

A photograph of an offshore wind turbine installation site at sunset. In the foreground, a yellow and black crane is mounted on a platform. In the background, a large offshore wind turbine is being installed on a platform in the ocean. The sky is a mix of orange, pink, and blue, and the water is dark blue.

Marine operations standards in offshore wind

Words: Steven Foong, Global Maritime

This article will look at the marine operations standards and guidelines that are emerging; areas that need to be considered in putting in place such standards; and how it is also incumbent on the marine providers themselves to put the necessary mechanisms in place internally.

There's no doubt that offshore wind is on the increase in Europe, Asia and the United States.

Bloomberg New Energy Finance, an energy research organization, predicts that the world's offshore wind-generation capacity will quadruple by 2025. The size of wind turbines is also increasing at such a rate that turbines with a capacity of up to 15MW are likely to be installed in the near future, according to the Chief Executive of Renewable UK, the UK trade association.

The European Wind Energy Association also estimates that between 20 GW and 40 GW of offshore wind energy capacity will be operating in the European Union by 2020.

Yet, just as the industry is continuing to grow, so do the necessary marine standards need to improve to ensure safe and effective operations.

Current standards & guidelines

So what current marine operations standards and guidelines are being used?

While such standards and guidelines in offshore wind were perhaps slow to take off, with the industry often implementing its existing HSEQ standards to the offshore wind environment, the last few years have seen the emergence of a variety of best practice guidelines. Some are focused predominantly on upstream oil & gas operations but which can be transferred to offshore wind and others focus specifically on offshore wind.

Lloyd's Market Association and the Joint Rig Committee, for example, have published a number of documents designed to assist insurers, operators and third party contractors better assess specific risks associated with offshore facilities. This includes guidance on the scope of activities for marine warranty surveyors required to ensure the safe movement of rigs and the safe conduct of upstream construction project operations such as load-out, transportation and installation.

The International Organisation for Standardisation 29400:2015 is more specific to offshore wind, covering information related to port and marine operations necessary for the installation and maintenance of offshore wind farms. It covers, among others, foundations made from steel and concrete gravity base structures; piled steel foundation structures; subsea templates and similar structures applied for pre-piling of foundations; steel towers; mobile offshore units; jack-up vessel and self-elevating offshore unit topsides; and array cables within the wind farms.

Other organisations that are playing an important role in establishing marine guidelines include the International Marine Contractors Association who have been

developing optimal designs and configurations to ensure the safe access to wind turbine foundations from crew transfer vessels; and classification society DNV GL who – as well as providing guidance on offshore wind structures – are also providing input to marine operations.

The role of industry associations

Industry bodies have also played an important role in establishing maritime guidelines worldwide.

Examples include the Asia Wind Energy Association that is leading the collaboration between wind energy companies in Asia. For marine warranty surveying, the aim is to provide registrations, training and a continuing professional development environment for qualified marine warranty surveyors (MWS). In terms of the Offshore

development of the United States offshore wind industry. The nationally focused standards and guidelines will also address the unique offshore conditions on the US outer continental shelf and state waterways, such as the Great Lakes.

Finally, Renewable UK has recently published its Offshore Wind and Marine Energy Health and Safety Guidelines under the organisation's goal 'to be a leading enabler in the delivery of an expanding UK wind, wave and tidal sector free of fatalities, injuries and work related ill-health.'

Vessel selection, training and recruitment

So what are the key areas to be aware of and possible pitfalls in developing marine operations standards and guidelines for offshore wind?



A Monopile installation

Wind Industry Collaboration Committee, this provides construction design management control and simultaneous operations guidance.

In the United States, the American Wind Energy Association, the Department of Energy, the National Renewable Energy Laboratory, the Bureau of Ocean Energy Management, the Bureau of Safety and Environmental Enforcement and the Business Network for Offshore Wind are also collaborating to develop standards to help accelerate commercial scale

Firstly, there is vessel and engineering, procurement, construction and installation selection.

The challenge of reducing costs in developing new offshore wind farms has created opportunities for new operators and new vessel types to enter the market. Not all of these new entrants, however, have undergone the necessary rigour and have demonstrated that they can operate to the highest safety standards prior to entering the market. The growing supply chains in

many projects also make it challenging to ensure the necessary quality. In such cases, the early involvement of an experienced third party, such as a Marine Warranty Survey company, is vital and an added benefit to ensure that the marine spread meets all requirements.

