**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:** **Preparing the safety case for technology optimisation and co-existence with site investigations, construction and operation** | |
| **Abstract (300-500 words):** The Swedish program for the management of spent nuclear fuel according to the KBS-3 concept is in a mature state of development regarding siting and technical implementation and has come far in the licensing process. SKB is about to submit a safety case requiring an approval by the Swedish Radiation Safety Authority (SSM) in order to start construction of a spent fuel repository. Construction is planned to start in 2027. The subsequent stage in the licensing process will be a safety case in support of an application for a permission to start trial operation of the repository. Two challenges are seen as particularly important to plan for at this stage: 1) The fact that detailed site investigations and safety assessment work need to meet the general time plan for construction of the repository facility, and 2) the need for optimisation of repository layout and technical barriers e.g. from the perspectives of value engineering, post-closure safety, and operational safety during construction.  In order to meet the time plan for construction and trial operation, SKB has analysed alternative ways to perform the safety assessment coupled to different stages in the detailed evaluation of the Forsmark site, based on data emerging from the excavation phase.  In order to prepare the organisation for handling questions regarding optimisation and alteration of repository layout and/or technical barriers, SKB’s unit for research and post-closure safety has developed a general procedure for handling such requests from other parts of the organisation. A working group, consisting of staff from both the unit for research and post-closure safety and that for technology development, have conducted a pilot project with the goal to optimise a selected hand-full of design requirements related to safety functions in the safety assessment. The aim is to develop a procedure which can be applied generally to future optimisation issues.  The possibility for further optimisation of the KBS-3 canister is evaluated in a project addressing the design, manufacturing process and material choice for the canister insert. In a collaboration between Posiva and SKB, possibilities to optimise the design and manufacturing of the copper overpack are evaluated. The feasibility to replace the backfill blocks with granular backfill material has been evaluated by SKB; some general conclusions will be presented.  External criticism of the KBS-3 concept has been expressed at some points during the licensing process. Such issues need primarily to be addressed with scientific analysis and arguments, emphasising the importance of the organisation being active and competent within various scientific disciplines. It is also important to have a safety assessment that facilitates an illustration of the potential impact on overall safety of issues raised (hypothetical scenarios), and thus allows evaluation of the role of e.g. individual components, technical barriers, and properties of the host rock, in terms of dose/risk and robustness of the repository from a post-closure safety perspective. | |