

Hydrodynamic services to support the development of your fish farm

Currently the industry is considering the operation of fish farms further offshore in less sheltered locations. Consequently these fish farms will be subjected to more extreme conditions. To ensure structural integrity of the farm and safe operations at the site the effects of these extreme conditions must be taken into account.

MARIN has wide experience with the assessment of environmental loading on various offshore structures in the Oil & Gas and offshore wind industry. We give advice on the hydrodynamic design and the operations of your offshore fish farm in exposed environments. Through numerical models and model test campaigns we determine the loading and response of your farm to give you a clear understanding of the hydrodynamic and structural viability of your design.

Services:

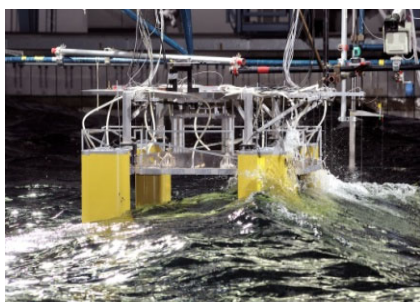
- Conceptual phase: Feasibility study
- Design phase: determine the 50-year wave load to assist in the design process
- Validation and verification: model tests to verify design and validate numerical models
- Full-scale monitoring: ensure safe operations for offshore fish farms

Conceptual phase: Hydrodynamic feasibility study

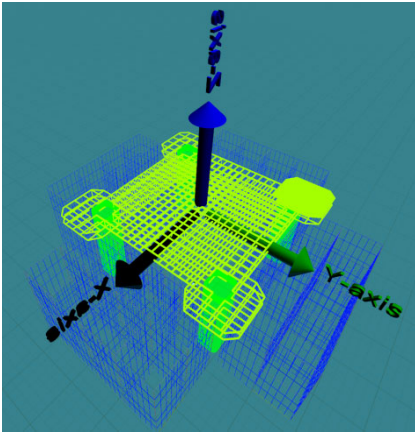
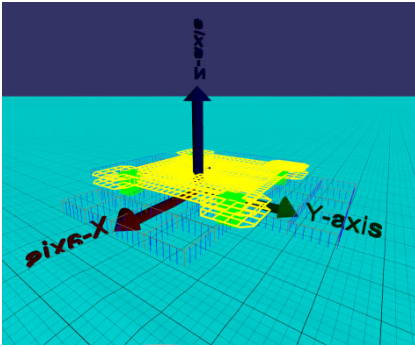
In the conceptual phase, a hydrodynamic feasibility assessment can support you with the siting and configuration of your fish farm for the prevailing sea states of your location. MARIN can conduct this feasibility assessment by means of numerical simulations to give insight into the operability of the farm. Various configurations and operating strategies can be evaluated and compared on key performance indicators, including aspects such as safety, operational risk and maximum operability.

Design phase: determine the 50-year extreme environmental load to assist in the design process

The trend to move production to more unshielded sites in combination with innovative fish farms requires more robust designs to withstand more extreme environments. From a hydrodynamic point of view MARIN can assist in the design phase by assessing the loads and responses of your fish farm design. In the design phase MARIN offers model tests in our testing facilities to assess the extreme wave and/or current loading. This assessment can support you in understanding the extreme environmental loading on your fish farm for the prevailing sea state at your site of interest.



Model test of semi-submersible in extreme weather



aNySIM time domain model of fish farm design

Related products:

- Operability assessments for offshore support vessels
- MARIN services for seaweed cultivation

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Validation and verification: Model tests to verify/validate performance

MARIN can independently verify and validate the offshore fish farm design and determine whether the system meets the requirements and specifications as set out by e.g. certification bodies.

Operating phase: Safety assessments

Offshore operations in the traditional offshore industry are subjected to high safety standards. MARIN is familiar with these standards and can assess safety levels of your farm (operations) through wave basin tests and numerical simulations. By simulating a variety of sea states the safety level as required by certification bodies can be evaluated for any type of operation related to your fish farm. This includes installation activities, lift operations, berthing studies and side-by-side operations (e.g. ship-to-ship-transfers).

Full-scale monitoring: Ensure the safe operation for offshore fish farms

Once in operation, full-scale monitoring can give further insight in the performance of the fish farm design. MARIN's Trial & Monitoring group can perform these measurements campaigns using their wide experience from the offshore Oil & Gas market and the offshore renewable industry.

State-of-the-art tools

Developed in-house, aNySIM XMF is the perfect software for hydrodynamic time domain simulations suitable for modelling fish farms. Detailed assessments can be carried out in our wave basins to gain insight into the motions, accelerations and loading on the fish farm. These model tests are essential within proof-of-concept demonstration and certification.

Expertise and experience

MARIN is an independent and innovative service provider specialising in hydrodynamic assessments and investigations. With over 80 years of experience, we are 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.