

Performance Monitoring

SeaTechnik Ship Performance Monitor (SPM) Level 1 Monitoring for all Ship Types

- Performance efficiency monitoring on board
- Performance continuously compared with ideal case
- Configurable for any vessel
- Emissions monitoring and reporting
- Data monitored, trended, stored & transmitted to remote office
- Trim optimisation by dynamic trim-meter
- Typical 3% savings means rapid payback



Ship Performance Monitoring

Fuel is the single largest operational cost of running a vessel.

Fuel costs are rising dramatically, and the key question occupying ship-owners, ship managers and charterers alike is; "In a competitive market how do we reduce the running costs of the vessels we operate while maintaining the level of service to our customers?"

Trelleborg Marine Systems UK has developed the total solution. For the last 25 years Trelleborg has been at the forefront of the development and implementation of Ship Performance Monitoring and Optimisation systems. Using the latest technology available, computer-based systems have monitored and controlled the performance of complex vessels such as multi-engined Ro-Ro ferries up to LNGCs. Trelleborg Marine Systems has now developed a family of systems in 3 levels. These range from a basic package for Ship Performance Monitoring to the most sophisticated Ship Performance Optimising systems that assure savings through continuous voyage planning and automatic propulsion control systems.

The systems are modular in concept to enable all ship system configurations to be accommodated and for systems to be upgraded. Interfaces are used to link with all applicable on-board systems.

The SPM-level 1 provides ship-operators with the tools to develop and maintain a strategy under the mandatory SEEMP as well as achieve real savings to remain competitive.

The three configuration levels are:

- **Level 1** – Monitoring, display & reporting machinery and hull performance data - applicable to all ships
- **Level 2** – Monitoring, display & reporting machinery and hull performance data - Further savings are achieved by advanced modelling techniques of sophisticated ship machinery & cargo arrangements, e.g. LNGCs, bitumen carriers

- **Level 3** – Ship and route specific voyage planning with automatic propulsion control - Optimum savings assured from voyage optimisation using predicted weather and ship modelling

Level 1 - Performance Monitoring and Reporting

The SeaTechnik SPM L1 system can be installed on any type of vessel from the conventional single slow speed main engine to a medium speed CPP or other propulsion system. It is designed as a cost-effective solution for the operator who is content with the base level savings and daily/ voyage reporting for Ship Performance Monitoring.

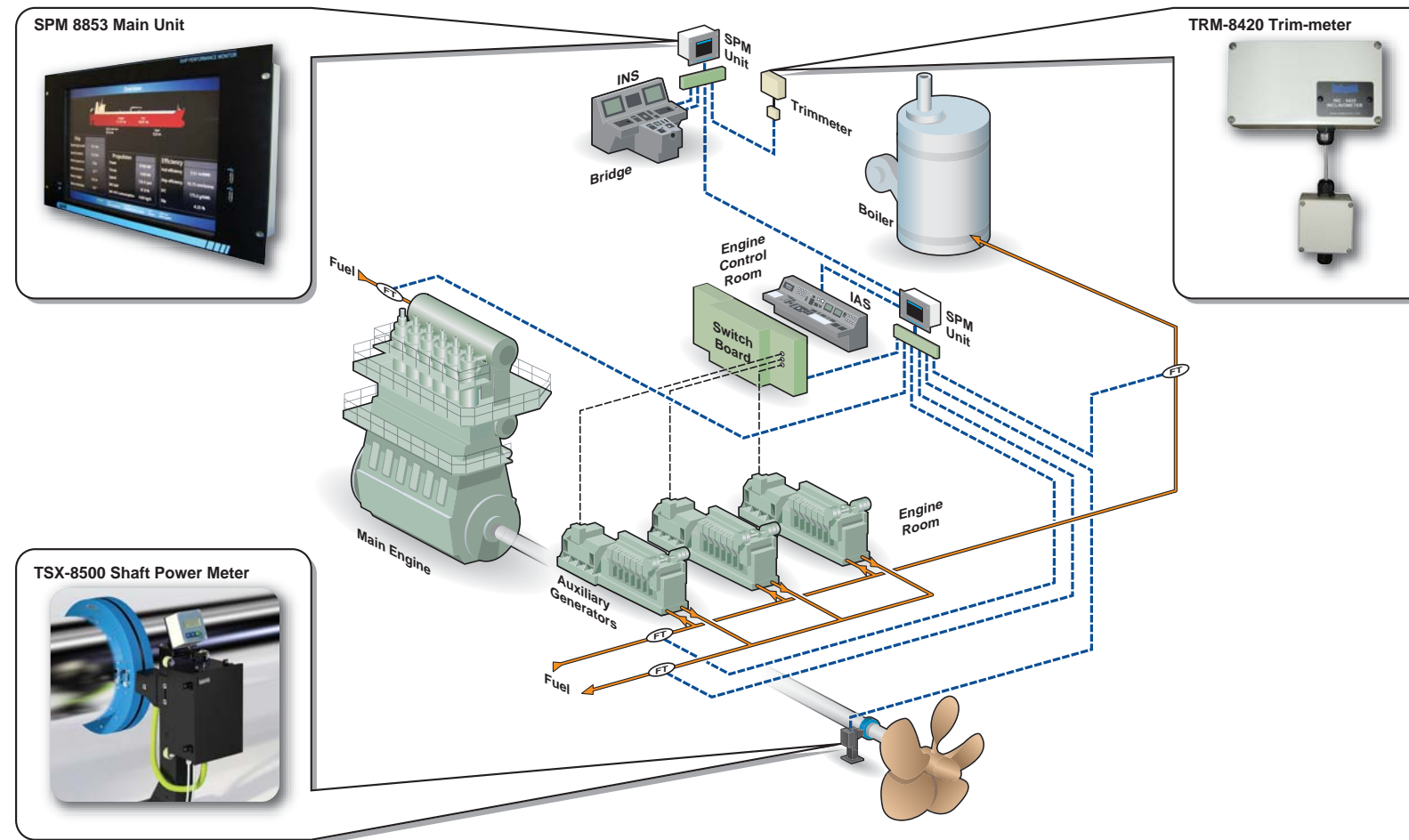
Taking data inputs from fuel mass flow, shaft power, draught, trim, auxiliary machinery energy consumption and output, machinery configuration and water depth as well as manual estimates of hull fouling, fuel bunker quality etc, the system continuously calculates machinery and hull efficiency. These are compared with a baseline model reference.

