



WORKFORCE PLANNING. MATHEMATICALLY OPTIMIZED.

SCEDAS® is a decision support system which assists the planner to calculate detailed work schedules for every seaman.



Fraunhofer
CML





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About Us

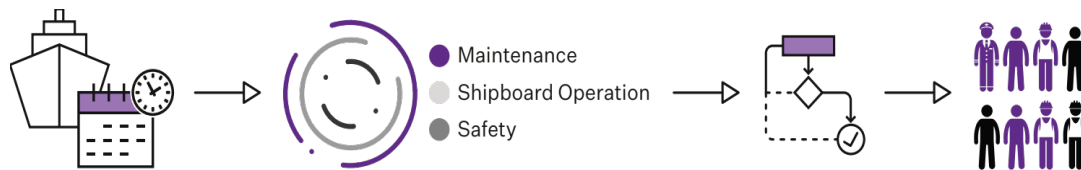
The Fraunhofer-Gesellschaft, headquartered in Germany, is the world's leading applied research organization. Its focus is the development of key technologies and their application in business and industry. Founded in 1949, the Fraunhofer-Gesellschaft currently operates 75 institutes and research institutions throughout Germany.

Fraunhofer Center for Maritime Logistics and Services CML

The Fraunhofer Center for Maritime Logistics and Services CML develops innovative solutions for the maritime sector and the maritime supply chain. We support companies and institutions from shipping, port management and logistics in initiating and implementing future-oriented technologies and processes.



SCEDAS® at a Glance



With the SCEDAS® software suite, you benefit from a crewing solution that has proven itself over many years not only in practice from the container to the cruise industry, but also in application areas beyond the maritime domain.

SCEDAS® offers individual support for short-term personnel deployment by determining and proposing mathematically optimized, detailed crew demands and deployment plans. It offers decision-making support for strategic management decisions as well as for a dynamic crew scheduling onboard. Task-based time tracking onboard the vessels creates the required data foundation. This allows insightful data analysis, that enables the company-specific configuration of SCEDAS®.

SCEDAS' approach to workforce planning increases the ability to plan for seafarers, minimizes incompliance to rest regulations and thus increases the safety of ship operation. Its solutions create transparency within the company and provide a data-driven basis of discussion, which guarantees the quality requirements of customers and reduces costs at the same time.

The Challenge

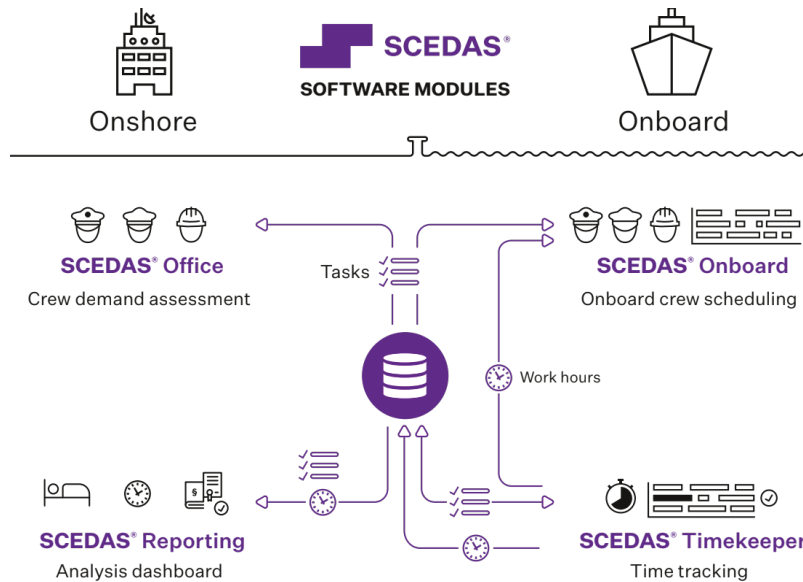


Source: Ship Operating Costs Annual Review and Forecast, Drewry Maritime Research, 2019

When it comes to safe and efficient ship operations, the crew can be considered as the crucial and most expensive enabler. Yet, reduced personnel resources on the ships give a rise to risks for shipping companies in the area of compliance, for example in observing the prescribed rest periods. In addition, large handling volumes and short lay times of merchant ships have led to an increased workload for the crew in recent decades. These changed conditions, combined with legal regulations and administrative burdens, make it difficult to assess personnel requirements on the basis of knowledge and experience alone.

In addition, the crew onboard is responsible for both the operation and maintenance of the ship. Consequently, maintenance management is closely intertwined with manning. Managing this balance between crewing budgets and compliance pressures, from rest regulations or maintenance targets, is a challenging task of ship management.

The Solution: the SCEDAS® Software Suite



The SCEDAS® software suite addresses this challenge and provides decision support for ship managers and the onboard crew.

SCEDAS® TIMEKEEPER

The solid foundation for any optimization is structured data. In addition to the required work hour documentation, SCEDAS® Timekeeper captures the work process onboard the vessels. The task-based time tracking establishes a database on navigational, operational and maintenance tasks and their executions.

