

Seafarer at work

SAFE SHIP OPERATIONS WITH CREW COMPLIANCE OPTIMIZER (CCO)

Challenges

Crew sizes have been decreasing on ships for many years due to efficiency requirements and technological modifications. Besides onboard working conditions, which have changed considerably in recent years, tighter work and rest hour regulations are in force. Shipping companies face several risks arising from non-compliance incidents relating to work and rest hours rules. Apart from crew fatigue and associated safety aspects, possible detentions can have a detrimental effect on reputation of shipping companies or expose them to financial risks. Due to the large number of influencing factors like higher port frequencies or increasing administrative work the reliable determination of crew size creates a complex planning problem.

Aim and modules of the CCO

The determination of crew size and composition today is often based on personal experience of the planner, primarily taking into account ship scales regardless of ship operation and voyage specifics. The CCO is a decision support system which assists the planner to calculate detailed work schedules for every seaman. It consists of three modules:

- Office Module

In the office module, necessary manpower demands per ship depending on a specific port schedule, resulting workloads and compliance rules are calculated. The output is the required number of every position with a detailed work schedule. This work schedule should ensure that compliance requirements are fulfilled.

- Onboard Module

In daily shipping it is likely that original planning will be more or less changed by unpredictable events (e.g. the pilot boat arrives three hours later than expected). The onboard module addresses this fact by constantly updating the work schedule during the voyage. Actual work and rest hour accounts of every crew member in combination with real-time voyage situations are considered enabling short term recovery from non-compliance incidents.

- Reporting Module

This module provides reports (e.g. time sheets) for external inspections and company internal controlling purposes (e.g. compliance reports per ship or fleet).

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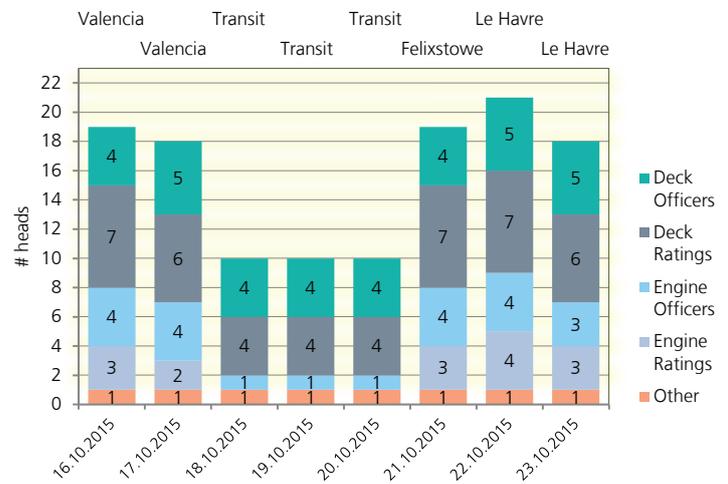
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IMPRESSUM

	Le Havre 23.10 06:00	Le Havre 23.10 06:30	Le Havre 23.10 07:00	Le Havre 23.10 07:30	Le Havre 23.10 08:00	Le Havre 23.10 08:30	Le Havre 23.10 09:00	Le Havre 23.10 09:30	Le Havre 23.10 10:00	Le Havre 23.10 10:30	Le Havre 23.10 11:00	Le Havre 23.10 11:30	Le Havre 23.10 12:00	Le Havre 23.10 12:30	Le Havre 23.10 13:00	Le Havre 23.10 13:30	Le Havre 23.10 14:00	Transit 24.10 14:00	Transit 24.10 14:30	Transit 24.10 15:00	Transit 24.10 15:30	Transit 24.10 16:00	Transit 24.10 16:30	Transit 24.10 17:00	Transit 24.10 17:30	Transit 24.10 18:00	Transit 24.10 18:30	Transit 24.10 19:00		
Master																														
Chief Officer																														
2nd Officer																														
3rd Officer																														
Deck Cadet																														
Rating Deck 1																														
Rating Deck 2																														
Rating Deck WK 1																														
Rating Deck WK 2																														
Rating Deck WK 3																														

Watch Other Delta Rest



Work schedule extract - deck positions

Number of positions scheduled per day

Procedural approach

DEFINING PORT SCHEDULE

- User defines the port schedule for whole loop or for next ports

CREATION OF SHIP OPERATING STATUSES

- CCO inserts standard sequences for every port which can be changed afterwards by the user

WORKLOAD SPECIFICATION

- CCO specifies the resulting workload under consideration of the defined tasks for every ship operating status

COMPLIANCE REGULATIONS

- User can define compliance regulations (e.g. minimum resting hours)

ALLOCATION OF POSITIONS TO TASKS

- CCO allocates crew members / positions to tasks by using scheduling algorithms

ANALYSIS

- User can analyze the calculated crew schedule in different ways which are provided by the CCO

Functionalities of the CCO

Data Management

It is possible to define and change base data concerning:

- Ports
- Ships
- Positions
- Tasks
- Ship Operating Statuses (SOS)
- Task Assignment to SOS
- Crew List

Scenario Creation

By comparing the calculation results of different input data the effects of specific scenarios can be evaluated. Different scenarios can be created by defining:

- Ship class
- Voyage details
- Min/Max numbers for every position
- Compliance Regulations (Work and rest hour rules and watchkeeping patterns)
- Allowed exceptions from regulations

Analysis Options

- Type and number of positions scheduled per day [in heads and full time equivalent]
- Depiction of workload and rest hours for every position per day/week/whole loop [in %]
- Maintenance time budget for every position group per week [in h]
- Detailed work schedule with task assignment for every position [in ½ h]
- Personal Compliance Index (PSI) and Ship Compliance Index (SCI) [in %]

Reporting

- Synchronization of vital information between ship and shore
- Work and rest hour accounts
- Incompliance reasons for every crew member

Benefits

Increased seafarer satisfaction

Compliance with work and rest hour regulations will be growing by conducting an automatic and optimized planning. This leads to a reduction of fatigue caused by violation of regulations.

Increased transparency

The increased transparency regarding workloads has the advantage of achieving time budgets for maintenance purposes or anticipated personnel costs. Also some classification societies have already announced an inquiry into internal company methodologies of determining crew size and consistency by means of annual audits. The CCO would represent a suitable tool to satisfy this inquiry.

Reduction of detentions

Possible infringements of rest hour regulations and thus the risk of schedule delays through detentions are minimized.

Reduction of administrative work

The CCO assists the ships command by providing work schedules on demand and taking into account the given rules and regulations. Additionally, many administrative tasks and reporting obligations will be rendered redundant by the automatic exchange of necessary information between ship and shore.

Optimized work schedule

Due to the large number of influencing factors the reliable determination of crew size and composition represent a complex planning problem. The creation of a work schedule using allocation algorithms leads to a better work schedule than a manually constructed one.