



MARIN simulators

MARIN's nautical centre MSCN (Wageningen) operates three different types of real-time simulators for research, consultancy and training purposes of professional mariners. The simulators can be used separately or combined in the same scenario. The steering controls can be easily adapted to the specifications of the simulated vessel. At MARIN the following 6 real-time simulators are available:

- **Full Mission Bridge I (FMBI):** Especially suitable to simulate large ocean-going vessels.
- **Full Mission Bridge II (FMBII):** A flexible facility, capable of simulating a wide range of vessels.
- **Four Compact Manoeuvring Simulators (CMS):** Smaller simulators that can be used to simulate all kind of tugs and smaller vessels.

MARIN operates full mission ship manoeuvring simulators at three different locations:

- MARIN: Wageningen, The Netherlands;
- MARIN USA: Houston, USA;
- Oceanica: Sao Paulo, Brazil.

Depending on the wishes of the client research projects, consultancy and maritime training can be done on each of these locations.



FMBI, bridge house with cylindrical projection wall

Full Mission Bridge I (FMBI)



This is a fully equipped bridge with 360 degrees visual projected scenery. A mock-up of a real ship bridge is located in the centre of a cylindrical projection wall on which the graphics image is projected. The diameter is 20m and the bridge house is approximately 8m by 6m. The bridge is equipped with realistic consoles and instrumentation, including bridge wing consoles. Bridge and console layout can be adapted according to client wishes or research needs.



Software

All simulators use MERMAID500 and Dolphin simulation software. This software is DNV approved.



Sao Paulo and Houston simulators

The simulator facilities in Sao Paulo and Houston use the same software as in Wageningen. Both facilities consist of a primary bridge and have the possibility to include a secondary bridge or Pilot/Captain station. The primary bridge has 360 degrees visuals. The secondary bridge can be used as a second vessel in the simulation or as a tug.



Sao Paulo



Houston

More information

A detailed description of the capabilities of MARIN simulators is given in the 'Capability statement'. This document can be obtained through the website (www.marin.nl) or can be provided upon request.

For more information contact MARIN:

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Full Mission Bridge II (FMBII)

Full Mission Bridge II (FMB II), has a 210 degrees visual projected image. In addition to the projection system, the rear view is presented on three separate displays, thus providing almost 360 degrees view. Additional viewing positions offering a 3D view from any observation point can be installed.

Compact Manoeuvring Simulators (CMS)

The four Compact Manoeuvring Simulators can be divided into:

- Two cubicles with 300 degrees visuals and rear-view monitor
- Two CMS with 180 degrees visuals and rear-view monitor

The four Compact Manoeuvring Simulators are based on exactly the same 'ownship' functionality as the full-mission simulators. The default configuration consists of a U-shape console with steering controls, radar, instruments and bird's eye view showing the area and position of vessels. These facilities are ideal to simulate tugs and smaller vessels, but can also be used for anchor handling or crane operations.

Mathematical modelling

In nautical simulations the mathematical manoeuvring model of the ownship is of major importance. The quality of this model can determine the outcome of a research project and the realism of training to a high degree. MSCN's models are based on extensive research into the field of ship hydrodynamics and port and waterway design. The ownship models have six-degrees-of-freedom (6 DOF) taking into account the influence of all external effects, e.g. wind, waves, tidal currents, bank suction, ship-ship interaction, etc. They are water depth/draft dependent, so the manoeuvring characteristics will vary depending on the actual water depth and the vessel's draught.

MSCN has a large database of mathematical manoeuvring models available. In addition to this, MSCN experts can prepare a dedicated model based on available model tests or manoeuvring tests.

Tugs and targets

Tugs can be included in MSCN simulators in three different ways:

- Controlled from a simulator (FMBII or CMS)
- Instructor controlled tug model (C-tug)
- Instructor controlled forces

The most realistic option is a man controlled tug from another simulator. It has the most realistic behaviour, especially when the tug is controlled by an experienced tug master. However, the instructor controlled tug model also results in realistic behaviour of the tugs. For the simulation of other traffic MSCN has a large number of target vessels available. Each target consists of a visual representation as well as a mathematical model for realistic manoeuvring.