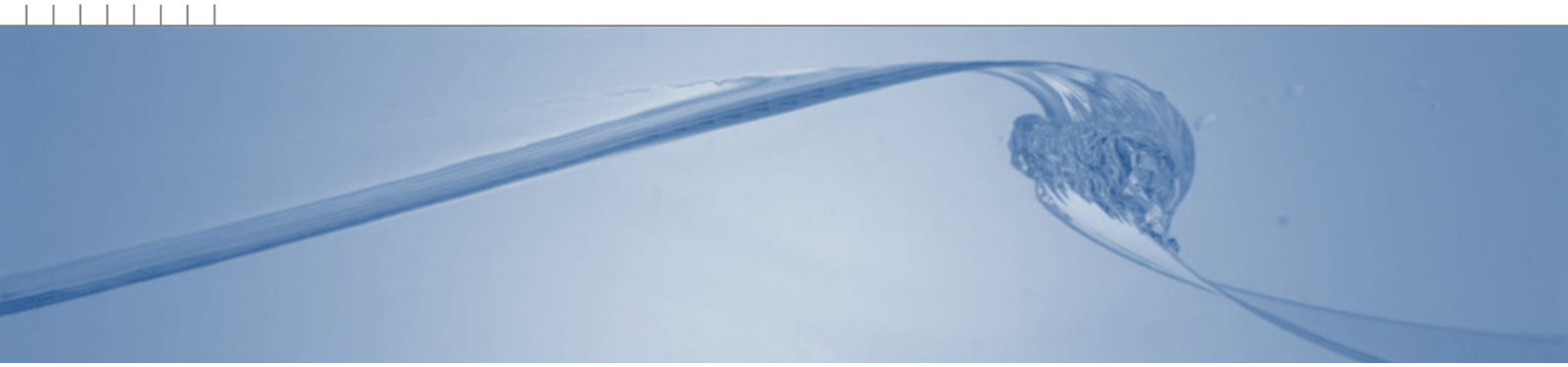
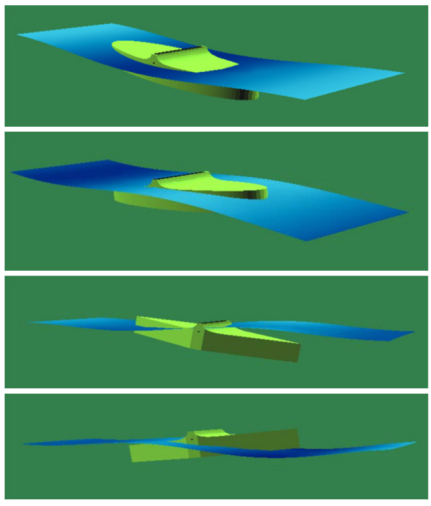


Determine the performance of your wave energy converter

Harvesting the abundant resource of wave energy has significant potential. Over the years many different designs have been initiated which all show their own characteristics. MARIN has a track record of more than a decade on various of these converters. We are in the position to offer services and advice on the hydrodynamic performance of your wave energy converter. Through state-of-the-art numerical models and model test campaigns P50, P75 and P90 energy yield calculations can be performed. These assessments will provide you adequate input to understand economic viability of your wave energy converter design or project.

Services:

- Conceptual phase: Feasibility study of wave energy converter design and/or project
- 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
- Energy yield assessments: Determination of energy yield expressed as P50, P75 and P90



Conceptual phase: Feasibility study of wave energy converter design and/or project

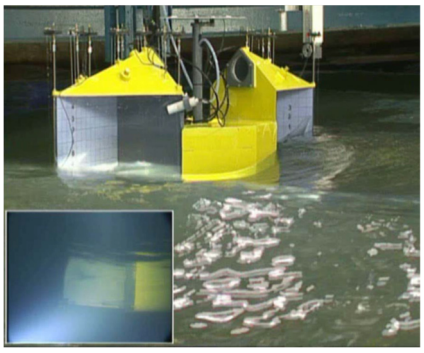
In the conceptual phase, a feasibility assessment can support you in understanding the limitations of your wave energy converter design for the prevailing sea state at your site of interest. Thereby interactions between mooring system, floater and Power-Take-Off system (PTO) will be investigated. MARIN 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, maximum operability and energy yield.

Design phase

In the design phase, MARIN offers model tests in a wave basin and numerical simulations to assess the performance of the wave energy converter. 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 design and PTO settings can be easily incorporated in the model to quantify the design improvements. Furthermore, MARIN offers an open interface to couple your in-house developed PTO system with our state-of-the-art time domain software.

Validation and verification: Model tests to verify/validate performance

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



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

For more information contact MARIN:
Erik-Jan de Ridder
T + 31 317 49 32 05
E e.d.ridder@marin.nl

Energy yield assessments: Determination of energy yield

The long term power production of a your wave energy converter can be calculated using the aNySIM hydrodynamic time domain simulation software. An energy yield assessment is routinely performed by engineers designing the wave energy converter. However, for financial risk assessment, investors and developers also require professional assessments and reporting of uncertainties related to the energy estimation and related metocean data inputs. Through state-of-the-art numerical models and model test campaigns MARIN can provide you with P50, P75 and P90 energy yield levels.

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 motion compensated gangways interacting with vessel motions. This software can be interfaced with any PTO control system modelled in Matlab Simulink. 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 Power Take-Off system. 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 wave energy converters. Thereby, time domain simulations and model tests are carried out to gain insight into the limitations of innovative systems. Previous experience includes studies on floating oscillators (Wavebob), Attenuators (Pelamis), overtopping devices (Wave dragon)