New European Union Project SUPRAPOWER

suprapower

Superconducting light generator
for large offshore wind turbines

July 24, 2013 (HE78). SUPRAPOWER (SUPerconducting, Reliable, lightweight, And more POWERful offshore wind turbine) is an EU FP7 founded research project focused on a major innovation in offshore wind turbine technology by developing a new compact superconductor-based generator.

The project aims to provide an important breakthrough in offshore wind industrial solutions by designing an innovative, lightweight, robust and reliable 10 MW class offshore wind turbine based on a superconducting (SC) generator, taking into account all the essential aspects of electric conversion, integration and manufacturability.

Today's geared as well as direct-drive permanent magnet generators are difficult to scale up further. Their huge size and weight drives up the cost of both fixed and floating foundations as well as O&M cost. New solutions to provide better power scalability, weight reduction and reliability are needed. Superconductivity may be the only technology able to combine such features and allow scaling to 10 MW and beyond by radical reduction of the head mass.

SUPRAPOWER aims to develop a new concept of an innovative, lightweight, robust and reliable wind turbine for offshore applications using superconducting (SC) technologies. This innovative concept will be a key technology to scale power up wind turbines to 10MW and beyond.

This project has the following overall objectives:

- To reduce the head mass, size and cost of offshore wind turbines by means of a compact superconducting generator.
- To reduce operating, maintenance and transportation costs and to increase life cycle using an innovative direct drive system.
- To increase the reliability and efficiency of high power wind turbines through a drive-train specific integration in nacelle.
- To maximize the power conversion and wind response of the wind turbine by means of dedicated control systems/procedures.
- To facilitate the development of the offshore wind potential and support its drastic increase.

The project participants are:

- Fundación Tecnalia Research and Innovation (Spain) – Project Leader
- Acciona Windpower S.A. (Spain)
- Columbus Superconductor Spa (Italy)
- Oerlikon-Leybold Vacuum GMBH (Germany)
- Institute of Electrical Engineering, Slovac Academy of Sciences (Slovakia)
- University of Southampton (United Kingdom)

- Karlsruhe Institut of Technology (Germany).

Publicly accessible information on this project can be found at http://www.suprapower-fp7.eu/

The Kick-off meeting of this Project was held on the 18th and 19th of December 2012 in Bilbao (Spain). Tecnalia, as the leader of the project, hosted this meeting.