



June
2015

DOPAS Newsletter 4

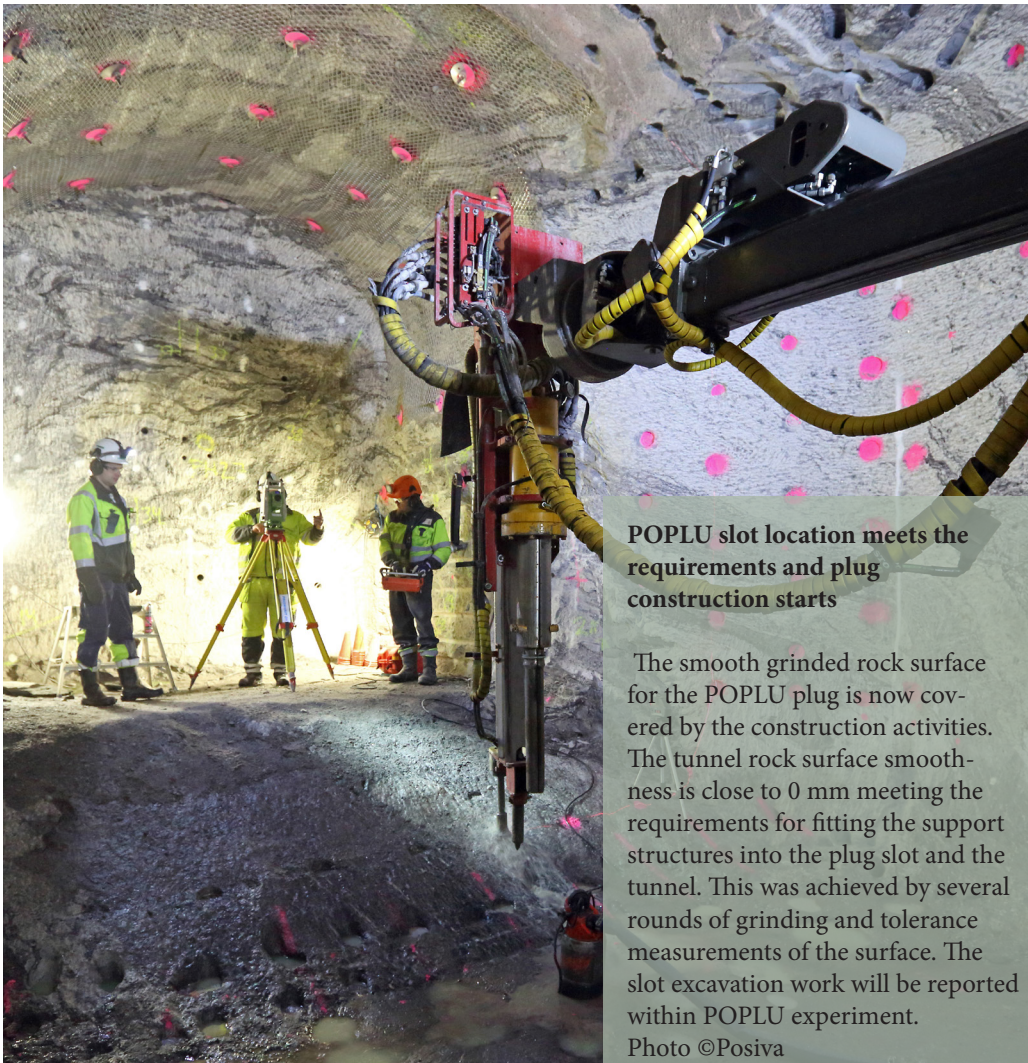
DOPAS facts

Full-scale Demonstration Of Plugs And Seals

- Project start: 1.9.2012, Length 4 years (48 months), Project end: 31.8.2016
- 14 Partners from 8 European countries (Posiva, Andra, DBE TEC, GRS, Nagra,

RWM, SURAO, SKB, CTU, NRG, GSL, BTECH, VTT, UJV)

- 5 full-scale experiments wholly or partially implemented within DOPAS



POPLU slot location meets the requirements and plug construction starts

The smooth grinded rock surface for the POPLU plug is now covered by the construction activities. The tunnel rock surface smoothness is close to 0 mm meeting the requirements for fitting the support structures into the plug slot and the tunnel. This was achieved by several rounds of grinding and tolerance measurements of the surface. The slot excavation work will be reported within POPLU experiment.
Photo ©Posiva

Photo from ONKALO demonstration area is showing slot excavation for the bottom section needed for construction of deposition tunnel plug. The POPLU Experiment is implemented in the future spent nuclear fuel disposal facility in Olkiluoto, Finland.

