

Management of tritium in ITER waste

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Some of the waste produced during ITER operation and decommissioning will be tritiated. ITER will use tritium as fuel, procedures and processes are thus put in place in order to recover tritium as much as possible, in particular from waste and effluents, and re-inject it in the fuel cycle. Moreover tritium content and thus outgassing may be a safety concern, because of the potential for releases to the environment, both from the facility and from the final disposal (leading to stringent acceptance criteria in waste final disposal).

The aim of this paper is to present the measures considered to deal with the specific case of tritium in the liquid and solid waste. It concerns all the processes that are considered from the waste production to its final disposal. The measures that will be described include:

- the in-situ baking at 350°C of the divertor aiming at reducing tritium content before extracting in-vessel components from the vacuum vessel and transferring them to the Hot Cell Facility (HCF),
- the removal of tritiated dust that is contaminating all the components coming from the vacuum vessel (dust is removed in the vacuum vessel and in the cleaning area of the HCF),
- the detritiation processes applied to solid waste to reduce releases to the environment and reuse tritium in the fuel cycle,
- the waste packaging foreseen to take into account tritiated materials,
- the interim storage (on site and/or in dedicated storage areas) to enable the radioactive decay before final disposal
- the compatibility with final disposal.

The measures taken at design level to prevent tritium spreading concern also the building where tritiated waste are managed and in particular the HCF and the Radwaste facility. It concerns in particular the collection, as close as possible to the source, of dust, chips and tritium that are produced or mobilised during refurbishment and waste management operations (cutting and tritium removal processes) and the construction provisions (stainless steel liner and retention basins) to limit tritium diffusion into the concrete and limit the consequences on the decommissioning.

Topic 2. Decontamination and waste management

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