

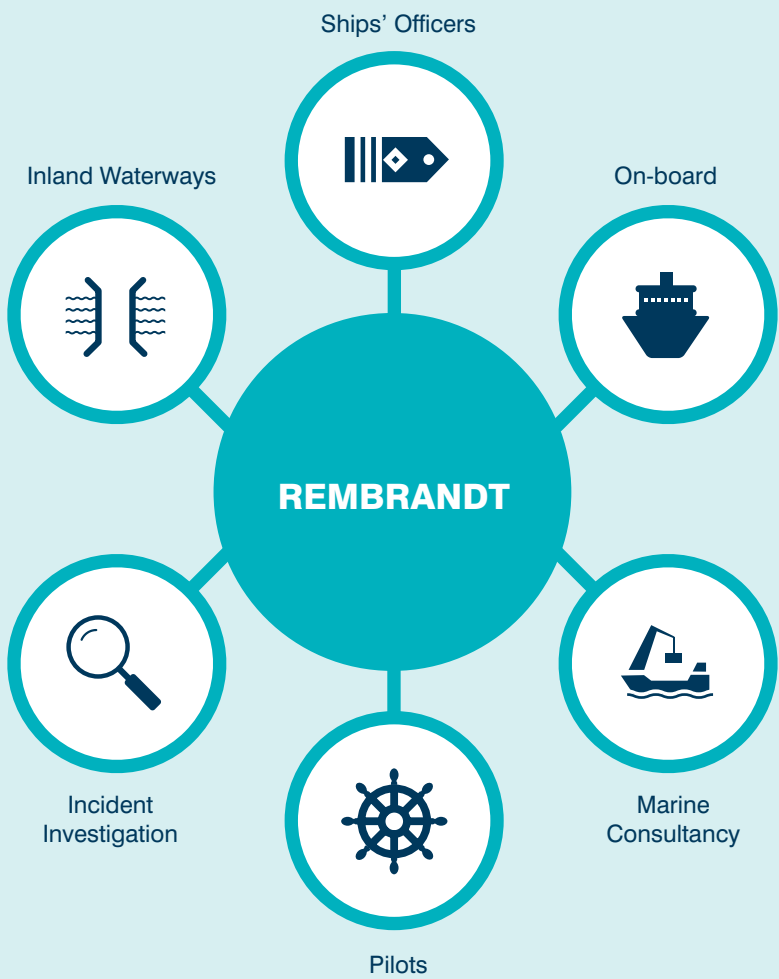
Manoeuvring and Navigation Simulation Services

Information and applications



REMBRANDT: simulating success

Maintaining its reputation as the benchmarking simulator for hydrodynamic accuracy, the latest version of BMT’s ship and manoeuvring simulator REMBRANDT (REal time Manoeuvring, BeRthing AND Training) continues to lead the way in many markets: port feasibility, design and evaluation studies; marine incident investigation; pilot training and bespoke training courses for shipping companies.



Utilising its newly constructed simulation centre near Southampton, U.K., BMT Ship & Coastal Dynamics now offers a fully equipped, full mission bridge simulator.

Comprising a main and second bridge, classroom with interactive facilities and instructor workstation, all fully supported by a team of experienced mariners and simulation experts.

In addition to providing high quality marine consultancy, detailed incident investigations for litigation plus a wide range of bespoke training courses specifically tailored to the needs of marine professionals, BMT's new facility is fully equipped to DNV Class A (navigation)

