Robots, drones and innovative radiation sensors, the future of unmanned operations with the XS-ABILITY project

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The developments in unmanned vehicles, whether Ground (UGVs) or Aerial (UAVs), allow to avoid exposition of operators, or access where human intervention ranges from undesirable to impossible. While using new technologies in Dismantling & Decommissioning (D&D) operations would avoid the risks and costs of having human doing them, as well as organizational issues related to limited intervention time and dangerous tasks, their deployment currently remains limited due to financial and logistical constraints. Started in October 2024 and coordinated by CEA, the XS-ABILITY project will have, for three years, seven leading actors of European nuclear research (CEA, IFE, VTT and SCK-CEN) and private sector (CAEN Flyability and Sigma), extend and upgrade the EU-funded CLEANDEM project's achievements (embedding sensors on UGVs), by addressing the issue of hard-to-measure radioactivity in/and hard-to-access locations. To reach this objective, XS-ABILITY will develop and deploy a swarm of autonomous UGVs and UAVs equipped with advanced radiation detection technologies. The sensors will be enhanced with AI-based algorithms and methodologies for accurate 3D scene reconstruction that will ease the situational analysis for humans and AI. Such data, implemented in any D&D digital-twin and supervision platform, such as the one from PLEIADES, and its follow-up project, DORADO (both EU-funded), will allow better planning and traceability of D&D operations, thanks to more accurate, more reliable, and up-to-date information, hence cheaper, and safer for D&D workers

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