

# Optimising ship lifecycle efficiency

BUSINESS WHITE PAPER



Ship lifecycle efficiency optimisation is a holistic process of identifying and planning value-generating activities to optimise ship performance and lower costs over the lifecycle of the vessel. It starts with analysing the true condition of the vessel. Based on this analysis, operation and maintenance can be optimised and modern technologies and standards adopted.

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# Market trends in the marine and offshore market

The current situation in the marine and offshore market is characterised by intensive competition and globalisation, fluctuating oil and gas prices, and increasingly stringent regulation. This has led to a slowdown in the market, with lower contracting prices putting pressure on costs. On the other hand, new technologies and access to real-time data and analytics provide opportunities to look into optimising operations and maintenance, and eventually the whole business. This will lead to performance-based business models, where success is measured and rewarded. These may also provide opportunities for increased revenue potential.

The key opportunities for marine and offshore operators are:

- optimising asset efficiency and performance in order to improve business performance and growth
- matching maintenance and operations with business needs, and complying to class rules and regulations
- complying with rapidly developing environmental regulation in different areas
- utilising opportunities of real-time data and analytics for optimising operations
- building and maintaining competences to match with technological opportunities.

# Services enabling business growth

The digitalisation of industrial services offers new kinds of possibilities for optimising asset performance and enabling business growth for marine operators throughout the installation's lifecycle, starting from the strategic and business planning and new-building phases and continuing with the operation and maintenance as well as upgrades needed to ensure asset performance over the years. These services are based on continuous gathering and processing of data from the ship's equipment. The process of creating value from this data requires a partnership in which digital technology and analytical skills of experts are combined to achieve a common goal.

There are four key value drivers that should be addressed: ship efficiency, asset availability and reliability, energy efficiency and regulatory and environmental compliance.

— Continuous advisory based on real-time information is a key feature of digitalised services.

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## SHIP EFFICIENCY

Ship efficiency can be optimised with a system of real-time monitoring and advisory, as well as adjustment of vessel parameters such as trim and engine performance, areas for improvement can be identified and adjustments made quickly. Predictive solutions to hull performance and engine efficiency optimisation enable more focus on optimal operations and preventing problems rather than solving them as they occur. This calls for continuous monitoring of equipment condition and a more holistic view to the vessel's systems, even the entire fleet.

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## ASSET AVAILABILITY

A key factor in improving performance and growth is ensuring asset availability. Digital solutions that offer real-time performance and condition monitoring of all equipment make it possible to guarantee uptime and availability for vessels with integrated engine, propulsion, automation and other systems.

A predictive approach to maintenance – instead of the traditional calendar-based preventive maintenance programmes – brings flexibility to maintenance planning. Grouping the maintenance of different equipment into maintenance windows that don't interfere with business operations and schedules is a way to maximise vessel availability. And being able to predict equipment condition and service needs minimises unscheduled downtime.

In the marine business assets tend to be constantly on the move. Therefore another aspect of asset availability is optimising the value chain to ensure the availability of spare parts and field services globally where and when needed.

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— Ship and machinery optimisation should be a continuous process in which adjustments can be made on the fly.

## **ENERGY EFFICIENCY**

Fuel consumption is a significant factor in optimising marine businesses. Ship and machinery optimisation should be a continuous process in which the various parameters affecting fuel efficiency can be continuously visualised and benchmarked. This will enable adjustments to be made on the fly to ensure that the vessel and all its systems are always operating efficiently.

The information that digitalised services produce enables operational advisory services that can, based on a combination of advanced analytics and human expertise, provide a wide range of ship and machinery performance and KPI reports based on deviations from the established baseline, as well as real-time advice on e.g. weather routing, vessel trim and the effects of hull fouling on fuel economy.

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## **REGULATORY AND ENVIRONMENTAL COMPLIANCE**

With the rapidly growing amount and complexity of environmental regulation, keeping up to date and ensuring compliance, as well as handling all the reporting requirements in different areas, has become an area of specialisation of its own.

An example of the increasing reporting load marine operators are facing is the European Union's (EU) monitoring, reporting and verification (MRV) regulation. From 2018 all vessels over 5,000 gross tonnes must report on fuel consumption, CO2 emissions and cargo in tonnes for voyages entering EU ports.

