

Determine the performance of your floating wind turbine

Harvesting the abundant resource of far offshore wind has significant potential. Over the years many different floating offshore wind turbine designs have been initiated which all show their own characteristics. MARIN has a track record of more than a decade on various of these designs. We are in the position to offer services and advice on the hydrodynamic performance of your floating wind turbine. Through state-of-the-art numerical models and model test campaigns key performance indicators such as loading on critical parts and maximum operability can be determined. These assessments will provide you adequate input to understand economic viability of your floating wind turbine design or project.

Services:

- Conceptual phase: Feasibility study of floating wind turbine design
- Design phase: Development of hydrodynamic numerical model to assist in the design process
- Validation and verification: Model tests to verify design and validate numerical models
- Full scale monitoring: ensure safe operations of your floating wind turbine

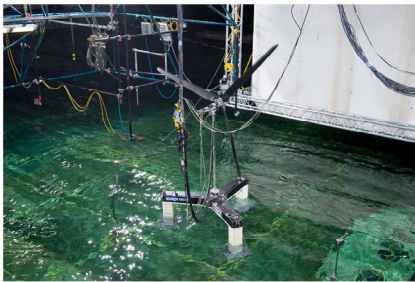
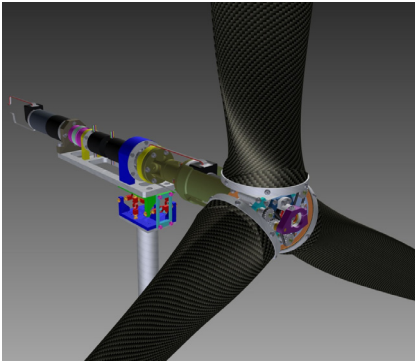
Conceptual phase: Feasibility study of floating wind turbine design

In the conceptual phase, a feasibility assessment can support you in understanding the limitations of your floating wind turbine design for the prevailing sea state at your site of interest. Thereby interactions between mooring system, floater and wind turbine will be investigated. MARIN can conduct this feasibility assessment by means of numerical simulations to give insight into the operational envelope of your system. Various system configurations can be evaluated and compared on key performance indicators such as loading on critical parts and maximum operability.

Design phase: Development of hydrodynamic numerical model to assist in the design process

In the design phase, MARIN offers model tests in a wave basin and numerical simulations to assess the performance of the floating wind turbine design. By tuning the numerical model on the wave model tests the uncertainty of numerical simulations is reduced such that the tool can be utilized to assist in design tasks. Design variations such as floater and mooring system design can be easily incorporated in the model to quantify the design improvements. Furthermore, MARIN offers an open interface to couple your in-house developed wind turbine model with our state-of-the-art time domain software.





Related products:

- O&M logistics
- O&M vessel selection
- O&M operational training
- WT landing platform alignment
- Wind farm traffic safety assessment
- Vessel seakeeping performance

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Validation and verification: Model tests to verify/validate performance

MARIN can independently verify and validate the floating wind turbine design and perform a check if the system meets requirements and specifications as set out by e.g. major certification bodies.

Full scale monitoring: Ensure the safe operation of your floating wind turbine

When the floating wind turbine is in operation, full scale monitoring can give further insight in the performance of the design. For this MARIN's trail a monitoring department can perform these measurements campaigns using their wide experience from the offshore Oil & Gas market.

State of the art tools

Developed in-house, aNySIM XMF is state-of-the-art software for hydrodynamic time domain simulations that are suitable for modelling floating wind turbines including the mooring system and interacting with the wind turbine. Detailed assessments can be carried out in our high-end wave basins to gain insight into the physical interactions of the mooring system, floater and wind turbines. For this a high quality wind setup and a model scale wind turbine including active pitch control has been developed. These model tests are essential in proof-of-concept demonstration and in certification.

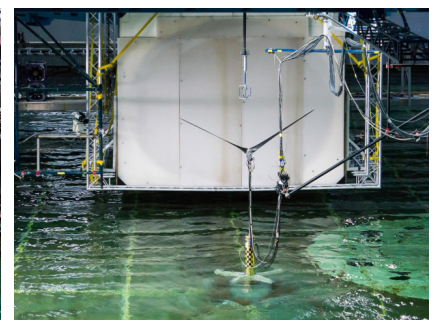
Expertise and experience

MARIN is an independent and innovative service provider specialising in hydrodynamic assessments and investigations. With over 80 years experience, we fully conversant with challenging metocean conditions in Oil & Gas and renewable energy projects worldwide. MARIN offers services for hydrodynamic analysis of various types of floaters, installations and operations offshore. Our expertise includes concept validation, seakeeping, slamming, operability assessments, hydrodynamic assessments on installation and maintenance operations, motion compensation and control, mooring, dynamic positioning and logistic scenario analysis.

This expertise and experience is combined in performing hydrodynamic studies for floating wind turbines. Thereby, time domain simulations and model tests are carried out to gain insight into the limitations of innovative systems. Previous experience includes studies on, Gicon Floating Wind Turbine, Glosten Floating wind turbine, Hexicon Floating Wind Turbine, SBM IFPEN floating wind turbine and many more.



DeepCwind turbine semi



Pelastar