

## Navigation services

Safety, flexibility and excellence



## Navigation services

New and developing ports require safe navigation with cost effective solutions, especially with the growing challenge to access new and more demanding locations, and service larger ships. Safe and reliable navigation is paramount and the ability to investigate ship behaviour under normal, extreme and emergency conditions is invaluable.

HR Wallingford is a world leader in assessing and simulating ship navigation and manoeuvring. Our world-class Ship Simulation Centres, comprising suites of real-time ship and tug bridge simulators, combine our extensive hydraulic modelling capabilities with our ship handling models and our experienced, expert team of maritime engineers, master mariners, pilots, tug masters, naval architects and software modelling experts.



## Industry applications

### Port and terminal developments

Vessel navigation is a fundamental aspect of port and terminal design, and ship handling issues need to be taken into account at all stages of planning and design. With a constant growth in ship sizes and with new marine facilities being developed in ever more exposed and hazardous locations, it is essential that the limits of safe navigability and manoeuvring are understood and defined.

### Vessels and special purpose facilities

Industries such as oil and gas or military applications may require new types of ships/ submarines. These specialist vessels have to operate in often adverse conditions and use berths, port facilities and/or channels specifically designed and constructed for “one-off” operations. The ability to test and perfect design, and also to familiarise the operators before doing it for real, is essential to the success of an operation.

### Operational improvement, training and familiarisation

Safety is paramount and we can provide the facilities to familiarise pilots, operators and ship masters with varying ship types, ballast conditions and environmental conditions, enabling performance to be improved along with enhancing operational procedures and evaluating aids to navigation. The preparation in the simulator for emergency situations such as engine failures, is a vital part of training, so the Pilot is able to instantly react to this infrequent situation.

Simulation can also form the basis of risk assessment and to assist in devising strategies for handling adverse conditions, emergency scenarios, associated procedures and the upper environmental limits in which the port can remain operational.





## Our Worldwide Ship Simulation Centres

HR Wallingford operates 10 real-time navigation simulators, with four at our UK Ship Simulation Centre in Wallingford and six in our Fremantle Ship Simulation Centre near Perth in Western Australia. These can all be run individually or simultaneously, allowing independent interactive control between vessels in the same simulated environment. They have been developed to deliver reliable and realistic simulation along with the flexibility to accommodate rapid modifications within the design optimisation process.

The HR Wallingford Ship Simulation System uses sophisticated techniques to represent the spatial and temporal behaviour of a ship or tug. Hydrodynamic modelling includes full six degree-of-freedom ship response to waves, wind and currents, allowing for both lift and drag effects and close quarter effects, such as shallow water, bank effects, bow and stern thrusters, ship interaction and even collisions.

Our Ship Simulation Centre operates on the following principles:

### Expert consultancy

Simulation studies are designed, planned and executed as part of a service that ensures the key issues and problems are explored and solved to the maximum benefit of the client.

### Accuracy

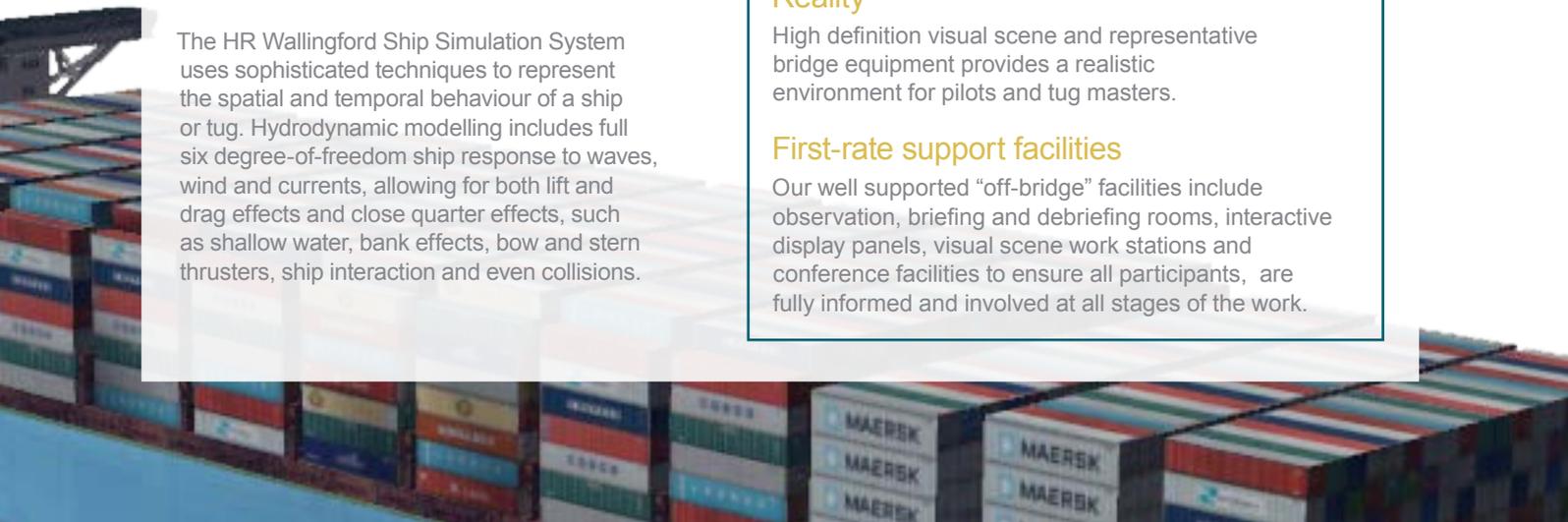
Reliable, accurate, state of the art software that is second to none in simulating the behaviour of ships and tugs at sea, which gives assured results.

### Reality

High definition visual scene and representative bridge equipment provides a realistic environment for pilots and tug masters.

### First-rate support facilities

Our well supported "off-bridge" facilities include observation, briefing and debriefing rooms, interactive display panels, visual scene work stations and conference facilities to ensure all participants, are fully informed and involved at all stages of the work.





**HR Wallingford**  
*Working with water*

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HR Wallingford is an independent engineering and environmental hydraulics organisation. We deliver practical solutions to the complex water-related challenges faced by our international clients. A dynamic research programme underpins all that we do and keeps us at the leading edge. Our unique mix of know-how, assets and facilities includes state of the art physical modelling laboratories, a full range of numerical modelling tools and, above all, enthusiastic people with world-renowned skills and expertise.

