

DeepWind-studies

MSc projects



The DeepWind concept (www.deepwind.eu) challenges offshore vertical horizontal axis wind turbines (HAWTs) in several ways:

- It has no heavy nacelle and operates independently wrt. wind direction changes; the centre of gravity lies very deep below the water line
- The rotation of the blades is not directly gravity affected: it has up-scaling potential compared to HAWTs
- The rotating tower, down to the mooring system, has to take loads.

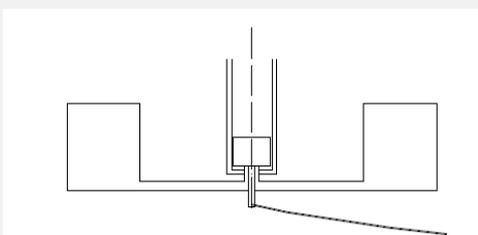
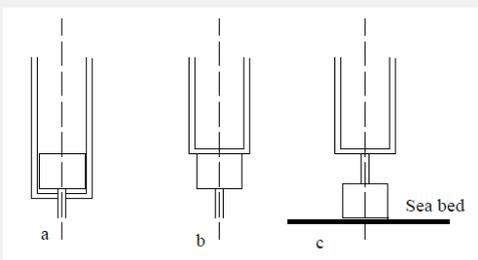
The MS project can take up several topics, such as the conversion of wind into mechanical power. Here the main issue is to compete with conventional HAWTs in fulfilling up-scaling capability. For the 2 or 3 bladed MW wind turbine it means the rotor has to be light weight:

1) Aeroelastic design of a light weight rotor where wind and gravity loads on the turbine are taken into consideration. Here the study is carried out on a turbine that can withstand the load of its own weight and fatigue loads under operation.

Another topic is the analysis of the power absorption: loads on the generator and safety brake device system are of high importance for smooth operation at deep sea. Loads will be directed onto the mooring device system placed 70-150m below waterline.

2) Design of a modular system- a generator and a safety brake device system for safe operation. The design has to consider maintenance issues (mooring design, remote deep sea operation)

Supervisor: U. S. Paulsen (uwpa@dtu.dk) plus a co-supervisor. Computational skills are required in aero elasticity and in hydrodynamics (HAWC2).



Upper frame: Exhibition model at the EWEC 2012 of the concept

Lower frames: Placement of the generator and view of safety brake device and mooring system