

# The Unseen Hazard – Unexploded Ordnance at Sea and how to deal with it.

## Commercial Marine EOD Operator Competency



Photos courtesy of Mr R Rickard Exord Ltd

An underwater explosion occurring on 15 December 2020 off the coast of Norfolk, UK, caused severe damage to the fishing vessel Galwad-Y-Mor. The fishing vessel was a crab potter and it was during the hauling in of the fishing gear that the explosion occurred. The vessel was 12.9 metres in length and 29.75 Net Tonnes, the explosion lifted the whole vessel out of the water and both it and the crew suffered serious damage and injury. Fortunately, nobody was killed and the vessel was towed to Grimsby for investigation. The UK Marine Accident Investigation Board has initially assessed that the explosion was caused by the fishing gear disturbing historical unexploded ordnance (UXO) on the seabed. At the time of writing the investigation remains underway. (More info at [MAIB Preliminary Assessment - Galwad-Y-Mor - Serious Marine Casualty \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/92424/MAIB_Preliminary_Assessment_-_Galwad-Y-Mor_-_Serious_Marine_Casualty.pdf))

The amount of historical ordnance still lying in European waters is unknown, but back in 1991, when I was completing my career training on the Royal Navy Mine Warfare and Clearance Diving Officers' Course, we were told that the rate of one or two finds per week of UXO in UK waters was expected to continue for at least 50 years. This rate of marine UXO action or in some areas higher, is found in many other European coastal states and as the development of offshore renewable projects grow internationally is likely to be repeated in those sea areas also. UXO has been a known risk for oil and gas exploration for many years, but now as the renewable sector has expanded it has become an even more significant aspect of offshore energy generation.

[Navy Disposes Of WWII German Bomb In Underwater Explosion \(forces.net\)](https://www.forces.net/news/navy-disposes-wwii-german-bomb-underwater-explosion)

The condition of unexploded ordnance (UXO) on the seabed, goes through various stages of decay, corrosion, burial and unburial and depending on what stage the UXO is in, greatly influences the likelihood of an explosion occurring however, the majority of UXO remains stable if left alone and spontaneous detonation is considered highly unlikely, although possible. Generally, as the chemical

constituents of High Explosive materials age, they decay and may become more unstable. Therefore, if by some chance they are interfered with, there is a real possibility of full or partial detonation, especially if they are directly impacted by amongst other things, the crushing effect of a jack-up vessel spud leg pressing down on the UXO, being struck by a trenching plough or as seen below sucked up into a seabed dredge hopper or being speared by an anchor fluke.



Photos courtesy of Mr R Rickard Exord Ltd

The common approach for offshore renewable projects, particularly windfarm developments is for there to be an initial desk top study assessment of the area, to assess the likelihood of the presence UXO, which is largely based on historical records of conflict activity. This is followed up by a geophysical survey phase, using seabed survey technologies appropriate to the expected potential UXO and seabed type. The results of this survey provides data for further assessment, preferably by marine Explosive Ordnance Disposal (EOD) specialists with the qualifications and experience to make an informed judgement on the survey data and to perform a contact assessment and classification process. The results of this affect the way the project develops, with the EOD technical advisor providing the client with options and recommendations for how to deal with what if anything has been classified as potential UXO (pUXO). Depending on the number, concentration and type of the suspected UXO, these options include target investigation of pUXO contacts, avoidance by small or large deviation of intended project development path or the option of removal/disposal of the UXO using various techniques.

Clearly the role played by the specialists employed in this work is critical and a degree of assurance that those involved are qualified and competent to do this, is necessary to provide confidence that the resulting measures taken are both commercially efficient, safe and environmentally acceptable. The consequences of not getting it right can easily be observed from the Galwad -Y-Mor and other incidents. More recently in October 2020, the controlled explosion of a Second World War RAF 'Tall Boy' 12,000lb bomb in Poland, resulting from an EOD operation to dispose of it by the Polish Navy graphically demonstrates that even when using military trained personnel things don't always go according to plan. In this instance the bomb partially detonated, with no damage to surrounding infrastructure nonetheless, it is evidence of how unpredictable underwater explosions can be. In both the UK and some EU countries, the use of naval military assets for UXO disposal is not always deemed appropriate. In fact, it has been seen to be a form of subsidising private enterprise, as the development of new offshore energy fields is to all intents a commercial venture. Therefore, the commitment of publicly funded assets for this purpose without recompense, is considered by some Governments to be inappropriate. The EU has been considering this issue since at least 2016.

