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

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| **Abstract Number: 47** | **Session 7.3.5** |
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| **Abstract Title:** GeneSiS: Moving from Generic to Site-Specific Safety Cases | |
| **Abstract (300-500 words):**  The Integration Group for the Safety Case (IGSC) has launched the Generic to Site-Specific Safety Cases (GeneSiS) project to provide a resource to help countries making the transition from generic to site-specific safety cases. It aims to do so by:   * providing a community of practice in which participating organisations can learn from the experience of more advanced programmes who have already completed elements of this transition; * producing guidance about which areas to focus on at different stages of the programme, what approaches are and aren’t suitable at different phases and how the approach may evolve as the programme progresses; and * producing generic products that can be adopted and used as a common and internationally tested starting point for safety case and design development.   This is achieved through four tasks, each addressing a different question.  **A) What are the stages of safety case development?**  The evolution of the repository programme generally follows a fairly consistent set of stages, moving through initiation, siting, construction and operations, closure and post-closure. Guidance around key activities and approaches is often presented in this context. As part of GeneSiS, a similar set of stages has been developed for the safety case. Since safety case work is intrinsically tied to the development and assessment of a safety concept, the safety case stages are distinguished, primarily, by the level of maturity of the safety concept. Definitions of the different safety case stages and a schematic showing how these relate to programme phases and key milestones have been produced and used as a basis for subsequent tasks and guidance.  **B) How do we move from generic to site-specific?**  A comprehensive questionnaire has been developed and used as a framework for conducting structured interviews with representatives from waste management organisations from different countries. It includes sections on key safety case topics and uses the safety case stages defined in task A to identify differences between countries and programme stages and explore trends in how the safety case evolves as the programme progresses. This informs guidance for countries on the most appropriate approaches depending on the stage at which they are working, the impacts of their current choices on future stages, and key considerations and best practices as they transition between stages.  **C) What makes a safety case?**  Safety case methods and expertise are used, alongside established methods from the semantic web and systems engineering to develop a ‘safety case ontology’, an explicit formal structured visual representation of the different elements relevant to a safety case (e.g. FEPs, safety functions, engineered and natural barriers, models, assessments, data, claims, requirements, etc.) and how they interact with each other, alongside an accompanying set of definitions. The resulting generic safety case ontology can be used as a basis for the development of digital tools, with associated benefits in consistency, change control, knowledge management, search, and useability. By presenting it in a concise visual format, it can also be used as a communication tool and training resource for people from diverse disciplines to familiarise themselves quickly with safety case methods and their wider context.  **D) How is safety provided in different environments?**  Literature review and the results of questionnaires conducted as part of Task A are used to analyse waste inventories, geologies and concepts that have been investigated internationally and develop a catalogue of international concepts, including their associated barriers and safety functions. By grouping together concepts with similar inventories, geologies, natural barriers and key safety functions, while being careful to consider the national context in which each concept was developed, a small set of generic safety concepts and safety functions is being defined for different geological environments, based on crystalline, clay and salt host rocks. These can be used as a good starting point for most countries investigating geological disposal. | |