Installation of the PRACLAY Hydraulic Seal

Exchange Meeting
25 November 2010
Goal PRACLAY Hydraulic Seal

- undrained hydraulic boundary for Heater Test
- examining feasibility of installing a seal
Design PRACLAY Hydraulic Seal

- ULg
- TRACTEBEL Engineering
- EURIDICE
Design criteria for steel structure

- bentonite pressure: 5 MPa
- upstream water pressure: 3.5 MPa
- upstream temperature: 90°C
First design

- placement bentonite ring (170 mm)
- assembly 4 parts of annular ring by welding
Second design

- thicker bentonite ring (310 mm)
- less in-situ welding
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- thicker bentonite ring (310 mm)
- less in-situ welding
- bentonite instrumentation
  - 35 thermocouples
  - 26 total pressure cells
  - 21 piezometers
  - 13 relative humidity sensors
  - 3 thermal conductivity probes
  - 2 extensometers
Construction and installation of the PRACLAY Hydraulic Seal

- SMET-Tunnelling
- Stork
- EURIDICE
- TRACTEBEL Engineering
Downstream flange

- 4 segments
- assembly by bolting and sealing resin
Upstream flange

- 4 segments
- assembly by bolting (and minor welding)
Cylinder

- assembly to downstream flange by bolting

- assembly to upstream flange by welding
Cylinder

- filters at extrados for artificial bentonite hydration
Installation works

- introduction cylinder in gallery
Installation works

- removal wood in alternative lining
Installation works

- installation downstream flange
Installation works

- installation downstream flange
Installation works

- installation upstream flange
Installation works

- installation bentonite blocks
Installation works

- positioning and assembly of cylinder
Installation works

- feed-through instrumentation
Conclusions

- goals
  - undrained hydraulic boundary for Heater Test
  - examining feasibility of installing a seal

- design
  - steel structure with annular bentonite ring
  - minimising in-situ welding
  - use of bolts, gaskets and sealing resin

- are the goals met?
  - in-situ assembly of large and heavy parts successful
  - technological void bentonite: 7-8%
  - bentonite hydration on-going
  - performance evaluation before and during Heater Test
Questions?