

Deployment scenario

ARL Berthing Planner

Berthing Planner for Bulk Terminals

Overview

The deployment scenario describes how a marine bulk terminal operator applies ARL's Berthing Planner in his planning function. The bulk terminal is a marine facility, where bulk cargo is loaded onboard, and discharged from, bulk carrier cargo vessels using cranes or conveyors on the berth or on a barge, or using the vessels' own gear. Bulk cargo is transferred to or from shore storage facilities or barges. The operations planning group focus on high productivity, efficient operations and maintaining maximum flexibility for dealing with unforeseen operational events. A large part of the success lies in proper planning including berth planning and planning of physical and human terminal resources related to vessels' changing ETA/ETD.

Berth Planning

A busy bulk 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.

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.

Berthing Planner Deployment Scenarios:

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

Berthing Planner for Bulk Terminals

Managing Sea Side and Berth Constraints

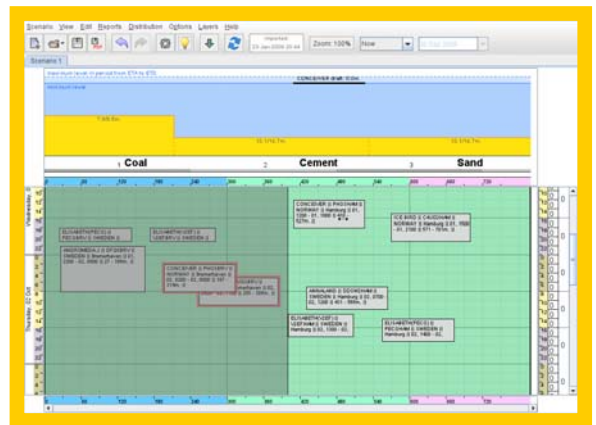
The terminal operator plans for berthing while taking physical constraints into account, including sea side conditions like different draughts at various berthing ranges and tidal changes, and shore side constraints like berth repairs and scheduled or unscheduled handling gear repairs.

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, conveyors and cranes under repair are 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.

Supporting Coal, Grain, Ore Berths.

The operator plans for vessels to berth at a facility suitable to the type of cargo arriving, being coal, grain, wood chips, ore, cement or other cargoes ensuring that proper handling gear and storage facilities are available for the load & discharge operation.

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.



Handling Gear Planning

The availability of handling gear on shore, on barges or onboard 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 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 and conveyors 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 bulk terminal resource types, as well as some generic resource types, ready for use. The pre-defined resources are easily extended by the operator. The bulk terminal resource types include cranes, conveyors and stevedores, and the generic terminal resource types include 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, f.ex. an LMS.

The ARL Berthing Planner supports the operations of a bulk 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.