

CBC DECISION/CLARIFICATION SHEET

Subject: Extent of load measurements in case of design changes e.g. tower	Standard and clause: IEC 61400-22:2010 Chapter 8.4.4	Sheet No. CBC 5C
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Related document: Minutes from CBC meeting in Hamburg, item 10		

Question

What kinds of load measurements are required when changing the design of tower sections or whole tower from steel tubular to concrete tower?

Answer

New measurements are necessary when introducing a different tower design.

Examples for different tower designs are

- steel tubular tower,
- lattice tower,
- concrete tower,
- hybrid tower.

The wind turbine natural frequencies shall be evaluated based on analyses for the subjected tower designs. The evaluation shall consider the risk for coupled rotor vibrations such as whirling i.e. higher modes than the lowest natural frequency. Based on this evaluation a limited load measurement program may be adopted and if coupled vibrations are not likely to occur RNA (Rotor and Nacelle Assembly) and/or tower measurements may be omitted.

In case of a changed hub height with similar tower design generally no load measurements are necessary.

Example of application:

In case of similar first tower eigenfrequencies (first and second order frequencies) of different tower designs the following procedure is possible:

- 1) Load measurements of blade and shaft may be omitted in case it can be shown by simulation that loads acting at blade, shaft and tower top do not deviate significantly.
- 2) Load measurements of the tower are normally requested for different design variants at critical tower sections. For example at sections in a hybrid tower where the material is changed.

Reference is made to

[1] "Guideline for the Certification of Wind Turbines", Germanischer Lloyd, Edition 2010

[2] "Wind turbine generator systems – Part 13: Measurement of mechanical loads, IEC TS 61400-13, First edition 2001-06