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BENEFITS OF DIGITAL CONTINUITY AND INTERACTIVE SIMULATION TO OPTIMISE D&D OPERATIONS

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Abstract

The decommissioning of a nuclear facility involves several steps: shutting down the facility, characterizing its state before D&D operations, defining and assessing the feasibility of decommissioning scenarios, implementing the operations and characterizing the final state of the facility before reuse or release of nuclear control.

The use of digital tools during the successive stages of a D&D project is becoming more widespread. Indeed, for several years, the use of interactive simulation such as virtual reality [1] has shown its benefits for the conception and the optimization of complex D&D operations [2].

Today, the use of these digital tools is based on specific extractions of the 3D and radiological data, which were acquired, most often, during the initial physical and radiological characterization of the decommissioning site. These extractions can be considered as a digital discontinuity, due to a need to adapt the data formats, to script the models, to merge various data sources, etc... The disparity of these data limits the capacity to easily update the 3D models and reduces the possibilities of use. Optimizing these data management processes from various reference sources (BIM, PLM, etc.) will not only ease the updating of the facility plan and configuration but also improve the efficiency in the use of interactive simulation at the different stages of a D&D project.

In this paper, we will introduce some use cases of different phases of a decommissioning project. Then, we will propose several approaches to manage the heterogeneity of the data formats, to accelerate the updates and to facilitate the integration of the data produced by these simulations in the digital model of the D&D operations. Finally, we will discuss the actions necessary to move towards a digital twin of the D&D worksite, allowing interactive simulations to be carried out in an increasingly relevant manner while minimizing manual processing effort.

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