

Note on Engineering Details

No: DWM-Woeb-extern-001

Title: D-Design Assessment

Ref.: GL Wind "Guideline for the Certification of Wind Turbines", Edition 2003 with Supplement 2004, Section 1.2.2 and
GL Wind "Guideline for the Certification of Offshore Wind Turbines", Edition 2005, Section 1.2.2.2

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Section 1.2.2 of the GL Wind "Guideline for the Certification of Wind Turbines", Edition 2003 with Supplement 2004, as well as Section 1.2.2.2. of the GL Wind "Guideline for the Certification of Offshore Wind Turbines", Edition 2005 describes the procedure for assessment of prototype wind turbines. Herein the C-Design Assessment or assessment of prototypes (in German: "Prototypengutachten") serves for the erection of the prototype of a wind turbine for testing purposes. Now the demand arose to make use of this first step prior to a complete design review within an A- (and B-) Design Assessment for other purposes than prototype testing, too. This includes e.g. public relations, presentations at fairs, project acquisition or other applications where an official and independent pre-review becomes important prior to the erection of a prototype wind turbine.

To fulfill these needs the existing A-B-C-concept for Design Assessment is supplemented by a D-Design Assessment. This implements a continuous differentiation and consistent identification:

A-Design Assessment:	remains unchanged
B-Design Assessment:	remains unchanged
C-Design Assessment (= Prototypengutachten):	remains unchanged
D-Design Assessment:	analogously to a C-Design Assessment, but without design documentation concerning the foundation nor any information on the site

The following text of the guideline is adapted for a D-Design Assessment and will be implemented in future revisions of the guideline:

1 D-Design Assessment

1.1 General

The D-Design Assessment is used to document the pre-review of a turbine design. The D-Design Assessment is usually based on a complete plausibility check of the loads, the rotor blades, the machinery components as well as of the tower.

1.2 Scope and validity

- (1) For each type of wind turbine, only one D-Design Assessment is produced. If a plant type is modified with other rotor blades, a different operating mode or in other points strongly influencing the loads, then these are reasons which justify another prototype plant and another D-Design Assessment.
- (2) The D-Design Assessment is valid for 2 years. Before the end of that period an A- (B- or C-) Design Assessment shall be completed.

1.3 Documents to be submitted

- (1) For the D-Design Assessment, the following documents shall be submitted:
 - general description of the wind turbine
 - description of the control and safety concepts
 - description of the safety system and the braking systems
 - complete calculation of the loads including stiffness parameters of the foundation
 - main drawings of the rotor blade, including structural design and blade connection
 - general arrangement drawing of the nacelle
 - drawing of the hub, main shaft and the main frame
 - listing of the primary components to be used (e.g. main bearing, gearbox, brake, generator etc.)
 - main drawings of the tower
 - description of the electrotechnical installations
- (2) Further documents may be necessary e.g. in case of new concepts.

1.4 Scope of assessment

- (1) With regard to the safety system of the wind turbine, it is checked whether the safety-relevant operating values are sensed and made available to the safety system. Furthermore, the existence of two independent braking systems shall be checked.
- (2) The blade root, hub and tower head loads to be submitted are checked for plausibility. This is possible if the extreme loads and fatigue loads can be compared with those of other wind turbines of similar size and type. If a wind turbine of a larger wind turbine type is submitted for assessment, then the pertinent values shall be extrapolated with due consideration of the physical circumstances.
- (3) The design of the rotor blades, the machinery components in the drive train and the tower are also checked for plausibility, if it is possible to apply the experience gained in the dimensioning of similar turbines.

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