

Retrievability in German SF/HLW Repository Concepts - Technical Solutions and Provisions for Implementation

Philipp Herold, Sabine Prignitz, Eric Simo, Wilhelm Bollingerfehr
BGE TECHNOLOGY GmbH, Research and Development, philipp.herold@bge.de

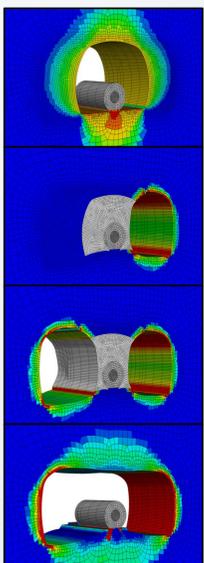
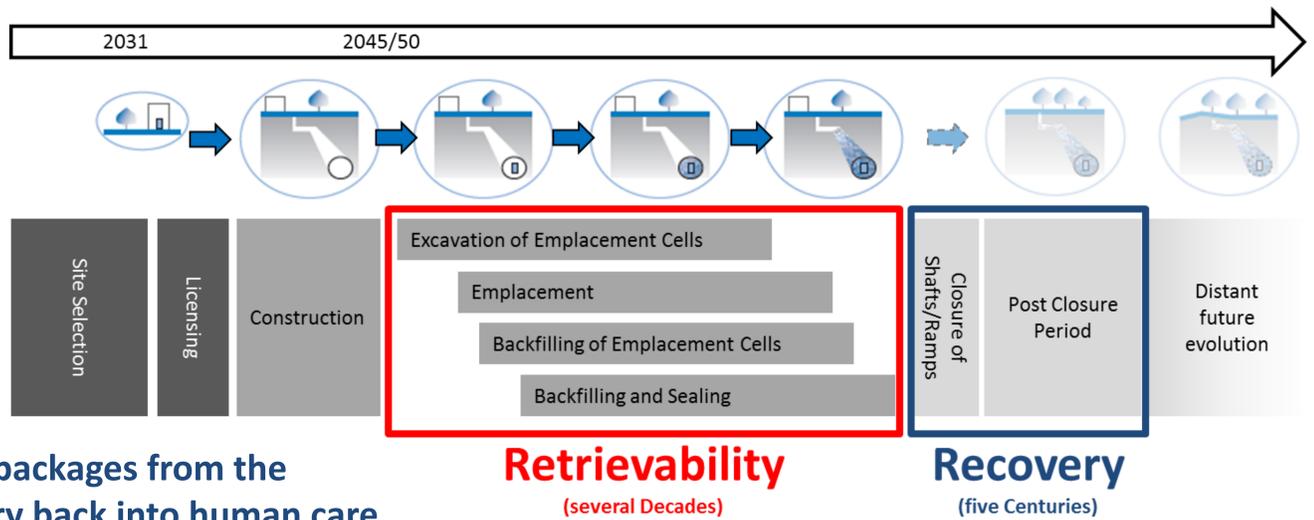
Retrieval Strategy and Implementation into Repository Concepts

Regulations:

“During the operating phase up until sealing of the shafts or ramps, retrieval of the waste containers must be possible.”

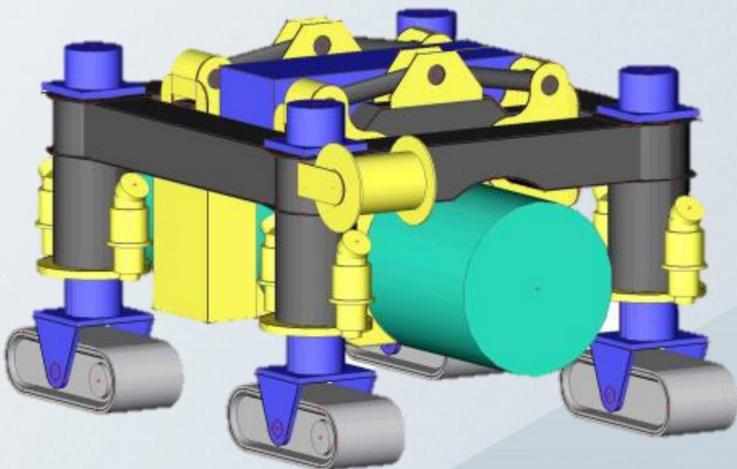
“...promptly loaded, then backfilled and reliably sealed from the mine building”

