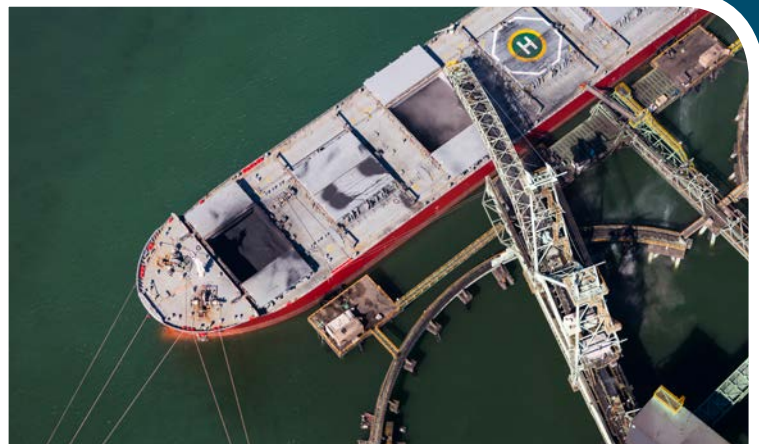


PortOps

Port and terminal operations simulation system



HR Wallingford uses a discrete event simulation system, PortOps, to provide assistance in the planning and design of marine logistics operations, terminal layout and storage requirements.

PortOps has been developed as a 'shell' allowing individual terminal components, such as vessel arrivals, cargo handling, allocation of resources (pilots, tugs, berths, equipment, labour) to be represented as sub-modules. These are integrated to form a simulation of the operation in question incorporating historical or forecast weather conditions and their influence on the operation.

Key system capabilities

- > Stochastic representation of non marine inputs such as plant production and reliability characteristics (product run down)
- > Representation of the cargo transfer and storage procedures (e.g. cargo flows within the terminal, transfer rates, cycle times, shore-side storage capacity)
- > Stochastic representation of ship arrival/departure operations incorporating journey times between facilities. This enables the entire transport cycle to be simulated and assessed
- > Incorporates time series weather conditions (wind, waves, currents, visibility) to allow windows of uptime to be accurately represented for each discrete operation
- > Can incorporate economic evaluation routines to enable the entire operation to be assessed based on realistic cost assumptions (e.g. demurrage)



Benefits

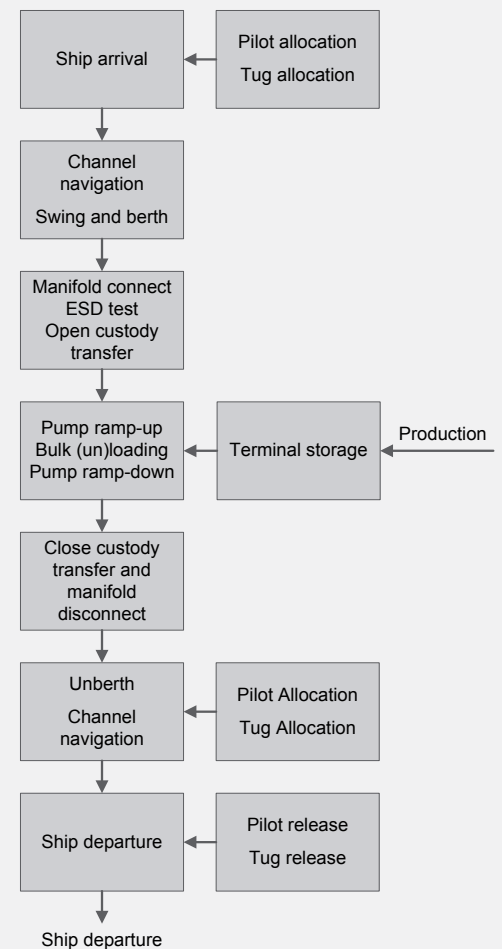
- > Assessment of terminal downtime, including seasonality, and product storage requirements
- > Implications of changes to terminal operations procedures can quickly be examined
- > Assessment of the economic implications of conceptual designs in terms of downtime
- > Rapid and reliable concept screening at conceptual design/feasibility project stages

Typical applications

- > Infrastructure capacity assessment (berths, storage, access channels)
- > Oil & gas import and export terminal operations
- > Marine services capacity assessment (shipping, pilotage, tugs)
- > Service harbour operations
- > Transshipment operations (multiple facilities)

Typical output

- > Statistical analysis of all possible facility performance parameters over an extended simulation period typically including;
 - berth allocation and berth occupancy,
 - demurrage cost
 - delays (average, P90 etc),
 - tank tops and tank bottoms (number, frequency)
 - channel capacity
- > Import / export capacity of marine facilities and associated infrastructure
- > Recommended capacities for;
 - Berths / quay space
 - Loading facilities (loading arms)
 - Storage (LNG tanks)
- > Shipping (number and size of vessels)



Example schematic of operations for a liquid export berth