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THE ESS IRRADIATED TARGET WHEEL HOT CELL OPERATIONS FOR HANDLING, DISMANTLING, SEPARATION AND PREPARATION FOR FINAL DISPOSAL

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The European Spallation Source (ESS), Lund, Sweden will be a 5MW long pulsed neutron spallation research facility with planned commission 2019. The ESS hot cell facility will be equipped with several systems and functions, where one of the functions shall cover the complete dismantling, separation and preparation for final disposal of the irradiated tungsten target wheel. The target wheel has a diameter of 2,5 m and consists of a tungsten core which constitutes the spallation material. A stainless steel shroud, including slab supports encloses the tungsten. The shroud is connected to a shaft via a central hub. The total height of the assembly is 5,3 m and the total weight is 14,5 tons.

The process of safe handling, dismantling, separation and preparation for disposal of the target wheel parts, needs a set of functional prerequisites such as; lifting, fixation, cutting devices, camera systems etc. The dismantling procedure needs to be well predefined to enable optimized packaging in relation to volume, materials, weight, radiation level, etc. A transport cask system adapted to the specific needs of ESS with regard to compliance to regulations in terms of handling of long-lived low and intermediate level waste is also needed to fulfil the process.

This paper will describe the specific ESS hot cell facility function, concerning the process: from separating the parts of an irradiated tungsten target wheel to the preparation for the off-site transportation.

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