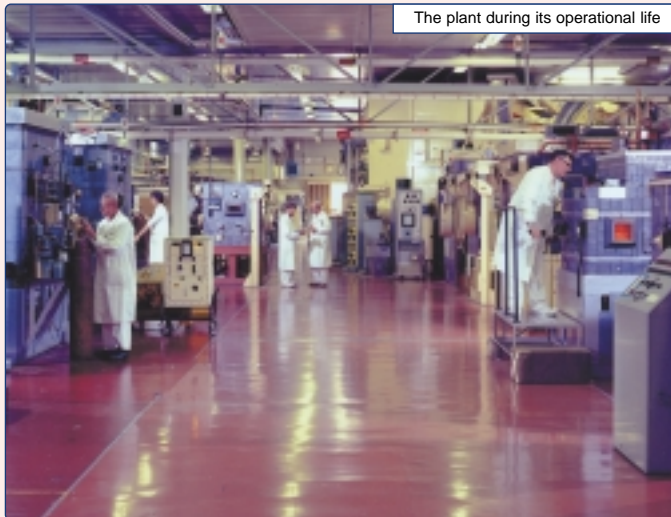


## B393.6 remote handling facility



### Background

Commissioned in the 1950s, Building 393.6 (B393.6) was a remote handling facility used for the post-irradiation examination (PIE) of radioactive materials. To protect operators from radioactive doses, the remote handling cells were shielded with lead.

Operation of the plant continued until the mid-1990s supporting a variety of commercial programmes for the UK nuclear industry, including the monitoring of reactor fuel performance and metallurgical studies of reactor materials.

### Objectives

To take B393.6 to Stage Three decommissioning, involving the demolition of the building and returning the land to a green-field site.



### Key challenges

- B393.6 was the first Category One shielded facility to be decommissioned at Harwell.
- The operations team was divested from UKAEA to a contracting organisation part-way through the decommissioning.
- Remote decontamination of heavily contaminated shielded enclosures to a level suitable for sending as low level waste to the national disposal facility at Drigg in Cumbria.
- Reducing the volume of intermediate level waste into either low level waste or free-release material.
- Decontamination/disposing of large volumes of lead.



## Solution

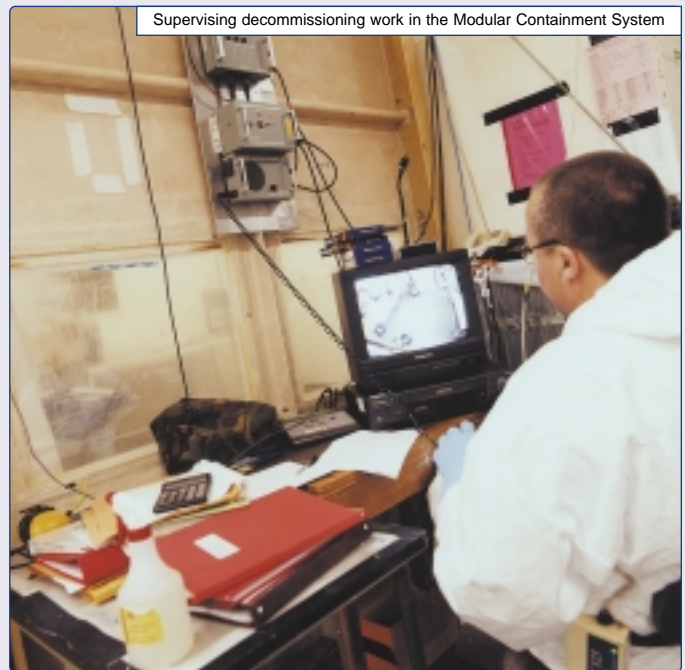
Decommissioning of B393.6 began with an internal UKAEA operations team familiar with the plant and its operational usage. Part way through decommissioning, organisational changes resulted in a decommissioning contract being let to a commercial company. The operations team was divested to that company in order to maintain the skills and knowledge base.

Existing techniques were used whenever possible and often utilising equipment already in place such as tongs and manipulators. The team developed additional tools to overcome specific technical difficulties. For example, the remote handling cells were linked together by a shielded tunnel that transported the fuel between operational stations. To decontaminate this tunnel a specialist mobile remote handling unit was developed which was positioned on the end of the tunnel. This unit enabled access to the internal surfaces for cleaning purposes. The decontaminated part of the tunnel was then removed.

After initial decontamination, the cell lead shielding was removed leaving the contaminated box in-situ. The contaminated box was transferred to a modular containment unit, enabling staff in pressurised suits to cut the boxes into sheets using a pneumatic cropper. These were cut to be flat-packed, minimising the volume of waste to be despatched as low level waste.

The removed lead shielding was decontaminated in a separate facility newly built inside B393.6. This allowed the majority of the lead to be disposed of as free-release and sold to the commercial market. Any contaminated material was disposed of as low level waste to Drigg.

Three concrete shielded cells were decontaminated internally by removing the top few millimetres of the concrete using a scabblers. These cells will be removed by cutting them into blocks using the preferred option of a diamond cutter and disposed of to a registered landfill site or as low level waste to Drigg.



Supervising decommissioning work in the Modular Containment System



Inside B393.6 at the end of Stage Two decommissioning

## Outcome

- B393.6 has been taken to Stage Two decommissioning, the removal of all radioactive materials. Stage Three decommissioning, the demolition of the building and return of land to a green-field site, is planned.
- 95% of the lead was sold as decontaminated free-release material to the waste recovery industry, 5% was low level waste and disposed to Drigg.
- The use of the expertise and experience of staff who used to work on B393.6 to guide the decommissioning was key to the project's success. This practice is being repeated across UKAEA, ensuring operators' enhanced knowledge of plant is used to effectively manage site restoration.

## Key facts

- |  |              |
|--|--------------|
| • Depth of lead shielding per cell       | 10 inches    |
| • Number of lead shielded cells          | 33           |
| • Number of concrete shielded cells      | 3            |
| • Volume of lead removed                 | 1,500 tonnes |
| and recycled as clean material           | 1,425 tonnes |
| and sent for disposal as low level waste | 75 tonnes    |

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