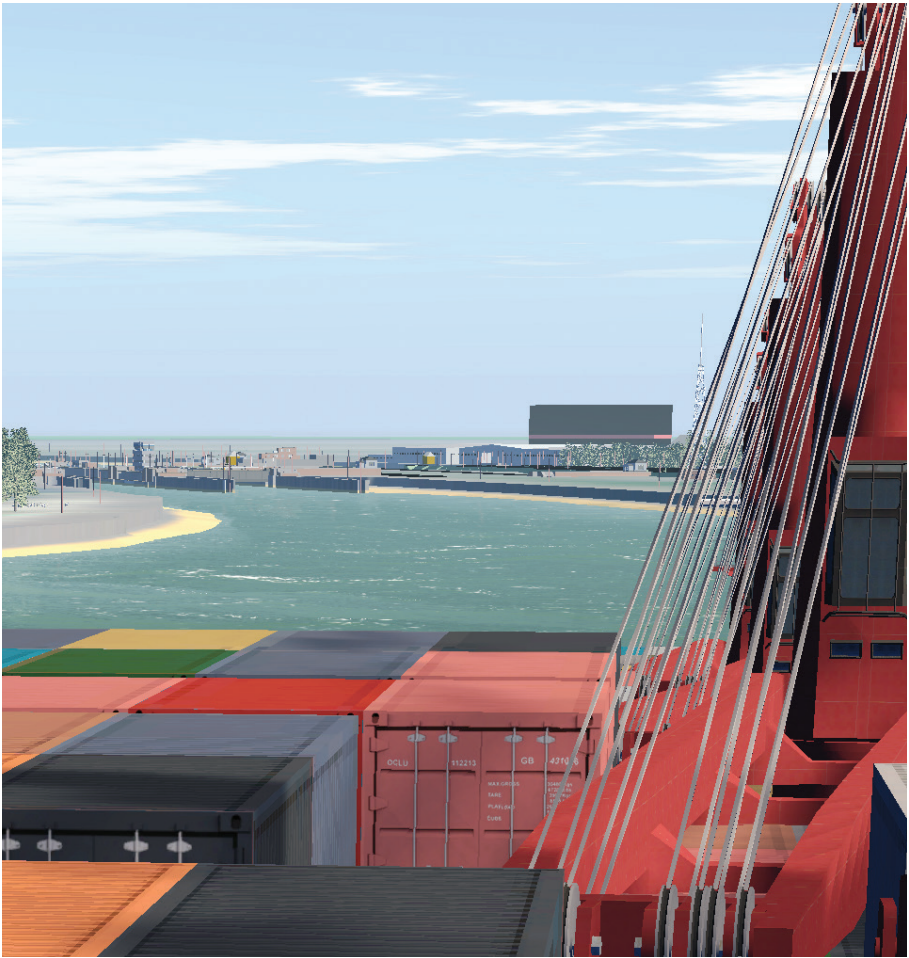
standards and can therefore be used for the delivery of IMO/STCW standard courses.

Building upon its extensive experience of delivering high quality simulations to the oil and gas, ports, shipping and pilotage markets, carefully designed and professionally delivered training courses will ensure that the intended learning objectives and trainee assessments are achieved.

The new REMBRANDT ship and manoeuvring simulator facility is ideally suited to:

- Ship handling manoeuvring training for ships' officers

- Assessment of port arrangements (berths, channels, aids to navigation)
- Validating port operational guidelines under varying environmental conditions
- Determining tug performance requirements
- Pilot training and assessment for PEC
- Development of inland waterway facilities
- Incident investigation and legal work
- Exploring alternative methods of ship control
- Practice of emergency scenarios



Ship Models
All hydrodynamically accurate ship models are created individually by skilled naval architects to reflect the characteristics of a ship or Class of ship and are fully validated.

Models can be supplied individually or as a library of different ships.

For example, each system placed on-board a particular ship could be ship specific, yet a shore-based system could be configured to provide the option of simulating any ship in a particular fleet or a range of ship types common in a particular port.

Most ship types - from catamarans, ferries, ultra large container ships to oil platforms and dredgers - can be accommodated on the simulator.

In addition to the creation of a highly detailed image of the ship model, features such as anchors, mooring lines and winches are also modelled by our naval architects to ensure that the full range of manoeuvring, berthing and mooring scenarios with correct fendering can be accurately simulated.

3D Visualisation

REMBRANDT automatically creates a 3D visual scene from the available S57 electronic navigation chart (ENC) or BMT proprietary charts.

The standard 3D visual scene is created from any chart at no additional cost to the user and accurately represents all the navigational information such as lights, navigation marks, bathymetric and other significant features.

Highly detailed scenes of ports and other locations can be built up by the addition of high resolution imagery such as aerial photographs and user digital photographs of significant buildings, landmarks etc.

A significant benefit to the user is the way REMBRANDT generates 3D imagery when a new edition of an ENC is uploaded to the simulator.

The object images that enhance the 3D visualisation are rendered separately as an overlay onto the navigation chart and are therefore reusable, thus avoiding the costly and time consuming task of recreating a port scene every time a new edition of a chart is published.

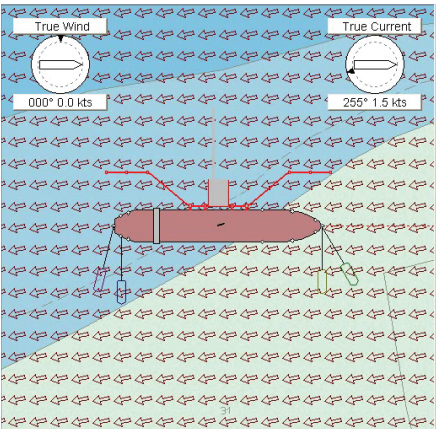
Scalable Installations

Starting with a straightforward desktop or laptop PC with two monitors where space is at a premium or portability is required, BMT can supply you with an easy to use economic solution that is perfectly suited to the training or office environment where the full immersive atmosphere of a full mission bridge is not required.

Our mini-bridge is the perfect option where a compromise between desktop and full bridge is needed.

The mini-bridge is ideal for a more extensive semi-permanent installation, with greater emphasis on visuals and information displays, yet where space and costs are still a limiting factor.

