

Decommissioning of Buildings 35 & 47



Background

Buildings 35 and 47 (B35 and B47) were originally RAF workshops. UKAEA used B35 for the machining of graphite and the manufacturing of fuel elements for the Harwell reactors and B47 was originally the decontamination centre for the Industrial Chemistry Group.

Heavy machinery including presses and lathes, in B35 produced the first fuel elements for the site's BEPO reactor. In the 1970s the building was used for the development of special materials and in the 1980s for handling uranium, plutonium and thorium. B35 was closed in 1992.

The decontamination centre in B47 was used for the clean-up of packages and equipment contaminated during operational use. The building was extended in the 1950s to provide additional laboratories for fabricating items from beryllium-oxide powders. Beryllium work ceased in 1962 and the decontamination centre was located elsewhere in the late 1960s. Work in the building then focused on ceramics and plastics technology including carbon fibres, adhesives, polymers and composite materials. This continued until B47 was closed 1991.

Demolition of B35



Objectives

To take B35 and B47 to stage three decommissioning - returning the sites to a condition where no significant hazard remains and the sites can be released for unrestricted use, including the removal of all radioactive materials, below ground systems and utilities, and building demolition.



Key challenges

- Decommissioning of the active waste drainage systems, which had significant contamination levels.
- Long duration of operational use and poor records of building modifications.
- Heavy industrial machinery in B35 caused vibration in the building, spreading contamination into the building structure and foundations.
- Combination of radioactive and beryllium contamination in B47.
- Contaminated ground below B47 due to historical legacies from active drainage system.

Solution

The first step in the decommissioning programmes was a thorough examination of all archived and historic documents to learn more about the use and modifications to the buildings and forecast potential hidden hazards or contamination.

Decontamination and decommissioning utilised existing technology in a methodical and staged approach, reducing the dose and risk to workers. Hazardous materials were systematically and carefully removed before the buildings were knocked down using conventional demolition methods.

A highly specialised team worked to decommission the below ground contaminated active waste drainage systems of both buildings. Layers of soil were carefully removed, examined and disposed before re-filling with fresh soil.

Areas of asbestos hazard and alpha contamination created by the machining processes in B35 were removed by workers wearing pressurised suits for protection.

Project teams, comprised of individuals from various organisations and departments, worked closely together to share knowledge, achieve common solutions and tackle problems when they arose.



Monitoring contaminated drains in B47



B47 returned to a greenfield site

Outcome

- B35 and B47 were returned to greenfield sites in 1996 after successfully reaching Stage Three decommissioning. The B35 site was conventionally remediated to grassland whereas the B47 site was planted with a mix of indigenous wild flowers.
- The standards set in the decontamination and decommissioning of B35 are now used in cases for delicensing parts of the Harwell site.
- For B35, staff who worked on the plant during its operational life were also involved in its decommissioning - a practice now widely used across UKAEA.
- The decommissioning of B35 was the first project where UKAEA employed a managing agent in the letting of contracts for delivering the site decommissioning management strategy.
- The use of multi-skilled project teams on B47 was particularly advantageous in tackling complex and unforeseen problems such as the underground contamination. This set a precedent for such teams at Harwell.

Key facts

Project timescales

	Start	Finish
B35 operations	1946	1991
B35 post-operational clear out	1991	1992
B35 Stage 3 decommissioning	1993	1996
B47 operations	1946	1991
B47 post-operational clear out	1991	1992
B47 Stage 2 decommissioning	1992	1994
B47 Stage 3 decommissioning	1994	1996

B35 occupied 1570m²

Decommissioning produced 155m³ of solid low level waste and 1121m³ other wastes

B47 occupied 1197m².

Decommissioning produced 70m³ of solid low level waste and 2113m³ other wastes

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