SCEDAS® REPORTING

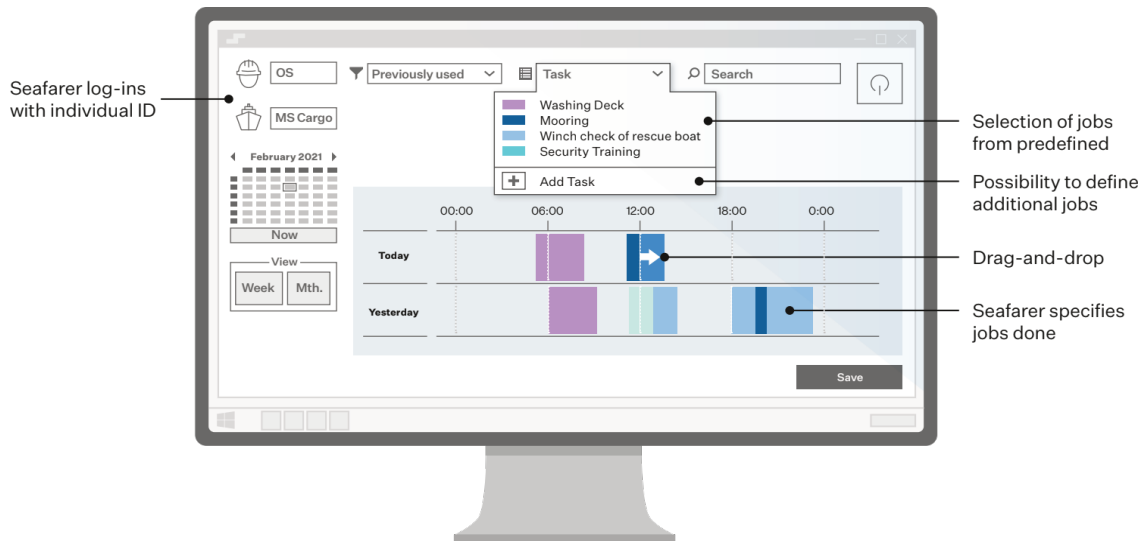
The structured data paves the way for insightful analyses. SCEDAS® Reporting provides insights into job profiles, workload distributions, the vessel's maintenance status as well as incompliance incidents to rest regulations.

SCEDAS® OFFICE AND SCEDAS® ONBOARD

Whether by data collection or by expert knowledge, a database on company specific ship operation lays the groundwork for optimized workforce planning. The planning tool SCEDAS® Office provides ship managers with the minimum crew complement for a ship and voyage that meets compliance and maintenance requirements. SCEDAS® Onboard assists the crew onboard the vessel with detailed work schedule proposals, considering current work records and short-notice voyage updates.

All software modules are independent from each other and can be deployed as stand-alone applications.

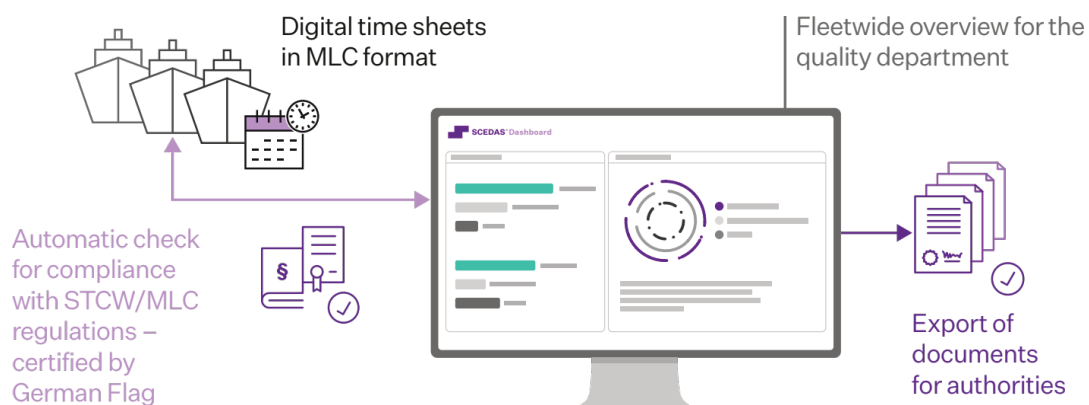
The Data Foundation



SCEDAS® Timekeeper provides work hour documentation and captures the crew's daily routines with only little extra effort. The crew members enter their hours and specify what they have worked on in an easy-to-use tool. Open interfaces enable SCEDAS® Timekeeper to integrate with suitable onboard or onshore systems. It can be synchronized with HR systems or can import jobs e.g. from a planned maintenance system.

The task-based work documentation establishes a collection of jobs that arise during the voyage, together with structured data on their executions, e.g. on involved positions, times and durations. This information is particularly promising regarding the maintenance executions.