[Video shows biggest WWII bomb found in Poland exploding while being defused \(nbcnews.com\)](https://www.nbcnews.com/news/wwii-bomb-found-poland-exploding-while-being-defused-rcna10288)

As a result, commercial EOD services are filling the gap left by the naval EOD teams. A few countries, such as Germany and the Netherlands, have introduced statutory standards for the conduct of commercial marine EOD operations, but this is not happening in every country where these operations are being carried out. In some cases, the statutory approach taken by Governments effectively prevents non-national enterprises offering EOD services, which might pose commercial and logistical challenges for project owners.

So, if the consequences are so potentially dangerous how do energy companies and major contractors gain assurance that the personnel engaged in EOD work in the commercial marine environment have the correct qualifications and relevant experience? Surely, you might think, there must be a standard or benchmark that will enable employers and clients to ensure their EOD service providers have competent professionals to deliver appropriate advice, recommendations and are able to execute the UXO mitigation work safely, effectively and efficiently? Unfortunately, the answer at the moment is that there is no international benchmark by which client companies can base this assurance of competency for marine EOD operations. The UN endorsed International Mine Action Standards (IMAS) offers a competence framework on competency for land based EOD operations, primarily minefield clearance and does have a 'marine' module for candidates with a proven background in EOD. But this weeklong package is not designed to equate to the months of specialist training that naval EOD operators undergo in NATO and other regional Armed Forces.

The handful of EOD service providers in the marine sector who operated in the oil and gas era, have been supplemented by a much larger number of EOD survey and disposal service providers working in the renewables sector. Many of these utilise ex-naval EOD specialists, but others use other ex-Service personnel who do not come from a background in marine EOD operations or even personnel without any military qualification in EOD. When combined with the fact that the marine environment presents a set of operating safety considerations which can pose unique hazards and require different methodologies than those employed in land EOD, the result manifests in avoidable delays, unnecessary costs and potentially dangerous incidents, including uncontrolled explosions. Moreover, underwater explosions are accompanied by other damage effects such as reflected shockwaves. In addition, recent environmental protection initiatives mean that conventional explosive disposal methods are no longer acceptable to some regulatory authorities and coastal states.

Following such an incident in 2015, which occurred during my tenure at IMCA as a technical advisor, the UK Health and Safety Executive (HSE) approached me to enquire if IMCA were intending to produce competency requirements for commercial marine EOD (CMEOD) operator professionals. At the time, other higher priorities prevented this, but in the autumn of 2018 following discussion with commercial EOD stakeholders, I had the opportunity to raise the lack of professional standards for UK CMEOD service providers with Nusrat Ghani MP, the former UK Shipping Minister. Subsequently, I was invited to initiate a project with industry stakeholders including the UK Maritime and Coastguard Agency, HSE, the insurance industry and the British Standards Institute (Bsi).



Photos courtesy of Mr R Watson

The aim of this initiative was to develop a framework for competency standards applicable to the CMEOD community. Originally this was intended to be for the UK but discussion with colleagues in BSI led to this being taken up by the International Standards Organisation. The initially UK focussed Commercial Marine EOD Advisory Group, formed to look at this work across the industry, was expanded to include Australian, Canadian, Dutch, French, US and Japanese representation. IMCA has also become involved and is providing welcome technical assistance. The final initial draft of the document outlining the competence framework and entitled 'Qualification and Training Standards for Commercial Marine EOD & UXO Operations' has now been completed and formally submitted to the ISO Technical Committee 8 Working Group responsible for training and education in the maritime sector for scrutiny. It is hoped that the Standard will be produced by the end of the third quarter of 2021. The completion of this initial draft has been a great team effort and thanks go to all concerned. It is expected that the marine insurance industry will adopt the Standard once published as a key aspect of the due diligence process for marine projects involving EOD operations.

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