How characterization and clearance process is planned to be optimized by combining MARSSIM methods with parametric statistics in decommissioning of Karolinska University Hospital in Stockholm

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ABSTRACT

There are different standards for the characterization and clearance process used globally in the radiological industry. All of them have advantages and disadvantages. This paper is describing a decommissioning project which is combining two methods in order to use the advantages of both and minimizing the disadvantages.

In Sweden there have been a standard since several years to use a method based on parametric Bayesian statistics for the characterization and clearance process. This method has great advantages close to the clearance limits due to few measurements per m^2, an ability to add extra measurements if needed and an ability to reshape area units without restarting the clearance process. Since the method is based on units with a normal or LOG-normal distribution of the contamination there can be several units far from the clearance limits.

The American MARSSIM method use non parametric statistics instead of parametric. In comparison to the Bayesian methods this results in the disadvantage of less accuracy close to the clearance limits but also in the great advantage with few units far from the clearance limits.

In the characterizing and clearance process of old radiological facilities at the Karolinska University Hospital in Stockholm the MARSSIM method is combined with the Bayesian statistics method to minimize the amount of measurements and by that the cost for clearance. By using Bayesian statistics close to the clearance limits, more areas will be approved for clearance and the risk of having to redo the survey is minimized. By using MARSSIM methods in the area with an assumed contamination below 25 % of the clearance limits, the areas are not needed to be divided into units with normal or LOG-normal distributed activity. Bigger areas can be handled as units which result in fewer measurements and a faster process.