James Fisher Marine Services
Unexploded ordnance

Fully integrated and technically innovative solutions for UXO mitigation
An innovative, fully integrated service for the detection, identification, removal and disposal of unexploded ordnance (UXO).

James Fisher Marine Services offers an innovative, fully integrated service for the detection, identification, removal and disposal of unexploded ordnance (UXO) offshore.

James Fisher Marine Services (JFMS) supports its customers’ offshore ordnance operations by detecting, identifying, removing and disposing of UXOs safely, efficiently and cost-effectively with minimal disruption to sea life.

With full in-house capabilities, we have experienced and qualified personnel with extensive experience of successful live operations. Together with one of the leading technical authorities on UXO disposal in the UK, we identify UXOs and advise on the most appropriate course of action in each situation.

We offer a comprehensive turnkey solution, from initial survey through to subsequent positive explosive ordnance disposal (EOD) action on designated targets. Our services include:

- UXO/EOD risk consultancy
- Survey
- UXO identification and investigation
- Subsea EOD
- Disposal and removal
- Seabed clearance
- Emergency EOD response
- Diver/ROV operated equipment
- Subsea boulder demolition
Health and safety

The use of non-electric detonators and non-electric shock tube lead-in lines makes operations extremely safe and reliable. Live firings can be configured to enable UXO targets to be initiated singularly or in group ‘ripple’ firings so that each detonation can be safely observed and the environmental impact minimised.

Environmental impact mitigation

JFMS proactively mitigates the environmental impact of disposing of live UXOs at all times, fully adhering to MARPOL environmental requirements.

Actively aiming to reduce the impact to fauna, flora and cetaceans, JFMS implements a number of measures including its acoustic deterrent device (ADD), a full ring bubble curtain and a passive acoustic monitoring system (PAMs) with marine mammal observers (MMOs). Two minor warning explosions are fired to warn sea life, 30 minutes and 10 minutes prior to detonation of the main charge.

Group-wide capability

JFMS offers a broad range of subsea services based on its core air/nitrox diving and ROV capabilities to support customers’ assets and subsea operations, including subsea survey and bespoke dive equipment, through to full project management and delivery.

JFMS has access to a broad range of marine services that enables it to further support our customers’ operations and deliver total engineering solutions in challenging environments.

We have an excellent track record of successful explosive ordnance disposal (EOD), with over 400 safe disposals without incident, in challenging and varying offshore environmental conditions.
Service capability

Innovative solutions that maximise the safety of personnel and assets at all times.

With full in-house capabilities, James Fisher Marine Services delivers tailored solutions to meet specific project requirements, undertaking cost-efficient UXO/EOD operations, delivering value to customers, and maximising the safety of personnel and assets at all times.

We provide fully integrated, technical solutions for UXO mitigation for a variety of geographical locations and environmental conditions, including nil-visibility, strong tidal stream, partially or completely buried targets, as well as close proximity to shore or shallow water circumstances.

Survey and UXO identification

We can locate potential UXO targets, both proud and buried, using a number of survey techniques to establish a target list. UXO targets are then identified, using non-intrusive dredging techniques, before their removal or disposal. To further support our range of products we also provide consultancy and technical advice, surveying, repairs and calibration.

Boulder demolition

We also have the capability to selectively demolish large boulders in shallow water with small controlled underwater explosions, should boulder-grabs not be able to operate from DPII vessels.
With considerable experience in the management and execution of controlled offshore EOD operations, we aim to implement innovative techniques to mitigate UXO risk, by providing customers with the safest, most efficient and cost-effective technology and methodology.

Techniques include use of an in-situ high order detonation device, Barracuda, and an innovative ordnance waterjet cutting solution, which utilises a cold cutting technique to enable safe UXO removal and disposal.

**EOD operations**

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**Emergency response**

With full in-house capabilities, JFMS is able to deliver an emergency UXO response with a 48hr turnaround – subject to a customer’s licence.
Pioneering techniques

JFMS develops and champions the use of pioneering technology to deliver safe, efficient and cost-effective solutions for the detection, identification, removal and disposal of unexploded ordnance.

The Barracuda

Barracuda is a self-filled, charge bomb and mine disposal system, which produces a blast of concentrated molten metal capable of penetrating many centimetres of steel. Passing through cold water at depth, it induces a high order reaction within the recipient target explosive.

Containing just 1kg of plastic explosives in its main charge, Barracuda keeps costs low as well as minimising the environmental impact.

Bubble curtain

The bubble curtain is a system that surrounds the identified UXO and releases a continuous stream of compressed air as a deterrent to sea life during EOD operations. It is a simple, yet effective solution that increases safety and reduces the environmental impact.

Waterjet cutter

JFMS has introduced an innovative, military EOD technique to the commercial industry which utilises a waterjet cutting system – a cold cutting technique that doesn’t cause a reaction in the main explosive. Significant technological developments have meant the waterjet cutting system has a range of 400m and can be easily mobilised and used via a remotely operated vehicle (ROV).

The waterjet cutting system is the safest and most innovative solution available for separating a mechanism section from the explosive section of a UXO target, enabling its safe removal and disposal. This technique is also ideal for boulder disposal.
Experience

The team's experience is showcased below:

**Nordergrunde offshore wind farm**
December 2015 - current day
Over 200 live targets located, identified and disposed of through diver and ROV operations.

**Sandbank offshore wind farm (Vattenfall)**
March - May 2015
26 live targets located, identified and disposed of in ROV operations.

**EOD support for the Estonian Navy**
2010 - current day
Over 150 live targets located, identified and disposed of using EOD divers and ROV operations.

**NORDSTREAM gas pipeline**
Historic munitions clearance operations, 2009-10
Over 250 live targets located, identified and disposed of in ROV operations.