



HEALTH, SAFETY, AND OFFSHORE WIND ENERGY



Health and Safety



Chris Lawson, Advice Group Director, Royal Haskoning

All offshore wind developers are required to consider the risks that may arise in their projects during construction, operation, and final demolition. With the announcements such as the vast Round 3 in the United Kingdom, the offshore wind energy industry is moving at such a pace that developers have had little time to consider the practical problems involved with these projects, but this is sure to be the biggest challenge that the industry has ever faced. Chris Lawson, Advice Group Director at Royal Haskoning, explains more on his view and experience on health and safety issues in the offshore wind industry.

There are a number of issues relating to health and safety that need to be addressed as wind farms move further from the shore and also into deeper water. If developers do not get it right at the inception of a project, then the burgeoning offshore wind industry will count the financial and human cost of failure. An inadequate response to the health and safety challenges at the outset will not just have an adverse effect on individual projects: it could affect the entire future of offshore wind development. If the industry wants to attract the best personnel and earn a reputation as a safe place to work, vital to its long term success, health and safety issues will require detailed consideration.

Current frameworks

Legislation will have a critical role to play in defining the health and safety requirements for offshore wind development. In the UK developers are already bound by the Construction Design & Management (CDM) Regulations 2007, which apply to all projects involving construction work carried out in Britain and its territorial waters. The difficulty is that this legislation has most often been applied to land-based projects, which do not always readily integrate with marine activities and maritime legislation.

Although we cannot wait for legislation to catch up with the speed of development, there are some of the basic principles of existing legislation that will be relevant. The industry must take a proactive approach to interpreting and developing these principles on Round 3 projects. With renewable energy targets to be met we must continue to press ahead with new wind farms, and apply what we already know, while anticipating new risks at the same time and putting measures in place to mitigate those risks. This will require drawing on the best practices from other industries, such as oil and gas and port and marine, as well as developing bespoke health and safety solutions to the unique challenges of offshore wind development.

Let us be under no illusion about the scale of the task in hand. The offshore wind industry is breaking new ground – we are passing through a transition between what the oil and gas industries deem reasonable, and what is required in practical terms to deliver offshore wind. The challenges we face will include:

- managing the risk of deep water,
- suitability of vessels,
- heavy lifting operations,
- competence of workforce,
- structural integrity of the turbines and other support structures,
- and the logistics of getting materials and personnel out to the site – both under normal circumstances, and especially, in an emergency.

From here to there

Let's take one aspect of offshore development and examine its health and safety implications in more detail. We have to actually get out into the sea before we can start work. Wave heights significantly increase in deeper water, and swells become more powerful, so the developers will have to use larger vessels to transport personnel and equipment to and from site. Vessel availability, adaptability and capability must be considered with regards to health and safety. A robust process already exists for obtaining certification to adapt vessels that are originally built for one purpose, to make them seaworthy for use on offshore wind projects. Despite this being in place, the resulting vessels do not always fit the bill. For example, inadequate spooling facilities on adapted vessels have led to anchor line damage, with the potential to fail and flick back and cause damage or injury.

The simple practicalities of operating in offshore waters introduces a new series of potential hazards. A heavy lifting barge,

for example, requires multiple anchors to hold it in position. It will require a 100 tonne anchor handling vessel to undertake frequent lifting activities involving high risk which are compounded when in heavy seas. When you consider the distances from shore that Round 3 projects will involve, the increasingly difficult conditions and heavy swells are going to make transportation a more high-risk activity than it has previously been. The hierarchy of risk should dictate that high-risk activities are avoided, in this case, by using a jack-up vessel in order to significantly reduce the frequency of anchor handling operations.

a risk assessment and ensure appropriate measures are put in place? Existing legislation provides the answer: the client is currently required to appoint a CDM Coordinator for any project which lasts more than 30 days. This is likely to become an even more pivotal role for offshore wind developments. The CDM Coordinator is required to:

- Check their own competence
- Advise and assist the client with his/her duties
- Notify the Health & Safety Executive (of the project, outline



