TRAINING

Information and discussion session on the SoK document on Containers

Access to the recording:

https://euradschool.eu/information-and-discussion-session-on-the-sok-document-on-containers/

The presentation will be based on the State of Knowledge report for HLW/SF Containers (Domain 3.2.1). Various aspects of container design and long-term performance will be covered in the talk, including: (i) safety functions, performance targets and container requirements, (ii) the factors underlying the choice of container material, (iii) a description of the nature of the environmental conditions and mechanical loads to which the container will be exposed and how they evolve over time, (iv) container design and fabrication, (v) the postclosure corrosion and mechanical performance of the container, and (vi) lifetime prediction and methods for justifying those predictions over the long timescales of interest. Emphasis will be placed on the long-tern corrosion behaviour of the container, although the mechanical performance and the impact of coupled corrosion-mechanical degradation modes will also be considered. The talk will focus on the design and performance of "conventional" container materials, including carbon steel, copper, titanium, and nickel alloys, with some discussion of copper-coated designs. Other types of metallic and ceramic coating and the use of bulk ceramics as container materials are outside of the scope of this SoK.

Learning outcomes

- The basis for the selection of the container material and design.
- The advantages and disadvantages of different container materials and repository designs.
- The importance of understanding the nature of the environment to which the containers will be exposed in the repository and relating these to the conditions used in laboratory experiments.
- A basic understanding of the corrosion behaviour of the various alloys proposed as container materials and of the types of corrosion that are, and are not, expected to occur.
- The importance of developing a sound mechanistic understanding of the corrosion and mechanical processes in order to support long-term predictions.
    - An overview of the types of empirical and deterministic models that have been developed to support both the calculation of container lifetimes and the broader safety case