**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:**  Lessons learnt on the management of risks and uncertainties in the post-closure safety assessment and the use of FEP's in a top-down approach. | |
| **Abstract (300-500 words):**  The paper and the oral presentation aim to provide lessons learnt from the perspective of young generation users on the management of post-closure event, processes and their uncertainties and the generation of scenarios over the last 30 years.  Identification and classification of scenarios in the post-closure safety is the fundamental basis for the PA assessment and for checking the robustness of the disposal system as well as the impact on human. Since the 2000s, Andra has used a “Top down” approach, meaning that identification of scenario lays on an identification of safety functions, description of the disposal system of the DGR and its post-closure evolution. As the DGR project, and the comprehension of its evolution matures, knowledge can be compiled in compendiums of events and processes. It is then considered that this compendium constitutes a specific FEP’s database.  As the Andra DGR project has progressed (from a generic site to a specific site, from a generic design to a more detailed one), the analysis of risks and residual uncertainties (ARI) laid on generic state of the art towards a more detailed (site specific, design specific) knowledge of the DGR phenomenological evolution. The FEP’s database moved from a database as an input at the generic level to a database for a control checking of the comprehensiveness of the analysis at the more specific stage.  Residual risks and uncertainties are put by Andra at the core of the definition of post-closure safety scenario quantified in the safety assessment to increase the robustness of the safety case. Thus, the goal of the qualitative analysis of risks and residual uncertainties (ARI) developed by Andra in accordance with national and international guides, is to check if the events, processes, and the uncertainties can affect, or not, a safety function of a component of the disposal system or affect significatively the migration of radionuclides in a component and the pathway to an outlet. Overall, the ARI is a tool to manage risks and the residual uncertainties based on the scientific, design state of knowledge and so identifies the measures to mitigate them (see also paper on the ARI for poster session).  Lessons learned from the application of this systemic “Top down” approach by young generation (especially those coming from outside the nuclear industry or scientific field) showed that this mature approach helped in understanding the assessment basis of (i) the disposal system, (ii) its phenomenological post-closure evolution and (iii) the links between science and post-closure nuclear safety requirements (relating to safety functions defined). Working on the ARI facilitated the integration in a multi-disciplines internal network of “experts” of each field. It could be considered as a practical tool for training on a key part of the post-closure safety training. The ARI was indeed a good tool to promote comprehensive exchanges between young generations and experts of each field (science, technology and nuclear safety).  The NEA 2019 FEP database was used as a check-up in a top-down approach to support the post closure safety demonstration in the safety case towards the licensing application for construction. The use of its 2000 counterparts compared to the 2003 version, showed that the declination of FEP’s in the 2003 version offers more flexibility and is more suitable for young engineers new in post-closure safety in charge of screening FEP’s. | |