

## HMC has the expertise for all kind of marine transportations

The complexity of detailed voyage planning and preparation is growing faster than ever. Due to the economy of scale the dimensions of module carriers and motions responses in extreme environmental conditions increase. Transport engineering encompasses the full scope of assessing the environmental conditions, optimal loading conditions, ballast plans, motions response calculations and fatigue damage calculations.

HMC has the expertise and tools to design reliable marine transportations. We can deliver logistics services for project cargo movements and calculations for transport of offshore constructions and offshore module components. During the past 10 years, we have gained a lot of knowledge on the hydrodynamic and hydromechanics part of heavy transport engineering and developed products and courses to assist in the design for transport. Our team consists of ex-sailors and naval architects which work closely together making the engineering

assignments tailor-made. Besides the engineering part of our company we also provide operational guidance during these types of projects. Please, visit our online [portfolio](#) to see a preview of HMC projects. More info can be obtained at [info@hmc.nl](mailto:info@hmc.nl)



*“HMC: every engineering assignment has to be tailor-made”*



## Design of sea fastening is very important

Sea fastening is the method of securing cargoes or equipment on a vessel or barge with the aim of preventing any movement whilst the vessel is in transit and subject to the motions and accelerations caused by environmental conditions.

In general terms, whenever a vessel is sailing it will be subjected to the six degrees of freedom which are heaving, swaging, surging, pitching, yawing and rolling. Your container lashings need to withstand these accelerations and forces. Container trade is one of the fastest and easiest modes of transporting cargo. With increase in size and technology in the shipping industry, container ships are now able to carry more than 18000 containers, with 8 or more container stacks lashed together. When a container is loaded on ships, it is secured to the ship's structure and to the lower container by means of lashing rods, turnbuckles, twist-locks etc. This prevents the containers from moving or jettisoning during rough weather. These designs start with a stability analysis to

check if all relevant criteria are met for the specific loading condition. When the wave height for the transport route is acquainted, the stability data from the analysis is used to calculate motions and accelerations. By way of determining the requirement amount of lashing of containers, our lashing module could reduce the total cost of damage and accidents. Usage of anti-roll tanks could reduce the roll movement of the vessel, thereby reducing the loads exerted on the lashings. Both the lashing requirements and the probability of damage will therefore be further reduced. We have improved our measurement method based upon previous experiences. This experience is based on incidents, near misses, and what was considered as normal.

*“The use of anti-roll tanks impacts the process of sea fastening”*



## HMC is capable to perform risk studies for offshore installations

Besides technical engineering work, HMC is also capable to do extensive risk studies for offshore related subjects. We have the knowledge and the experience to accurately perform risk studies regarding offshore installations such as wind turbines or oil platforms.

Because of the increasing pressure on safety, environmental, economical and financial aspects of operations, the operational freedom becomes smaller. Because of this, a design based on risk analysis becomes more important. To minimize risks, strict regulations are often applied. Unfortunately implementation of merely strict regulations is not sufficient. It is of great importance to analyze all risks that can occur. With decades of experience in warranty surveying and risk analysis HMC is able to perform such studies in an efficient and well trained way. An example of these

studies is the calculation of the chance of a collision between a ship and an offshore wind farm off the coast of Holland. The field was located near a busy transit route. HMC conducted a risk analysis for the technical and logical chance of a collision due to captain's or technical failure. For more information please contact our office at [info@hmc.nl](mailto:info@hmc.nl).



*“Designs based on risk analysis become more important”*



## Offshore installation projects are becoming more complex

In 2014, HMC visited several leading engineering companies to discuss heavy transport engineering and design for transport. Offshore installation projects are becoming more and more complex and the requirements are becoming stricter with each new project.

Additional fatigue is caused by ships which length over beam ratio is close to 3 in combination with a high beam over draft ratio. This results in stiff motions. Stiff motions result in more accumulated fatigue damage during transport. Thence, this also introduces the phenomenon of whipping which contributes to the non linearities of motions analysis and eventually causes fatigue damage of the heavy transport vessel which results in higher deflections during transport. The oil and gas modules located on the heavy transport vessels are subjected to these additional deflections, which will result in more fatigue damage on the module itself. HMC introduced the in house developed Marine Quality Kit (MQK) to measure strains and motions during each

transport to assess the fatigue damage over time. In this way, world leading oil companies can guarantee the designed life time of their on – and offshore oil and gas facilities. For more information or info about our MQK, please contact our office at [info@hmc.nl](mailto:info@hmc.nl).



*“Stiff motions result in more fatigue damage during transport”*

*“HMC: Passion for Engineering”*

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