



Blade Pitch Angle Inspection Report

WTG: EX-XXX

WIND FARM:

**Parc éolien d'XXXXXX,
(Ardennes, France)**

Measurement date : 10/04/2017

ALPHA **WIND**

Société par Actions Simplifiée au capital de 1000 euros

SIREN 507 735 199 RCS Toulouse

25 Ter rue des chênes, 31830 Plaisance du touch - France



alpha **wind**

Project data

Client: XXXX **Report number:**
 Operator: XXXX Project title: XXXXX
 Location of WTG: XXXX Order number:
 GPS: Contractor: ALPHA WIND
 WTG number: XXXXX

WTG data

Manufacturer: XXXXX **Power [kW]:** 2000
 WTG model: XXXXX Rotor Ø [m]: XXX
 Number of blades: 3 Hub height [m]: 100
 Blade type: chord(root)[mm]: 3900
 Blade marking: Blade 1 opposite of the hub hatch chord(tip)[mm]: 900

Measuring conditions

Measurement system: ROMEG-M 20 G **Serial-number:** Root :2222654
 Tip : 2222634
 Weather: Slightly Cloudy Measure. type: Ground front
 Wind [m/s]: 9 Measure. option: 1
 Temperature [°C]: 12 Technican: LJO
 Revolutions [r/min] 13 Date : 10/04/2017
 Comment:

Results

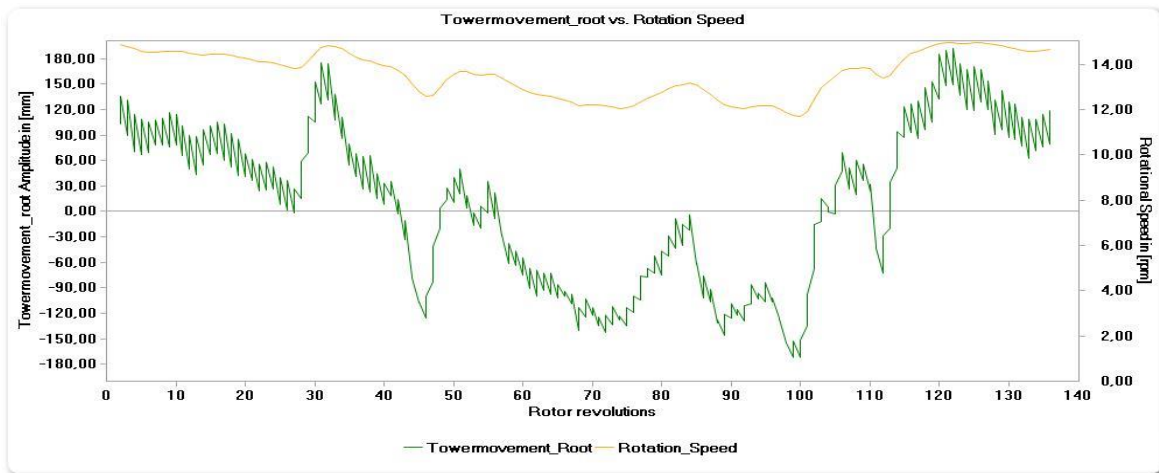
Initial	Blade 1	Blade 2	Blade 3	Difference
Root[°]	0,07	0,59	-0,66	1,25
Tip[°]	0,15	0,66	-0,81	1,47
Twist[°]	0,08	0,07	-0,15	
Sharing(°)	0,09	-0,26	0,18	

Correction recommended: The pitch difference of 1.25° is higher than the 0,6° recommended by GL*. The tower oscillation graph presents some abnormal high frequency oscillations (50mm amplitude) compared to the same wind turbine with correct pitch angle.

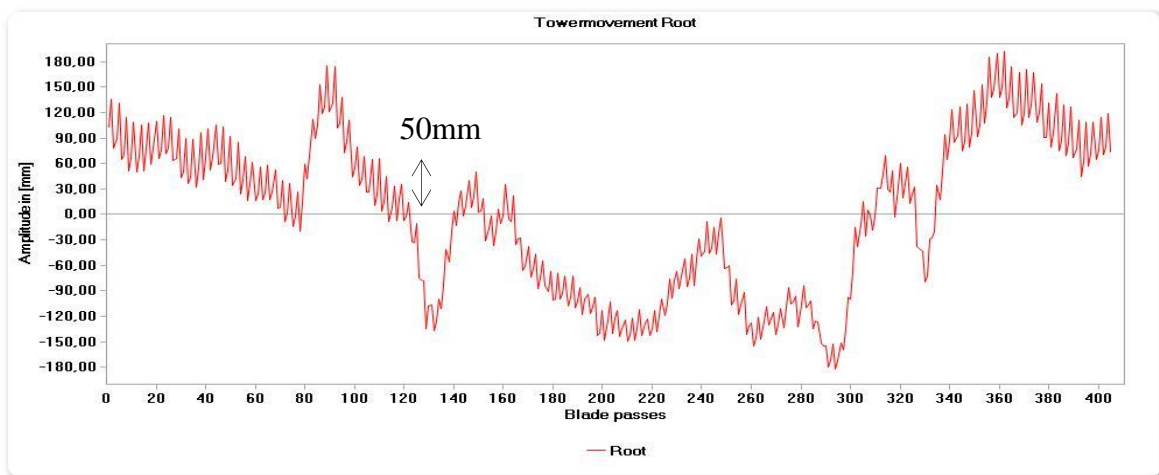
Evaluation of results see page 2

* Limit for aerodynamic asymmetry please see Directive Germanischer Lloyd 2010 Section 4.3.4.1.