For a permanent full mission bridge simulator BMT's REMBRANDT suite of modular software is the ideal solution, where the requirement is for an installation that will satisfy the requirements of a fully Type Approved system certified by DNV to Class A standards.



REMBRANDT markets

The accuracy and realism of REMBRANDT make it a powerful training and familiarisation tool as well as a valuable port planning resource and incident investigation tool.



REMBRANDT for Ships' Officers

Opportunities to practice taking a ship into a new port, taking command of a new ship type or berthing alongside a floating production unit in the real world can be very limited.

Nonetheless ships' masters are expected to successfully

and professionally handle their ship in a wide variety of different circumstances, often in extremely adverse weather conditions.

Using BMT's simulation experts, bespoke training courses, such as conducting mooring operations associated with berthing alongside

an FLNG platform or FPSO, can be practiced in a variety of conditions likely to be encountered in the real operational environment.

By working closely with the client, BMT will ensure that the training provided delivers in line with the client's expectations.



REMBRANDT for On-board

REMBRANDT is regularly and effectively used on board cruise and other ship types for the assessment of safe operating limits in a particular port under varying environmental conditions, including under-keel clearance, speed of approach etc.

This makes it an ideal tool for providing junior officers with ship-handling experience that they would otherwise not receive.

As well as on board, REMBRANDT may be used at ship operators' offices for overall company use.

It is ideally suited to the rehearsal of manoeuvres prior to entering into commercial arrangements and making overall assessment of port suitability for specific ship types.

More recently, shipping companies operating LNG tankers have been demanding REMBRANDT as part of the new-build, fit out specification for bridge equipment.

Public perception of LNG vessels demands that operators of these ships are seen to be taking every precaution to ensure the highest standards of safe operations.

By training on REMBRANDT, masters and senior officers can practice port approaches and manoeuvring in advance of port arrival.



REMBRANDT for Marine Consultancy

BMT has many years' experience in all aspects of ship manoeuvring from full scale trials, free running and captive model tests to mathematical prediction and simulation. BMT experts typically use REMBRANDT for real and fast-time ship-handling and manoeuvring simulation for the following applications:

- Assessment of port layout, channel width and depth, turning circle dimensions
- Assessment of safety of port access operations and of approach of offshore structures
- Specification of tug requirements and NAVAIDS
- Limiting conditions for safe arrival and departure including tanker and LNG carriers at FPSO/FLNGs and other offshore structures



A typical navigation study will involve:

- Model preparation: edit the navigational electronic charts, collect Metocean data, model the environment and representative vessels
- Development of scenarios: create a matrix of simulation runs for each area of investigation
- Contingency planning and vessel failure mode analysis scenario planning
- Simulations: matrix of simulation studies posted and carried out with the input of the assembled specialists. Interaction between the operators may lead to development of alternative scenarios
- Reporting includes observations made from notes and a summary of the scenarios together with explanations of significant findings and results
- Recommendations and conclusions include limits of operating windows for tide and weather conditions, tug size/numbers, channel width and depth (thus scope of dredging requirements), berth alignments and orientation etc



REMBRANDT for Pilots

The role of the pilot – and the relationship with that of the ship's master - is well established.

With ever increasing commercial pressures, bigger and more complex ships, the skill of the pilot is being tested more and more. The pilot is often seen as the last line of defence against substandard ships entering a port.

IMO Resolution A960 is very clear on the need for pilot training and the importance of maintaining high standards of professional competence.

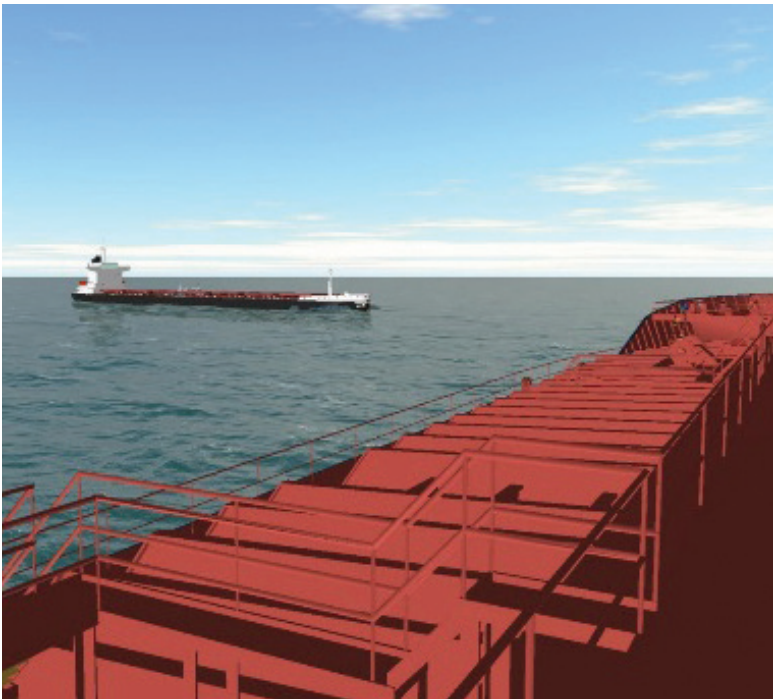
In the event of an incident, not only are the actions of the pilot closely scrutinised, but that of their organisation, including the attitude towards and level of training given to support the pilots. The competence and capabilities of the pilot all contribute towards the commercial attractiveness of a port.

