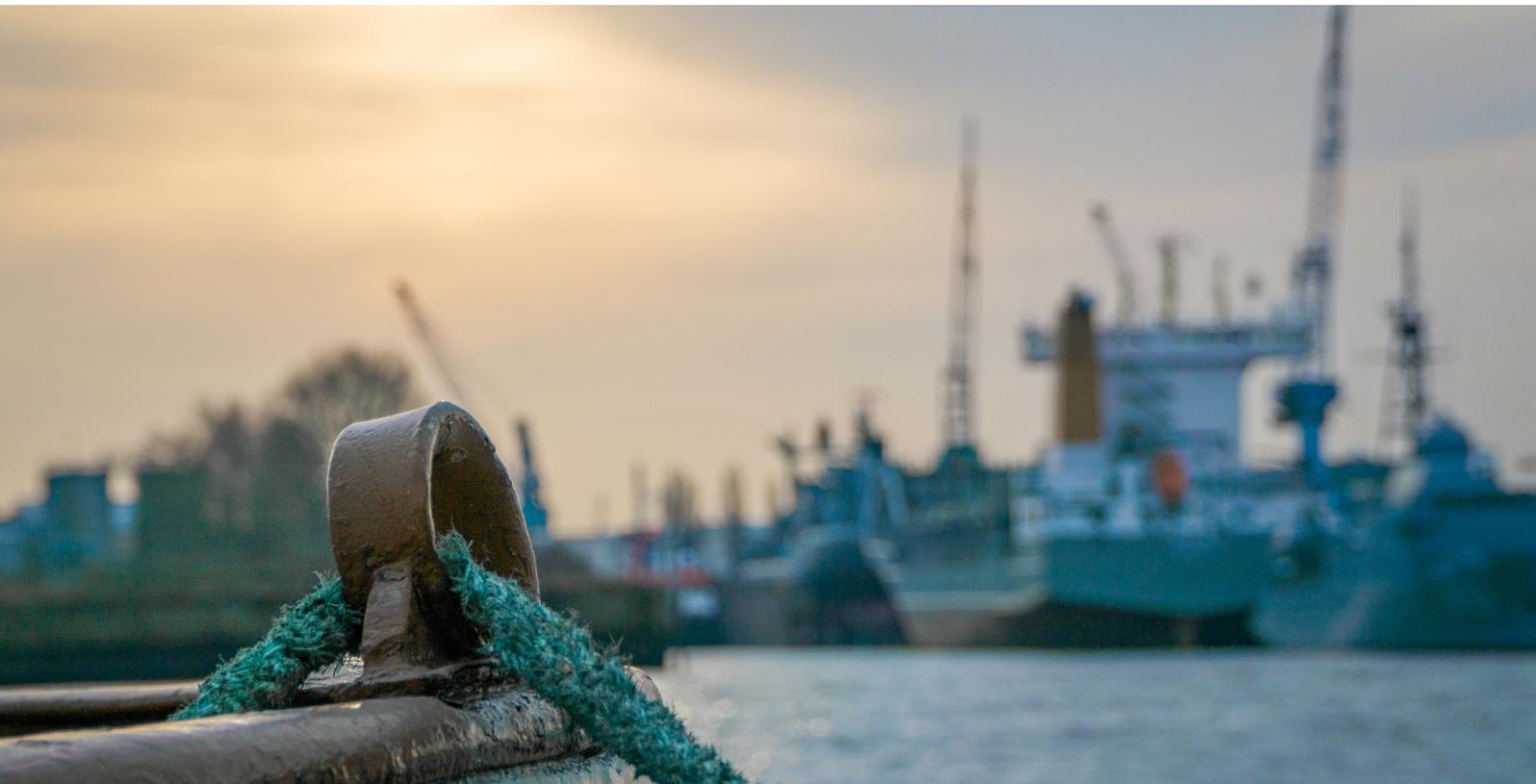




General Introduction

Hydrographic & Marine Consultants BV

AN INDEPENDENT ENGINEERING ORGANIZATION



SAFE
CLEAN
SHIPPING

LET'S MAKE AWESOME THINGS!
TOGETHER.

About us

since 1986



THE ENGINEERING SUPPORT

Offshore and maritime engineering

Hydrographic and Marine Consultants BV is an independent engineering organization operating in the maritime industry since 1986. HMC's scope is within the domains of Marine Services & Hydrography, Maritime software, and Maritime Education.

The products are geared towards improving the safety, quality, and efficiency of maritime operations, improving the economics of operations, and supporting policy decisions.

INDEPENDENCE –
THE KEY TO SUCCESS



About us

since 1986

THE HEAD AND THE HEART OF THE COMPANY

A.J. Bos M.Sc MBA Eur.Ing
Director



Mister Bos is a highly committed marine consultant, with over 30 years of experience. He attained the titles Master of Science in Naval Architecture and Marine Engineering, Master of Business Administration and European Engineer. The title of European Engineer is an award for a high level of knowledge and practical experience.

In 1978 he started as an apprentice at the Wijsmuller Group of companies which is a company renown for salvage and towing. In 1982, he graduated as a naval architect and marine engineer from the Delft University of Technology in the Netherlands.

Since 1978 Mr Bos is involved in towing, salvage and heavy transport operations. In 1986 he established Hydrographic and Marine Consultants (HMC) as an independent engineering company in the field of offshore transport, towing, salvage and anchor handling.

