

Voith Turbo

VOITH

Project Report 2009

Voith Turbo Wind GmbH & Co. KG

Hermes Award for Voith WinDrive

International Prize for Technology goes to Voith Turbo

Voith Turbo is the recipient of this year's Hermes Award, the coveted international prize for technology of the Hanover Fair. The prize, which comes with EUR 100,000 award money, was presented on the occasion of the opening ceremony of the world's largest industrial fair. The independent jury thus gave the thumbs-up to a new Voith drive for wind power station of the future: the Voith WinDrive.



Over the last five years, the Hermes Award has evolved into the “Oscar for Engineers.” The jury had to assess 70 product innovations and then nominate five companies for the final. This is where Voith Turbo asserted itself with its drive concept Voith WinDrive. “This year’s award-winning innovation ensures that there is a fresh wind blowing on the rapidly increasing wind energy market,” this is how Prof. Wolfgang Wahlstätter explained the jury’s motivation when he handed over the prize to Dr. Andreas Basteck, Executive Vice President of Voith Turbo Wind.

The technological challenge of the multi-megawatt class of wind energy plants lies in a demand for reliable, efficient wind turbines that meet all requirements of grid-feeding in line with power station standards. Existing concepts are based on inverter technology, often coupled with mechanical gears, and cannot comprehensively meet these high demands on the electricity that is fed into the grid. As a highly dynamic, mechatronic system, the Voith WinDrive allows for the first time that power-station approved technologies can also be used for wind turbines, and thus ensures the necessary grid stability. With this technology, inverter concepts whose mean failure rate is less than two years, are rendered unnecessary. This results in a high availability rate of wind parks, as well as lower operating and maintenance costs. Due to the under-proportional growth laws of the WinDrive, weight reductions of the gondola and hence the tower and the foundation of wind turbines for multi-megawatt plants are possible.

High grid-feeding quality is one of the major advantages of the awarded drive system. Thanks to the utilization of proven synchronous generators, requirements such as reactive power control or grid stabilization during short circuits, can be met without problems. Additionally, the WinDrive excels by its high reliability. Owing to the absence of frequency inverters and step-up transformers, the complexity of the wind turbine is significantly reduced. This, in turn, decreases the probability of failures and standstill, so that the overall reliability increases by more than 30 percent. As a result of its variable-speed mode, the wind rotor can be operated with various motor speeds during varying wind speeds within an aerodynamic optimum. Synchronous generators allow operation on medium-voltage levels without any additional components. The total efficiency of a wind park is thus improved by over one percent. And last but not least, the WinDrive also allows reaction times within the milli-second range, consequently reducing loads within the driveline.

On the basis of its components approach alone, WinDrive technology is suitable for on- and offshore installations; island operation is also possible. Locations situated at heights of more than 4,000 meters above sea level are no problem for the WinDrive. The WinDrive can also be used in hydro power stations for increasing the efficiency of variable-speed water turbines. WinDrive systems have been running in pilot stations in Cuxhaven (Germany), Valedaro (Argentina) and Sweetwater (USA) for over one year without any problems.