Training and recruitment is also crucial to establishing standards moving forward, with a focus on competency and training. While there is still much to do, organisations, such as the Global Wind Organisation, a non-profit organisation of wind turbine owners and wind turbine manufacturers, is playing a crucial role in setting common standards in safety training and emergency procedures.

Another body that is helping put safety and training at the top of the agenda is the 'Walk to Work' joint industry project led by DNV GL that has developed industry guidance to assist offshore facility operators in achieving safe and efficient personnel transfers to and from their facilities via a gangway system on a workboat, ship or semi-submersible unit.

Alongside, the need to maintain standards and ensure appropriate standards is the need to recruit. According to the EU's Wind Energy Technology Platform report, the European on and offshore wind industry faces a deficit of 5,500 appropriately qualified personnel that has the potential to increase to 18,000 by 2030. Under such circumstances, it's important not to focus on just recruiting at the expense of training.

Building up expertise internally

So what more can be done to address the issues around marine operations standards and support the work trade and industry associations are carrying out?

It is my belief that the key players in marine operations in offshore wind can also play a crucial role themselves in setting guidelines and showing technical leadership.

Global Maritime, for example, has established a Technical Authority Board that will ensure consistent and high-quality technical standards.

Each board member, who is nominated for a two-year term, has specific knowledge in one of the following disciplines - marine operations, structural engineering, naval architecture, dynamic positioning assurance, marine systems, risk, insurance and mooring. Many such disciplines are crucial in offshore wind, with mooring also important for floating wind turbines.

The respective members are then responsible for defining the competency requirements for their specific disciplines and are encouraged to become external industry experts through participation in expert panels and the writing of technical papers.



Global Maritime recently signed a Memorandum of Understanding with a number of Taiwanese organizations to develop closer cooperation on offshore wind technologies in Taiwan

Such a Board ensures that technical standards are not only consistent but the most up to date and relevant and can translate into value-added solutions that help offshore wind companies achieve both their business and safety goals.

Recent work from the Technical Authority Board include a robust 'Marine Vessel Vetting Criteria' with support from the Board and active involvement in marine and project safety forums, such as the International Marine Contractors Association Marine Renewable Energy Committee.

The role of marine warranty surveys

The role of the marine warranty surveyor (MWS), on an offshore construction project, is to protect the interests of the client and the client's insurers by checking that all marine operations are properly engineered and planned, and are then executed in accordance with the agreed procedures, using vessels and equipment.

A greater focus on marine warranty surveys is an important means of establishing guidelines and best practices in offshore wind, playing a critical role in reducing risk for major offshore wind projects and marine operations. Independent verification is also an important means of ensuring a balanced approach to risk on behalf of the client.

The scope of the MWS covers the review of all relevant engineering, design and marine procedural documentation; the inspection of vessels and the witnessing of loadout, transport and installation operations of the insured assets.

The approval of all vessels involved in a project is a key part of such surveys and will be based on an inspection by experienced mariners, with a valid certification of compliance and equipment

inventory a minimum requirement. Fitness for purpose and crew competency can also be verified to ensure safe and proficient operations.

Recent examples of Global Maritime activities in offshore wind marine warranty surveys include the signing of a Memorandum of Understanding between Global Maritime and a number of Taiwanese organisations; and the provision of marine warranty surveys for the Block Island Wind Farm, America's first offshore wind farm.

In regard to the Taiwan partnership, organisations included the Bureau of Standard, Metrology and Inspection (MOEA); the Taiwan C R Classification Society; the Taiwan Institute of Economic Research; and the Taiwan Electric Research & Testing Centre (among others) with the goal being to develop closer cooperation on offshore wind technologies in Taiwan including marine warranty surveys, inspections and testing services.

In this Block Island case, services provided included a technical review of all installation procedures and calculations; the survey and inspection of installation vessels; the witnessing of the installation of turbines and subsea cables; and the issuing of Certificates of Approval.

A crucial time

The offshore wind industry today stands at a crucial time in its development as it comes close to mass commercial rollout. Through the work of trade and industry bodies - alongside marine warranty surveys, technical innovations and leadership from the key marine operations providers - effective marine operations standards are starting to emerge.

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