HMC's business unites



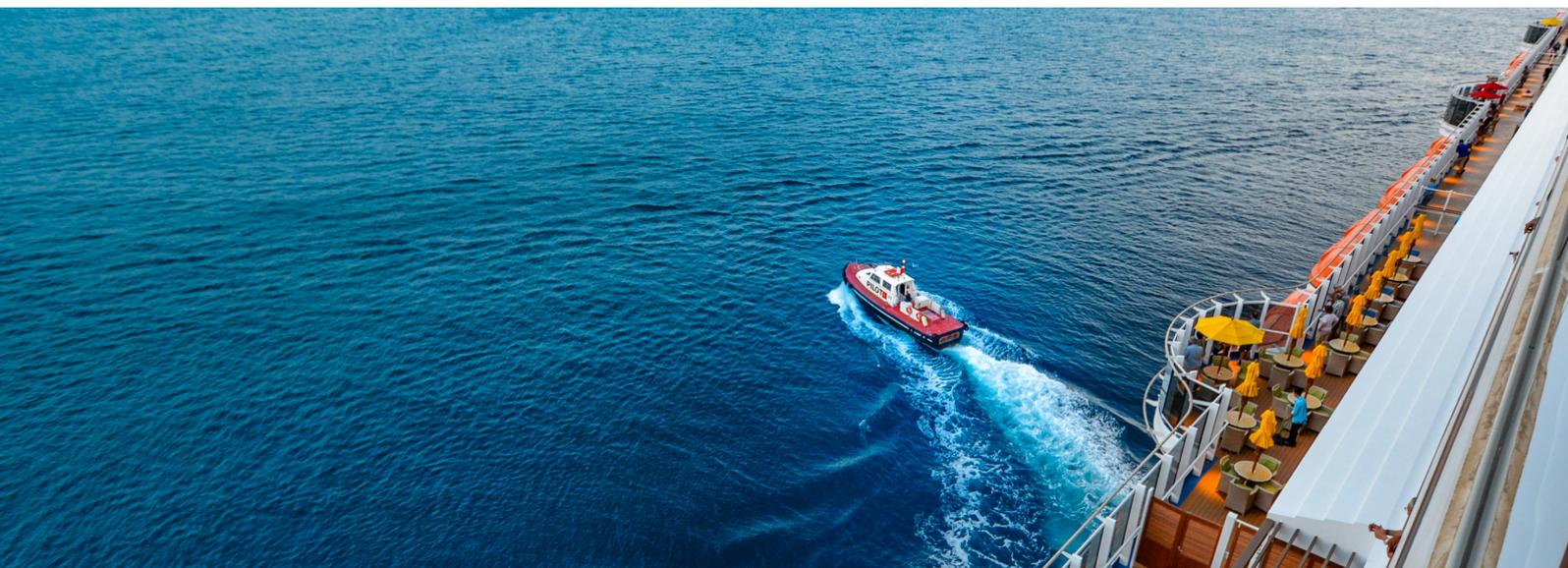
Marine Services aims to support its customers with engineering and operational services and problem-solving during maritime and offshore projects. One of our strength is the wide range of services underlay with more than 35 years of experience.



Maritime Business Applications were designed to give a maximum feeling of safety on board. It is a combination of management science, information technology and engineering, all this in one tool.



To support industry-wide innovation and safeguard the continuity and quality of education, the business unit Maritime Education (ME) aims to share HMC's knowledge on naval architecture and transport engineering with the industry and educational institutions. ME delivers both course materials and complete training sessions.



HMC services



Marine Services

Transport engineering

- Hydrodynamics analysis
- Mooring
- Ballast plan
- Loading operations (Roll-on/off, Skid on/off, Lift on/off)
- Transport manuals
- Towing manuals

FEM engineering

- Simulations
- Strength analysis
- Fatigue analysis

Naval architecture

- Stability books (probabilistic stability calculation)
- Longitudinal strengths booklets

Marine Warranty Surveying

3rd party independent evaluations

Dry docking & launching

Risk analysis

FEED studies

Structural engineering

There are no problems,
only challenges.



Marine Services

References

Brasil	Louis Dreyfus Fairmount	Engineering and conducting the load out and discharge of the Pride South America on the semi submersible heavy transport barge Gavea Lifter. The semi submersible rig was dry docked and thus placed on high cribbing
The Netherlands	Fairmount Marine	After the accident with the Bourbon Dolphin the Norwegian Inspectorate imposed new legislation upon operation with Ancher Handling Tugs (AHT). The rules were worked out for the Sherpa class of AHT
The Netherlands	Shell/Nuon	Study into the feasibility of placing large numbers of Wind Turbines on the Dutch Continental shelf. Study related to navigation around the turbines and the safety of shipping traffic
Monaco	SBM	Feasibility of the transportation of the Deep Panuka MOPU from various load out port in the Far East and Middle East to NW Europe and from NW Europe to offshore Canada. Transport weight 17000 ton
Monaco	SBM	Feasibility of the transportation of the Mopu Talisman Yme weighing 12000 ton from various load out port in the Far East and Middle East to NW Europe and from NW Europe to offshore Canada
Brasil	Maua Jurong	Engineering support for dry docking operations
Malaysia	SDE	Feasibility study and verification of the engineering for the skidding, transportation from Pasir Gudang to Qarar and float over of 2 topsides of 9600 and 9000 ton respectively
The Netherlands	Fairstar Heavy Transport	Ballast sequence and transport condition of Gorilla Type of rig on the Fjord as typical example and part of the class approved stability booklet
The Netherlands	Nepa Shipping	Motion response calculations and assessment of the loads on the seafastenings of inland barges loaded on the multipurpose vessel Ameborg from Shanghai to Rotterdam
France	Technip	Determination of the design parameters of barges for the transportation and float over topsides in the categories weighing upto 10000 ton, between 10000 and 15000 ton, between 15000 and 20000 ton and weighing over 20000 ton
The Netherlands	Fairstar Heavy Transport	B-100 freeboard relaxation for the semi submersible heavy transport vessel Fjord loaded with the Ensco 100 JU Rig
The Netherlands	Biglift	Transport engineering for heavy lift vessels equipped with cranes
The Netherlands	Fairmount Marine	Development of heavy duty long haul ocean going tug
The Netherlands	Fairmount Heavy Transport	Transportation engineering and monitoring of the loading and discharging of the Ensco-100 on HLV Fairmount Fjord
The Netherlands/ Gabon/Malta	Louis Dreyfus Fairmount	Transportation engineering and monitoring of the loading and discharging of the West Titania (ex- Seadrill 7) on semi-submersible barge Gavea Lifter
The Netherlands/ Cameroon	Fairmount Heavy Transport	Engineering for dry-dock operation on the semi submersible barge Fairmount Fjord of Jack-up rig Trident XIV. Rig to be placed at the stern of the barge on 1.60m high cribbing. Loading and discharge by jacking on/off method.