In this way random external parameters that affect efficiency reporting can be isolated so that the base vessel efficiency in operation can be maintained by adjustment of propulsion power, mode and controllable factors such as trim.

System Benefits

The benefits of the SeaTechnik Level1 SPM system for vessel operators are:

- Continuous calculation of ship efficiency
- Calculation of EEOI
- Proactive administration of mandatory SEEMP and other company specific KPI's
- Increased vessel efficiency through continuous crew awareness of efficiency and potential for wastage
- Data transmission via Ship IT network for onshore monitoring & reporting for fleet management teams
- Data transmission to SeaTechnik for on-going analysis and trouble shooting of efficiency issues
- Reduced fuel costs up to 3%
- Reduces emissions
- Rapid Return On Investment (ROI); months not years



The Trelleborg Marine Systems UK TSX5 advanced shaft power meter uses strain gauge technology for repeatability and accuracy. Power to the water measurement is fundamental to the successful application of the SeaTechnik SPM L1 system.

The SeaTechnik TRM-8450 Dynamic Trimmer is another key instrument in optimising vessel performance and is recommended for use with all SeaTechnik SPM L1 applications.

Modular interfaces and network capability enable the system to be configured to accept any signal, digital or analogue and link with

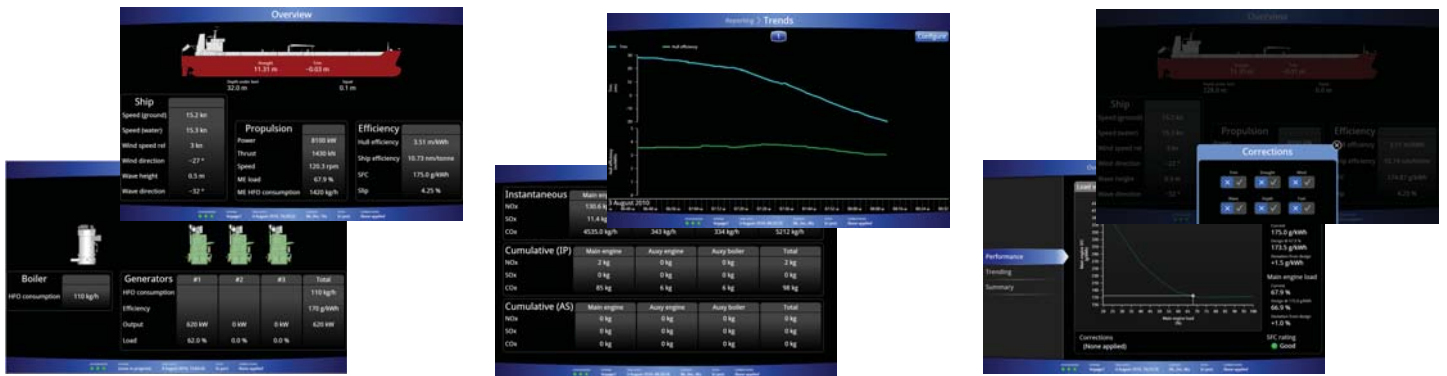
- Discrete or Integrated Automation Systems (IAS) / Machinery Systems (MACS)
- Discrete or Integrated Navigation Systems (INS) / Integrated Bridge Systems (IBS)
- SeaTechnik instruments
- Shipboard management systems for networking, printing, data storage and data transfer to remote offices

Results can be viewed instantaneously via the SPM screen in the ECR or wheelhouse enabling corrective action to be taken as necessary.

All or any parameters, measured or derived can be trended over time to find the optimum operation point for certain parameters. These include trim for a given power, speed and depth.

Measured data can be saved, printed as a snapshot in time or routine report in a given format.

Savings will always depend on the commitment to apply corrective action but the SeaTechnik SPM 1 will result in savings typically exceeding 3% on the best managed ship. Trelleborg Marine Systems' analysis of data, the development of the ideal ship specific cases and identification of optimum operational points will enable these savings to be regularly and repeatably achieved.



Service & Support

Trelleborg Marine Systems UK has been designing, manufacturing and supporting leading edge marine energy management and safety systems for over 20 years. With the Head Office located in Northwest UK, a team of experienced service engineers and performance analysts / specialists provides installation, commissioning and in-service support worldwide. The worldwide team includes dedicated staff in our Korea and Singapore offices.

A network of experienced sales/technical agents and associates worldwide provides further support, and ongoing technical training is offered to both customers' and associates' engineers worldwide.