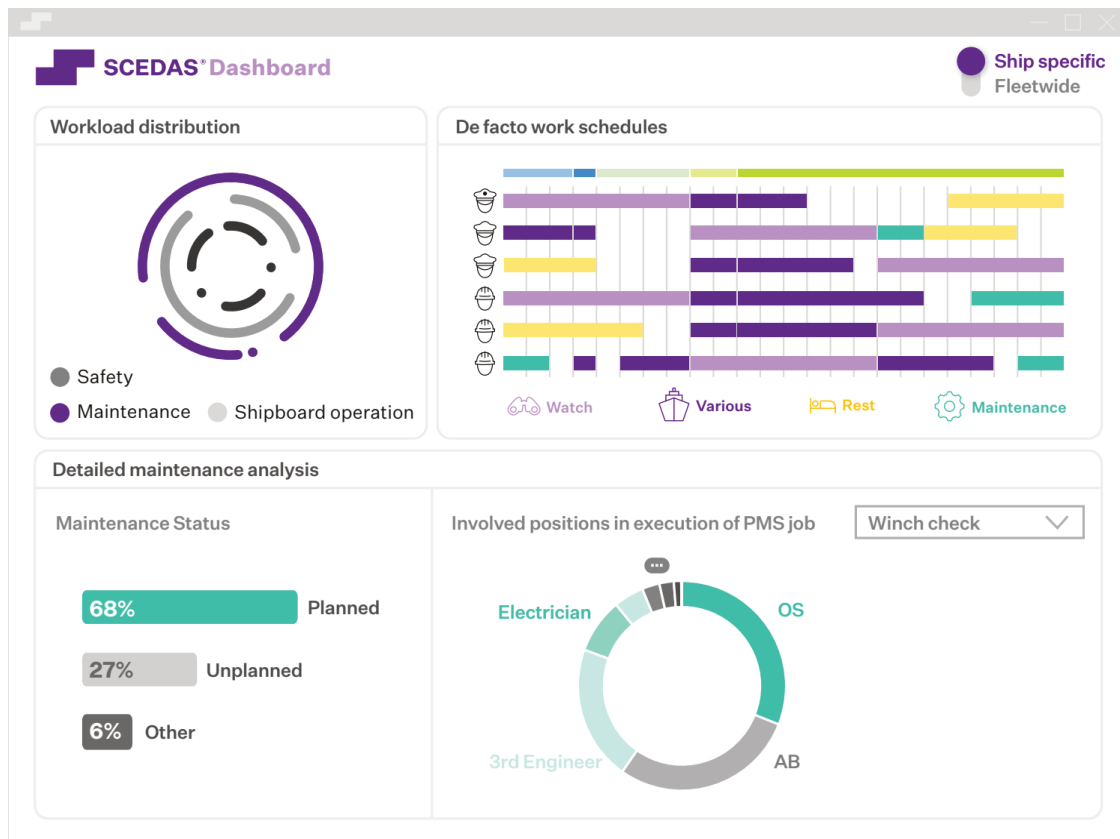
In order to protect the crew's personal data, detailed task executions cannot be traced back to the employees but to their qualification levels.



SCEDAS® Timekeeper checks for compliance with rest regulations and exports documents for internal or external inspections with one click. The algorithms for compliance checks are certified by the German Flag. With an overview over the fleet's compliance status, ship managers can get a grip on rest hour incompliance and steer towards safe ship operation.



