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Decommissioning Planning for Forsmark and Oskarshamn NPPs

N. Bergh, M. Edelborg, I. Farías, G. Hedin, M. Pettersson, K. Snis
Westinghouse Electric Sweden AB, Västerås, Sweden

J. Carlsson, F. de la Gardie
SKB AB, Stockholm, Sweden

Abstract

Decommissioning studies have been carried out for the three BWR units of Oskarshamn and the three BWR units of Forsmark nuclear power plants. The final closure of these units is far ahead but anyhow there has been a need for developing a more general decommissioning planning basis. The main objectives of the studies have been to establish an estimate of the waste amounts arising from these units during decommissioning. The waste amounts will be used when designing the extension of the existing facility for final disposal of short-lived low- and intermediate level waste, the SFR, at Forsmark, Sweden, to accommodate also similar waste from decommissioning. The broader studies will also provide a firm basis for funding of the decommissioning phase for these units and will be used for verification that the existing national decommissioning fund is of an adequate size.

The studies have been performed by Westinghouse in cooperation with the utilities of Forsmark (FKA) and Oskarshamn (OKG), on behalf of SKB, the utility-owned Swedish waste management organization, responsible for coordination of the national waste fund as well as for designing, building and operation of waste management facilities.

Each of the studies contains a general description of the plant with the purpose to characterize them to facilitate decommissioning project comparative studies of different plants. Also, a detailed inventory of all materials in the plant have been put together and modeling of radioactivity data have been carried out to establish typical contamination levels for the main parts of the plant. The procedures and technologies foreseen to be used for the future dismantling and waste management work are briefly described based on standard, presently easily available techniques.

The combination of the materials inventory data and the radiological data is used to calculate the number of different waste containers that will be produced during dismantling of the plant. Standard 20 feet ISO containers will be used for the low-level

waste while special steel containers that fit the transport overpack system will be used for intermediate level waste. The long-lived waste will be loaded into thick-walled steel containers for interim storage until a repository for long-lived waste is available (the year 2045 according to present plans).

The inventory data will also be used by experience models that calculate work hours for taking care of all the different types of plant components. The working time estimates are then combined, together with general duration data for different activities during plant decommissioning, into a time schedule for the complete program, from initial planning and preparatory activities to non-radioactive building demolition and site restoration.

Based on these decommissioning studies costs may be estimated for each of the work breakdown structure (WBS) elements of the time schedule. Summarized it will provide a budgetary estimate for the complete decommissioning program.

The paper will provide detailed data of waste characterization and amounts, as well as of time schedules for the main part of the Swedish BWR fleet and show how decommissioning will fit with the existing well-developed waste management system of the country.