



Department Profile Maritime Operations

Nautical safety and efficiency

Maritime Operations is the nautical department of MARIN, the Maritime Research Institute Netherlands. MARIN is a reliable, independent and innovative service provider for the maritime sector.

The mission of Maritime Operations is to contribute to safer operations, at sea, in ports and on inland waterways. In order to achieve this mission we use various simulation and safety models. We implement and use the results of hydrodynamic research executed in the various departments of MARIN in our tools.

The department is divided into two teams:

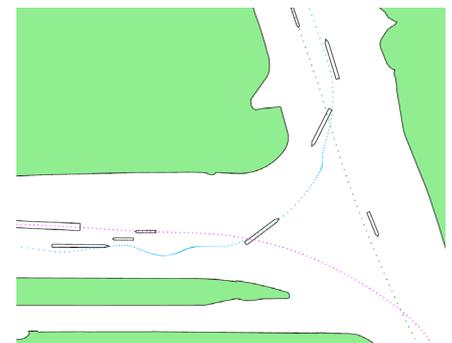
- Operations & human factors;
- Traffic & safety.

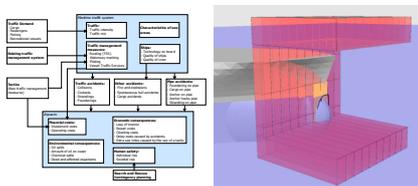
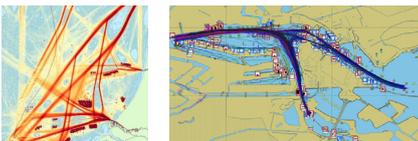
Nautical Operations

The Nautical Operations team executes nautical consultancy and research as well as training. The key word is 'operation'. This can be a complicated offshore operation (platform installation, towage, offloading) but also the nautical evaluation of new infrastructure (ports and fairways). We are able to design and simulate your operation from an early design stage up to the final training for the actual operation(s).

We can contribute to your design process at various levels. Our experienced nautical consultants can give advice in an early stage of the design process. By using our in-house knowledge regarding the behaviour of floating structures and ship manoeuvring characteristics we can give a first appreciation of the feasibility of the operations. In port and channel design simple methodologies like PIANC and ROM can also help to draw up a first design.

For a more accurate advice we can apply (fast-time) simulation tools, e.g. E-DOLPHIN or SHIPMA.





However, for most operations 'the man in the loop' is the most important link in the operation. His contribution to the set up and execution of the operation is essential to make it successful. MARIN can provide simulation sessions using multiple training positions. Each representing, a ship's bridge, a tug, a crane etc.

The outcome of such simulations can be diverse. Typical examples are an operational handbook, maximum environmental conditions, admission rules, required space for the operations, tug and line forces, required thruster capacity etc. Special attention should be given to the mental workloads of the team during the operations. MARIN can execute task analysis but also workload measurements during simulations.

Prior to the execution of a complex nautical operation, training is required. Regularly executed operations need frequently specialised training. Maritime Operations offers specialised training for the maritime professional world, i.e. pilots, ship officers, mooring masters, tug masters and offshore personnel, in the field of vessel handling and Bridge Resource Management.

Traffic and safety

Next to the safety of a specific operation we can also assess the safety level of all operations in a certain area. By combining the traffic flows, environmental conditions and characteristics of an area the general safety level (expected number of nautical accidents with consequences) can be determined. With the introduction of AIS (Automatic Identification System) the possibilities to study the behaviour of shipping has increased enormously. For MARIN it generates important input for our safety models. However, it has far more applications. AIS data can be used to study emissions from shipping, e.g. emissions to air, to water, and the radiation of noise. In some cases AIS data can be used directly in safety studies. And with AIS data more precise information can be obtained of the traffic intensity in a specific area.

In general safety studies are executed when the infrastructure is adjusted, traffic patterns have changed or for further optimisation of risk reducing measures. An example of changes in the infrastructure are the development of offshore wind farms, the installation of offshore platforms, reception of dangerous cargoes in ports (e.g. LNG) and also the risk of damage to cables and pipelines. Maritime Operations computes the probability of an accident (grounding, foundering or collision), but we also compute the damage to the cargo tank. The result of this computation can be used to compute the outflow of cargo (oil or dangerous goods) and the effect on the environment. In some studies the outflow of cargo is the input for further consequence analysis or optimisation of risk reducing measures (e.g. oil spill recovery equipment).

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