Safe and Reliable Docking/Berthing Approach Systems

Mampaey Offshore Industries, The Netherlands

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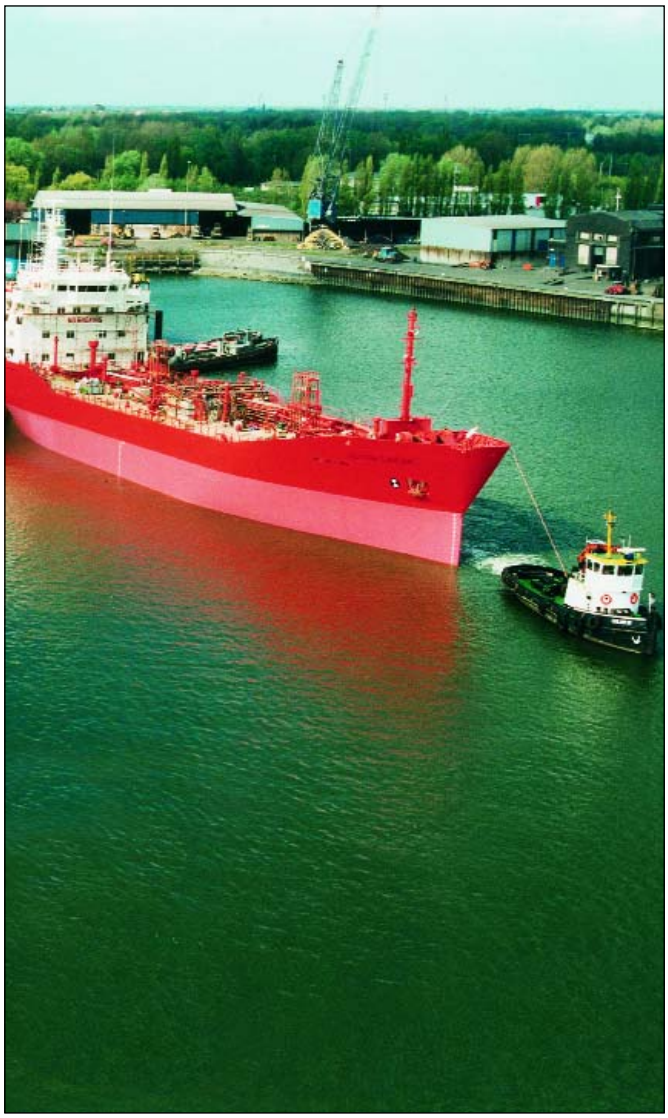
In 1904 Mampaey developed the traditional towing hook.
Since then Mampaey has grown to be Mampaey Offshore Industries B.V. the world leader in Safe Mooring and Towing Systems. Mampaey design and manufacture a complete line of equipment for towing and mooring applications which are in use world-wide.

Only the highest level of safety standards are acceptable in our world today. Vessel and terminal operators must eliminate every chance of dangerous situations developing. Personnel involved with the berthing of a vessel need to have every possible piece of information available to them. The last stages of a vessel's approach are critical in ensuring personnel and equipment safety. To enable this, personnel deserve the best equipment available to them to eliminate the chances of injury or damage to the jetty.



