

Voyage planning



Choosing the optimal route, adjusting the speed and avoiding hard weather reduces the fuel consumption significantly. Together with Danish Meteorological Institute, FORCE Technology has developed the onboard decision support system, SeaPlanner, which aids the navigator in choosing the optimal route.

SeaPlanner enables the navigator to plan a route with minimum fuel consumption and at the same time avoid unacceptable weather conditions and ship motions.

Key objectives are:

- Optimised route
- Optimised speed along the route
- Selection of propulsion plant operation (number of engines in operation, WHR etc.)
- Safe weather routing

SeaPlanner can be used as the only route planning and weather information tool. Alternatively it may be combined with the weather routing service provided by an experienced marine meteorologist at DMI - Maritime Service (a division of the Danish Meteorological Institute).

The operator can:

- Calculate routes as combinations of great circles and rhumb lines or let the system calculate the optimal rhumb line or great circle route taking wind, waves and currents into account
- Select the optimum route based on operational criteria including: Total fuel consumption, Min enroute time, fixed ETA Const Power, Fixed ETA Optimised Speed, fixed ETA Const RPM, fixed calm water speed
- Perform easy comparison and evaluation of route alternatives
- Perform simulations of weather and route progress
- Access User-defined route library

Route planner

The weather and routes are presented on a globe which provides an intuitive user-interface to the weather data and the route planning functions.

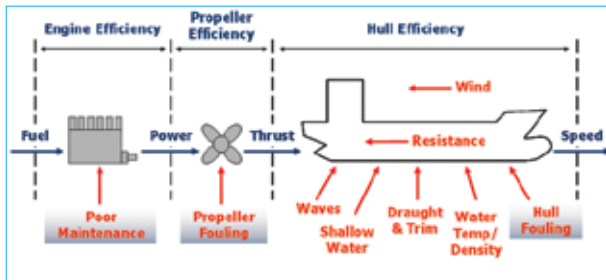


The main features of SeaPlanner are:

- Accurate high-resolution weather forecast
- Advanced propulsion model
- Flexible propulsion plant model
- State-of-the-art route calculator
- Several planning modes
e.g. fixed ETA with at const. speed, RPM or power
- Optimised routes either as Great Circle or Rhumb Line
- Enroute evaluation of wind, wave, swell and current encounters
- Timeline with wave height, current speed, wind speed, sea height, swell height, etc. along the planned route
- Tracking options with continuously optimisation of the remaining voyage
- Optimised speed profile along the route
- Fuel consumption between waypoints and for the entire route
- Advanced wireless repeater display (optional)

Propulsion model

The propulsion model includes all important parameters affecting the vessel during voyage.



- Still water resistance dependent on speed, draught (based on semi-empirical model, model tests or sea trial data)
- Added resistance in waves (based upon semi-empirical model, seakeeping calculations or model tests)
- Added resistance due to shallow water (based on semi-empirical model, advanced CFD calculations or model tests)
- Wind resistance from database or wind tunnel tests

- Propeller characteristics for fixed or controllable pitch (based on semi-empirical model or on propeller open-water diagram)
- Engine configuration (Single engine setup, multiple engines, diesel electric, WHR, etc.)

Weather data

The weather data is provided by the Danish Meteorological Institute, DMI, which is a leading provider of weather routing services. The high-resolution global data are verified and acknowledged to be the best and most reliable data available:

World wide weather forecasts updated twice on daily basis, for any area world wide.

Resolution: 0.5°, 1.0°, 1.5°, 3.0°, 5.0°

Forecast time step: 12 hours, 24 hours

Forecast length: up to 240 hours

DMI high resolution forecast Scandinavia and North Sea (Optional)

Resolution: 0.1°, 0.2°, 0.5°, 1.0°

Forecast time step: 1 hour, 2 hours, 3 hours, 4 hours, 6 hours

Forecast length: up to 54 hours

Weather forecast parameters:

- Mean Sea Level Pressure (Isobars)
- Wind speed and direction
- Significant Wave Height, period and direction
- Swell Height, period and direction
- Sea Height, period and direction
- Surface Current Speed and direction
- Freak Wave Index

Weather data can be retrieved automatically by subscription or by single request and feed to the system via e-mail.

The SeaSuite Family

SeaPlanner is a part of the SeaSuite of onboard systems provided by FORCE Technology with focus on fuel efficiency. The SeaSuite include SeaEngine – engine performance monitoring, SeaTrend – performance monitoring, SeaTrim – optimum trim guidance. The modules in SeaSuite are integrated so data gathered in SeaEngine can be utilized by either SeaTrend or SeaPlanner.

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