



## Condition Monitoring for Thruster Systems

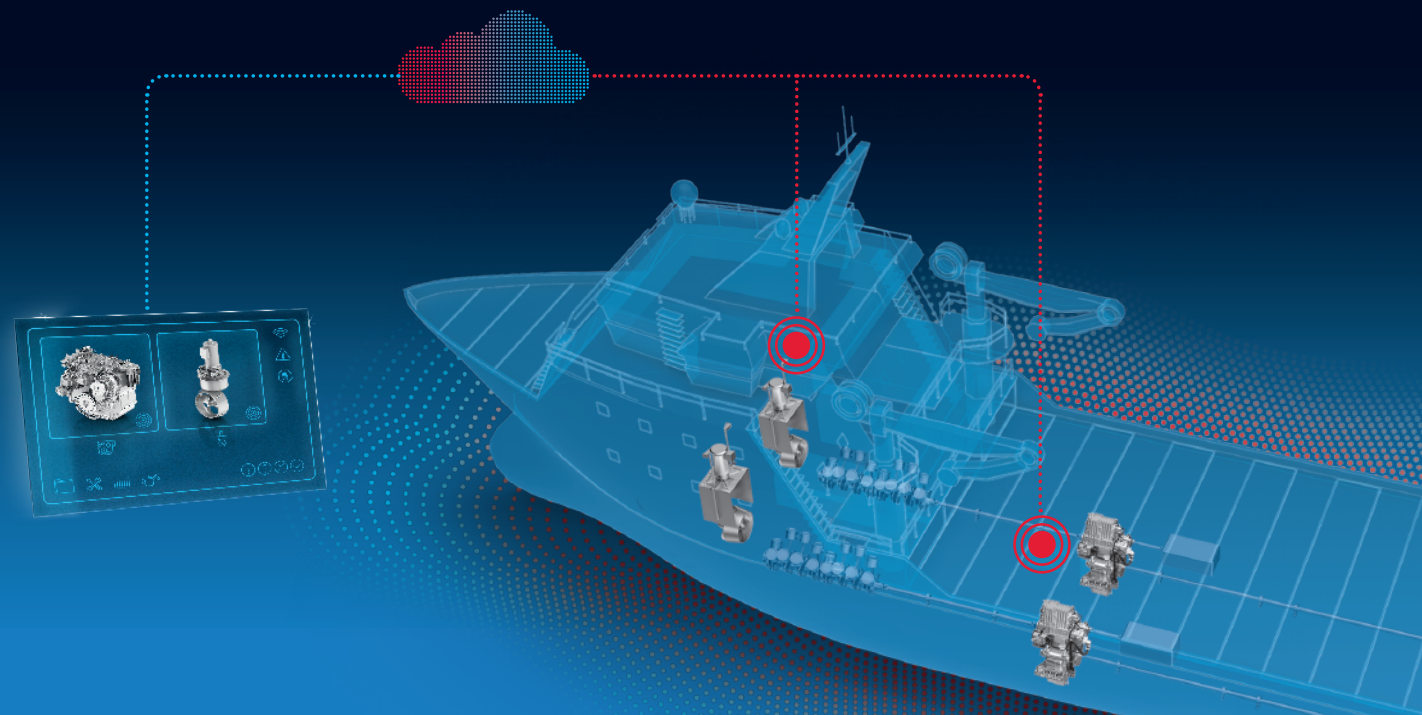
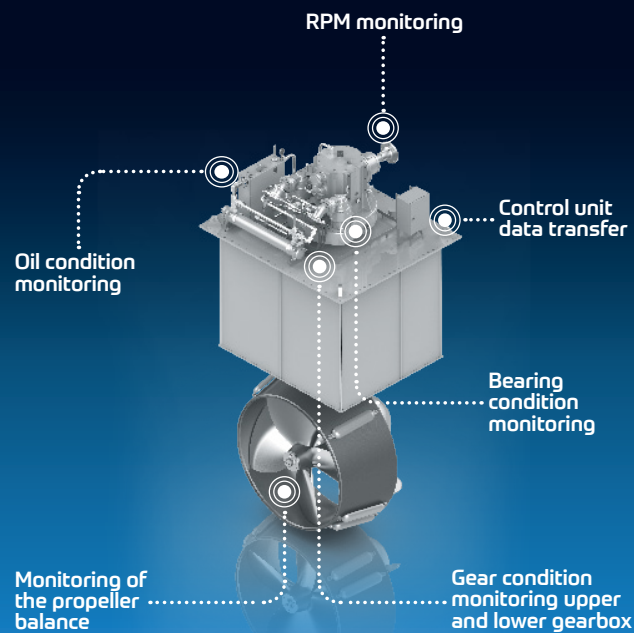
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## Condition Monitoring System

The intelligent Condition Monitoring System demonstrates how integrated sensors and advanced data analysis tools can further improve efficiency, reliability and safety on board.

### The highlights at a glance

- Maximize vessel operation time
- Predictive maintenance – Condition based service
- Lower operating costs by prevented / shortened down-time
- Detect changes in the performance of the components early on
- Extended lifetime of monitored systems
- Data turned into knowledge - Optimized crew tasks
- Support from ZF experts worldwide
- Possible extension of the five year required class survey

## Operation excellence with condition monitoring

The Condition Monitoring System from ZF includes various sensors as well as an intelligent evaluation unit. Information will be provided about the condition of:

- Bearings
- Gears in upper and lower gearbox
- Propeller balance
- Oil with regards to particulate and water content

Collected data enables the user to prioritize and schedule maintenance when it is actually needed. Via a secure VPN (Virtual Private Network) connection, ZF data analysis experts are processing the data and report results and maintenance recommendations periodical. Using advanced algorithms and analysis, ZF experts are able to assist with failure detection and advise accordingly. The vessel operator and owner can fully concentrate on their core business with full awareness of the status of their thrusters.

## Outlook Smart Propulsion

Connectivity – ZF has identified this future megatrend and is developing solutions for the next generation mobility which will help to better connect products and therefore simplify complex processes.

The IoT (Internet of Things) platform developed by ZF, allows the integration of data and systems to optimize the operation of ships. Based on customer requirements all on-board systems can be connected to a holistic fleet management system.