SKB RD&D perspective

Explanatory note on the panel session:

3 to 4 implementer/panellists in different stages of repository development list in short their major RD&D topics. These initial statements will in total make up 20’, then questions/comments by the audience can be formulated to the panellists on:

- How to tackle these challenges in general
- Which role the IGD-TP can/should play in this
SKB RD&D perspective
SkB - Future Tasks

Planned activities related to Research, Safety Assessments and Site Description up till 2031

- Spent Fuel Repository (KBS-3)
  - PSAR
  - SAR
- SFR (short-lived low level waste)
  - Review of application
  - PSAR
  - SAR
  - Renewed SAR
- SFL (long-lived low level waste)
  - Safety evaluation
  - SAR
  - FPSAR
- R&D-programme
  - Fud 2019
  - Fud 2022
  - Fud 2025
  - Fud 2028
  - Fud 2031
- Site Description
  - Forsmark
  - Site for SFL

△ = data freeze

The most important research issues at SKB presently:

- Is there a risk of **erosion of the bentonite** clay around canisters in a KBS-3 repository?
- How is the copper canister affected by **corrosion by sulfides** present in the groundwater, and by sulfides which may be present in gas phase during the time up till saturation of the the bentonite clay?
- How will **doped fuel react** when contacting water if a canister is damaged?
- How does the **fracture network** in the Forsmark lense affect **groundwater flow and transport of solutes**, and how will the fracture network affect the **mechanical load** on the canister during future glacial conditions?
- How will degradation affect the **concrete strength** in the SFR repository (1 BMA) during the life span of the repository (up to 20,000 years)?
- How can **transport of radionuclides** from SFL be retarded or diluted such that discharge and doses do not exceed acceptable limits?
- How can we separate natural hydrological changes from antropogenic hydrological changes during construction of the repository?
License application related issues

• Supplementary information to the Government
  • Cu-canister issues (see next slide)
  • Other supplementary information – suggestions on conditions
  • Will be submitted by end March 2019

• Resolving SSM issues
  • Key issues
    • Canister (Cu corrosion, insert stability, manufacturing NDT, QC)
    • BBC production, installation and QC
    • Underground characterization programme
    • Monitoring programme
Corrosion

• Issues
  • Corrosion due to reaction in oxygen-free water
  • Pitting due to reaction with sulfide, including the influence of the sauna effect* on pitting
  • Stress corrosion cracking due to reaction with sulfide, including the influence of the sauna effect* on stress corrosion cracking
  • Hydrogen embrittlement
  • The effect of radioactive irradiation on pitting, stress corrosion cracking and hydrogen embrittlement

• Time schedule
  • Most supporting work is now being completed
  • Documentation ready for international review in mid January
  • Update presented to SKB board early March
  • To be submitted end March 2019