

# Decontamination and Dismantling of a Modular Steel Alpha Chamber for JRC Karlsruhe Hot Cells

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## 1. Abstract / Introduction

The scope of activities of the Nuclear Waste Management unit at the Joint Research Centre (JRC) Karlsruhe includes the operation of the entire hot cell suite, which constitutes the hub for PIE of conventional and advanced fuel and for spent fuel and waste management studies in JRC. In support to the various experimental campaigns on irradiated fuels and/or nuclear materials, the 'Alpha-Gamma' intervention team within the unit takes care of the handling, installation and renovation, repairing and maintenance and also of final dismantling & disposal of most of the technical features and components in and for the 24 Hot Cells. These tasks range from installation and operation of scientific instruments to the maintenance of large process equipment, with all operations requiring dexterous manipulations. Most of the interventions are unstructured and require real-time human operation.

The poster describes the technologies and procedure implemented to completely decontaminate and dismantle a modular stainless steel alpha-chamber used in one of the high activity Hot Cells. The design of these modular alpha chambers enables relatively fast exchange between two nuclear experimental set-ups irrespective to the complexity of all the supply connexions (fluids & electric) and allows for significant dose, cost and time saving.

All the described decontamination and dismantling operations took place in a low activity decontamination facility available within the laboratory. After thorough decontamination of the upper part of this alpha chamber, the 4 mm steel structure was carefully cut using plasma cutting technology according to strict personnel safety (ALARA) and waste minimization standards.



**Figure 1.**  
3D design of the  
alpha chamber module



**Figure 2.**  
3D transfer to the  
decontamination cabin



**Figure 3.**  
Plasma metal cutting



**Figure 4.**  
final sheet metal sample