The advantages of Weathervaning in Floating Wind Platforms

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As wind turbines go further offshore they will grow in size and will have to be more reliable due to much increased service costs. In the oil and gas Floating Production Systems (FPS) market these deep water and bad weather applications incorporate a weathervaning turret and about 40% of FPS' have this feature. This paper examines the applicability of this principle to Floating Wind Energy (FWE).

A study was made of the advantages and disadvantages of weathervaning in the FWE market. The outcome of this study is presented. Advantages and disadvantages are quantified where possible. The conclusion is that, in most cases, there is a role to be played by this technology and the result is an advantage in the reduction of cost, weight and the servicing of the platform.

If the floating platform allows rotation to align with wind and wave direction, an electrical power swivel is required. This step will also enable multiple turbines to be placed on one platform.   Currently the targeted voltage of transmission for these platforms is 66 kV. This may rise to 132kV. Currently there are no standardized electrical swivels operating at these voltage levels. Moog Focal has built power swivels up to 36 kV for the offshore oilfield market. These swivels have proved to be highly reliable. Focal is now embarked on a program to provide units for the floating wind market at 66 kV and up to 170kV. Work has been carried out to TRL 4 per ISO 20815.

This paper will demonstrate that weathervaning has distinct advantages for floating wind. Secondly, the main perceived disadvantage, the lack of a high voltage swivel, is addressed.