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PROJECT PRESENTATION (PP)

Large Underground Concept Experiments LUCOEX



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Introductory paragraph

Nuclear waste disposal implementers involved in experiments in underground research laboratories (URL) have established a joint collaboration with the purpose of carrying through four full scale demonstration tests of concepts designed to dispose of high-level long-lived nuclear waste in clay or crystalline host rocks. The objectives of the tests are to check the suitability of the concepts for their intended purpose and to provide a possibility to understand and compare important parameters for their implementation and their long-term performance.

1. Nature and scope of the project

The consortium consists of the four European implementers - SKB, Andra, Nagra and Posiva - who have a long history of cooperation, interaction and sharing experience on demonstration projects in URLs. Each of the implementers has major experience as an owner and operator of a URL and in carrying through demonstration activities in large scale in collaboration in them, quite often in joint projects between some of the implementers.

Important experience is expected to be obtained regarding testing and improving of methods, equipment, technologies, processes or operability related to the construction, operation and closure of a repository system. The key technical areas to address are the gallery construction, manufacturing and emplacement of buffer around waste canisters, emplacement of waste packages, and backfilling and sealing of galleries.

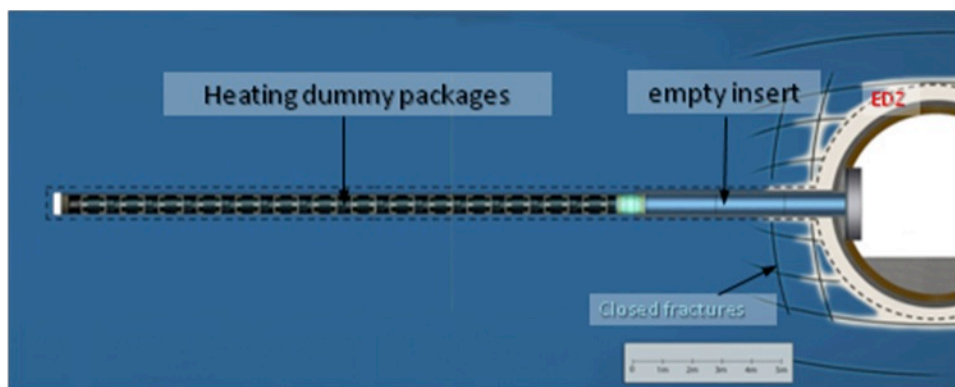


Figure 1. Schematic view of the demonstration test on horizontal disposal of waste packages in Callovo-Oxfordian clay in the Bure URL

