



Key points

- Cuts and collects stratified nuclear sludge
- Successful deployment at Hunterston-A nuclear facility in the UK
- 10m³/hr to 60m³/hr depending upon sludge type and working environment
- Remote operation using umbilical system
- Modular system
- Compact for confined spaces

BLADECUTTER

Active nuclear sludge waste retrieval.

Waste transfer – Bladecutter is a fluidising technology that can be deployed horizontally by a hydraulically powered, remotely operated tracked platform, or vertically by robot crane or gantry. Both platforms have a patented fluidising device with no moving parts that can be deployed accurately to remove hazardous sediment wastes.

Heterogeneous waste recovery – fluidised sediment waste is removed from the operating environment by a bespoke pumping system. Bladecutter can tolerate, without damage, larger particles and heterogenous waste components such as nuts bolts and fittings.

Its patented design allows it to cut through and collect stratified nuclear sludge, fluidising the material as part of the process. This allows contaminated material to be collected from radioactive sludge ponds and gathered for more effective storage – usually box encapsulation.

Agile and compact – Bladecutter is dimensionally compact to allow for deployment into confined spaces. Bladecutter is also attached to a robust umbilical system that provides power and control as well as debris removal for processing.

Designed for hazardous environments – The complete system is designed for durability and reliability. All features are designed to minimise contamination by hazardous wastes and to be easily decontaminated after use. Hoses, cables and pipes are suitably protected from the ingress of contamination.

Dedicated deployment – Bladecutter can be deployed from the surface of a large body of water by the Barrnon Hydrospyder.



Sludge collection

The horizontal Bladecutter configuration is moved using hydraulically driven tracks that are remotely controlled by the operator. The vertical configuration is moved by crane, hydraulic arm or manipulator. A fixed, pumped water driven header unit cuts into the sediment and fluidises it. The fluidised sediment is removed from the Bladecutter by a high volume pump. Negative head is generated remotely and is delivered to the ROV via the combined services umbilical. The water borne debris is then pumped to the surface for further processing.

The system offers a collection rate of 3 – 10% of sludge by volume resulting in collection rates between 10m³/hr to 60m³/hr depending upon sludge type and working environment.

Bladecutter is dimensionally compact (1,700mm x 575mm x 600mm) allowing deployment in confined spaces. It is powered, controlled and debris is removed for processing through an umbilical.

Trials and active deployment have shown that Bladecutter can handle a wide range of debris including particulates, cable ties, washers and bolts without blocking the system. Bladecutter is normally deployed on a tracked ROV which can be remotely operated with CCTV augmented by cameras, lights and sensors. A vertical system is also available for gantry type deployment in restricted areas.

Barrnon Specialities

- Nuclear decommissioning solutions
- Sludge waste handling specialists
- Nuclear fabrication
- Concept to close-out in house
- Patented technologies
- Environment characterisation
- Rapid prototyping
- Plastic and metal 3D printing
- VR control of robotics
- CAD design

Bladecutter Capabilities

Bladecutter can retrieve sludge of varying viscosities. In testing and deployment, it has successfully handled alluvial sands, clays, oils, PHP arisings, cementitious sediments and B30 simulants CMS and CMGS.

In practice, it has shown to be capable of removing 30 cubic metres of contaminated sludge in just 10 operational days.

Bladecutter's ongoing success has led to requests for several design variations to meet specific client needs.



For more information on Bladecutter

www.barrnon.com | T: 017683 53440 | E: enquiries@barrnon.com



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