

ABSTRACT

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Segmentation and packaging reactor vessels internals

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With more than 25 years of experience in the development of reactor vessel internals and reactor vessel segmentation and packaging technology, Westinghouse has accumulated significant know-how in the reactor dismantling market.

The primary challenges of a segmentation and packaging project are to separate the highly activated materials from the less-activated materials and package them into appropriate containers for disposal. Since disposal cost is a key factor, it is important to plan and optimize waste segmentation and packaging. The choice of the optimum cutting technology is also important for a successful project implementation and depends on some specific constraints.

Detailed 3-D modeling is the basis for tooling design and provides invaluable support in determining the optimum strategy for component cutting and disposal in waste containers, taking account of the radiological and packaging constraints. The usual method is to start at the end of the process, by evaluating handling of the containers, the waste disposal requirements, what type and size of containers are available for the different disposal options, and working backwards to select a cutting method and finally the cut geometry required. The 3-D models can include intelligent data such as weight, center of gravity, curie content, etc, for each segmented piece, which is very useful when comparing various cutting, handling and packaging options.

The detailed 3-D analyses and thorough characterization assessment can draw the attention to material potentially subject to clearance, either directly or after certain period of decay, to allow recycling and further disposal cost reduction.

Westinghouse has developed a variety of special cutting and handling tools, support fixtures, service bridges, water filtration systems, video-monitoring systems and customized rigging, all of which are required for a successful reactor vessel internals segmentation and packaging project.

The purpose of this presentation is to provide an overview of the Westinghouse reactor internals segmentation experience with a focus on optimum segmentation and packaging plans and eventually minimization of the number of waste containers.