Reporting will therefore become mandatory for the approximately 40,000 vessels a year entering EU waters. Companies will be required to submit their monitoring plans by August 2017, indicating the methodology and means chosen to monitor and report emissions and other relevant information for each of their ships.

With continuous measuring of emissions, digitalised services can enable a largely automatic system of logging and reporting of compliance towards authorities. With a system of continuous performance monitoring and condition-based maintenance in place, a service partner can even offer compliance guarantees for its customers.

# Partnering for business growth

Wärtsilä's lifecycle solutions enhance asset performance and help business growth. They use digital innovations, advanced data analytics and global centers with experts to create a holistic approach that goes beyond maintenance and servicing. The result is a package that allows operators to focus on their core business, while Wärtsilä matches maintenance to their operations, ensuring that operations run efficiently and in accordance with regulations.

The solutions are based on data acquisition systems and smart analytics by global center experts that enable prediction and onboard advisory. They offer the following benefits:

- increased competitiveness and effectiveness in daily operations with real-time optimisation
- improved asset and business availability and predictability with lifecycle maintenance
- ensured safety of operations and instant support whenever and wherever needed
- optimised ship and energy efficiency.

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## WÄRTSILÄ LIFECYCLE SOLUTIONS FOR THE MARINE AND OFFSHORE SECTORS

### Guaranteed asset performance

Guaranteed asset performance is a ground-breaking solution that provides guaranteed operational reliability. In practice, this means that performance targets are determined based on measured data, and Wärtsilä can guarantee that these targets are reached and maintained. Measurable indicators can include, for example, availability, reliability and fuel consumption. The agreed targets are reached through automated key performance measurements, optimised maintenance and remote advisory services. Customers in marine and offshore can get real-time support regardless of their location, and the remote service is complemented with on-board advisory services. Condition monitoring and audits, together with a performance improvement plan, increase availability and reliability.

### Main benefits

- Guaranteed operational reliability and uptime
- Savings in operational costs thanks to improved and maintained ship efficiency
- Maximised uptime through optimised maintenance and remote support
- Performance improvement plan
- Maintenance cost guarantee
- Long-term cost predictability and shared goals

### **Optimised operations**

Optimised operations offers real-time monitoring and advisory services that maximise efficiency. The solution provides a ship energy efficiency management plan that follows the IMO guidelines. Onboard advisory services, such as trim and fuel consumption monitoring together with predictive analysis of hull performance and engine efficiency and condition as well as vessel audits and component condition evaluation, help identify areas in which performance can be enhanced. Ongoing performance evaluation and possible system-efficiency upgrades lead to continuous improvement of operations.

#### **Main benefits**

- Optimised energy efficiency
- Real-time advisory services
- Long-term cost predictability and shared goals
- Performance improvement plan
- Maximised uptime through optimised maintenance and remote support
- Ship Energy Efficiency Management Plan (SEEMP) in compliance with MARPOL (marine pollution) regulations
- Global and local co-ordination through network companies with workshops and skilled service experts

### **Optimised maintenance**

Optimised maintenance involves planning and scheduling maintenance procedures to suit the customer's business operations, improving long-term cost predictability and uptime. In addition, Optimised maintenance offers remote operational and technical advisory services, whenever and wherever needed. Optimised maintenance is a proven way of preventing the unexpected and optimising an installation's availability throughout its entire lifecycle.

#### **Main benefits**

- Maintenance cost and service level assurance
- Long-term cost predictability and shared goals
- Maximised uptime through optimised maintenance
- Remote operational and technical support
- Scheduled work and parts included
- Global and local co-ordination through network companies with workshops and skilled service experts
- OEM spare parts and consumables – anytime, anywhere

## **Ensuring your lifecycle operations**

Wärtsilä is an experienced lifecycle solution provider, with a proven track record in operation and maintenance services. Globally, more than 300 ships are covered by Wärtsilä service agreements.

Wärtsilä's extensive global service network and efficient spare parts logistics ensure that you can focus on your core business, resting assured that your maintenance needs can be optimally met, whenever and wherever.

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