**Integration Group for the Safety Case (IGSC) Symposium 2024***MOVING TOWARDS THE CONSTRUCTION OF A SAFE DGR – GETTING REAL*

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| **Abstract Title:**  **“****Analysis of safety attributes of potential host rocks for geological disposal of ILW and HLW”** | |
| **Abstract (300-500 words):** The objective of this piece of work carried out by the Belgian Agency for Radioactive Waste and Enriched Fissile Materials (ONDRAF/NIRAS) responsible for managing radioactive waste in Belgium, is to develop a methodology to screen out potential host rocks for a geological disposal (GDF) for high-level waste (HLW) and intermediate level waste long-lived (ILW-LL).  Despite its 40 years’ experience of Research, Development and Demonstration (RD&D) in poorly indurated clays, namely in Boom Clay and Ypresian clay, ONDRAF/NIRAS was required by the Federal Agency for Nuclear Control (FANC) to apply the optimization principle to the choice of the host rock, and hence to consider other types of geological formations before recommending a specific host rock for a GDF.  The process of optimizing the host rock is described, starting with the development of safety attributes derived from regulatory guidance, and applied to generic geological settings (no site). The safety attributes are physico-chemical parameters (e.g. hydraulic conductivity; porosity) but also more global features such as the presence of fractures or the tectonic activity. All these safety attributes represent the general safety approach of isolation and containment translated into safety principles including robustness and demonstrability. Re-starting from the “European catalogue of geological formations having favourable characteristics for the disposal of solidified high-level and/or long-lived radioactive waste”, the geology of Belgium was re-visited in the light of updated knowledge and the methodology of safety attributes was applied using exclusion criteria and a multicriteria analysis on the retained options. Different kinds of pelites are compared with a different degree of uncertainty.  The results of this work show that all the pelites could be considered as potential host rocks, at first sight. However, they also show the existence of epistemological limitations which probably prevent a proper implementation of the optimization process to the choice of the host rock. | |