# Making vessel motion monitoring smarter

As the number of personnel being transferred to and from offshore windfarms increases, and as transit times increase, greater focus is being placed on the quality of their ride

by Philip Woodcock*

In the offshore wind industry, the majority of personnel transfers are undertaken by high speed vessels of less than 24m length. The design of these vessels is evolving to reflect not only the roles that they undertake but also the 'ride quality' for those on board. One interesting observation is that in many designs the increase in ride quality requires a compromise in cargo-carrying ability.

Vessels with advanced wave-piercing or small waterplane area twin hull (SWATH) hullforms improve ride quality by reducing accelerations as the vessel pushes through waves, but reduce buoyancy and thus load-carrying capacity, especially in the bow of the vessel.

Improvements in ride quality reduce fatigue experienced by windfarm technicians, making them safer and more productive when at the worksite. As windfarms move further offshore, into more hostile environments, it is becoming increasingly challenging for windfarm operators and vessel owners to determine what the best vessel for each particular site is, and how best to protect their employees.

BMO Offshore in the Netherlands recognised these challenges and worked hard over the last 18 months to develop tools and undertake extensive monitoring campaigns to allow stakeholders to make informed decisions.

The personnel at BMO have leveraged their background in engineering and practical experience within Siemens Offshore Wind and TNO to produce an elegant and cost-effective technical solution and provide clients with clear answers rather than mountains of incomprehensible data.

BMO Offshore's Vessel Blackbox (VBB, briefly highlighted in the first quarter 2013 issue of *OWJ*), which entered service on the Greater Gabbard offshore windfarm in October 2012, where it was tested by Siemens, is the first tool that offers a practical solution to operators.

The VBB offers vessel and windfarm operators the ability to monitor and record vessel motions, including whole body vibration and motion sickness, as well as providing high definition video footage of each landing at a turbine so that there is a record for accident investigation or crew training purposes.

The VBB monitors a wide range of parameters during the voyage including the effects of the sea state and vessel course and speed and has demonstrated its value at a number of offshore wind sites in the UK and Germany. In co-operation with bow fender designer RG Seasight, the next vessel installation, on Workships Contractors' *Offshore Wenduine*, will also monitor pressure on the fender when pressing against the boat landing.


*Offshore West Hinder received the first commercial installation of the VBB*

Although the needs of a vessel owner differ from that of a windfarm operator, certain topics are always of interest. From a health and safety perspective, the ability to monitor whole body vibration in accordance with BS/ISO 2631 *Mechanical vibration and shock: Evaluation of human exposure to whole-body vibration: General Requirements* ensures that stakeholders have the necessary information to effectively ensure their duty of care.

Monitoring vessel motion also allows BMO Offshore to report on ride quality using the motion sickness index, which states how many people, on average, would feel seasick in a given period of time. A windfarm operator with a standard monitoring package on different vessel types (as SSE has on the Greater Gabbard windfarm) can clearly see how each type performs in various weather conditions, and thus allows them to refine their vessel acquisition strategy.

The installation on the Offshore Wind Services' 19m Southcat design, *Offshore West Hinder*, was undertaken in co-operation with SSE and represents the first commercial installation of the system. Further installations have since been made on Frisia Offshore's vessel *Wind Force 1* and *Offshore Wenduine*. Workships Contractors, managers of *Offshore West Hinder*, received its first monthly report at the end of February, which was shared with the vessel's crew.

Workships found that one particularly interesting result of monitoring the vessel using the technology is that skippers should ensure that all technicians are seated in suspension seats when operating at speed in a sea state of in excess of 0.9m significant wave height (the seating in the saloon does not have suspension mountings). This practical conclusion is something appreciated by the crew as well as management.

BMO Offshore says it recognises that vessel motion monitoring and analysis is only a first step in its goal of making offshore wind 'smarter'. As highlighted in the first quarter 2013 issue of *OWJ*, this has also been acknowledged by the Carbon Trust's Offshore Wind Accelerator programme, which has selected the VBB as its monitoring package for forthcoming trials of access systems designed for crew transfer vessels. **OWJ**

***Philip Woodcock is operations manager/QHSE/marine manager at Workships Contractors in the Netherlands***