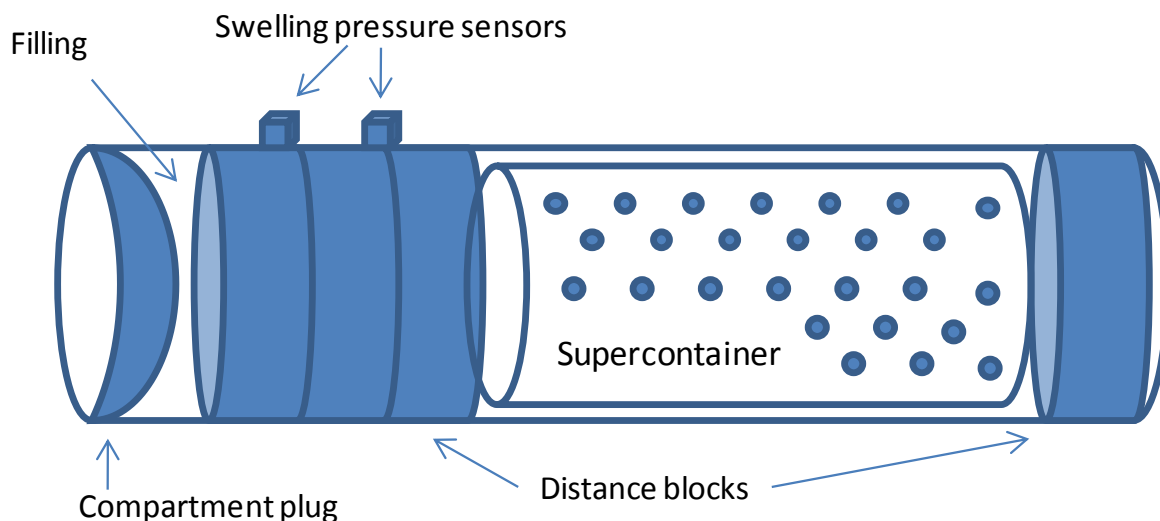


Figure 2. Schematic view of the demonstration test on horizontal emplacement of buffer and supercontainer in the Äspö URL

2. Activities

The project concerns final or close to final verification steps in the process of achieving the so called “initial state”. By “initial state” is meant the situation when a disposal cell is filled with waste package(s) and sealed, where after no improvement of performance by man is deemed applicable, i.e. a comparable meaning as with “as designed”. The so defined “initial state” is the basis for the analysis of the long-term evolution of the repository. The accuracy in the prediction of the long-term safety is thereby directly dependent on the knowledge of the conditions at “initial state”. These conditions are basically defined as a span with limits of deviations from the ideal condition. The task for the engineering work of a repository is therefore not only to obtain methods and machines for doing the job, but also to assure that they do the job within acceptable deviations from the design.

A project web portal at www.lucoex.eu will provide the open communication of project news and results. It will also communicate the dissemination events and the announcement of different scholarships for training and participating in workshops. Direct communication links are opened with European organisations responsible for development of national repository concepts for engagement in discussion and dissemination of project results.

3. Expected results

The different disposal concepts are demonstrated in order to facilitate the stepwise implementation of safe, deep geological disposal by solving the scientific, technological and social challenges, and to support the waste management programmes in the Member States. Other waste management organisations can be expected to benefit from the work completed through participation in workshops and through access to the published information.

The demonstration activities are expected to contribute to demonstration of concepts’ feasibility by:

- proving evidence that different tested disposal concepts of geological disposal are technically feasible and that they can be implemented in line with the compliance of requirements,

- advancing the treatment and/or understanding of key remaining issues,
- improving the robustness of associated performance and safety analyses,
- increasing confidence in the safety case related to the disposal concepts,
- proving the operability of the different disposal concepts,
- collecting the information and knowledge of different demonstration experiences, and
- increasing confidence among decision makers and the public.

4. Societal impact

The successful implementation of a repository programme relies on both the technical aspects of a sound safety strategy and scientific and engineering excellence as well as on the social aspects like stakeholder acceptance and confidence. The project's programme on large scale experiments performed in URLs is a key point to demonstrate feasibility of common elements of repository concepts.

The project's analysis, dissemination of the result on common repository elements and openness to society with access to visits to demonstration sites and to discussions in workshop environment are foreseen to build up specific technical knowledge among technicians and deeper insight in technical feasibility among stakeholders and the general public. This is envisaged to increase the overall possibility for implementing geological disposal facilities in Europe.

5. Information about important public events

A workshop will take place at Äspö in Sweden in April 2014. It will have the dual purpose of exchanging information among the project participants and their core of professional network and to disseminate information on results to a broad public of technically trained persons, stakeholders, decision makers and interested members of the public.

Project information

Website address: www.lucoex.eu

Project type: Collaborative Projects - Large-scale integrating (CP-IP)

Project start date: 01/01/2011

Duration: 48 months

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Partner number	Partner full name	Short name	Country code (2-letter ISO code*)
1	Swedish Nuclear Fuel and Waste Management Company	SKB	SE
2	National Agency for Radioactive Waste Management	ANDRA	FR
3	National Cooperative for the Disposal of Radioactive Waste	Nagra	CH
4	Posiva Oy	Posiva	FI

* List of country codes: <http://publications.europa.eu/code/en/en-5000500.htm#ia5>.