...and much more.



Marine Services

Did you know that...

Ships cover astronomical distances. On average, a container ship travels a distance equivalent to 75% of the way to the moon and back in a single year.

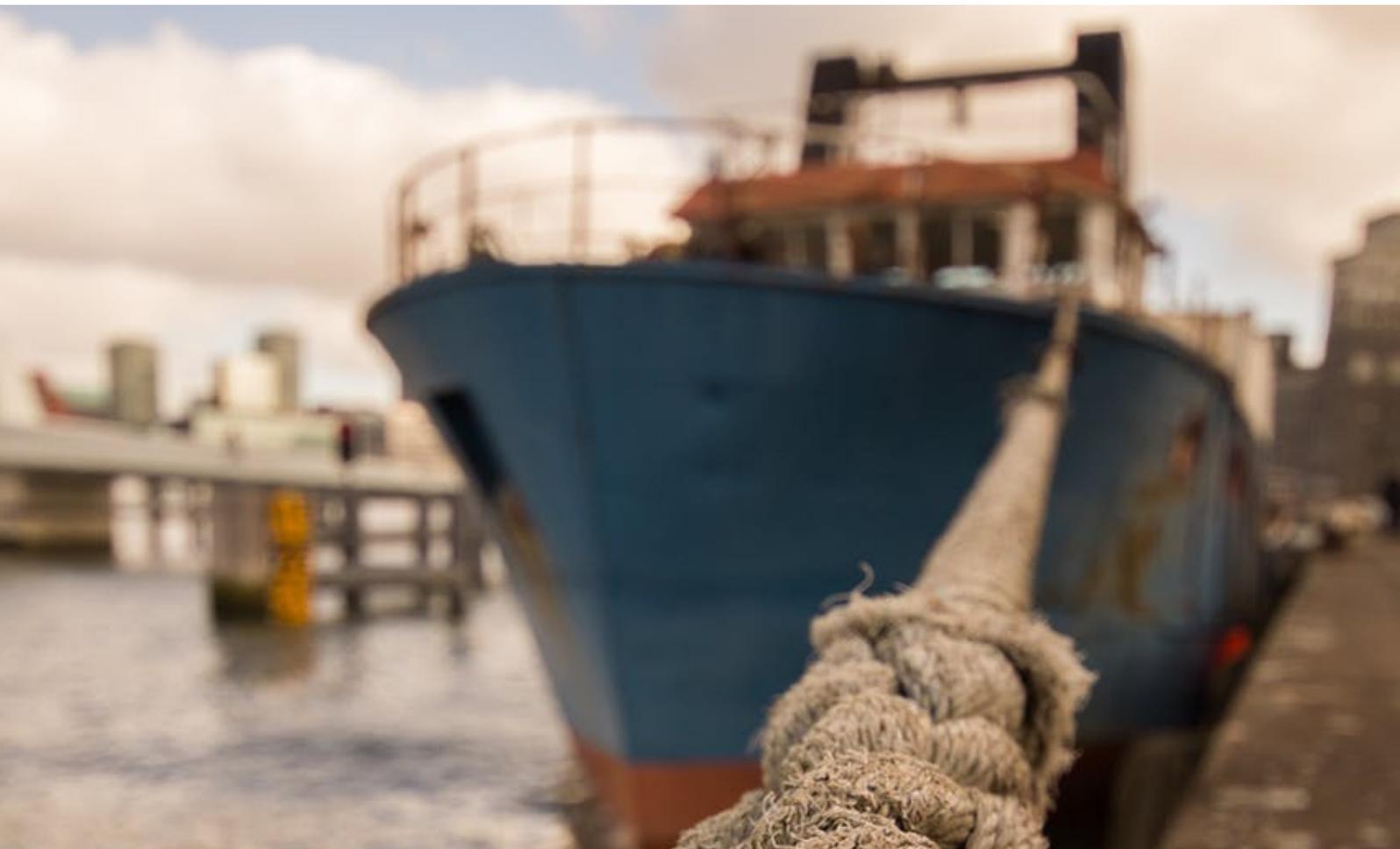
HMMC products



Cost-saving

Time-saving

Comprehensible



Marine Business Application

Cargo Planning and Loading Computer

Ensure the ship stability with our loading computer CPC 2.0

Hull Monitoring System

Measure on-board stresses and forces in the hull online and continuously

Marine Quality Kit

Monitor strain, fatigue and motion behaviour of floating objects

SafeTOW

Try the best assistant for towing and anchor handling

Fuel Efficiency Monitoring Systems

Decrease fuel consumption, save our environment and increase your profitability

All products comply with IMO regulations



Maritime Business Applications

Did you know that...

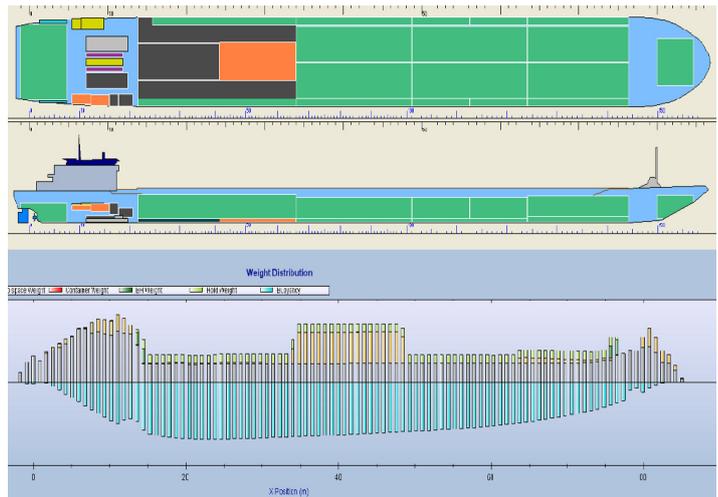
Shipping was one of the first industries to adopt widely implemented international safety standards. And to this day, it is still more heavily regulated than most other industries—with agencies such as the International Maritime Organization (IMO) setting standards for safer, more environmentally friendly shipping.