- Initial training for new entry pilots
- Targeted training
- Familiarisation with new ship types
- Refresher training

- Practicing emergency scenarios and manoeuvres
- Exploring alternative manoeuvres
- PEC evaluations
- Pilot master exchange
- Radar/blind pilotage exercises
- CPD training packages



REMBRANDT for Incident Investigation



BMT's technology can help in reconstructing incidents such as collisions, allisions or groundings. This can then be used as an aid in the identification of the root cause of the incident and to carry out simulations to investigate "what-if" scenarios.

Using BMT's globally respected PC based real and fast time simulator REMBRANDT, shipboard Voyage Data Recorder (VDR) data and regional AIS information is combined with high fidelity ship models to produce meaningful three dimensional recreations of marine incidents.

Custom ship models can be readily created in REMBRANDT for use in a wide range of simulation investigations.



REMBRANDT for Inland Waterways

The need to transport raw materials and goods continues to grow globally. Many countries around the world are making efforts to divert goods from road to sea.

To support these aims there has been significant expansion and interest in the development and expansion of national and international inland waterway networks.

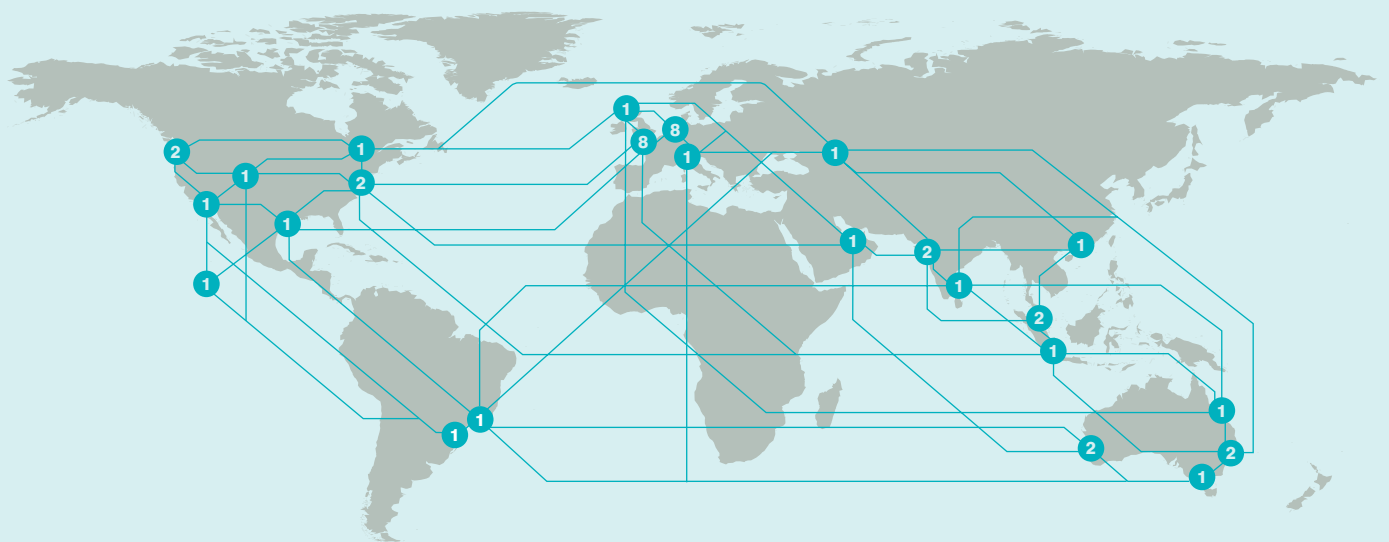
Coupled with an ongoing scaling up of the inland shipping industry there are more and larger scale inland port facilities being built around the world, many with direct waterway intermodal connections to sea ports.

This in turn presents an ever increasing need for pilots, skippers and operators to safely navigate in these often relatively restricted inland navigation areas.

REMBRANDT-INLAND is a specially designed version of the navigation simulation software specifically aimed at the inland waterways markets.



With locations in all of the major markets we serve, ours is an active network that sees us sharing skills and knowledge, combining disciplines and building international teams to create integrated answers to the questions of our customers.







● Number of local offices.

For further information contact:

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