

## **From robots to drones, the future of decommissioning operations – The CLEANDEM and XS-ABILITY projects**

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In recent years, there has been an increase in Dismantling & Decommissioning (D&D) operations of nuclear facilities, driven by the ageing of infrastructures and political decisions to phase out nuclear power. These operations, which can last from a few years to several decades, require mature and reliable techniques that meet international standards, local safety regulations, and radiation protection criteria. Despite developments in robotics, sensors, and digital tools that could reduce manual labor and risk exposure, their deployment remains limited due to financial and logistical constraints. The EU-funded projects CLEANDEM and XS-ABILITY address this challenge by upgrading advanced nuclear sensors and mounting them on autonomous terrestrial (CLEANDEM) and both terrestrial and aerial (XS-ABILITY) robots. These robots are and will be designed to assist operators by enabling continuous monitoring during D&D processes, reducing radiation exposure (CLEANDEM), and accessing hard-to-reach areas and difficult to measure radionuclides (XS-ABILITY). They also minimize human errors and organizational issues related to limited intervention time and repetitive tasks. CLEANDEM's results were showcased at its final workshop, and XS-ABILITY, launched October 1<sup>st</sup> 2024, will build upon these developments to further improve safety and efficiency in D&D operations. This work focuses on CLEANDEM's technical developments, and presents XS-ABILITY as one of its perspectives

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