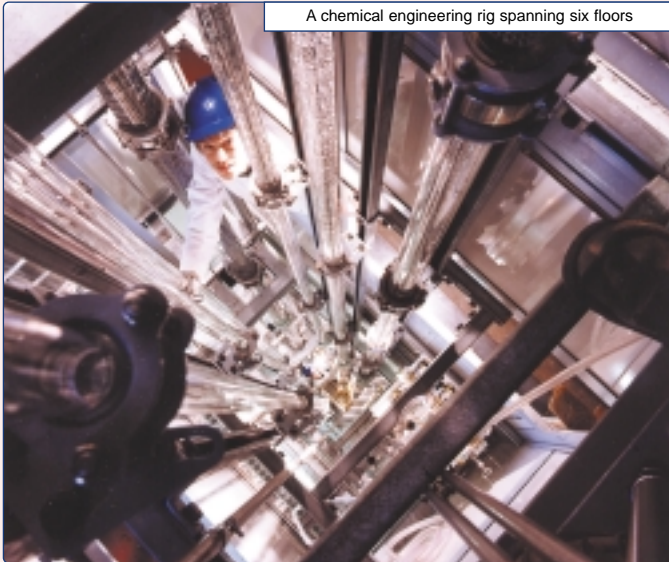


## Decommissioning of B351 chemical engineering building



A chemical engineering rig spanning six floors

### Background

B351, Harwell's chemical engineering building, housed reactors, plant and equipment for research into nuclear materials. During its operational service between 1952 and 1991, B351 was used to explore all aspects of the nuclear fuel cycle - from fuel fabrication to high-level waste vitrification (the sealing of waste into glass blocks for long term storage) and research into nuclear fuel reprocessing.

At the start of decommissioning, the seven-storey building contained more than 100 separate laboratory areas, a wide range of chemical contaminants and over 200 Radiological Designated Areas (RDAs).



Final demolition of B351

### Objectives

To completely decommission and demolish Building 351, leaving the site available for future development.



Exterior of B351 before decommissioning

### Key challenges

- Legacy of many tonnes of hazardous substances and radioactive materials to locate and remove.
- Vast building segregated into separate experiments, for which only limited records were available.
- Extensive chemical and radiological contamination.
- Co-ordination of a wide range of contracting teams.

## Solution

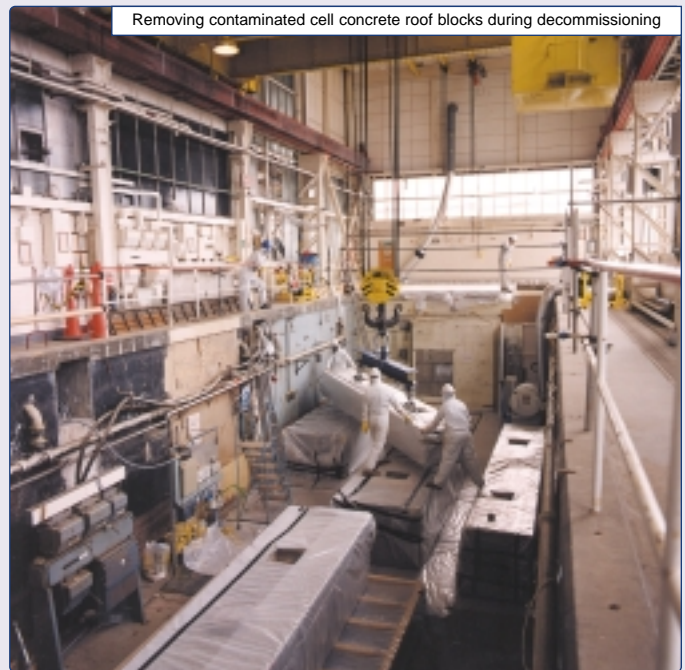
Throughout decommissioning, UKAEA maintained continuity of both in-house teams and use of contractors to ensure an optimum blend of resources, knowledge and expertise.

A comprehensive document management system was established to record findings, achievements and learning points. In the early 1990s, this was one of the first electronic multimedia-based document management systems with hyperlinking and information recorded onto CD-ROM.

Decommissioning took a laboratory-by-laboratory approach, prioritising and ordering the schedule to ensure work was completed safely without creating further hazards.

To access severely restricted or contaminated parts of the building, the project team pioneered the use of equipment, such as folding cranes, stacker trucks, CCTV (including 3DTV), large volume modular containment areas, versatile mobile filtration units and a wide range of hand tools for decontamination. Novel processes were developed, for example the in-situ treatment of 3m<sup>3</sup> of uranium-contaminated solvent.

B351 was demolished in four months using conventional techniques wherever possible. Approximately one tonne of nuclear material was dispatched as intermediate level waste and 4km of contaminated steel ductwork was removed from the ventilation systems.



## Outcome

- The project was completed in the planned timescale and within the expected budget.
- The building was demolished in 1997 and the land is now ready for further development in line with the future site strategy.
- Use of CCTV and remotely steered surveillance systems across the project gave direct observation and management of work in progress and provided clear views of areas with limited access.
- Continuity and the common approach from the UKAEA project team and contractors ensured a consistent standard of work and safety.

## Key facts

### Building specification

- Height/width/length 27m x 50m x 115m
- Asbestos cladding 3,500m<sup>2</sup>
- Total floor area 10,351m<sup>2</sup>
- Structural steel 1,200 tonnes
- Length of lagged pipework 2,500m
- Length of ductwork 4,200m

### Building condition

High maintenance cost building with many areas needing complete renewal or replacement

### Timescales

- Initial Operation 1952
- Final Shutdown 1991
- Demolition 1997

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