navis®

CARRIER AND VESSEL SOLUTIONS

SAVE FUEL BY TRIM OPTIMIZATION WITH MACS3 TROP

Trim optimization is recognized as one of the most efficient ways of optimizing fuel oil consumption and reducing greenhouse gas emissions during ship operations. With the help of the integrated MACS3 trim optimization module TROP, the crew is able to identify the optimum trim in relation to regulatory requirements, to the current fuel oil consumption and to the current loading conditions. The results prove it: applying TROP saves fuel.

By operating at optimum trim, up to 15 % of fuel savings is achievable. Using MACS3 TROP assists in trim optimizations in a numbers of ways:

IDENTIFICATION OF OPTIMUM ACHIEVABLE TRIM | The module considers the restriction of trim and draft constraints given by the stability booklet. TROP takes into further account the physical limits imposed by the design of the ballast tanks to calculate the optimum achievable trim.

BALLAST WATER OPTIMIZATION | The loading instrument provides suggestions for optimizing the ballast water operations to get the actual ballast water arrangement resulting in the optimum realistic trim.

SFOC CURVE INTEGRATION | If the specific fuel oil consumption (SFOC) curve is available, the actual fuel consumption and savings in tons per hour as well as the saved CO_2 emissions, can be calculated when following TROP suggestions for optimized trim.

CARGO INSTEAD OF BALLAST WATER | When TROP is available in the stowage planning solution StowMan, the vessel can be trimmed with cargo during vessel planning by the stowage planner.

REPORTING | For documentation and reporting a trim optimization report can be issued and shared with all relevant stakeholders.

BENEFITS

- ✓ Trim calculations to identify the optimum trim for a particular draft and speed considering stability and ballast water designs
- ✓ Trim the vessel with cargo instead of ballast water thanks to connectivity of MACS3 and StowMan
- ✓ Trop ensures trim optimization as integrated part of excellent voyage executions

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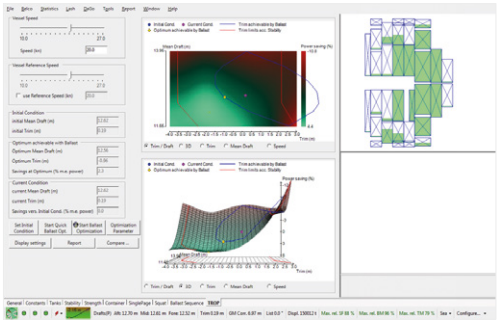
FEATURES

- Defining initial conditions
- Defining vessel speed and vessel reference speed
- Defining optimization targets in „Display Setting“
- Various presentations of TROP curves using heatmaps with clear presentations of restrictions from design and stability regulations
- Compare functions to identify the best possible trim
- Ballast optimization functions to enable ballast water operations
- Integration in computer status panel to enable a fast control of the trim results
- Generating trim optimization report

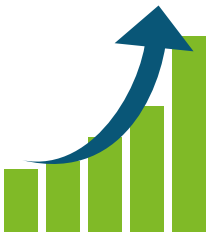


CASE STUDY

A customer conducted a study comparing two series of container vessels of the same size. The only difference of the design was some were equipped with fully rated main engines with propeller design matched to engine power and some equipped with de-rated main engines with propeller design matched to the de-rated power. The vessels were all operating in the speed range where the vessels with de-rated engines should have performed better.

The customer found that the vessels with the fully rated engines were consuming less fuel than the vessels with de-rated engines and were using more power than the vessels with de-rated engines 85% of the time. All vessel were equipped with TROP, but only the fully rated vessels used it.

As a result, the vessels using TROP were consuming **225mt less** fuel per year than those not using TROP. Further analysis showed that the vessels were not being trimmed to the full extent suggested by TROP. If the vessels had been trimmed closer to the suggested trim, they would have **saved 355mt** of fuel, 57 % more savings, per year. Based on this calculation there is a return of investment for the MACS3 TROP module after only a few months.



APPLYING MACS3 TROP SAVES FUEL!

ENERGY EFFICIENCY TRIM OPTIMIZATION

- Stability and strength
- Ballast water operations

MACS3 TROP

- Consider trim during planning
- Trim with cargo instead of ballast water

STOWMAN TROP

BENEFITS

- Fuel savings
- Reduced CO_2 Emissions
- Increased cargo intake
- Improved CO_2 footprint

If you have any enquiries or would like to set up an appointment with one of our sales representatives, please phone or e-mail us:

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