Cargo Planning & Loading computer **CPC 2.0**

CPC 2.0 is the solution for class approved ship loading operations. This Cargo Planning & loading Computer combines all obliged stability and strength parameters with an efficient and user-friendly interface. The key aspect of the development of CPC 2.0 was to decrease the expert knowledge needed to operate the program. This was succeeded by renewing the interface and redesign the visual aspect of the program.

Specifications

CPC 2.0 is server-based, enabling an exchange of all stored data within the office or ship's server. CPC 2.0 is fully compatible with Windows XP, Vista and 7 and can be delivered with class approved hardware for onboard purposes, or as a license for office use. The program will enjoy class approval and every ship delivery will have a specific vessel approval as well.



Features

- Server-based ship loading computer
- Container, breakbulk, grain and project cargo input
- Ballast water & consumable tank input
- Draft, trim & list calculation
- Observed draft correction input
- Stability & strength calculation

Background

CPC 2.0 is based on CPC 1.9, which was installed on over 1500 ships worldwide since its first delivery in 1970. At that time it was one of the first ship loading computers available for a wide range of ships. During the past years, the program developed and expanded to cover a greater variety of needs which resulted in an extensive list of features available, from a full crane stability option to drag and drop RoRo additions.

Cargo Planning & Loading computer **CPC 2.0**

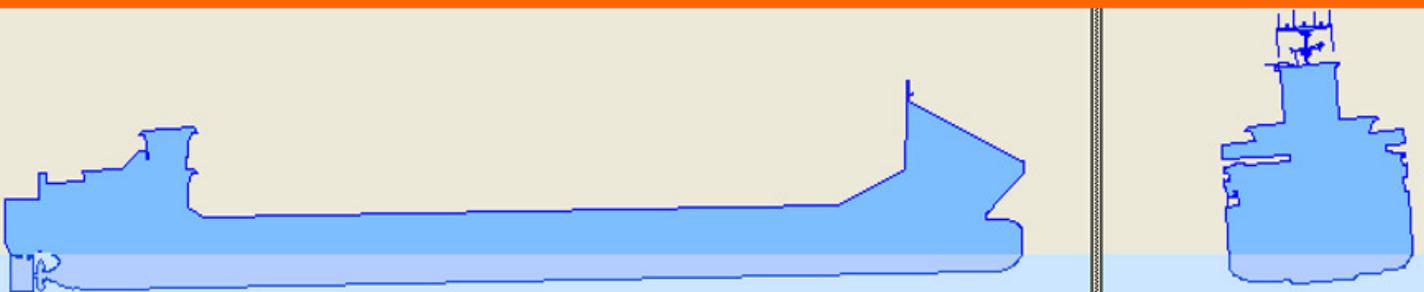
Why to choose CPC 2.0 ?

CPC 2.0 is a **cost-efficient** way to **comply with the IMO stability & safety requirements**. Besides that, CPC 2.0 is **user friendly** as it gets and makes work aboard more efficient and **less time-consuming**.

Vessels sailing nwith CPC 2.0

- Goodwill Condor Ferries
- Clipper Condor Ferries
- STX Fleet STX Pan Ocean
- SV Blue Ship Cooperativa San Martino – Soc. Coop
- Nova Cura Nova Sea Transport
- Nexus Damen Bergum
- Orcana Scheepvaartbedrijf De Haan
- Akatun Dagi Van Oord

...and much more.



Vessel Data

Name	HMC
Lightship Weight	1298.2 ton
Lightship Freeboard	6.900 m
Lightship Air Draught	32.000 m

Hydrostatics

Trim	-1.998 m
Displacement	2611.7 ton
Freeboard	4.166 m
Air Draught	28.515 m

Allowable Values

Minimum Trim	-5.000 m
Maximum Trim	5.000 m
Minimum Freeboard	1.550 m
Available DWT (LCG)	1747.1 ton

Cargo Planning & Loading computer

CPC 2.0 - Roro module

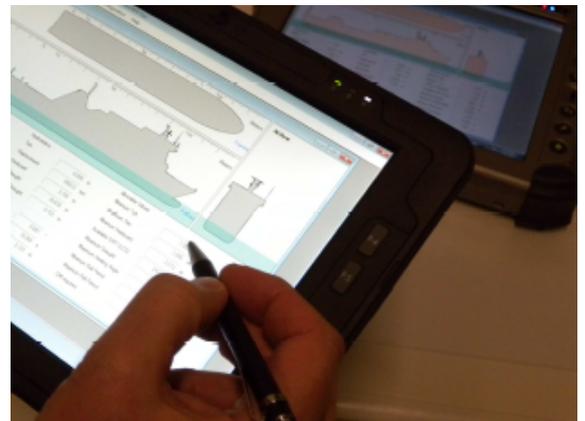
Cargo Planning & Loading Computer (CPC) integrated with RoRo-module

A specialized module for RoRo ships is available, enabling deck officers to manually enter rolling and driving cargo on multiple decks simultaneously. This module is specialized for RoRo ships. And enables a common RoRo type vessel to efficiently load within 1-2 hours and increases onboard safety in the meantime.

Reducing operational costs

We strove to reduce the economical consequences caused by delays of loading and discharging from which the following specifications were derived:

- Enter vehicles on site within CPC 2.0.
- Direct data transfer to the bridge which allows the officer on watch to adjust the ballast condition so the operation will not be hampered.
- Adjust weights, dimensions and positions on deck.
- Direct data transfer from ship to shore to verify the stability condition with the office.
- Synchronize several handheld computers with one cargo planning & loading computer.



Did you know that...

Ocean freight is surprisingly cheap...Thanks to containerization, it is very cost-effective to transport huge volumes of goods by sea. For example, the average costs to ship a bicycle and a can of soda are only \$10 and \$0.01 respectively.