Learning from the Data



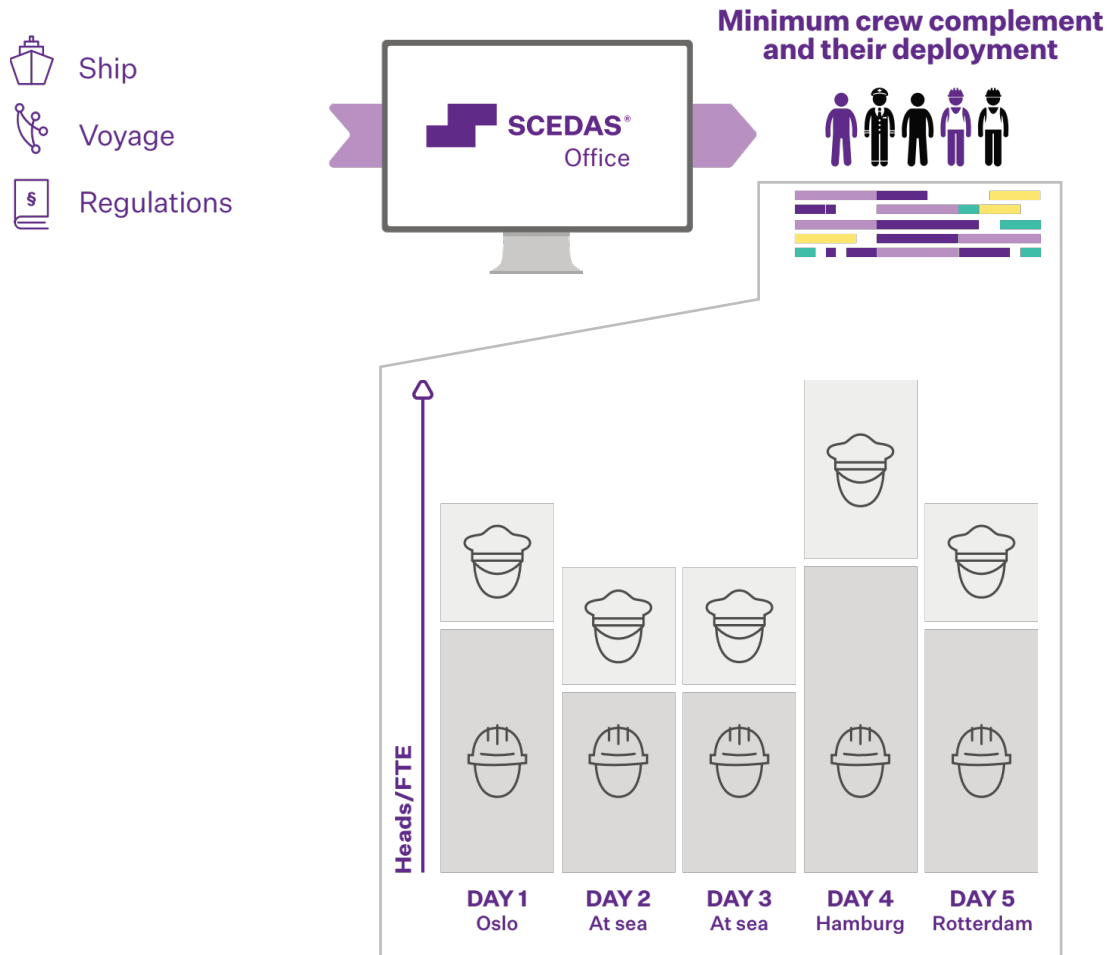
A foundation of structured data paves the way towards business intelligence, smart maintenance management and data-driven workforce planning. A customized dashboard provides insights on the de facto work processes and workload distributions. An expert analysis can indicate how job profiles can be optimized and task executions facilitated.

Moreover, with the analysis of maintenance executions ship managers can draw the conclusion about the ship's and fleet's maintenance condition. The investigation of planned and unplanned maintenance occurrences offers support with the optimization of planned maintenance specifications. This analysis also enables the deduction of relevant information on planned maintenance, e.g. average job durations and what routines are redundant or could be optimized. This provides input that can be fed back into planned maintenance systems.

In regards to optimized workforce planning, these data analyses offer great information on tasks to be scheduled, qualification levels and execution times in correlation to the voyage. This data foundation facilitates the company-specific configuration of the planning tools.

