**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: Quality Assurance Methods in Safety Assessment**  Main author: Slimane Doudou  Company: Galson Sciences Limited, UK  Email: sd@galson-sciences.co.uk | |
| **Abstract (300-500 words):**  The Belgian Agency for Radioactive Waste and Enriched Fissile Materials (ONDRAF/NIRAS) is responsible for developing a solution for the long-term management of radioactive wastes in Belgium. ONDRAF/NIRAS is undertaking a research and development programme investigating geological disposal of category B waste (low-level and intermediate-level long-lived waste) and category C waste (vitrified high-level waste and spent fuel) in poorly indurated clays.  ONDRAF/NIRAS is preparing a safety and feasibility case that outlines the arguments that demonstrate the long-term safety and feasibility of geological disposal in Belgium. Safety assessments are an integral part of the safety and feasibility case. Quality assurance (QA), in the context of safety assessment, refers to procedures and best-practice measures that are applied to ensure the quality and reliability of the assessment. The following processes and tools are used by ONDRAF/NIRAS to ensure appropriate QA of its safety assessments. The presentation will focus on key aspects of these tools.  **Qualification, Verification and Validation (QVV)**  Qualification aims to show that the abstraction of the scientific understanding to define an assessment case has been correctly carried out and that the numerical model is an appropriate representation of the conceptual model. This requires involvement of appropriate experts to ensure adequacy of the hypotheses made in the abstraction process.  Verification is the process of showing that the numerical model has been correctly implemented in a numerical tool. This includes activities such as independent checking of the model implementation in the tool by an appropriate expert, mass conservation checks, and cross-comparing performance of the numerical model in terms accuracy and robustness of the results against other software or analytical solutions. For the latter, ONDRAF/NIRAS has developed a simple tool to provide an analytical solution for radionuclide transport in a diffusive porous medium.  Validation is achieved by comparing the results of the numerical model with experimental data, field observations, or natural analogues. In the context of long-term safety assessments, the relevant temporal and spatial scales are such that validation in the classical sense can only be accomplished for parts of the system, such as for specific processes.  **Data clearance process**  A data clearance system is employed by ONDRAF/NIRAS to manage, approve and update parameter values across all components of the programme. For safety assessment, a direct link between the assessment model input files and data clearance tables is established to ensure consistency with approved values and to minimise the potential for user error when transposing data.  **Knowledge management protocols**  Appropriate documentation and recording of all model implementation and verification activities are achieved through the use of a standardised “calculation form” and procedures to ensure consistency, clarity and comprehensiveness. | |