The research leading to these results has received funding from the European Union's European Atomic Energy Community's (Euratom) Seventh Framework Programme FP7 (2007-2013) under grant agreement no 323273, the DOPAS project.



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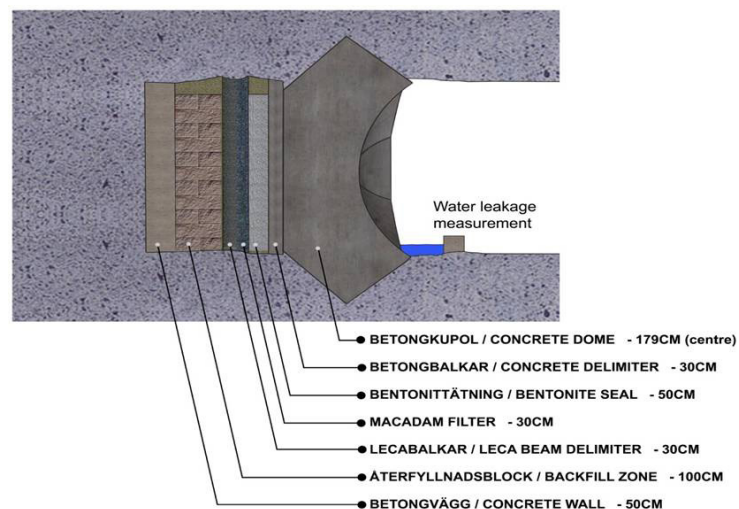
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DOMPLU Experiment is running

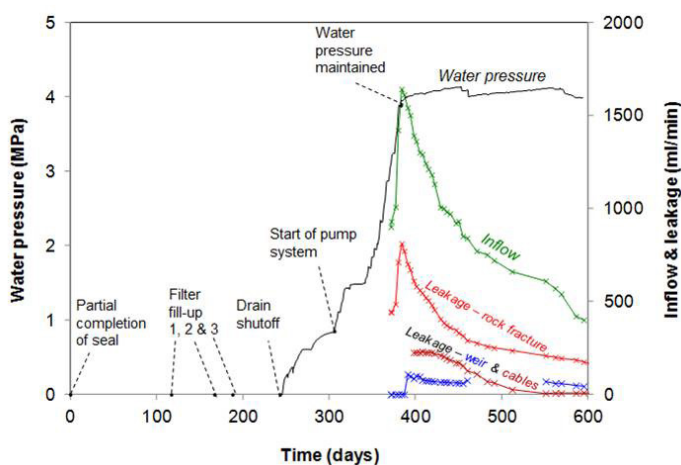
- System design development for deposition tunnel end plugs has been carried out in cooperation between SKB and Posiva Oy according to the KBS-3V reference disposal concept. The system design development has included verification of the dome plug design by analytical and numerical calculations, laboratory examinations and small scale tests. The main activity though, was to test a plug system in full scale (The DOMPLU experiment) with representative hydrogeological conditions at the Äspö Hard Rock Laboratory (HRL).

- In the autumn of 2012, an octagonal slot excavation for the concrete dome abutment was carried out by wire-sawing. The backfill, the bentonite seal and the filter components were installed in January 2013. Pipes for contact grouting and the concrete cooling system were installed during mid February directly followed by formwork assembly. The concrete dome was cast on March 13, 2013. The cooling system was used to cool the structure down to +4°C at the time of casting to prevent thermal gradients. Finally, about three months after casting, contact grouting with ultrafine cement was performed in June 2013. During the summer of 2013, the filter section was flooded and the water pressure controlled to provide possibility for the bentonite seal to gently initiate saturation. It had been shown in laboratory tests that the bentonite seal gives reliable sealing function when a swelling pressure of about 500 kPa is reached in all parts. Predictive calculations acknowledge this process to take 1-2 years.



- After four months flooding of the filter, the drainage valves from the filter section were closed. Subsequently pressurization of DOMPLU began by natural groundwater inflow from October 2013. The pump system was then started on December 2, 2013. The artificial pressurization was stepwise increased to 4 MPa during the period from December 2013 to February 2014, and has been maintained at this level until the date for data freeze for the DOPAS project on September 30, 2014.

