

Implementing Waste Led Decommissioning in Practice - Experiences from a Research Facility

Per LIDAR (Studsvik), Magnus HÖRLING (MAX IV), Karin Strid (Studsvik) and Arne LARSSON (Cyclife-EdF),

per.lidar@studsvik.se; magnus.horling@maxiv.lu.se; karin.strid@studsvik.se; arne.larsson@cyclife-edf.com

MAX Laboratory is a national laboratory in Sweden hosted by Lund University. It operates accelerators producing synchrotron light of very high intensity and quality. As a new high capacity facility, MAX IV, was built at a new site the installations and the entire MAX-lab facility at the University was shutdown late 2015 for immediate decommissioning. After completion of the radiological survey and the planning activities, the physical decommissioning of the MAX-lab facility started in 4th quarter 2015. The buildings will after completed decommissioning be used for other purposes by Lund University. The intention is to complete the entire decommissioning process including clearance of the facility before the end of 2016.

An early strategic decision was to apply a waste led decommissioning and to use a risk based graded approach concept. As mentioned above an early action was to perform a radiological characterisation to map the facility in a radiological perspective. Based on the characterisation results, plant owner knowledge and an investigation of historical operational records and incidents the facility was categorised in risk for radioactivity in materials and structures. The plant owner experience that no loose contamination had been generated by the operations of the accelerators was confirmed. Induced activity was found in the installations as well as in the building structure. The radiological survey measurements was also used to generate nuclide vectors to be used for the waste management and the clearance measurements.

A rip and ship concept was preferred by the plant owner over several reasons not at least the time aspect. After dismantling all material but concrete with a potential or likely content of radioactivity was sent to the waste treatment facilities at the Studsvik site for clearance measurements or waste treatment. Staff from the waste treatment organisation were involved already in the planning and dismantling processes which made the decommissioning very efficient.

After completed dismantling, the surfaces of the remaining structures were measured nuclide specific. Surface areas both over and under the clearance regulation limits were measured. Most results were as expected but, like in all decommissioning processes, some unexpected locations with elevated radioactivity content was identified and was to be managed before application to the regulatory body for clearance of the facility and termination of license.

This paper gives an overview of the decommissioning project from the early characterisation activities up to completion and how the plant owner, the decommissioning team and the waste treatment organisations effectively can work together.