

Note on Engineering Details

No: DWM-Stgr-extern-001

Title: Load assumptions at extreme temperatures

Ref.: GL Wind-Technical Note 067 "Certification of Wind Turbines for extreme Temperatures (here: Cold Climate)", Rev. 2
Section 4.1

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1. Motivation

The GL Wind-Technical Note 067 "Certification of Wind Turbines for extreme Temperatures (here: Cold Climate)", Rev. 2 was issued in 2005. The fourth sentence in Section 4.1, 4th bullet deals with the load assumptions for idling at extreme temperatures:

... "As long as no information regarding power train losses for $\theta_{1\text{year},\text{min}}$ exist, generator sided braking torques of $2 \cdot T_N$ (torque at the gearbox entry at nominal power; $\theta_{1\text{year},\text{min}} = -40^\circ \text{C}$) are to be considered for wind turbines with three-stage planetary-spur gears." ...

The value $2 \cdot T_N$ in this section is based on only a few tests and can be regarded on the safe side.

2. Diversification of the test basis

During the last years more gearbox tests were performed in cold climate chambers, by which the experience with power train losses for $\theta_{1\text{year},\text{min}}$ was significantly expanded. These tests showed that the power losses for $\theta_{1\text{year},\text{min}}$, described in terms of torque, typically reach values well below T_N .

3. Change in the GL Wind-Technical Note 067

Because of the expanded experience, listed above, the fourth sentence in Section 4.1, 4th bullet shall read:

. . . “As long as no information regarding power train losses for $\theta_{1\text{year},\text{min}}$ exist, they can be approximated in terms of torque by the value $0.5 \cdot T_N$ (nominal torque at the gearbox entry) for wind turbines with three-stage gearboxes.” . . .

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