Additional options RoRo-module

- Possibility to deliver the system without wireless connection replaced by a docking station.
- Combine RoRo-module with the damage stability module of CPC 2.0 to increase the ability of assessing and resolve the situation correctly.

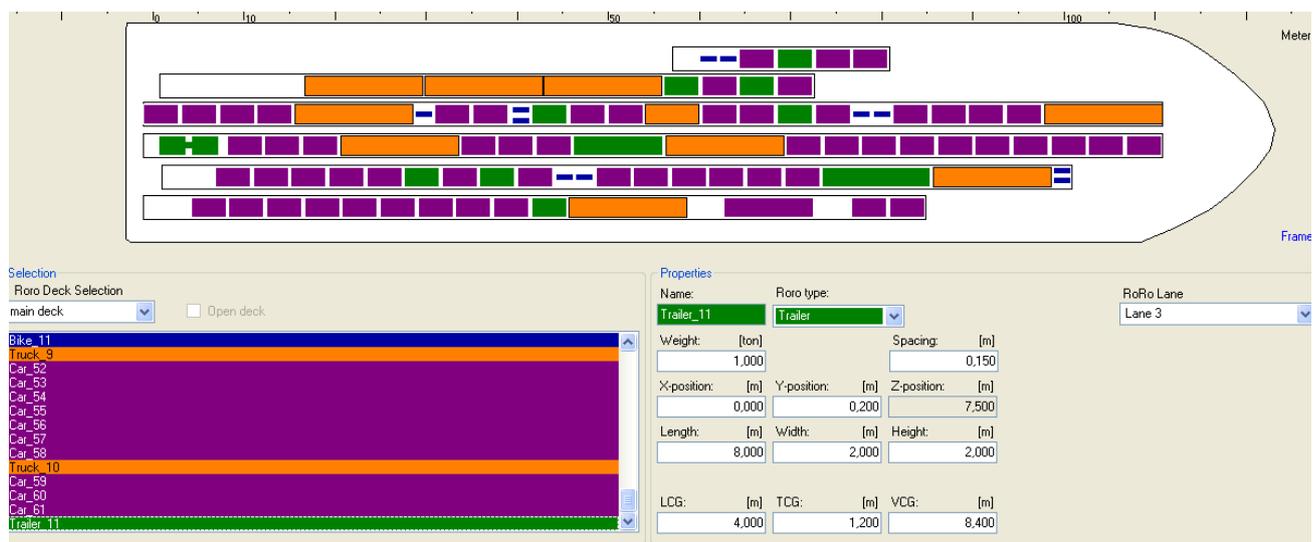
Cargo Planning & Loading computer

CPC 2.0 - Roro module

Increasing safety on board

During the development phase of the RoRo-module, a number of aspects have been taken into account when it comes to increasing the safety management on board. During calamity of RoRo ferries:

- The direct transfer of stability data which is entered at one of the decks
- Transfer of stability data from ship to shore
- The master will be informed directly by the loading computer which is connected to the handheld computers on each deck
- Adjusted operator interface to swiftly assess the current loading conditions and handle adequately
- Knowledge of vehicles location, size and weight during the calamity
- Establish a portfolio of voyages



HMC always has had a high standard for technological improvement and development. HMC invests every year a significant part of her time and effort in the research & development of the products and services delivered.

Hull Monitoring System

Real-time strain information

HMC's Hull Monitoring System is a real-time measuring system monitoring fluctuations in strain on a vessel's hull.

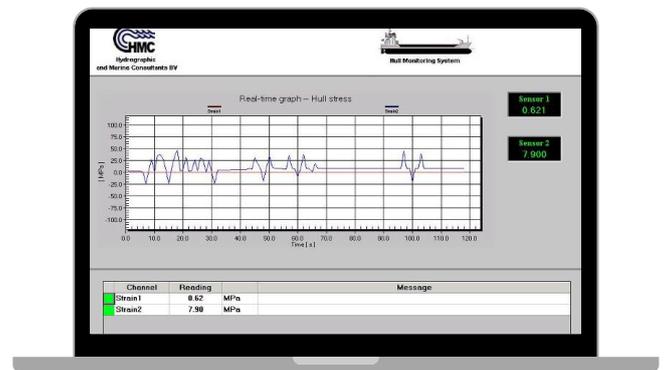
HMC's Hull Monitoring System can be used either as a stand-alone monitoring system or integrated into a bridge information system. The system includes an alarm system for the crew in case the pre-defined design and operational strain limits are exceeded. The system processes and displays the information to the officers of the vessel for operational purposes.

The information displayed on the bridge includes:

- Constructional strain, stress and fatigue
- Motion Fluctuations

Optional:

- Translation to stress & bending moment
- Check with maximum allowable bending moment



The Hull Monitoring System consists of 4 modules that act independently under an overarching program:

- **The Strain Analysis Module (SAM)** monitors the strain on critical positions in the vessel via intelligent strain gauges, which are integrated with a micro-controller.
- **The Ship Motion Analyser (SMA)** monitors and analyses the vessel's motions.
- **The Fatigue Analysis Module (FAM)** uses the input from the strain sensors to analyse the fatigue in critical positions on the vessel.
- **The Fatigue Analysis Monitoring Online (FAMON)** system enables the bridge to monitor the actual rate of accumulative fatigue damage directly influenced by the speed and heading of the ship.

Hull Monitoring System

Hull Monitoring System and ISM Regulations

HMC's Hull Monitoring System supports the implementation of the ISM regulations, such as:

- Ensuring safe operation as per article 1.2 of the ISM-code.
- Chapter 5 on the master's responsibility and authority is supported by different log-in levels ensuring authorities to be clearly stated and carried out.
- Chapter 7 as the Hull Monitoring System can be used to ensure the safe loading of the vessels.
- HMC's Hull Monitoring System is built according to rules for the classification of ships (DNV) and can be certified.

