

Deployment scenario

ARL Berthing Planner

Berthing Planner for Multipurpose Terminals

Overview

The deployment scenario describes how a marine multipurpose terminal operator applies ARL's Berthing Planner in his planning function. The multipurpose terminal is a marine facility, where vessel of multiple types are serviced, cargo is loaded onboard, and discharged from vessels, using different means depending on the vessel type. The cargo is transferred to or from shore storage facilities or barges. The operations planning group focus on high productivity, efficient operations and optimal use of the flexibility in a multi-purpose berthing facility, satisfying operational constraints of the vessels types, handling gear and cargo storage facilities. A large part of the success lies in proper berth planning and planning of physical and human terminal resources related to vessels' changing ETA/ETD.

Berthing Planner Deployment Scenarios:

- Container Terminal
- **Multipurpose Terminals**
- Bulk Terminal
- Oil & Gas Terminal
- General Cargo terminal
- Ro-Ro & Ferry Terminal
- Cruise Line Terminals

Berth Planning

A busy multipurpose terminal with a long quay side operates around the clock. In the constantly changing environment they have to accommodate their plans to changing vessel schedules, agreements with vessel operators, and own technical procedures and limitations. The goals of the berthing planning group is to utilize the available berth space, meet all contractual commitments and minimise vessels' time in port by securing high productivity, whilst planning for work as efficiently and cost effective as possible.

The tool is setup and the planning horizon defined. The planning process runs in WYSIWYG (what-you-see-is-what-you-get) mode with a drag-and-drop interface. The tool supports fully automated mode, where all berthing positions are selected by the operator's single click, as well as semi-automated mode, where certain vessels are locked and the remaining vessels are planned automatically. If insufficient berthing space is available in certain time zones, the operator is prompted for action. The operator distributes the plans to other stakeholders by email in desired format.

Supporting Multipurpose Terminals

The operator plans for vessels to berth at a facility suitable to the type of vessel arriving, being container, bulk, ro/ro, ferry & passenger, general cargo or others, ensuring proper handling equipment and storage facilities availability.

The tool distributes all vessels respecting all known constraints. As the vessel types are known when importing the ETA/ETDs, the berthing is setup to reflect handling gear and storage constraints and arriving vessels are distributed accordingly. In manual mode operator shift any vessel in time or along the berth. The tool highlights both valid and invalid berths.

Berthing Planner for Multipurpose Terminals

Managing Sea Side and Berth Constraints

The terminal operator plans for berthing while taking physical constraints into account, including sea side conditions like different draughts at various berthing ranges and tidal changes, and shore side constraints like berth repairs and scheduled or unscheduled handling gear repairs.

The berth configuration is reflected in the Berthing Planner setup with all characteristics like berth names, draught, bollards, tides and more. The Sea Side Constraints feature visually displays the draught available for all vessels within the planning horizon. Berth or handling gear under repair is displayed as “berth unavailable zones” in time and space using the Berth Constraints feature. Berth planning takes the constraints into account, when automated re-planning takes place, as well as visually towards the operator for manual planning.

Re-plan when ETA/ETD changes

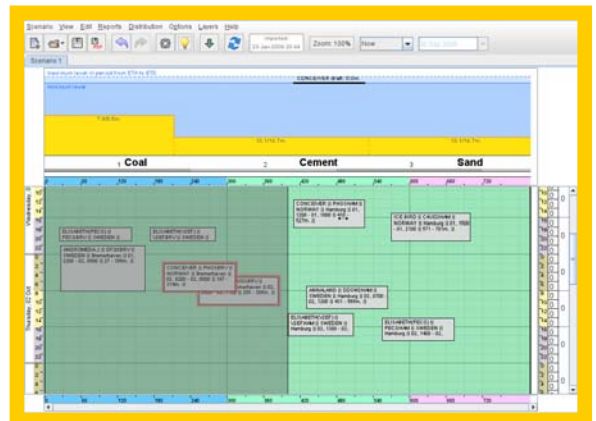
The berthing plan need to be re-worked as a consequence of vessels' adjusted ETA/ETDs. The operator faces challenges re-working the plan frequently as each iteration of re-work requires many considerations.

The Berthing Planner imports the vessels schedules from existing data sources, like a port information system or other sources, via a neutral XML file interface. All schedule changes are automatically read by the Berthing Planner and the berthing plan is refreshed any time by the operator by a single click automatically considering all the constraints known by the Berthing Planner, at choice evaluating multiple berthing scenarios in parallel. The re-planning function takes place as frequently as desired by the planning function with minimal manual effort applied.

Handling Gear Planning

The availability of handling gear on shore, on barges or onboard like cranes, ramps, gangways and hoses affects load and discharge operation speed and the duration of vessels' port stay. The planning group assigns handling gear to individual vessels in accordance with the vessel type and physical characteristics and contractual agreements with the vessel operators.

The Quay Crane planner add-on is managing allocation of berth or barge mounted handling gear, with limited or unlimited mobility within the berth. The Quay Crane Berthing Planner add-on assigns cranes to individual vessels in visual mode. The tool keeps track of assigned gear and only offers gear, which are not assigned to other vessels. The operator generates a handling gear assignment report for a specified time period, and distributes the report to his colleagues by email.



Planning Terminal Resources

The terminal manage or plan for a number of physical and human resources prior to, or during vessels' arrival and departure, or throughout the duration of the port-stay.

The Resource Planner Add-on contains a set of pre-defined multipurpose terminal resource types, as well as some generic resource types, ready for use. The pre-defined resources are easily extended by the operator. Terminal resource types include cranes, ramps, gangways, stevedores, security officers, tugs, bunkers barges, inspectors and customs officers. The resources are visually assigned to vessels, related to the ETA/ETD, or organized in pre-set shifts. Resource assignment reports are distributed to stakeholders or exported in XML-format for detailed resource planning in an external system, for instance an LMS.

The ARL Berthing Planner supports the operations of a multipurpose terminal operator in the berthing and resources planning process, allowing the operator to automate the planning process, optimize time and resources for the port stay and evaluate consequences of multiple berthing scenarios against resource constraints, and to collaborate electronically with external human functions and IT systems without retyping.