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Wind energy: nacelles on the test bench

In spring 2015, Germany's first nacelle test rig is opening

The journey taken by wind turbines from their preliminary design to their market launch is long. Particularly in the final phase, prototypes have to undergo arduous and intensive practical testing. To shorten this period, in spring 2015 a test rig for nacelles will commence operation in Bremerhaven, Germany. Here the mechanical and electrical components can be tested under accelerated conditions. The BINE-Projektinfo brochure "Fast-track testing of nacelles" (15/2014) presents the test rig. It is designed for complete nacelles up to eight megawatts in size. The data obtained here is incorporated in the certification process and makes it possible to fine-tune new wind turbines.

"The tests on the test rig help to increase the reliability of the wind turbines – especially offshore. In addition, the loads acting on the drive train can be reduced by new control strategies," says Martin Pilas, project manager at the Fraunhofer Institute for Wind Energy and Energy System Technology IWES, in summarising the benefits for manufacturers and wind farm operators. A load transmission system can simulate all the forces and moments that also act on nacelles in the field. An electricity grid is modelled in what is currently the most powerful grid simulation system in the world. Here, the electrical components of the wind turbines are investigated in regards to grid perturbations, short circuits and emergency stops.

In addition to the nacelle test rig, the Dynamic Nacelle Testing Laboratory (DyNaLab), which is the name of the overall facility in Bremerhaven, is equipped with testing equipment for generators, converters, bearings and main shafts. The project is coordinated by Fraunhofer IWES.

The BINE Projektinfo brochure, which can be obtained free of charge from the BINE Information Service at FIZ Karlsruhe, is available online at www.bine.info or by calling +49 (0)228 92379-0. The brochure cover and two additional images can be downloaded from this web portal in the press section.

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