

WG2: Canister Design

Summary & common interests

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Working Group 2

- 9 presentations
 - 3 WMOs
 - 4 Research institutes
 - 2 Manufacturers/commercial
- 22 participants in total

Objectives

- Information exchange on design requirements (regulatory, host rock specific, repository concept specific)
- Information exchange on state of the art on design, manufacturing and demonstration
- Information exchange on waste canister coating and lid/head welding
- Identification of RD&D needs for waste canister design, manufacturing and demonstration

Canister requirements: currently

Safety concept is the driver for deriving reqs.

- Required basis for successful design
- Sources: regulatory, long-term safety, operational safety
- Separate sets of reqs. per country
- Focus mainly on long-term safety
- No international standards, codes or guidelines

Canister requirements: RD&D potential

- Compilation of existing requirements is deemed useful
- Interactions between requirements and design
- Canister concepts are open for modification/optimization
- Potential for collaboration on definition of generic requirements from technical p.o.v.
- How do we comply to (changing) requirements?

Materials properties

- Sufficient knowledge of “legacy” materials (carbon steel, copper, ...)
- New tech and materials not evaluated sufficiently
- Ageing over operational timeframes (retrieval)?
- Ageing over repository timeframes is addressed with conservative bounding assumptions. Extrapolation? Uncertainties?
- Cooperation potential in deriving set of generic data.
- Completion of material database not deemed urgent

Design tools

- Available tools sufficient for current approach
- Outcome depends on quality of data
- Improvement of tools always desirable, but we can't drive it.
- General interest in coupling of multiple phenomena, treatment of uncertainty and sensitivity.

Manufacturing & welding

- Manufacturing technology available for metals (not ceramics).
- Early input from manufacturers is important (inherent variability of processes)
- Welding feasibility ensured, optimization needed
- Open questions: inspection, residual stresses, other materials (cast iron...), remote operation (hot cell), repair

Coatings

- New field, big interest by WMOs (CAN, KOR, CH, UK, JP, CZ...), large optimization potential
- Feasibility is ensured. Adaptability?
- Open questions: NDT, porosity and density, dislocation, material properties & characterization, transport and handling, substrate materials, functionally graded or multi-barrier coatings...
- What are the requirements for coatings???

General remarks

- WMOs have clearly identified needs, challenges, fields of cooperation
- Research institutes have necessary expertise
- Manufacturers are ready and interested
- Feasibility ok, optimization needed

Suggestion

- Elaboration of the potential of and RD&D project on coated canisters
- Necessary project steps:
 - Definition of requirements on materials and processes
 - Assessment of materials and design options
 - Process optimization
 - Production and inspection
 - Characterization and testing (in-situ...)
 - Input to safety concept and performance assessment