

Radiological mapping and characterization at the Barsebäck nuclear power plant

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Mapping and characterization of the radioactive contamination at the shut down Barsebäck nuclear power plant (project KAKA) has been going on since a few years. The main objective of this project is to generate the radiological basis for the planning and cost estimation of the decommissioning of the site. The project consists of two parts. First the plant areas outside the buildings were investigated. In the second part the buildings and the plant systems were examined. Both radiological contamination and environmental hazards was investigated but this presentation only discusses the radiological part.

The plant area was sampled for surface soil, sea and pond sediment, drilled soil and ground water, vegetation. The area was also scanned with a NaI-detector. Several hundreds of samples were taken and more than one thousand positions were scanned with in-situ gamma spectroscopy. The choice of sampling and scanning positions was biased by plant radiological history assessment that might have resulted in radioactive contamination. All samples were analyzed with high-resolution gamma-spectroscopy at the Barsebäck environmental and low background laboratory. A smaller number of samples were also sent to VKTA in Germany for the analysis of "hard to measure" nuclides and transuraniums.

In general the radioactive contamination in the Barsebäck plant area is low. Elevated activity of Co-60 and Cs-137 is found only on a few locations and this can be explained by historical events. H-3 is detected in a few ground water samples with activities not higher than 2 Bq/l. This is fairly close to the detection limit. No transuraniums were detected. The methods, analysis results and some conclusion will be presented.

The buildings and systems were sampled during 2011. Drilled concrete systems material and plant resins samples were complemented with three thousand smear samples. All smear samples were analyzed for total beta and alpha and pooled smear samples and all concrete and systems samples were analyzed with gamma spectroscopy. Some chosen samples were analyzed for "hard to measure" nuclides. The analysis of the measurement results are in progress at the time of this writing. The methods and analysis results will be presented.