Optimized Workforce Planning

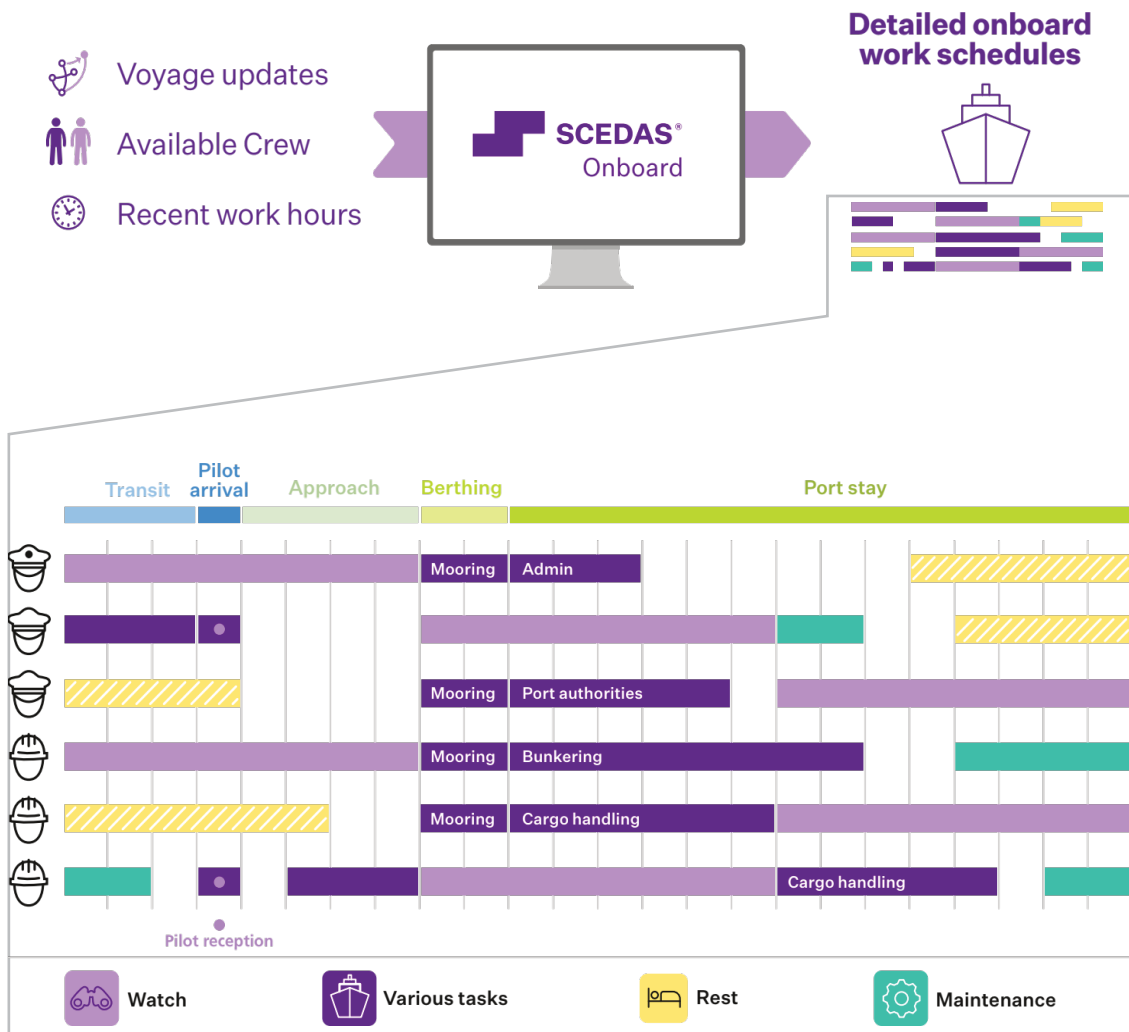
CALCULATING CREW DEMANDS



SCEDAS® Office supports ship managers at predicting the crew demand for a ship's upcoming voyage. For any ship with any itinerary, SCEDAS® calculates the minimum crew complement that is necessary to meet internal or legal requirements as well as maintenance targets. SCEDAS® computes the workload along the voyage and proposes a detailed work schedule. It considers crew demand due to shipboard navigation, ship operations as well as maintenance.

The planning tool provides decision-making support for strategic management decisions. It facilitates anticipatory crew deployment with minimized non-compliance and creates transparency for crewing decisions.

DYNAMIC WORK SCHEDULES ONBOARD

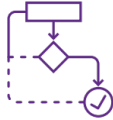


The planning tool SCEDAS® Onboard supports the crew onboard the vessel with work schedules that minimize incompliance with rest regulations or maintenance targets. In case of any voyage updates or shortfall of staff, SCEDAS® reschedules at the click of a button.

If integrated with SCEDAS® Timekeeper, the work schedules respect recent work hours. This way, SCEDAS® relieves overworked crew members and decreases the risk to violate rest regulations. It is also possible to integrate SCEDAS® with the onboard planned maintenance system. This way, upcoming maintenance procedures can be integrated into the work schedule.

A CUSTOMIZED SOLUTION

Company specific configuration



Tasks



Qualification levels



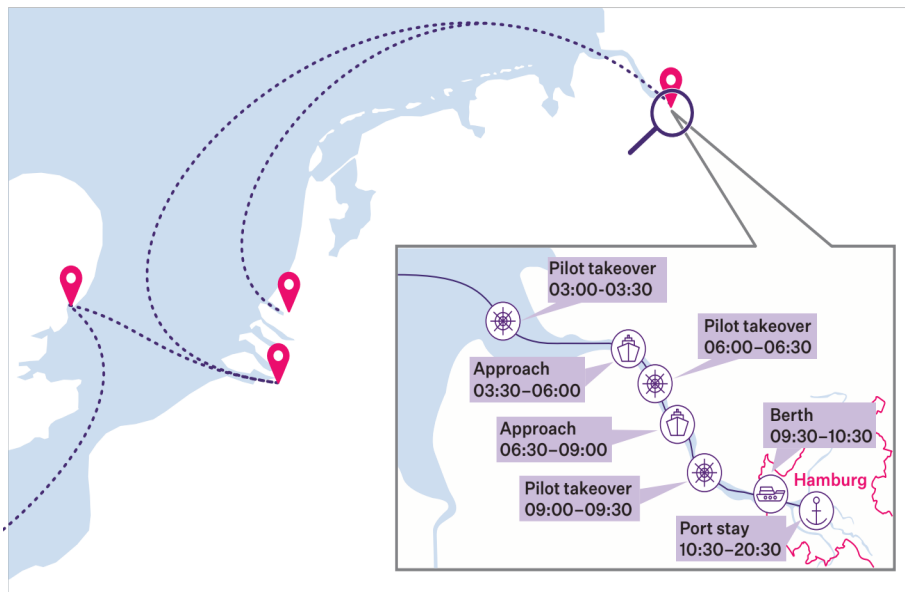
Ship classes



Maintenance targets

Either on the basis of expert knowledge or collected data, the planning algorithms of SCEDAS® are set up to fit your company's requirements. It knows your processes during ship operations as well as the available qualification levels and ship classes. If integrated with a planned maintenance system, SCEDAS® considers the maintenance plans.

