
Contents

Page

1. Introduction	3
2. Extreme foundation loads.....	3
3. Fatigue foundation loads	3
4. References	3

Table list

Table 1 DIRECTWIND 54*900 extreme 75m foundation loads according to IEC-2.....	3
--	---

1. Introduction

This document gives the foundation loads for the DIRECTWIND 54*900 wind turbine with 75 m hub height, for an IEC-3 wind climate regarding operational loads and IEC-2 wind climate regarding extreme loads according to [3] and [4].

2. Extreme foundation loads

The loads were extracted from [2]. [1] reports the calculations and gives the starting points (turbine description and modelling in Phatas IV, the structural loads program).

In Table 1 the extreme loads are summarised as calculated above (no material and/or load factor) and with a factor 1.35 (load factor 1.35 according to IEC 61400-1 and NVN 11400-0). The weight has been multiplied with a load factor 0.9 (favourable load).

Extreme foundation loads	Vertical force [kN]	Horizontal force [kN]	Tilt moment [kNm]	Torsion moment [kNm]
Incl. load factor acc. to [3]	-1070	501	32672	1400
Excl. load factor	-1190	371	24202	1037

*Table 1 DIRECTWIND 54*900 extreme 75m foundation loads according to IEC-2.*

Remark: The foundation stiffness against rotation around a horizontal axis must be larger than $1,2 \cdot 10^{10}$ Nm/rad.

3. Fatigue foundation loads

The fatigue loads for the tower base are presented by the Markov matrix of twbaseMx_rmm.txt and twbaseMy.rmm.txt at ref [2]. The loads are binned mean moments combined with the number of occurrences for different cycle ranges.

The load factor for fatigue loads according to [3] is equal to 1.

The weight load of the turbine can be extracted from Table 1.

4. References

- [1] ECN-CX—04-039, *Load set DIRECTWIND 54*900 IEC IIIA + IEC IIIBpark, 75 m hub height*, C. Lindenburg, August 2004.
- [2] CD-ROM, *DIRECTWIND 54*900 IEC IIIA + IEC IIIBpark, 75 m hub height*, C. Lindenburg, 5th August 2004.
- [3] NVN 11400-0 Wind turbines-Part 0: Criteria for type-certification-technical criteria, third edition, April 1999.
- [4] IEC 61400-1, Wind turbine generator systems – Part 1: Safety requirements, second edition 1999-02.