

Optimized determination of the radiological inventory during different phases of decommissioning

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Abstract

The decommissioning of nuclear facilities comprises a lot of activities such as decontamination, dismantling and demolition of equipment and structures. For these activities the aspects of health and safety of the operational personnel and of the general public as well as the minimization of radioactive waste have to be taken into account.

An optimized, comprehensible and verifiable determination of the radiological inventory is essential for the decommissioning management with respect to safety, time, and costs. For example: right from the start of the post operational phase, the radiological characterization has to enable the decision whether to perform a system decontamination or not. Furthermore it is necessary, e.g. to determine the relevant nuclides and their composition (nuclide vector) for the release of material and for sustaining the radiological health and safety at work (e. g. minimizing the risk of incorporation).

Our contribution will focus on the optimization of the radiological characterization with respect to the requisite extent and the best instant of time during the decommissioning process. For example: which additional information, besides the history of operation, is essential for an adequate amount of sampling and measurements needed in order to determine the relevant nuclides and their compositions? Furthermore, the characterization of buildings requires a kind of a graded approach during the decommissioning process. At the beginning of decommissioning, only a rough estimate of the expected radioactive waste due to the necessary decontamination of the building structures is sufficient. With ongoing decommissioning, a more precise radiological characterization of buildings is needed in order to guarantee an optimized, comprehensible and verifiable decontamination, dismantling and trouble-free clearance.

These and other examples will be discussed on the background of and with reference to different decommissioning projects involving direct dismantling and safe enclosure.