

Bridge-View Ship Manoeuvring Simulation



Background

SimFlex is an advanced PC-based simulator for the detail investigation of ship navigation and manoeuvring conditions. *SimFlex* is a virtual reality 'bridge-view' simulator, in which the simulated ship and sailing environment is seen from the vantage point of the ship's bridge. With *SimFlex*, simulations can be conducted for a selection of ships and for user-defined port/berth layouts, environmental conditions and traffic situations. Vessel assistance can be provided by user-controlled tugboats. The simulated vessel is controlled by its engine telegraph, rudder and thrusters, using the computer mouse. The visual display provides a realistic view of the port environment from the ship's bridge, bridge controls and fully-

functional, simulated bridge instrumentation, including ARPA radar, electronic chart and GPS. Simulation in *SimFlex* is conducted in real time under human control.

Features

- Mathematical modelling of ship motion dynamics, including rolling, pitching and heaving
- User-defined environmental conditions - tidal level, wind and wave conditions, current field and visibility
- Wind effects, including sheltering from structures
- Wave effects for a spectrum of waves
- Squat, bank and quay effects
- Current and shallow water effects

- Dynamic tug control
- Aids to navigation, including buoys and lighthouses
- Replay and data extraction for analysis

Application

SimFlex is an advanced tool for the final-stage evaluation of port layout designs and terminal and harbour operations. Through its bridge view, *SimFlex* provides the operator with a true-to-life view of the simulation environment. It includes the actual motions of the ship under wind and waves. This adds to the realism of the simulation and the quality of its findings. *SimFlex* is applied for final-stage evaluation of limiting environmental conditions, tug requirements and optimum berthing procedures.

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