In practice, there are limited numbers of specialist vessels currently available, and they are expensive to deploy. We are aware of operators who have commissioned new vessels with massive lifting capacity and the ability to fulfil other operations exclusive to the wind industry, because experience tells us that the demands of Round 3 sites will require more fit for purpose vessels. Crew competence is another very important issue for consideration. If crews are supplied by agencies there can be problems with the crews being unfamiliar with the vessel procedures and language problems for example, however responsible vessel owners have strong recruiting and selection procedures followed up with crew training programs. But measures to control these possible problems in the offshore wind industry as early as possible would minimize any risk.

In addition to crew, the general standards of training for offshore workers may need improving, and this will become more urgent as Round 3 projects get off the ground. Up-skilling workers and equipping them with the right knowledge to carry out their work safely will ensure that the offshore wind industry builds a reputation for being a safe and responsible industry to work in. Royal Haskoning is committed to improving skills and is working with The Crown Estate on a training programme for its representatives who are responsible for the safety of vessels using ports and wharfs which are used to service offshore wind farms.

Roles and responsibilities

The question which inevitably arises where health and safety is concerned relates to responsibility. Whose job is it to conduct

programme and parties involved)

- Coordinate health and safety aspects of design work and cooperate with others involved with the project
- Report and advise on obvious risks to those persons whom can instigate control measures
- Facilitate good communication between client, designers and contractors
- Liaise with the Principle Contractor regarding ongoing design
- Identify, collect and pass on pre-construction information
- Prepare/update the health and safety file at project completion for those who are involved in its operation and subsequent decommissioning

This may sound like a total solution to the question of roles and responsibilities, but it is not that simple. Because there is currently no section of the Health & Safety Executive (HSE) to provide specific guidance on offshore wind projects, it is up to the CDM Coordinator to interpret the CDM Regulations and apply them to an individual project.

Royal Haskoning is uniquely positioned to work with developers in this area because of its extensive port and maritime experience. We have been appointed CDM Coordinator on the Sheringham Shoal development for the entire project, which will see the construction of 88 wind turbines and two offshore substations off the coast of North Norfolk. One of the hurdles we have had to overcome on this site is coordinating vessel movements by different contractors in a small service area. The use of GPS trackers to all vessels on the project site, including the supply

vessels entering and leaving the notional boundaries, so that their respective positions, routes can be shared with all contractors, to minimise the risk of collision.

Sharing information

This is just a modest example of another essential aspect of health and safety management: sharing information. When working in a high risk environment, ignorance can kill. While we cannot yet know all the challenges the offshore wind environment presents, we can do a lot to make sure we share and disseminate information and experience within the industry so that we develop best practice quickly. Trade body RenewableUK is undertaking valuable work to drive standards in this area; for example through its 'Lessons Learnt' database. The organisation produces a quarterly report based on this database which provides analysis of recent experiences and trends specific to the wind industry. The lessons learned are accessible to those companies that are prepared to submit accident, incident and "near event" data on a non-attributable basis. This kind of information-sharing is crucial to developing innovative solutions and mitigating risk. We hope that more companies will contribute as Round 3 projects progress.

Conclusion

Health and safety relating to offshore wind development contains a lot of uncharted territory, very like the deeper waters themselves. In the early stages, success will depend on the industry's ability to anticipate risk wherever possible using available knowledge and expertise from related industries like oil and gas to make sure that suitable equipment, such as deep water vessels, are developed. Equally, the level of competence and training among crews and construction personnel requires continuing attention. Information sharing will be vital in developing and maintaining the highest levels of health and safety procedures as the need of more renewable energy pushes wind power generation further out to sea.

One thing is for sure – the leap into the unknown with Round 3 projects will throw up more health and safety issues than ever before. The developers who are not afraid to take a proactive and innovative approach to interpreting existing legislation, and to finding solutions to new challenges, will reap the rewards.

Thanks to Chris Lawson, Advice Group Director, Royal Haskoning



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HEAVEN-SENT on the high seas

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