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Making “First Breeze” a Reality for the WindFloat – ABS Conducts Hazard Identification Study for Principle Power’s WindFloat

HOUSTON, TX (USA) – July 21, 2009 – With experience in floating offshore structures and wind energy, ABS in cooperation with its affiliated company ABS Consulting, has conducted a hazard identification study (HAZID) as the first step in the Preliminary Planning and Advice (PPA) stage for Principle Power’s WindFloat, a novel floating support structure for large offshore wind turbines.

WindFloat is one of several floating offshore support concepts currently under development. “Treating these concepts as an offshore structure makes sense,” says Dominique Roddier, Chief Technology Officer, Principle Power Inc. “When designing the unit we looked at the synergies from oil and gas concepts—from fixed platforms to Spars to a semisubmersible,” he added.

The unique design by Principle Power features a three-column floating structure with the ability to support an offshore specific wind turbine, manufactured for marine applications, in the power range of 3.6 to 10 megawatt (MW). The innovative design of the WindFloat dampens wave and turbine induced motion, enabling wind turbines to be sited in previously inaccessible locations where water depth exceeds 50m and wind resources are superior.

The key structural components of the WindFloat are a wind turbine tower, columns, truss and water entrapment heave plates. The design features a semi-submersible structure, which is fitted with water entrapment heave plates at the base of each column. The plates reduce the structure’s size and minimize pitch and yaw motions of the system. In addition, the WindFloat has an active ballast system to further optimize energy production efficiency.

Principle Power is looking to ABS to provide advice through the concept design phase and, ultimately, seeks the leading offshore classification society’s “Approval In Principle” or AIP for the WindFloat design.

“For ABS, this renewable energy design review provides us with the opportunity to extend established offshore industry practices,” says Stephen Newell, Manager Corporate Energy Project Development, ABS. “There is room for a great deal of flexibility in this initial design and assessment stage provided that, ultimately, safety equivalencies to existing standards can be confirmed. The society is applying relevant prescriptive criteria from its class Rules as well as the risk based analyses from its established Novel Concepts Guidance Notes as the basis of its initial assessment.

The ABS affiliate, ABS Consulting has also cooperated with ABS in carrying out the detailed HAZID study. Principle Power intends to incorporate the findings into its front end engineering design (FEED). According to Ahmad Shafaghi, Director, Energy Risk Consulting, ABS Consulting, who led the HAZID, the multidisciplinary team concerned themselves with the “what ifs” from the transport to normal day-to-day operations of the floating structure.

“We focused on the risks associated with the design so this feedback can be incorporated into the design prototype,” explains Shafaghi. “The factors of safety must be looked at critically. We are here to help Principle Power make wise choices with regard to the design that are supported by risk analyses that use realistic safety requirements.”

The HAZID exercise examined the structure from the “what can go wrong” perspective as well as took into consideration possible environmental impacts. “What if you have a collision? What if you damage the hull legs? What are the potential problems with the tow out of such a tall structure? These are just some of the areas we considered,” says Shafaghi.

Principle Power’s fabrication and deployment plan calls for the unit to be assembled onshore and towed out to its final location. This eliminates the need for specialized heavy lift installation vessels fitted with large cranes and creates more site flexibility.





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“The challenge for floating wind turbine support structures are pitch motions and accelerations which may lead to structural fatigue,” explains Newell. From a class society perspective, he says the critical issues for review are: hull strength and fatigue, stability of the unit under tow and in-place, the mooring system and dynamic loading of the wind turbine.

About ABS

ABS, www.eagle.org, founded in 1862, is a leading international classification society devoted to promoting the security of life, property and the marine environment through the development and verification of standards for the design, construction and operational maintenance of marine-related facilities.

About Principle Power

Principle Power, www.principlepowerinc.com, is a technology developer focused on the offshore wind energy market. Principle Power’s enabling product, a floating wind turbine support structure called WindFloat, provides for siting of offshore wind turbines in water depths greater than 50m, thus exploiting the world’s highest capacity wind resources. Offshore wind installations in water depths of 50m and greater, to date, have not been feasible due to economic and technological limitations.

Editor’s Note: A graphic of the WindFloat design is available for download from the News & Events, Newsroom, Press Releases section of the ABS website.

Further technical details regarding WindFloat can be found from the Principle Power website at: <http://www.principlepowerinc.com/products/windfloat.html>

For more information, please contact:

ABS

Susan V. Gonzalez, ABS External Affairs
1 281 877 5853 or sgonzalez@eagle.org

Principle Power, Inc.

Craig Andrus *Senior VP Business Development*
phone +34 64 525 7617 | fax +1 425 988 1977
candrus@principlepowerinc.com