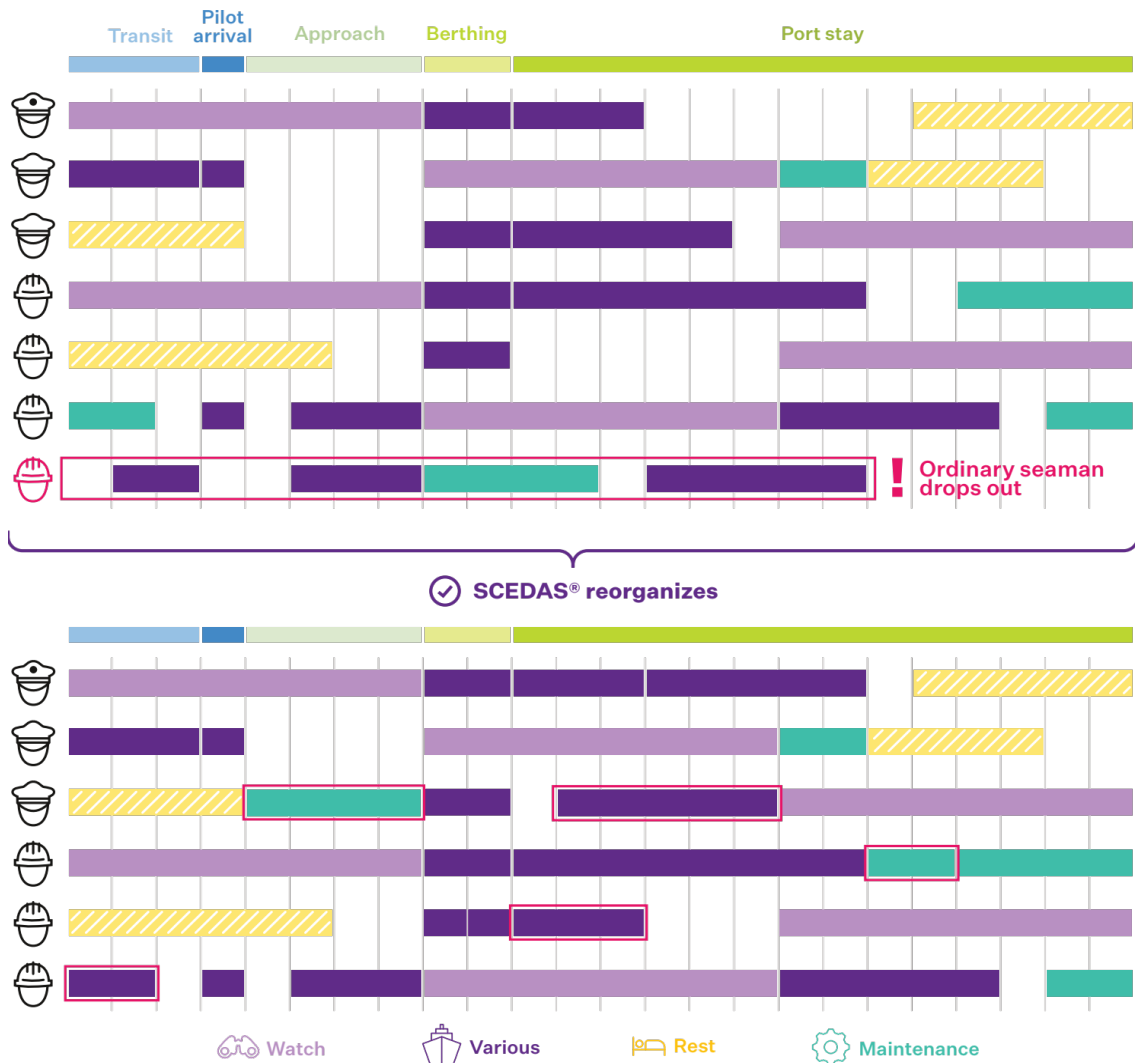
THE INPUT: THE SHIP'S VOYAGE



The source of any SCEDAS® calculation is the ship's voyage. Predefined port settings make it easy to enter the detailed itinerary. SCEDAS® derives corresponding tasks from the voyage and creates a workforce plan by assigning tasks to the right crew at the right time. Ship managers can simulate various scenarios with the voyage specification. This makes it easy to assess the crew demand for future routes or new ship types.

