



Prototype Measurement

Load Measurement

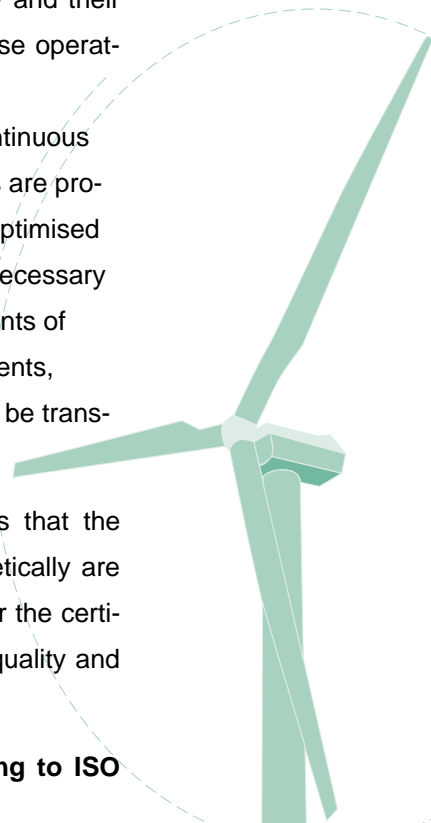
Wind, air temperature and pressure – wind energy systems (WES) during their operation are exposed to the most varied Loads, besides the constantly changing environmental conditions also to mechanical loads. The actual forces affecting the most highly Loaded spots however can only be determined by direct measurements on the WES. These verify the simulated values defined during the design of the WES. For this, the most varied components are tested for their eigenfrequency and their mutual stimulation / interference during the most diverse operating conditions.

Benefit to the Customer

For more than 20 years now WES are experiencing continuous advancements. Not only increasingly efficient machines are produced, but also the existing ones can be continuously optimised due to the constantly growing expertise. This became necessary not only due to the raised machine efficiency requirements of investors, but also due to the fact that different components, which have been developed by other industries, cannot be transferred to WES on a 1:1 basis.

The measurement of the mechanical loads ensures that the values determined by the system manufacturer theoretically are verified by measurements. The results are the basis for the certification of the WES and also for the enhancement of quality and the technical optimisation of the WES in general.

wtg is accredited for load measurements according to ISO EN 17025.





Implementation

An autonomously operating measuring system, whose modular design allows for a virtually unlimited number of measuring channels, is used for the recording of data. Data are normally recorded at a sample rate of 50 to 100 Hz. Temporary incidents – stopping incidents in particular often result in extreme Load peaks – can be examined more thoroughly in short campaigns with higher sample rates up to the kHz range.

The measuring system is geared to the respective requirements and design conditions of the WES.

In addition to the mechanical Loades, all values must be recorded that describe the current operating conditions of the WES. These are among others the electrical output, WES status, rotational speed, pitch angle and nacelle position.

These measuring results are then related to the meteorological marginal conditions (wind speed and direction, turbulence intensity, air density), which are measured using a freely blown wind measuring mast.

The results are documented in a comprehensive report.

As a rule the measurements are carried out according to the international directives IEC 61400-13 and IEC 61400-12.