- The water leakage past the plug system has been measured during 8 month at a hydrostatic pressure of 4 MPa (400 m head). On the date for data freeze of DOMPLU (September 30, 2014) the recorded leakage rate was about 0.044 l/min (2.6 l/h). This is well below the desired water leakage lower than 0.1 l/min to avoid risk for an unacceptable loss of bentonite from the repository. Initially, about 1.0 l/min injection water was needed to keep the 4.0 MPa water pressure inside the plugged volume. After eight months, just about 0.4 l/min was needed to maintain the same pressure (see Figure). Two experimental-related water escapes have occurred, one by-pass in a rock fracture and one via sensor cabling. Thus, in addition to the online recording of seepage water collected in the weir, the two water escapes are manually measured. All leaks have decreased with time (see Figure). This is probably due to effects of the swelling bentonite clay and mineralogical clogging of fractures.



DOPAS Dissemination activities

- DOPAS Experiment EPSP was presented in a Poster in 20th World Congress of Soil Science in Korea in June 2014 http://www.20wcscs.org/sub01_1.php
- The DOPAS project and the laboratory and in-situ work done for sealing of salt repository alternatives was presented in DAEF 2014, in Cologne, in September 2014. www.daef2014.org
- FSS Experiment and casting the SCC wall was presented in WMSYM 2015
- DOPAS Experiment EPSP was presented in Icone 23 conference in Japan in May 2015. <http://www.icone23.org/>
- DOPAS and its experiments and performance indicators were presented in Clay Conference in Brussels in March 2015. <http://www.clayconferencebrussels2015.com/>
- DOPAS and Design basis for plugs and seals and Experiment 1 FSS and Experiment 3 DOMPLU Experiment will be orally presented in LUCOEX conference and workshop in June 2015 . In addition DOPAS is represented in few posters and in panel discussion as well. <http://www.lucoex.eu/conference/index.html>
- DOPAS and POPLU experiment will be presented in Global 2015 in Paris, in September 2015 <https://www.sfen.fr/GLOBAL>



DOPAS

Training Workshop 2015

14 - 18 September 2015

Czech Republic, Prague and Josef URC

The detailed programme and registration will be available in June 2015.

The training workshop is free of charge for the participants, but the participants are responsible for their travel and accommodation in the Czech Republic.





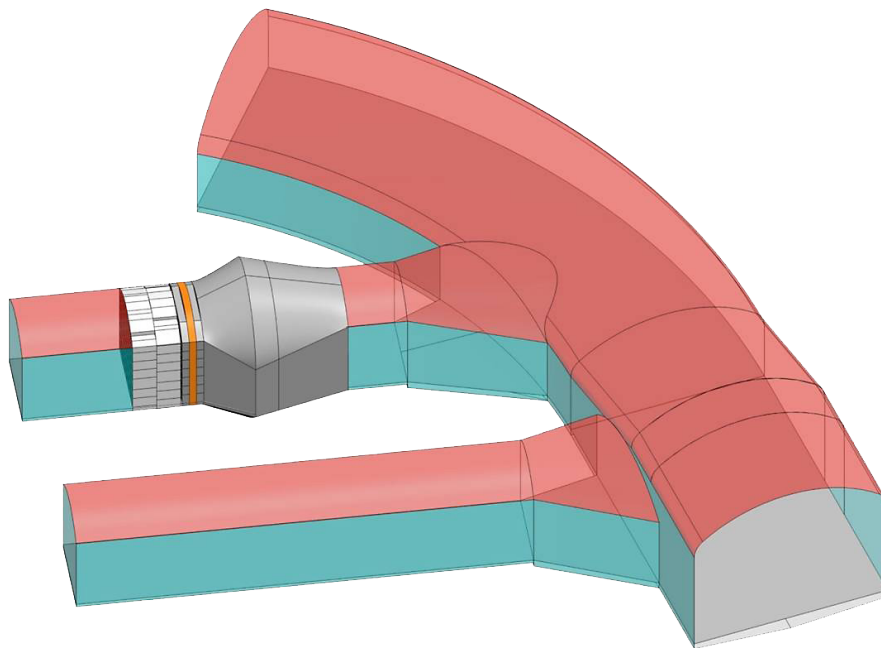
DOPAS 2016

Plugging and Sealing Seminar

25.-27.5.2016 Turku, Finland

This seminar is open for anyone who is working now or in the future with repository to define better closure or operation and related development and research items specific but not limited for the radioactive waste management and spent fuel disposal in geological formations.

Plenary, oral presentations and poster sessions will be organized.
An optional technical tour to Finland's repository location at Olkiluoto will be arranged.



Preliminary schedule:

- Call for abstracts Summer 2015.
- Deadline for abstracts 30.11.2015.
- Author notification 31.1.2016.
- Final programme available 28.2.2016.
- Extended abstract submission 31.3.2016.
- Seminar 25.-27.5.2016.

Stay tuned to DOPAS and IGD-TP webpages for more details.



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