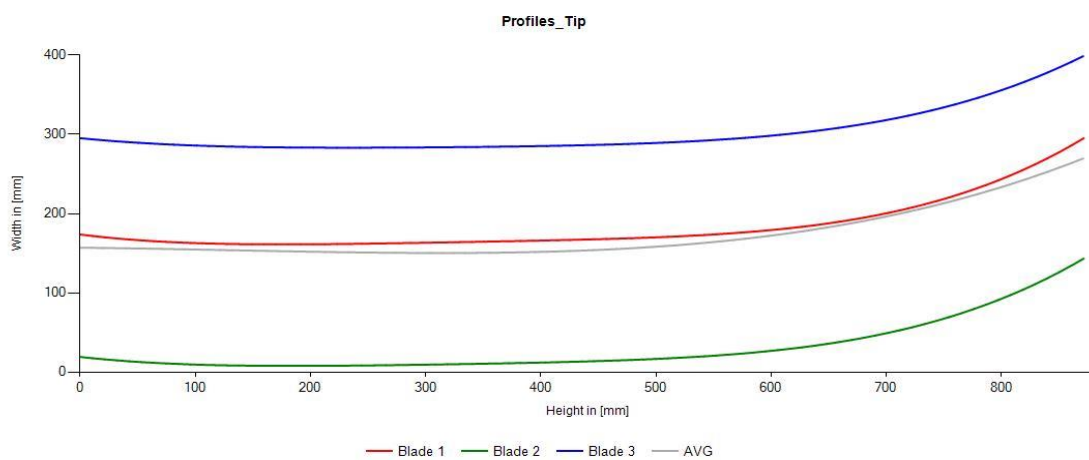
Towermovement_root vs. Rotation Speed



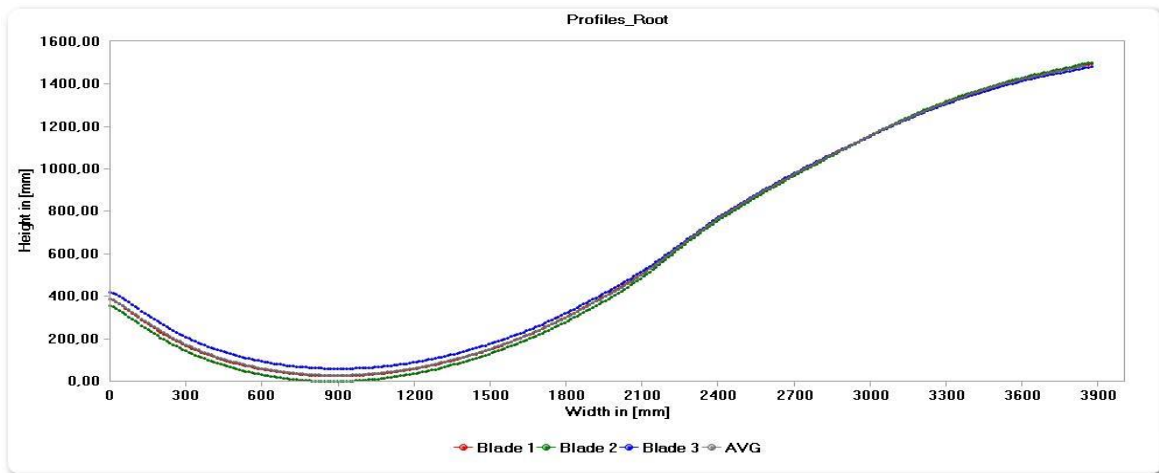
Towermovement Root



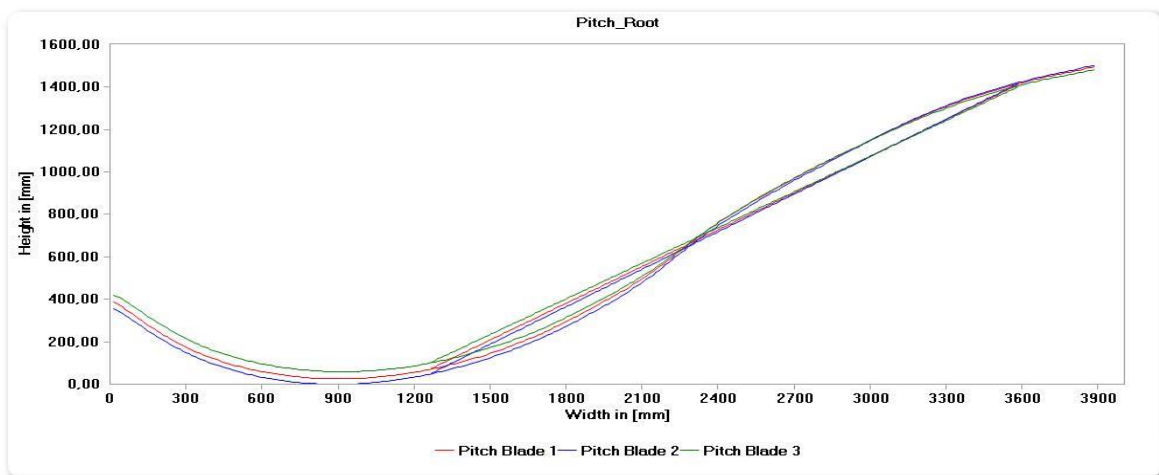
Profiles_Tip



Profiles_Root



Pitch_Root



- The protocol is prepared electronically and valid without signature -

Legend of defects	
	Severe defect requiring to stop the turbine and to repair it immediately.
	Moderate defect requiring to adjust the turbine within 1 to 3 months.
	Minor defect needing a regular control in time.
	No defect noticed
	Suggestion, observation, for information or axis of possible improvement.
	Not inspected (too high or too low wind speed * / Topography did not allow the control ** / Rain ***).