HMC's Hull Monitoring System offers the following advantages:

- The possibility of reducing hull repairs and the risk of damaging cargo.
- It provides data to plan ship maintenance, minimizing condition-based maintenance and supporting the classification process.
- Empirical measurement results of the system may result in the optimization possibilities for ship constructions and the reduction of expenses.
- The system promotes the safety of vessel, cargo, passengers and crew by allowing the officers to reduce hull strain and increase the durability of the hull.
- The system enables the officer to operate the vessel prudently.
- The system provides data to estimate the fatigue life of the hull; moreover, this data can be used to improve the design of new vessels.
- Finally, the system acts as a recorder, which enables owners to monitor the handling of their vessel.

Hull Monitoring for Dockwise

Among others, HMC's Hull Monitoring System has been installed on the Dockwise (former Fairstar) Fjord and Fjell. These two semi-submersible heavy cargo transport ships deal with extreme hull stress and deformation. The input is used as a real-time measurement of seaworthiness as well as proof included in safety reports to customers and third parties.



Marine Quality Kit

Mobile version of Hull Monitoring System

The Marine Quality Kit (MQK) is a portable tool to monitor real-time strain, fatigue and accelerations. In contrast to HMC's HULLMOS system, which also measures strain and fatigue, the MQK is a mobile system. This allows the system to be easily transported and installed on any given structure, in or outdoors.

The MQK measures accelerations and strain. In combination with FAMON fatigue measuring and monitoring software it also provides a crew, owner or contractor with fatigue data. An accelerometer is added to combine real-time strain and fatigue data with sea state conditions and allow the crew to adjust speed and heading to lower stress on the structure.

Where the MQK can be installed?

The MQK can be installed on objects in rugged environments outdoors and indoors. Except for a 230 V power supply, it is fully self-supportive (i.e. cooling). The system can be used either as a measuring device for post-hoc readout and analysis or as a real-time monitoring device. In this last set-up, information is sent to the bridge via a wireless connection.

Vide variability of usage

the MQK can be a useful tool for shipowners, marine surveyors, the insurance industry, contractors and their respective clients.

- Real-time monitoring of motions
- Tool for making real-time adjustments to heading
- and speed to reduce fatigue damage
- (Fatigue) damage report of transported object
- Post-hoc analyses of strain
- Post-hoc analyses of motions
- Comparison to maximum strain
- Real-time monitoring of strain



Marine Quality Kit

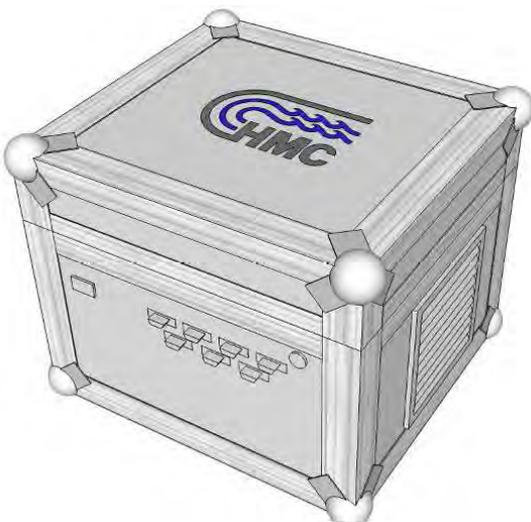
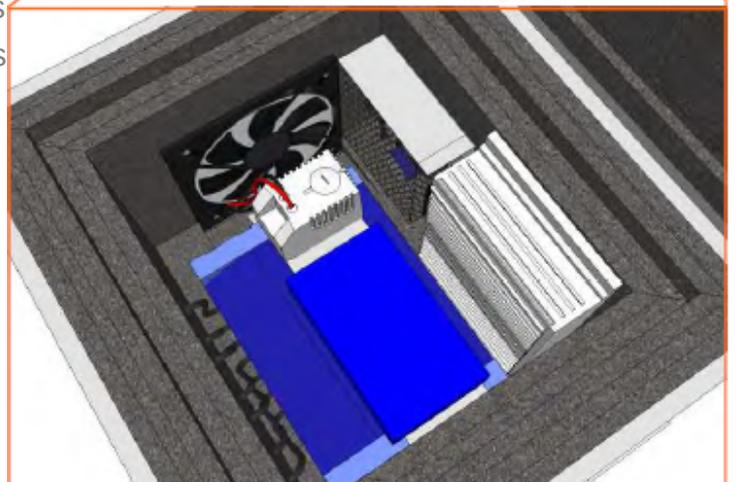
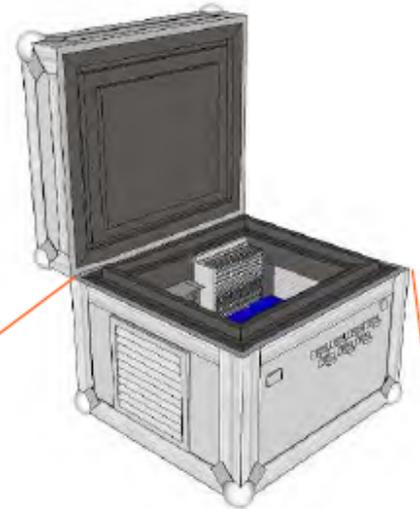
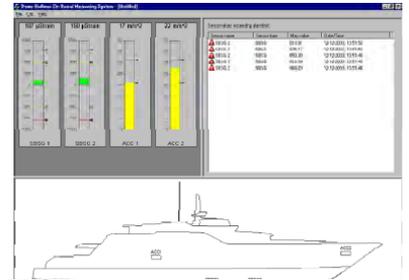
Data

The system saves all strain, fatigue and motion data in corresponding directories. It is also possible to log all real measured data by turning LOG ON. The system will show all measured data in real-time on-screen. Raw data will be processed and analysed by HMC and delivered as per the measuring report.

I have just purchased the MQK. What can I expect?

One accelerometer with three rate gyros forms the core of the measurement box. This way all accelerations can be measured. Besides the sensors, the measurement box contains a data acquisition board and a micro PC to store the data. Five channels are used to record five strain values measured at critical points. Data are transferred to the computer via a USB data link. After this, data will be transferred via WiFi to a pc located at the bridge, to be able to view the data in real-time.