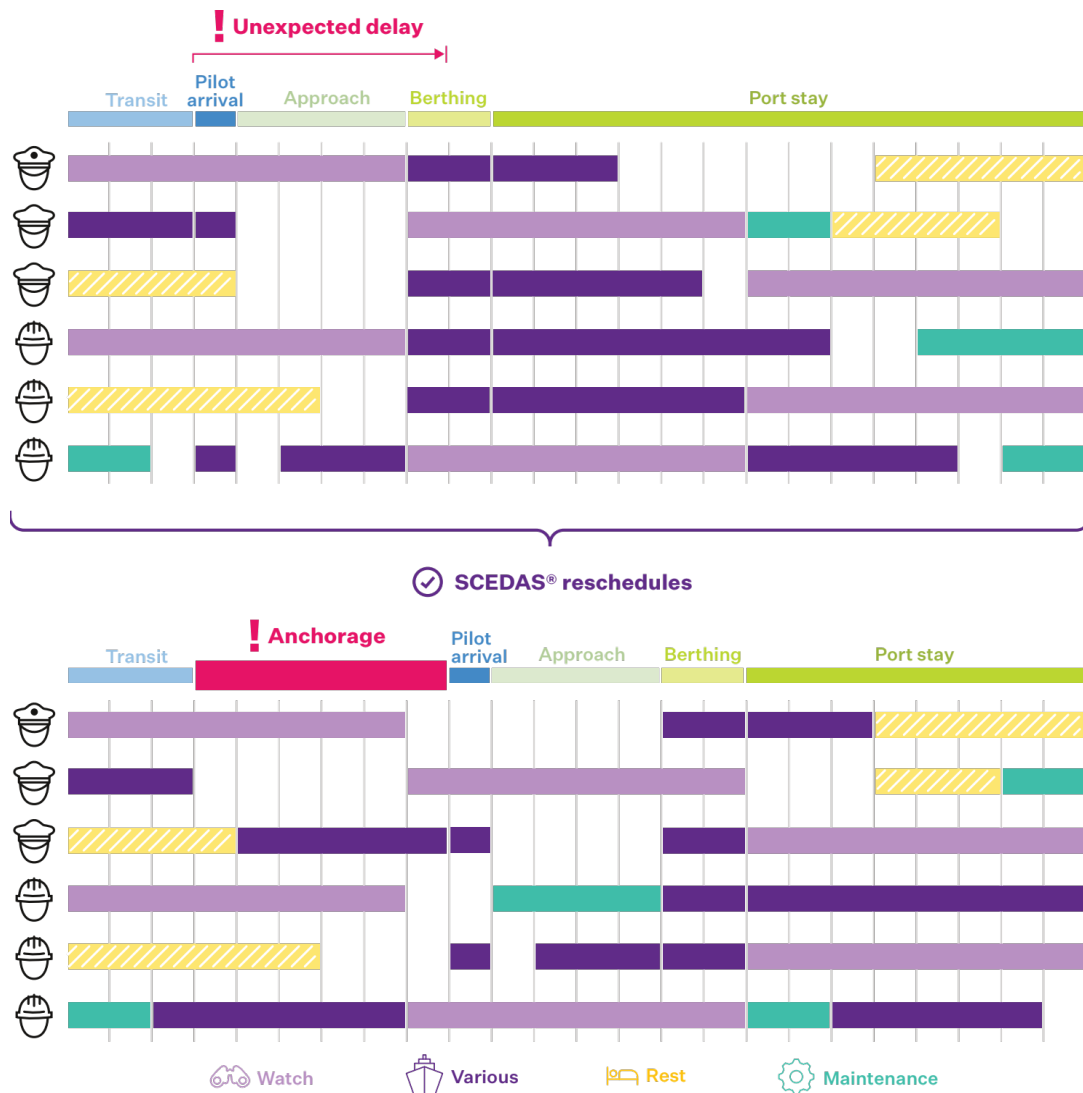
Decision Support – Examples

WHAT IF MY CREW AVAILABILITY CHANGES ONBOARD?



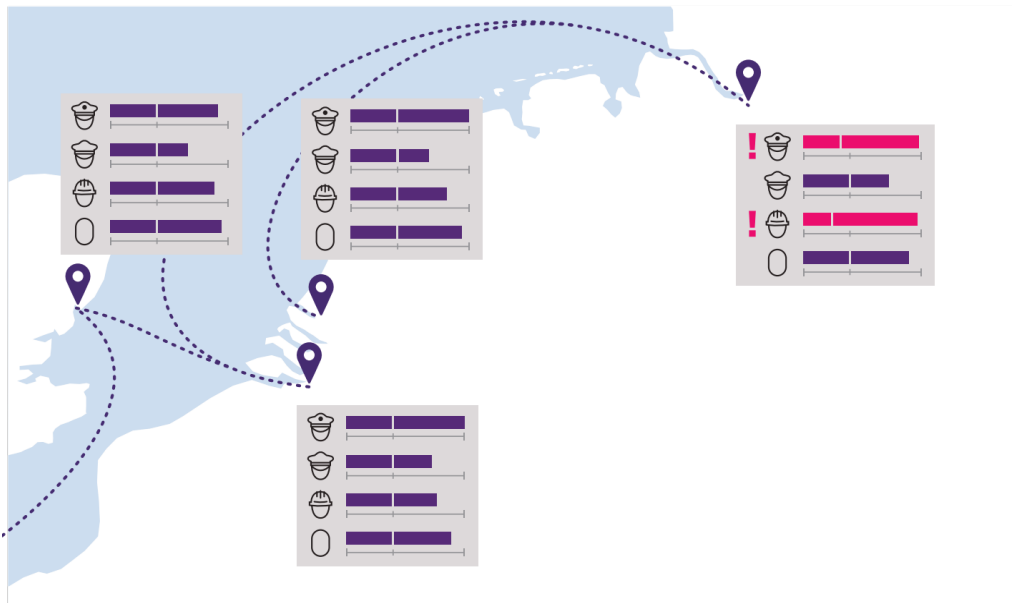
SCEDAS® considers the current crew complement onboard. In case of illness or unforeseen crew changes, SCEDAS® supports the crew with dynamic work schedules that minimize regulatory non-compliance. The algorithms underlie STCW, flag state or company specific rest regulations and distribute the workload among the available crew with optimized regulatory compliance.

