

H2020 INSIDER PROJECT: PROGRESS ON SAMPLING STRATEGY AND IMPLEMENTATION ON THREE USE CASES

Y. Desnoyers¹, S. Boden², B. Rogiers, N. Pérot³

¹ Geovariances, Avon, France

² SCK-CEN, Belgian Nuclear Research Centre, Mol, Belgium

³ CEA, Cadarache, France

desnoyers@geovariances.com, sven.boden@sckcen.be, bart.rogiers@sckcen.be,
nadia.perot@cea.fr

Abstract

The EURATOM work program project INSIDER was launched in June 2017 (17 partners and 9 countries). It aims at improving the management of contaminated materials arising from decommissioning and dismantling (D&D) operations by proposing an integrated methodology of characterization. The methodology is based on advanced statistical processing and modelling, coupled with adapted and innovative analytical and measurement methods, in line with sustainability and economic objectives.

The overall objective of INSIDER is to develop and validate a new and improved integrated characterization methodology and strategy during the D&D process, based on three main use cases:

1. A nuclear R&D facility: radioactive liquid and sludge in tank at JRC Ispra (Italy),
2. A nuclear power plant: activated bio-shield concrete of BR3 reactor (Belgium),
3. A post accidental site remediation: contaminated soils beneath a CEA building (France).

The main objective of Work Package 3 (WP3), is to draft a sampling guide for initial nuclear site characterization in constraint environments before decommissioning, based on a statistical approach. This is done by selecting state-of-the-art techniques concerning sampling design optimization, using prior information and multiple iterations, testing the approach through different case studies and reviewing the feedback from overall uncertainty calculations. The process followed to meet the main WP3 objective consists of four steps:

1. Status: provide an overview of the available sampling design methods and state-of-the-art statistical techniques.
2. Development: develop a strategy/methodology and implement it in a software package by making use of (and possibly extending) state-of-the-art techniques.
3. Implementation: apply the methodology to the different test cases considered in order to test its adequacy.
4. Guidance: summarize all the findings in a comprehensive sampling strategy guide.

This paper then aims to present and share the mid-term outputs of WP3 on sampling strategy and ongoing implementation on the three selected use cases.

Keywords: Radiological characterization, sampling strategy, integrated approach, data analysis