Screenshots in this flyer show the updated 2012 version of the hardware. The previous version of MQK (without WiFi function) has been installed multiple times.



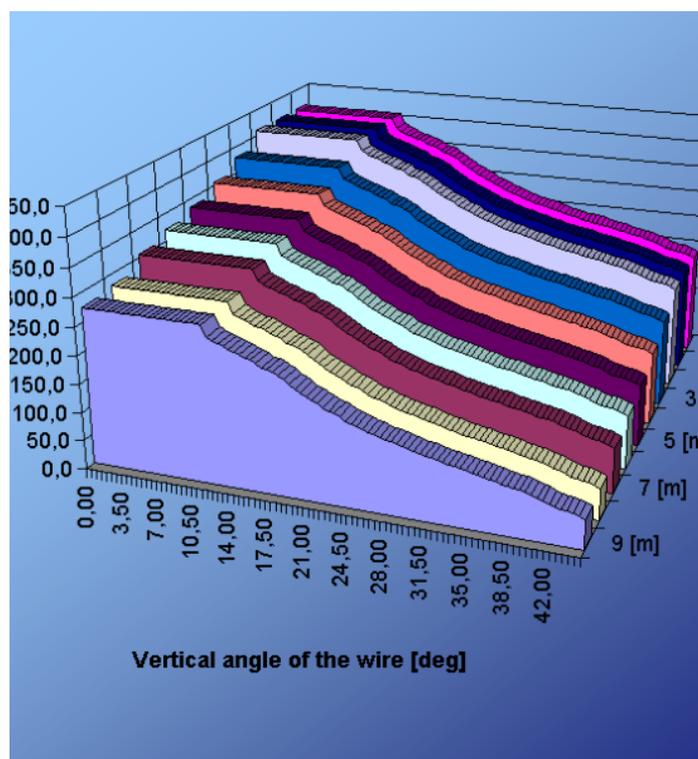
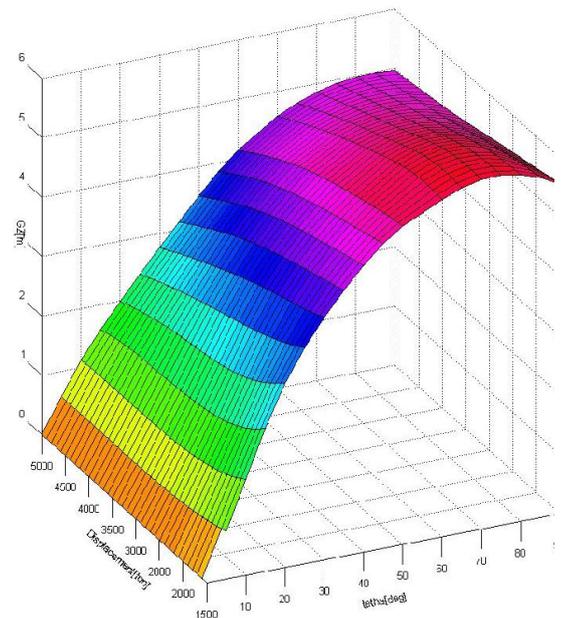
SafeTOW

Safety system for towing and anchor handling

HMC's SafeTOW is our safety system which offers a solution for stability aspects of vessels engaged in towing and anchor handling operations. With this safety system, you have the ability to keep an eye on the tug's power and propulsion system during your operations.

Tug vessel propulsion

Tug vessels can have power ratings up to 20.000 [kw] and are highly manoeuvrable. Dangerous situations can occur when tugs are not in line with the forces on their tow line or when the tug is swung beam onto the towline. This happens usually by excessively high tow tensions. This phenomenon is known as 'girting'. These kinds of accidents occur when the tow takes control of the tug. The tug can be towed sideways which might result in capsizing.



Safety card

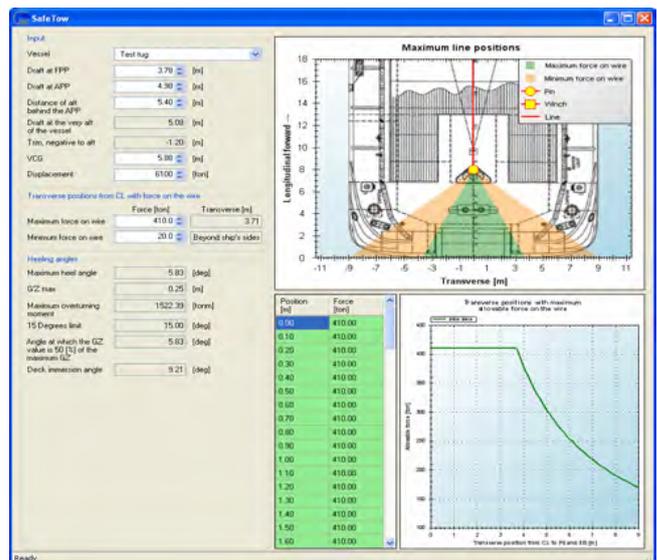
Information on HMC's SafeTOW safety card HMC's SafeTOW safety card can be used at the bridge to keep an eye on things that could happen during towing or anchor handling operations. In advance, we present all our measurements about your towing operation and assess the current towline force concerning the lateral distance of the vessel's centreline which guarantee the safety of the vessel and the crew. At the moment we are working on the implementation of SafeTOW in HMC's Cargo Planning and loading Computer (CPC). These combined HMC products ensure the safety of the vessel and crew.

SafeTOW

Safety system for towing and anchor handling

Stability of Tug vessels

The stability range of a tug, when towing or anchor handling, can only be judged from its GZ curve. The reduction in a tug's range of stability (caused by the increase in the stern trim) is by far the most significant. When there are large amounts of thrust necessary it is often not possible to realize how close the tug is from capsizing. Tug vessels are powerful vessels but can be thrown off when their own strength is used against them.