Berthing Aid System

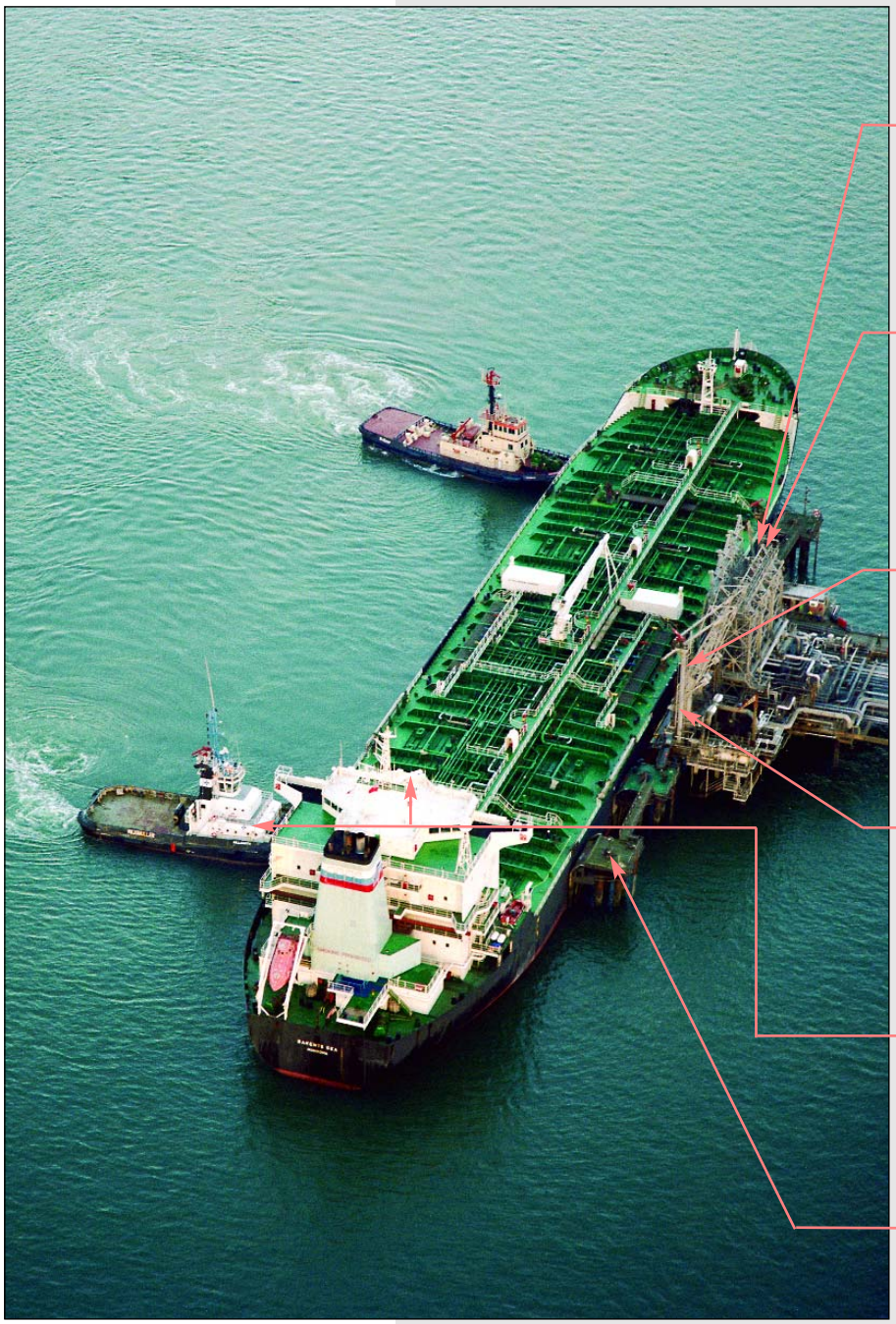
Judgement of low speed as a vessel make its final approach during berthing operations can be particularly difficult. Berthing Aid Systems (BAS) assist Pilots and crew during final berthing manoeuvres increasing the safety and security of the whole operation.

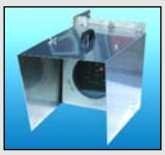
With the use of two laser modules, the distance, angle and speed of approach of a vessel during final approach can be communicated to the Pilot in one of several ways.

A 'traffic light' display can be used to give safe, warning and danger indications of speed of approach fore and aft.

A large numeric display unit gives continuous advice about speed of approach, distance from fenders and angle of approach.

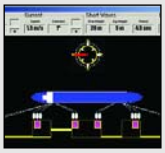
Additionally, hand held 'pager' units can provide the same data to onboard personnel and / or tug boat crews.





① **Laser Units**

② **Environmental Monitoring System**

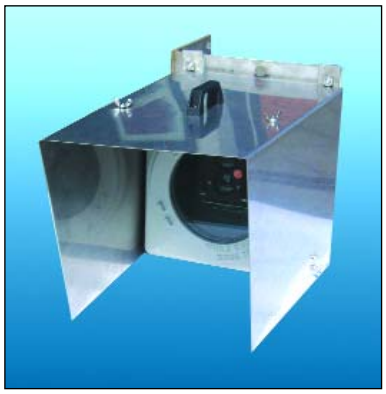


③ **Control Room Equipment**

④ **Display**

⑤ **Pager Units**

⑥ **Mooring units with Mooring Load Monitoring**



1. Laser Units

These binocular type laser units emit invisible, eyesafe (class 1), infra-red energy pulses. Sophisticated circuitry and a high speed clock are used to instantaneously calculate distance, by measuring the time it takes for each pulse to travel from the sensor to the target, and back. Two identical laser units are mounted on adjustable support frames on the wharf face inside the fender line. Measurements are made using fender line as a datum point. Fender compression will be recorded as negative distances.

