunnel as well as the plug for the tunnel.





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Learning from Posiva's experience

The participant gains valuable information of Posiva's experience in

- encapsulation process,
- hoisting, transporting and storing canister and other components underground,
- installation of canisters, buffers, backfill and end plug with approved and licensed machinery,
- mitigation of the situation caused by a damaged canister.



Encapsulation process

Experiencing the 1st full scale encapsulation process in the entire world run by personnel and procedures to be used in the operation phase

Seeing the real process, discussing with designers and sharing their concrete learnings gives invaluable information for all process planners and programme owners.



Encapsulation process



Hoisting, transporting and storing canister and other components underground

Canister logistics, thoroughly considered and designed systems for optimised logistics chain will be tested and demonstrated.

This gives each participant invaluable benchmark for comparison as well as good ideas of pros and cons for designing their own systems.





Installation of canisters, buffers, backfill and end plug with approved and licensed machinery

Installation of canisters buffers, backfill and end plug will be done for the first time in the world using machinery and procedures, which have been approved for real final disposal operations by nuclear safety authority.

Discussions with designers of the machinery gives valuable insight for designing corresponding machinery.



Canister installation machine



Mitigation of the situation caused by a damaged canister

This unique phase in the TRFD gives a concrete experience of

- hoisting a damaged canister up to the encapsulation plant,
- opening the canister,
- controlling contamination and handling the opening waste,
- removing the fuel and
- returning it back to safe state for repacking.

This is an excellent benchmark for designing similar tests in other organisations.



Content of the participation

Posiva Solutions offers you a unique opportunity to monitor at a close range and gain all the knowledge of how the spent nuclear fuel final disposal process is managed from the interim storage of Olkiluoto to the deep geological repository ONKALO[®].

Participation to the TRFD is divided in four parts during 2023 (*):

- 1. Introduction webinar setting the scene for the overall Trial Run of Final Disposal (March)
- 2. 1st on-site workshop: Transport, encapsulation and retrieval processes (June)
- 3. 2nd on-site workshop: Canister, buffer and backfilling (September)
- 4. 3rd on-site workshop: Sealing and filter layer installation and / or plugging (November)

In addition, the participants will get a series of thorough documents describing the planning, organisation, implementation and lessons learned from the Trial Run of Final Disposal.

(*) Exact schedule is subject to change. The duration of workshops 2 - 4 is 2 - 3 days in Olkiluoto.



What do you as a participant get, operations point of view

- **The Big picture:** to address that final disposal can be performed as it has been planned to be done, according to all requirements and guides
 - canister management process stage by stage, e.g. transport, managing the fuel rods, encapsulation process.
 - final disposal processes: instalment of canister and barrier, filling the disposal tunnel, plug.
 - logistics related to each process stage within the facility area, incl. canister transport.
 - pass-through times at every stage.
- Overall performance of equipment and interacting systems and processes in practise.
- Management of aforementioned processes, control rooms and corresponding technologue
- Events during operational phase: despite of thorough planning, only the trial run will show how all sub processes will function with each other.
- Proving the long-term safety plans into practise.



Project organisation



- "Operational activities" covers a description of operation, with required tasks and roles, i.e. transfer from spent fuel storage, encapsulation and final disposal.
- "Engineered Barrier System (EBS) installation" covers actual final disposal, with required tasks and roles.
- "Operation planning" covers schedules for procurement of materials, logistics planning, monitoring of progress in relevant rock spaces.
- "Nuclear safety" covers integrity of fuel, functionality of engineered barriers, nuclear safeguards and radiation protection, as well as an assessment of operating practices.
- "Test programme" covers the planning and preparation of the result report referred to in Section 4.6 of YVL Guide A.5.
- "Systems" cover the monitoring of progress made with systems required in the Trial Run of Final Disposal.
- "Retrievability" covers retrieval of finished canister. i.e. machining to open canister and retrieve practice assemblies.



Contact information to discuss more about Trial Run of Final Disposal: - benefits for a WMO - schedule during 2023

- participation in practise

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POSIVO Solutions

Protecting the biosphere