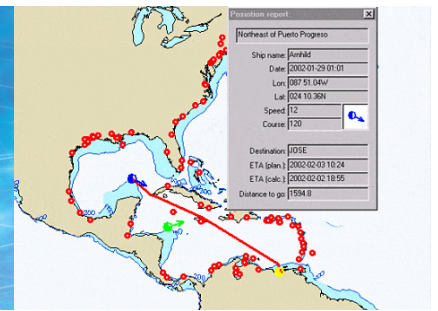


MARINTEK

TurboRouter

- A Decision Support System
for Fleet Optimization



SINTEF

Through a combination of shipping experience, operational research and business consulting we have developed TurboRouter, a scheduling and optimization software solution for medium- and large-scale decision problems in the maritime industry. TurboRouter will add value to your decisions at operational, tactical and strategic levels, and the package can be used for a variety of tasks, ranging from optimizing your sailing plans to calculating the size and specifications of your future vessels and operation – in other words delivering a better return on your investments.

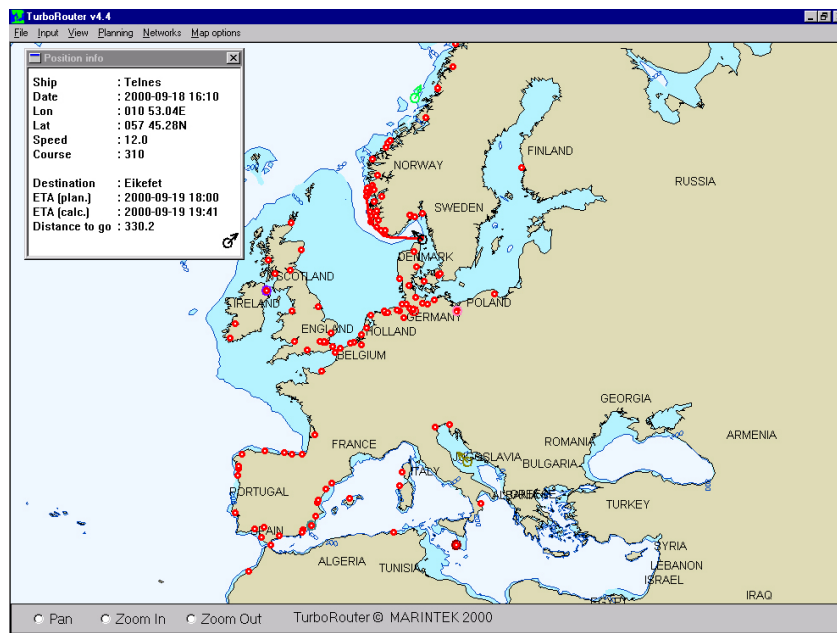


Figure 1. TurboRouter main window.

Users of TurboRouter include ship-owners, vessel operators, shipping pools, energy companies and major industrial cargo owners, all of whom take advantage of the comprehensive and highly flexible fleet scheduling and optimization capabilities of TurboRouter. Taking account of all normal operational and economic parameters such as deadweight, cubic capacity, draft, speeds, consumption, bunkering procedures, subletting, selection of spot orders, time chartering of vessels in and out, dry-docking,

fuel costs, canal dues, port charges etc. TurboRouter offers complete support for your operational and tactical decision-making processes, resulting in improved returns and freeing up time.

Scheduling

How do you plan your vessels' schedules today? In many companies this is done manually by the schedulers/planners on the basis of their experience and with limited use of advanced computer

tools. The scheduling process is a complex task and the optimization of cargoes and vessels represents a large combinatorial problem with a number of constraints.

Managing Vessel Planning Schedules Effectively

TurboRouter has been developed in cooperation with partners in the shipping and oil and gas industries as a tool for optimizing vessel fleet utilization. The design philosophy behind TurboRouter is to combine the knowledge and experience of planners with advanced operational research methodology and the calculating capabilities of the computer. A great deal of emphasis has therefore been put into the development of the graphical user interface and presentation of these rather complex combinatorial problems.

TurboRouter was initially developed to cover typical tramp operations (tankers and drybulk) but has since been enhanced to cover LNG/LPG and products/chemicals. Current development plans include a liner/RORO version and a new module for Inventory Routing.

Please turn the page



Features

Strategic decision support

- Fleet size and mix evaluation
- Market evaluation
- Feasibility studies

Tactical decision support

- Charter in/out decisions
- Contract evaluation
- Spot market evaluation

Operational Decision support

- Tonnage allocation
- Day-to-day fleet scheduling/-optimizing
- Deviation handling and rescheduling

MARINTEK

- Your knowledge partner

Maritime Logistics is a department in MARINTEK that targets maritime logistics and business development. We offer leading maritime expertise with broad experience of close cooperation with the shipping, logistics and oil and gas industries. These resources work closely together with the operational research expertise at the Norwegian University of Science and Technology (NTNU), making up one of the world's leading knowledge clusters in the field of maritime scheduling and optimization. By supporting our customers with our highly reputed know-how and expertise, we enable them to successfully exploit maritime business opportunities.

Besides our TurboRouter software, we offer a range of services that can be tailored to suit your company's needs. We transfer knowledge and insight, enabling our customers to make faster, better and more profitable decisions. Whether your organization is looking for a fully integrated solution or a stand-alone scheduling and optimization tool, our team will help you to meet your goals.

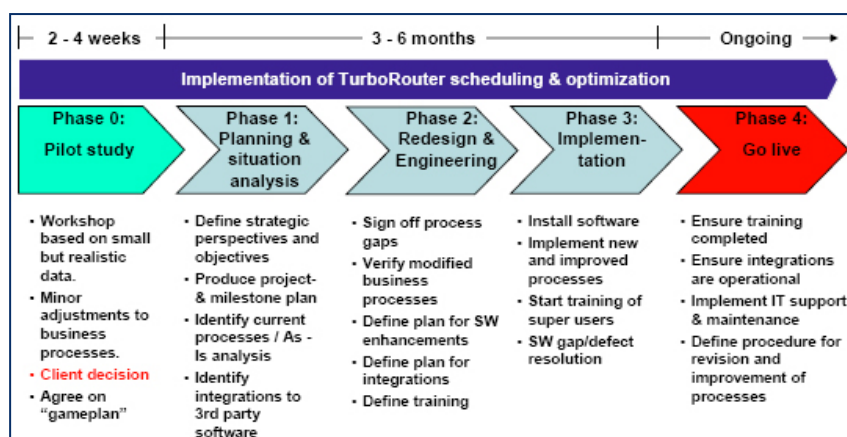


Figure 2. Methodology for implementation of new scheduling & optimization processes and software

Consulting

MARINTEK Solutions offers consulting services to the shipping industry, with a focus on optimizing operations through the use of quantitative analysis and optimization tools. Our approach is based on analysis of our clients' business and our comprehensive knowledge of logistics and transport optimization. We provide consulting services in relation to implementation of TurboRouter, but also in the form of general business consulting that focuses on improved maritime logistics solutions.

Implementation

In order to take maximum advantage of TurboRouter it is important to align

internal business processes and procedures with the best practice embedded in TurboRouter. Our experience is that knowledge transfer and a review of the company's commercial processes are just as important as the software itself. In the course of time we have developed and enhanced our implementation methodology; see Figure 2.

Training

Training is essential for successful implementation of TurboRouter and we offer both standard and company-specific training courses. We also offer initial training for new employees, as well as brush-up or more extensive training for experienced users.



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