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INSIDER

Danièle Roudil^{1,*} and Laura Aldave de Las Heras²

¹ CEA, DES, ISEC, DMRC, University of Montpellier, Marcoule, France

² European Commission, Joint Research Centre (JRC), Directorate G – Nuclear Safety & Security, Rue du Champ de Mars 21, 1050 Brussels, Belgium

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The H2020 Euratom European project INSIDER (Improved Nuclear Site Characterization for waste minimization in decommissioning under constrained environment) was launched in June 2017 for a duration of 4 years; it currently includes 17 partners from 10 European countries.

The project is focused onto radiological characterization applied to waste-driven integrated approaches, including the sampling overall strategy and design. Its objectives are to improve the management of waste with medium (MA) and high radioactivity (HA) levels coming from nuclear sites or facilities under D&D (Decommissioning and dismantling) and/or other constrained environments. The optimization criteria refer to operational decommissioning efficiency, safety and costs. The outcome of the project will increase knowledge on the amounts and characteristics of radioactive waste resulting from D&D and increase confidence on the sound definition of subsequent storage and disposal end points.

INSIDER is thus mainly focused on the issues of pre-characterization upstream of decommissioning operations.

The methodology is based on advanced statistical processing and modelling, coupled with validated measurement techniques and methods, in situ or in laboratory, with a final objective of economic gains, and improved safety and sustainability.

The technical approach of the project is on one hand to develop different sampling strategies, coupled with characterization methods whose performances are known in representative situations, and on the other hand to qualify the contribution of this approach to- and validate its effectiveness in real situations on 3 concrete case studies representing typical configurations of decommissioning worksites:

- Nuclear reactor: BR3 reactor vessel at Mol (SCK-CEN);
- Installation of the fuel/waste cycle: effluent tanks at ISPRA (JRC);
- Post-incident management: contaminated soils (CEA).

The first project workshop took place on 24 and 25 May 2019 in Bilbao. The articles presented in this special issue offer a global vision and a representative sampling of the scientific and technical advances developed in the project:

- Assessment of the results acquired during the first period of the project in terms of sampling strategy, identification and prioritization of techniques and methods of analysis in situ and in the laboratory, and metrology tools to improve confidence in measurements based on the mastery of processes and estimation of uncertainties [1,2].
- Organisation of benchmarking, in situ measurement campaign and interlaboratory comparisons on matrix reference materials and real samples [3–6].
- Analytical innovation [7].

At the end of the first period of the project, the input data and the experimental validation on the first two case studies are in place, with very first results available.

The different statistical treatments adopted will allow a realistic evaluation of the performances of all the measurement methods, in situ and off-line; this is essential to demonstrate the contribution of this coupling methodology for the pre-characterization phases of decommissioning projects.

The originality and the innovative aspects of all the intercomparison exercises based on in situ measurement campaigns should be underlined, in addition to those on reference samples sent to the laboratories. This fundamental contribution is the result of multi- and cross-disciplinary work.

The INSIDER project is working towards defining recommendations and guidelines for improving decision making of the industrial implementers for decommissioning and remediation activities. Thereby, a key contributor is effective knowledge sharing within the scientific community. Final assessment of the outcome will strengthen the recommendations and guidance, and promote sharing European expertise through guide and pre-normative texts.

* e-mail: danielle.roudil@cea.fr

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