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The Euratom project MICADO with its innovative procedure for the characterization of Nuclear Waste Packages

All over the world the nuclear waste management is always part of the public debate. Independently from the origin of the waste, the main concern is the radiological emission and the impact on human health and the environment. The inexistence of a standardized characterized procedure of nuclear waste types and packages, a country dependent legislation with own definition of waste categories and activities do not help to have a comprehensive and homogeneous overview of the situation and an efficient management and treatment. Moreover, there is often the necessity to perform the characterization of large amount of legacy waste because of lost or not complete information, or required analysis of a large amount data that are not always promptly accessible.

The MICADO project started under the H2020 Euratom call aiming to demonstrate the feasibility to improve the characterization of nuclear waste packages. 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 unnecessary measurements of the same waste package. The combined data analysis fuses different measurement results to extract information not available by the individual systems and reduces 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. This work summarizes the final results obtained by the project that was concluded last February. It will be presented the final status of the project, tests performed in real life and almost real-life configurations and the future plans for the industrialization of the systems.

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