**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:**  **Role of the safety case for the LILW repository in Loviisa, Finland** | |
| **Abstract (300-500 words):**  In Finland, the waste producer has the responsibility to manage nuclear wastes produced, including the final disposal. Fortum disposes the low and intermediate level wastes (LILW) produced at the Loviisa nuclear power plant (NPP) in a repository located at the NPP site at a depth of approximately 100 meters. The repository was commissioned in 1998. Having the whole chain from waste production, handling, transportation and disposal of the LILW within a single organisation has proven to be a straightforward and cost-effective way to manage and dispose of the nuclear waste produced.  The post-closure safety case is updated at least every 15 years in conjunction with the periodic safety review for the disposal facility. The safety case was updated in 2018 and was approved by the regulator in 2019. The safety case included both the operational wastes as well as the future decommissioning wastes that will be disposed of prior to the repository closure. Many aspects of the safety case have been adapted from Posiva's and SKB's safety cases, considering a graded approach. The assessment period was selected to be 100,000 years justified by the radioactivity of the waste.  The safety case is influenced by the existing repository design, engineered barriers, wastes produced so far and monitoring carried out in and around the repository. In addition, the assumptions regarding future waste accumulation and plans for the future extension of the repository have a direct impact on the safety case.  The main outcomes of the safety case are identified as:   * integration of the relevant information and demonstration the compliance of the disposal with long-term safety requirements; * identification of the main uncertainties affecting the long-term safety and guidance to further research and development programmes or to design changes; and * communicating the results to various stakeholders and support their decision making.   A large proportion of the operational waste has already been disposed of in existing waste caverns and the possibilities to modify the disposal concept of those wastes are limited. The possibilities to influence the disposal of decommissioning waste are greater, since the decommissioning of the Loviisa NPP is planned to begin in 2050s at the earliest. For example, the latest safety case update assumed the reactor pressure vessels to be disposed as whole and the reactor internals were disposed inside them. The disposal plan of the reactor pressure vessels and the reactor internals will be re-evaluated in the near-future considering both the decommissioning and long-term safety aspects.  The safety case was utilised when applying for a life-time extension for the Loviisa NPP and the disposal facility in 2022. The safety case results indicated that also the wastes arising from the life-time extension can be safely disposed of in the disposal facility. The government granted updated licences for the NPP and disposal facility in 2023. | |