Why to choose SafeTow?

SafeTOW was developed through HMC's experiences in towing and anchor handling operations. The danger of capsizing cannot be underestimated. Officers only have minutes to recognise these situations which then is becoming irretrievable.

Did you know that...

Passive anti-roll tanks are the most economical solution to prevent parametric roll. The solution is simply to install a small anti-roll tank to absorb the surplus energy that you otherwise collect to produce parametric roll.



The Passive anti-roll tanks can be interfaced with our loading instrument CPC as well as the Hull Monitoring System of HMC. This installation we recently installed on a highly sophisticated research vessel.

FEMS

Fuel Efficiency Monitoring Systems

With stringent emission regulations on the horizon, the market is in need of a system that measures your ship's efficiency. HMC is proud to present an intelligent tool that measures your actual fuel consumption and generates a detailed overview for optimizing engine and fleet performance while maintaining emissions compliance

Reduce your fleet's Green House Gas Emissions

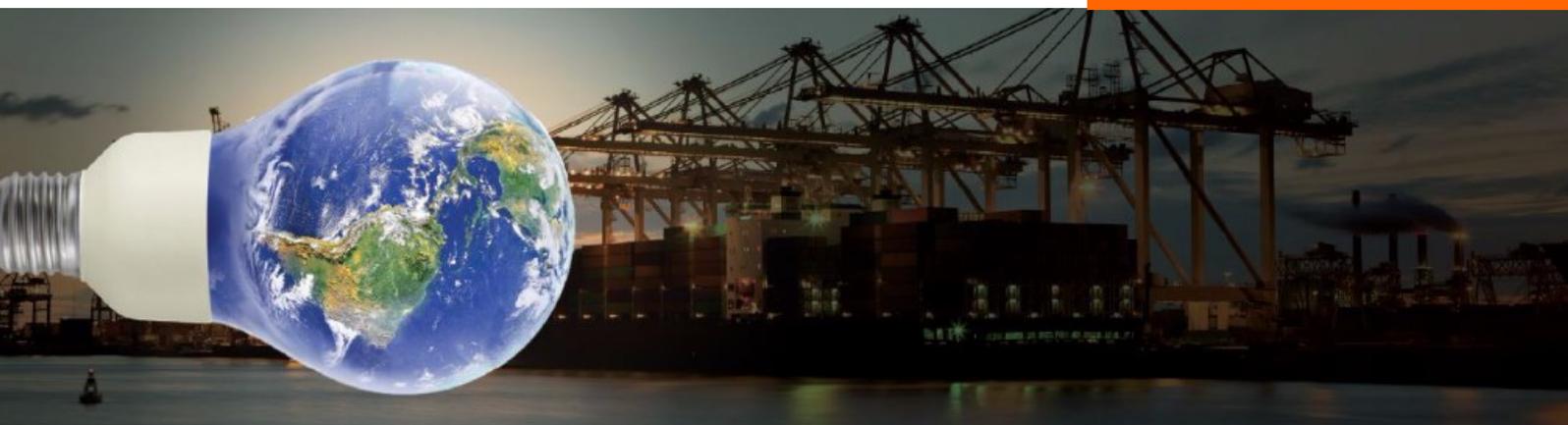
At HMC BV we care about our environment. We believe we can help reduce the Green House Gas Emissions. Through our passion for ship technology, we want to contribute to the preservation of our planet for future generations.

Our solutions work three fold:

- Provide the captain and his officer's with insight into the Key Process Indicators (KPI's) that make up efficiency and with the tools to take immediate action to improve efficiency.
- Providing comprehensive (voyage) reports to the operations department to plan efficient voyage in regards to optimal cost and optimal fuel operations.
- Provide data information to the technical department for long term trend analyses in order to efficiently plan major maintenance and keep the fleet in perfect condition.

Proven facts:

- Pay back time on average short sea ship is 2-4 months
- Complying with the latest IMO regulations on Emission Reductions.
- Optimal use of the Latest Technology
- More than 150 systems in operation.



FEMS

Fuel Efficiency Monitoring Systems

Reporting

Several reports are generated automatically in CSV format and stored onboard. They can be opened in Excel or used as input in analysis software. Available reports are:

- Log files
- Daily reports
- Voyage reports
- Voyage update/progress
- Fuel oil change over reports

The reports can be accessed by any ships computer connected to the skip's Ethernet. Ship officers can use it there for making reports or can be sent to the shore office(s).

All available data can also be retrieved from the systems by MODBUS over Ethernet for use by other management software.

Analysing

The product line is complemented with a powerful inline analysis tool. Data is automatically sent ashore via e-mail.

Easy accessibility

The information, reports and analysis tools can be accessed with any electronic device with an internet connection.

Why FEMS?

- reduction of emissions
- improved fuel efficiencies
- increased profits
- compliance with IMO



HMC education



Maritime Education

Knowledge is the key

To support industry-wide innovation and safeguard the continuity and quality of education we aim to share the knowledge-base with the industry and educational institutions through our lectures.

Lectures offered by Marine Education:

- On-site training on custom topics within the area of the maritime industry
- In-house courses on various topics (transport engineering, MWS etc.)
- Guest lectures on schools and universities
- Re-training courses for nautical employees towards maritime engineering careers

References

- Course Transport engineering on semi submersibles for TPI MegaLine, Seoul South Korea
- Guest lecture TU Delft Wet Transport of Floating Offshore Structures 2010 TU Delft, The Netherlands
- Guest lecture TU Delft Wet Transport of Floating Offshore Structures 2011 TU Delft, The Netherlands
- Guest lecture TU Delft Wet Transport of Floating Offshore Structures 2012 TU Delft, The Netherlands
- Absolute BME training: New generation anchor handling for offshore fields Kuala Lumpur, Malaysia
- Absolute BME training: Transportation & Design for FPSOs and oil & gas installations Kuala Lumpur, Malaysia
- Absolute BME training: inspection, maintenance, selection & application of marine steel wire ropes Kuala Lumpur, Malaysia





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