2. Environmental Monitoring System

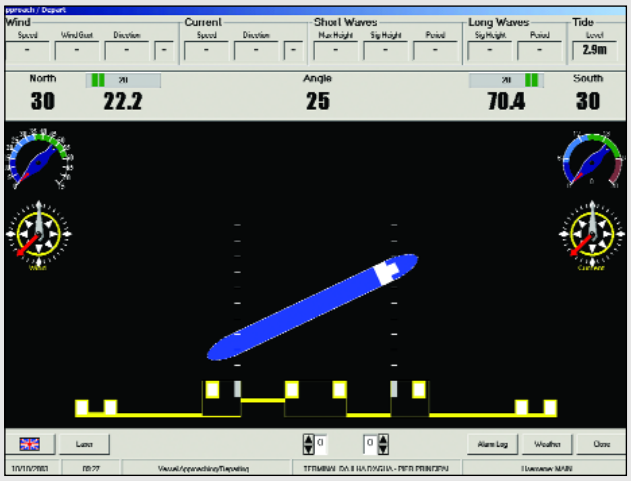
The addition of an Environmental Monitoring System (EMS) further enhances safe berthing. The EMS gathers and displays data such as: tidal status, sea current speed / direction, wind speed / direction, barometric pressure, ambient temperature and relative humidity. A variety of sensors are available for wave, tide and sea current measurement and it is critical to assess the local condition in order to install the correct sensor. Mampaey can offer help and guidance to ensure your system meets the requirements of local environment.

3. Control Room Equipment

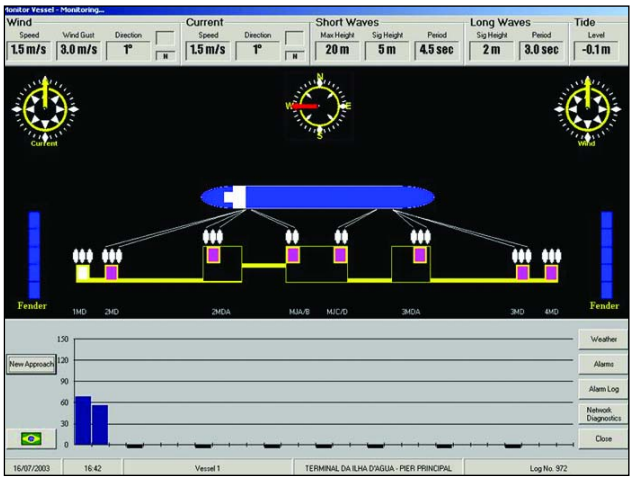
Control Room equipment is modelled around the client's specification but would typically be based upon a touch screen computer. This enables visual indication of the berthing and mooring situation with the additional benefit of control of remote release mooring hooks.

After the vessel is berthed, mooring units with integral load monitoring systems provide valuable information to the terminal personnel. The mooring load is measured by the integral load cell, giving the proportional load in the mooring line.

The signals from the load cells are networked into a data link terminating at a computer which is often located in the jetty control room. From here the data can be incorporated into DCS systems if required.



Vessel Approach



Load Monitoring

Once an approach sequence is initiated, the selected vessel will be displayed upon the screen as soon as it comes within range of the laser sensors.
The display gives a dynamic representation of the vessel's final approach to the jetty. The display also indicates any faults or warnings such as excessive speed or angle of approach. All approach and mooring data is stored on the hard disk of the computer.

Once the berthing process is complete the software switches to the MLM screen view. The vessel's mooring configuration is displayed and the load on each line is represented in a bar graph across the lower third of the screen.

4. Berthing Approach Display

A variety of units can be offered to give a visual indication of berthing operations.
From the relatively simple traffic light display with red [danger], amber [unsafe] and green [safe] berthing speed warning lights, to the fully integrated large numeric display incorporating the traffic lights.

A high visibility display, suitable for Zone 1, can be located on the jetty to view the data generated by the two lasers. The data displayed on a large 7 segment display comprises:

- 3 digit distance display in meters fore and aft
- 3 digit speed display in cm/second fore and aft
- 6 speed lights, red, amber and green

5. Pager Units

The pager system [wireless displays] enables personnel involved with the berthing process to receive updated information regarding vessels attitude. Information displayed can vary dependant upon the phase of berthing but in general would include such information as: distances and speeds for stern and bow, alarms and mooring load data.

6. Quick Release Mooring Hooks

Mampaey Quick Release mooring hooks have been specifically designed for safe manual or automatic release of mooring lines whilst under full load conditions. This requires only minimal of effort.
Only a single action is required to reset the hook to its working position.
Standard mooring units are available with 40, 60, 75, 100, 125, 150 and 200 tons S.W.L. and as single, double, triple, quadruple or sextuple versions.

The units can be mounted on concrete or steel deck structures.Units are designed to operate through 180 degrees horizontally and 45 degrees vertically. They can also be supplied with integral capstans and/or other features, such as electric or hydraulic remote release systems controlled by a remote panel.

Mampaey Offshore Industries also offers Commissioning and Training. After being installed and electrically connected equipment can be commissioned and started-up by a Mampaey Engineer. Training for jetty and control room personnel can also be performed either at Mampaey's premises or at site

Other product lines from Mampaey offshore Industries include:

Quick Release Towing Hooks - Offshore Hooks [FPSO] - Mooring buoys

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