WHAT IF THE ITINERARY CHANGES ON SHORT NOTICE?



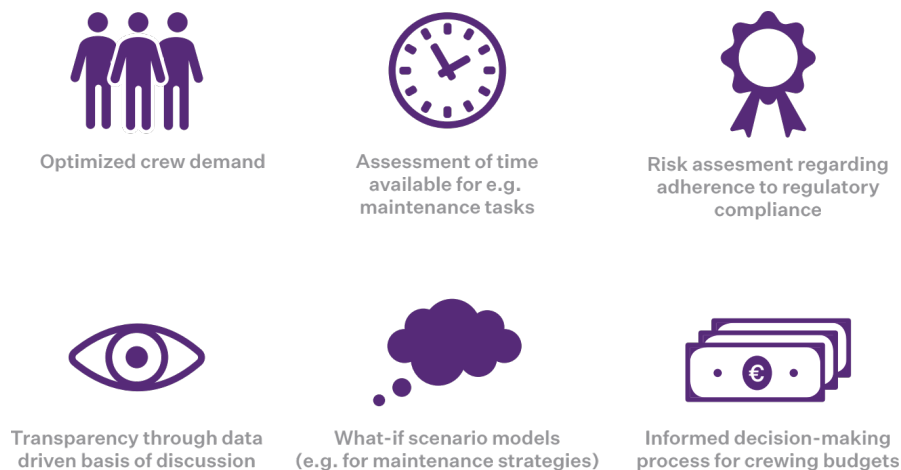
The master onboard the vessel can enter voyage updates on short notice and SCEDAS® answers with an adjusted work schedule at the click of a button. In case of a pilot delay, a changed port slot, rerouting due to weather conditions or a rescheduled ship operation, SCEDAS® redistributes the work and uses available time slots for maintenance and servicing tasks.

HOW CAN RIDING GANGS SUPPORT MY CREW?



The crew demand is highly dependent on the ship's itinerary and can vary from port to port. The key is to detect demand peaks in advance and aid the crew onboard with support from riding gangs or external services. With SCEDAS®, ship managers can analyze the crew demand along the upcoming voyage and identify ideal times for support.

CAN MY CREW HANDLE DIFFERENT MAINTENANCE SCHEDULES? HOW DOES THE WORKLOAD CHANGE IF WE CONVERT TO LNG?



SCEDAS® offers ship managers a proof of concept for new requirements. Simply edit operational or maintenance specifications and SCEDAS® answers with the minimum crew complement. Comparing the results for different scenarios shows how other circumstances effect the crew demand. A data driven basis of discussion creates transparency for crewing budgets and enables an informed decision-making.

ROADMAP FOR A SCEDAS® PROJECT



INNOVATION

Research and development projects for innovative answer



PROBLEM-ORIENTED SOLUTION

Launching innovation in the business or marketplace with focus on the real-world problem



TAILOR MADE

All solutions are independent from each other and are customized to the company's needs

SCEDAS® has proven itself over many years not only in practice from the container to the cruise industry, but also in application areas beyond the maritime industry. Within the scope of research and development projects, SCEDAS® is constantly being developed and equipped with new features.

In a SCEDAS® project, we can setup our existing modules to create a customized solution. Whether support for work and rest hour management, a business intelligence dashboard or optimized workforce planning, we can create a suitable solution from the SCEDAS® software suite depending on your company's needs. We configure the algorithms to meet the company-specific processes and implement custom features for a tailor-made solution.

Yet, a SCEDAS® project is not restricted to our existing solutions. Our experience from previous projects offers a head start for innovative answers in new environments. We have already faced problems in port, maintenance or even healthcare logistics and developed solutions on the basis of SCEDAS®.



**WANT MORE INFO?
INTERESTED IN A DEMO?**

**info@scedas.com
www.scedas.com**

Fraunhofer Center for Maritime Logistics and Services CML

Am Schwarzenberg-Campus 4, Gebäude D
21073 Hamburg
Germany

Phone +49 (0)40 42878-4450

Mail info@cml.fraunhofer.de

www.cml.fraunhofer.de