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The Euratom project MICADO and its innovative characterization process of the Nuclear Waste Packages

All over the world the nuclear waste management sector is always part of the public debate. Independently from their origin, the main concern is the radiation emission, which makes it a particular hazard for human health and the environment. The situation gets worse considering country dependent legislation, storage sites and final disposals. This means have different definition of waste categories and activities (e.g. free release), the necessity to use multiple radiological sensors with incompatible outputs inducing the necessity to redo the characterization at each site, to analyse a large amount of off-line data and process manual reports of the operators, etc.

It is in this framework that in 2019 the MICADO (Measurement and Instrumentation for Cleaning And Decommissioning Operations) project started under the H2020 Euratom call aiming to demonstrate the feasibility to improve the characterization of nuclear waste packages.

MICADO would like to become a reference in the nuclear waste characterisation field thanks to the platform under development. It wants to change the actual manual operations applying an analysis procedure, waste type dependent, and combining information from different detectors to better qualify the waste package under analysis. It has established a characterization process, data analysis and information storage able to cope with different types of waste activities (LLW, ILW, legacy waste), types (metallic & concrete filling) and drum dimensions.

This is done with a toolbox of up to date and novel gamma and neutron detection technologies, working as modular elements, and a digital software platform used as a base for the digitalization of detector information and the off-line analysis for the uncertainty assessment. The procedure was defined to reduce the measurement time in each step and being able to select the required detection technology avoiding multiple identical measurements of the same waste package. The combined data analysis fuses different measurements results to extract information not available by the individual systems and reduce the individual uncertainties. This aspect is extremely important as a possible solution to the problem of having a satisfying and reliable categorization of the waste package activity of complex cases as high density waste drums or the request for the free release. The software platform also aims to reduce operator costs and improve the ALARA principle, decreasing the time spent on field by the operators and promise a simple and easy data control on historical basis of all the already characterized waste packages.

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Ms

Affiliation

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Authors: FANCHINI, Erica (CAEN s.p.a.); Mr MORICHI, Massimo (CAEN s.p.a.); Mr IOVENE, Alessandro (CAEN s.p.a.); Dr GIORDANO, Ferdinando (CAEN s.p.a.); Mr PEPPEROSA, Andrea (CAEN s.p.a.)

Presenter: Mr MORICHI, Massimo (CAEN s.p.a.)

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