**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:**  **IGSC MeSA-2 results: Process view and evolution along a disposal programme** | |
| **Abstract (300-500 words):**  Safety assessment stands at the core of each safety case: it helps demonstrate repository safety and informs safety-related programme decisions. While the details of assessment methods vary depending on regulations, programme context, and the specific safety concept under consideration, the general methodology for demonstrating safety is established and well understood (see e.g., Methods for Safety Assessment of Geological Disposal Facilities for Radioactive Waste. Outcomes of the NEA MeSA Initiative, 2012). However, in advanced programmes, implementation aspects become increasingly important: the safety case must *demonstrate* safety, but the design and its implementation must *achieve* it. At the interface between the safety case, the design, and its implementation, sit the derivation and management of requirements. This interface would benefit from clear methodological consideration and documentation, in much the same way as has been applied to safety assessment and safety case methodology in the past. To systematically address this, the IGSC has established a new initiative in 2023 to develop a holistic view on these aspects and embed the existing MeSA framework within this wider context.  One aspect of this new initiative is dedicated to exploring the evolution of and interaction between safety assessments, safety cases, requirements, and repository design over time, as the disposal programme advances from a generic feasibility / methodological project, through site characterisation and a site-specific design, finally to facility construction and operation.  We will present the newly developed process-oriented flowchart that complements two other flowcharts resulting from the new initiative on (i) the role of safety assessment in the wider context of the safety case and repository development and (ii) the assessment methodology itself. Driven by the overarching goal to *design for safety,* each step in a disposal programme starts from the previous stage, must consider external requirements and constraints, and has a specific goal or aim. It follows that the implementation process can broadly be seen as an iterative loop between (i) requirements formulation, (ii) analysis and assessments, and (iii) system and design development. Successive iterations build on the previous understanding until the overall aim of a design that satisfies the safety requirements under all credible scenarios is achieved. Depending on the project milestone, a formal safety case may be compiled at each iteration. In any case, there is a return of experience to the disposal programme at large that includes an update of the scientific basis, proper tracking of remaining uncertainty, and possibly an update of boundary conditions. An example of the latter is the result of site selection, after which the geology can be considered as an external constraint. It may also be necessary to address any significant changes to programme policy, e.g., changes in the inventory for disposal.  For specific stages along a disposal programme, details of the process are fleshed out based on national experience gathered, inter alia, in Finland, France, Sweden, Switzerland and the UK.  The results are a contribution to an update of the MeSA report (2012) that results from the overarching new initiative. Special consideration has been given to the relationship with the IGSC’s GeneSiS project addressing the evolution from generic to site specific safety cases as well as with the ongoing EURAD work on requirements management. | |