

DRAGON

Reactor Core Decommissioning WSSG 13th May 2025



Dragon

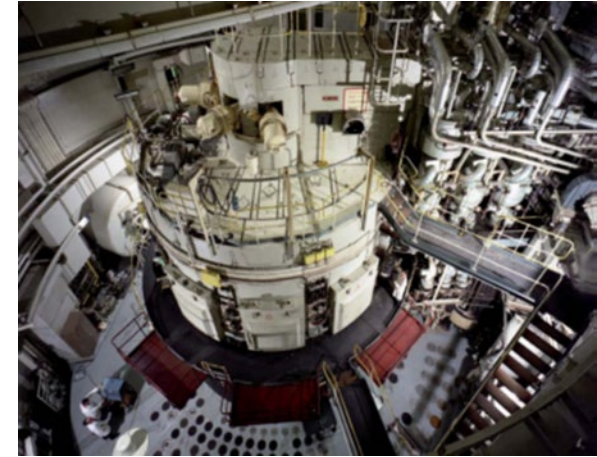
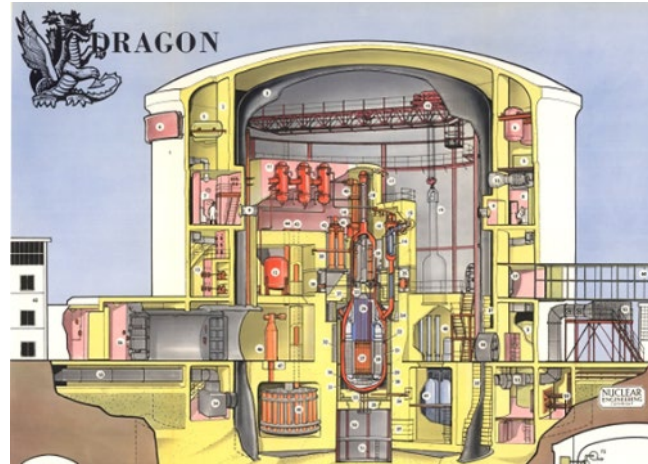
Prototype high-temperature helium cooled reactor

A trans-European project involving 13 countries

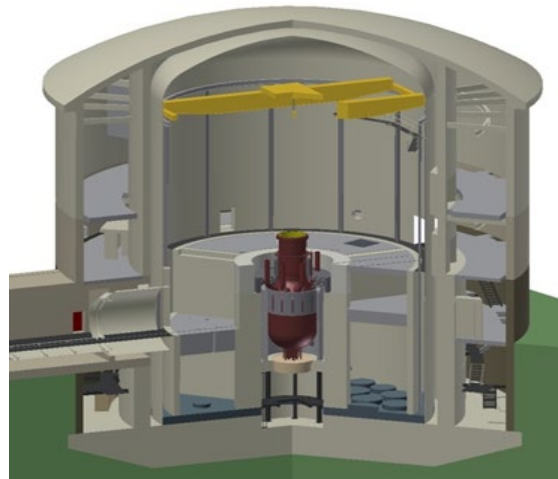


Dragon Decommissioning Project

At the start of the project, the reactor building had been de-fuelled but was otherwise fully intact



Decommissioning has progressed to the point where all of the active plant outside of the reactor core has been removed and disposed of.



Dismantling the reactor Core

For worker safety, the core of the reactor must be dismantled **remotely**. We have remodelled the building, and installed new plant, to create a dismantling facility over the reactor core, operated from outside the building.



The principal Dismantling Tool is the RCSM (Reactor Core Segmentation Machine)

The RCSM is a telescopic mast with a robotic manipulator arm at the end.

It runs on a gantry above the reactor core and is being used to remotely dismantle the core from the top down and inside out.

It has a large range of tools that it can use, but the principal one, and the most innovative, is a laser cutter.



RCSM shown in the head cell above the reactor core



RCSM shown on the Core Mock Up at an earlier stage of the project

Waste Export Facility



12/05/2025

Control Room

The Control Room is situated outside the reactor building.

Personnel access to the reactor building is prevented during operations: the access doors are interlocked with the dismantling equipment.



Reactor Core Decommissioning: Laser Cutting



Why Laser?

Laser has a number of advantages over alternative hot cutting techniques for our application:

- **Versatile:** can cut a range of thicknesses and different metals with a single head design.
- **Low smoke:** Aids visibility for remote works, simplifies ventilation and minimises filter changes.
- **Fast cutting speed.**
- **Low secondary waste:** Width of cut is small
- **Variable Stand Off** – Cutting head does not need to accurately follow contour of component being cut. Very useful in reactor with curved geometry.
- **Cuts multiple layers in a single pass.**



Next Phase

- The plant will be used to progressively dismantle the core, starting with the shielding we are removing currently, progressing to intermediate level waste (ILW) later this year.
- The boxes of ILW will be moved to SGHWR's box grouting and lidding facility for completion before shipping to Harwell for interim storage.
- When the reactor core has been dismantled, the new plant will be decontaminated and demolished.
- The Dragon building will then be demolished to ground level and the site restored to heath.

The Dragon Project

- We are the first reactor decommissioning project to use laser to dismantle the reactor core.
- Dragon is at the forefront of reactor decommissioning globally.
- The project recently presented at the week-long, Waste Management Symposia in Phoenix, Arizona where it was (arguably) the best received amongst all of the lectures there.
- It is anticipated that the experience gained on the Dragon project will form a firm foundation for future decommissioning of nuclear reactors in the UK and the industry globally.