→ Retrieval is the transfer of the waste packages from the passive safety system of the repository back into human care



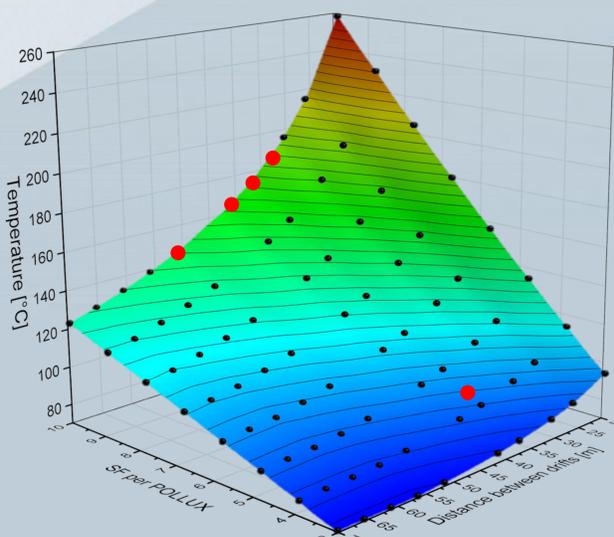
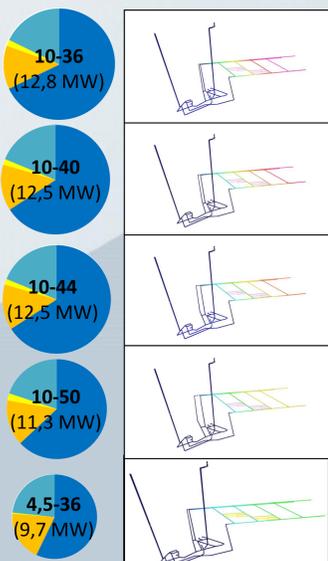
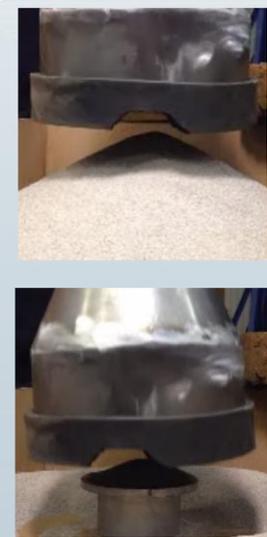
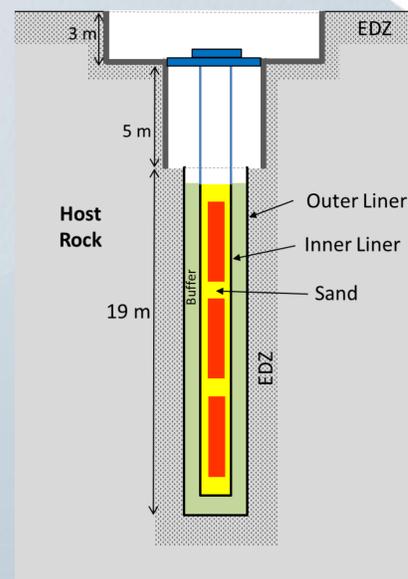
Retrieval of POLLUX® casks

The stepwise re-excavation of POLLUX® casks starts with the excavation of a first retrieval drift parallel to the emplaced waste packages. In the same manner, a second drift is constructed at the other side. Possible displacements due to thermal impacts and floor lifting would be detected by an exploration program. The final cross section is created by the removal of the remaining pillar between the two drifts. The waste packages, located inside the pillar, will be exposed by a remote controlled demolition robot.



Retrieval of BSK canisters

Retrieval of the BSK-canisters from a vertical borehole is a reversal of the already demonstrated emplacement process. Before retrieval the concrete abutment and the bentonite seal have to be removed and parts of the liner have to be reinstalled. The remaining technical challenge, the backfill removal, will be done by a new suction device. The device has the same outer dimensions as the canister and operates with a circulation airflow inside the borehole.



Modifications of Repository Layouts

Current Safety Requirements allow the implementation of technical measures or layout modifications to ease retrievability as long as the long-term safety is not affected in a negative way. Layout modifications allow the adaption of temperature conditions during retrieval. Increasing drift distances spread the heat to a larger amount of rock, reduces the local rock temperatures and the impact to the geo-mechanical properties, such as creep rate.