

Nuclear Silo Decommissioning

SELLAFIELD, UK



Safely decommissioning the UK's nuclear legacy is a long-term task with technically complex challenges that require flexible and adaptive solutions.

Legacy facilities contain appreciable amounts of waste contained in nuclear fuel storage ponds and waste silos. The nature and state of the highly hazardous material kept in these facilities requires characterisation before retrieval and passivation, so that the long-term hazard is minimised and the material can be stored in an inert manner.

BHR Group is perfectly placed to support the nuclear industry in delivering these highly complex projects, decommissioning one-of-a-kind facilities.

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Operational since the 1940's Sellafield is home to 80% of the UK's nuclear waste. In 2011/12 the Windscale Advanced Gas-cooled Reactor became the first nuclear powered reactor to be decommissioned in the UK; nuclear fuel was retrieved from a legacy storage pond for the first time in over sixty years and a detailed plan was published detailing work to be undertaken at Sellafield up until 2025/26.

The Pile Fuel Cladding Silo (PFCS) is one of four Legacy Ponds and Silos at Sellafield prioritised for clean up by the NDA. It contains intermediate level waste (ILW).

"This cutting method was selected as it is quick and efficient and does not generate excessive heat or sparks. Cutting accuracy is essential for efficient operations and vital to meet strict water usage targets."

John Reekie

JFN SENIOR ENGINEER

The PFCS consists of a series of silos built in the 1950s to store ILW from the Windscale Pile reactors. A programme of work is underway to safely retrieve this material and package into a passively safe form ready for disposal. The project is being delivered by Cumbria Nuclear Solutions Ltd, via a partnership comprising James Fisher Nuclear and Shepley Engineers in conjunction with Sellafield.



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BHR Group water jet cutting equipment was ideally suited to the unique challenges facing the client:

- The interior of the silo is not man-accessible
- The facility contains high levels of inert argon gas to eradicate the risk of fire. Throughout all operations this atmosphere has to be maintained
- The silo is fitted with steel “deflector plates” supported on a steel framework which has to be cleared of obstructions and cut up, before waste retrieval can commence
- There are limited penetration points and camera positions

Using BHR’s water jet cutting equipment, the team has successfully started to cut up some of the interior of the PFCS facility at Sellafield to allow for its removal and disposal, using BHR Group’s innovative abrasive water jet cutting technology.

The first phase of the project was to remove debris from on top of the plates. Preparatory work included a full-scale mock-up of PFCS at JFNL’s Egremont facility.

Whilst the debris-removal operations were on-going, the cutting process was developed further and the team managed to substantially increase its speed and efficiency. Transfer to site operations has subsequently been a smooth process.

For over 40 years BHR Group has designed, built and sold or licenced specialist high pressure cold-cutting and cleaning abrasive water jetting products.

ABRASIVE COLD CUTTING

Our cutting systems are ideally suited to hazardous and explosive environments or where heat would have a detrimental effect on the material being cut.

FIELD DEPLOYABLE OPERATIONS

Our portable abrasive jet cutting systems can be carried, wheeled, or vehicle mounted to support a wide variety of field applications.

CONTROLLED AND PRECISE

The cutting systems are capable of cutting through virtually any known material with millimetre precision making them ideal for decommissioning, decontamination and disposal operations.

“Using the Full Scale Test Rig we were able to develop techniques which could meet the challenging technical requirements and overcome replicated spatial constraints whilst proving the viability of the chosen solution and simultaneously training and up-skilling operators prior to site works.”

John Reekie
JFN Senior Engineer

The technology is ideally suited to dismantle the sensitive former nuclear reprocessing site, as it is quick, efficient, does not generate excessive heat or sparks and can be used in very tight confined spaces. As the cutting tool is operated remotely, it removes the need to expose personnel to hazardous radiated environments.

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