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Regulatory Aspects of Clearance and Recycling of Metallic Material forming Part of Buildings of Nuclear Facilities in Germany

Stefan Thierfeldt, Stefan Wörten, Philip Harding
Brenk Systemplanung GmbH (Germany)

Metallic materials as part of buildings of nuclear installations, like reinforcement in concrete, anchor slabs, pipework buried in concrete, but also steel liners of water basins or anchor rails that are welded to the reinforcement steel etc. require special considerations during decommissioning. It is the aim to release as much of this material as possible for recycling (either by melting in conventional foundries or by melting in a controlled recycling plant for reuse in the nuclear field). This poses problems as on the one hand these metallic materials cannot be removed from the buildings prior to their demolition, while on the other hand they would in principle require a specific clearance procedure for which they should be available separately. Besides aspects of radiological characterisation and measurements, this is also a regulatory issue, as the competent authority has to grant clearance of materials that may not be fully characterised by measurements, but for which a significant part of the information required for clearance is inferred from the operational history, from conclusions by analogy and from other sources.

This issue has been resolved in different ways in various NPPs in Germany. Examples of materials that pose problems of the kind listed above (including relevant contamination pathways) are given, together with examples for solving these problems by specific considerations in the clearance procedure. The clearance regulations for metal scrap in Germany require adherence to both mass specific and surface related clearance levels in Bq/g and Bq/cm², respectively, which are similar to those as laid down in the EU recommendations RP 89/101. Therefore, approaches had to be developed for inferring sufficiently comprehensive and conservative estimates of the mass and surface related activities for metallic materials forming an integral part of buildings from measurements that do not cover 100 % of the material. The ways are outlined in which the requirements of the German Radiation Protection Ordinance were fulfilled in each case.

These experiences from German clearance procedures may also be valuable for decommissioning projects in other countries where similar technical issues will exist which may yet be unsolved.