ABB Ability™ Marine Advisory System – OCTOPUS
Passenger vessels
OCTOPUS Suite
Passenger vessels

ABB offers the widest portfolio of marine software and optimization systems to the maritime market. Its performance management solution consists of a modular and comprehensive decision support toolkit to optimize the safety of a ship, and to minimize the overall fuel and energy costs for the whole fleet.

**ABB's OCTOPUS suite**
The OCTOPUS system provides onboard staff with tools that are able to forecast conditions which could jeopardise shipboard operations, plan the most comfortable voyage considering weather and hydrodynamic conditions, identify the most economical power configuration to produce reliable power and ensure that power produced is efficiently consumed.

OCTOPUS is able to provide data through secure links to shoreside ABB Ability™ Collaborative Operations Centers, providing additional visibility to all stakeholders, ensuring end to end transparency. The OCTOPUS shore tools provide a fleet view, which don’t just provide basic data, but also enable Fleet Managers to plan key maintenance tasks, such as hull and propeller cleaning. OCTOPUS based technology has been installed on hundreds of ships.

**Optimization modules**

**Speed optimization**
Fluctuations in propeller RPM is a source of significant energy losses. RPM/Speed Optimization minimizes fluctuations in propeller RPM to reduce losses by 1%. The optimum speed/RPM profile is calculated by using intended route, required ETA, weather forecast and vessel characteristics.

**Power plant optimization**
Assists onboard staff configuring the optimum energy balance onboard. It calculates and advises the optimum load sharing between the various producers such as auxiliary engines, shaft generator, waste heat recovery- and energy storage systems.

**Trim optimization**
With dynamic trim optimization, the operating crew will receive advice on the optimum trim in any condition, including variations in speed, draft, water depth, wind and waves. Depending on the vessel type and operational profile, the savings potential can be up to 5% of propulsion energy cost.

**SFOC**
The SFOC Monitoring module gives a dynamic view to the performance of diesel generators. The performance is evaluated by calculating how much fuel the engine uses to produce a certain amount of energy in g/kWh (SFOC). The performance is visualized with three SFOC curves; manufacturer, baseline after maintenance and current state. Reduced performance of the diesel generator can be noticed as lower engine performance index. It is also visible as growing difference between current and baseline curves.

**Clean hull module**
Estimates hull and propeller fouling based on an advanced data model of the vessel. This helps shore staff to coordinate the cleaning schedule and the calculation of return on investment.
**Comfort Optimizer**
The OCTOPUS software suite is the industry leader in vessel motion prediction solutions. It combines wave measurements, weather forecasts and navigation data such as speed, course, RPM and the voyage plan, with ship characteristics, loading conditions and motion sensor measurements. This facilitates continuous monitoring as well as simulation and forecasting of the ship responses and performance. As a result the captain and operating crew can select the most favorable heading and speed in order to provide maximum passenger comfort and prevention of seasickness. The OCTOPUS motion forecast can also be used as a decision support tool for more conservative usage of the fin stabilizers, leading to fuel savings.

**Advanced Energy Management and Monitoring**

**Energy diagram**
This system minimizes overall energy costs. It compares and analyzes the historical and current operational data of the vessel, then provides decision support on where to focus energy efficiency efforts. The solution consists of onboard & onshore modules for energy monitoring and optimization.

**OCTOPUS MRV Software**
ABB's MRV software has been certified by Verifavia as a tool to monitor all parameters required to comply with within the EU's Monitoring Reporting and Verification (MRV) regulation requirements. The system is in compliance with the requirements of the Regulation (EU) N° 2015/757, the associated Delegated and Implementing Acts and the ISO IEC 25051 standard on software engineering. The MRV web-portal can be accessed from any internet browser for both manual input of the data and report generation.

**A SEEMP compliant fuel monitoring solution**
With fuel costs taking in a huge portion of the operational costs of a vessel and new SEEMP (Ship Energy Efficient Management Plan) regulations within the shipping industry, measuring performance against fuel consumption Key Performance Indicators is increasingly becoming a priority for shipping companies. ABB's SEEMP solution is capable of measuring and displaying important vessel fuel consumption KPIs and making this data available as well on the vessel as to the onshore operations department.

**ABB Ability™ Marine Fleet Portal:**

**Easy access to vital information**
- Fuel & performance KPI’s for individual vessels and benchmarking within the fleet
- Clean hull module estimates hull and propeller fouling based on an advanced data model of the vessel. This helps shore staff to coordinate the cleaning schedule and calculation of return on investment.
- Measured and forecasted vessel motions and accelerations
- Sailed routes and location
- Alarms and notifications in case of sensor timeouts or failures

Authorized users can access their own part of the protected website to retrieve the latest information. After the voyage, the recorded data is evaluated and the performance of an individual vessel or entire fleet can be evaluated. The database can be made accessible for all parties required. It can be used to tune motion roll motion and for various other purposes, such as fatigue analysis.

**Advanced analytics**
ABB offers a broad range of analytics and consulting services:
- Energy Analytics
- Operation Modes & Movement Analytics
- Customer training
- Feasibility studies
- Sea-keeping and wave analysis
- Remote support, data health checks and troubleshooting.

**Our holistic approach**
The total offering from ABB's digital portfolio is the most comprehensive suite available within the maritime industry and provides seamless exchange of data, full integration of sensors, automation and ship software and cloud solutions. Important elements within the suite are decision support software for safety and comfort and energy efficient operations, and remote diagnostics technology that preventively and continuously monitors critical equipment onboard of a ship. Furthermore, ABB has invested heavily in shore side expertise, analytics firepower and engineering availability to provide 24/7 support from our ABB Ability™ Collaborative Operations Centers that support troubleshooting, maintenance planning, benchmarking, and interventions based on predictive diagnostics.
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