



SPM



Marine Solutions

More Efficient Maintenance

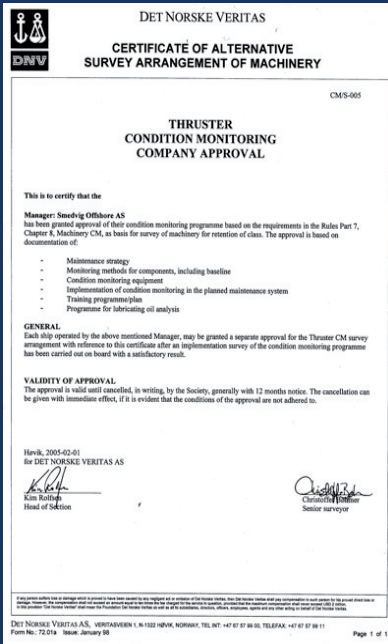
Onboard maintenance tasks are handled by fewer and fewer personnel and the lack of trained engineers makes it difficult to maintain knowledge how to conduct cost effective maintenance

Machines are inspected and repaired unnecessarily and new problems are built in during overhauls. The solution to maintaining reliability despite the reduction of onboard staff is implementing an online condition monitoring system.

Examples show that by relying on condition information instead of traditional routine work based on running hours, the amount of work orders may be more than halved.

The Intellinova online system is ideal for reducing costs through condition monitoring of critical machinery. The system is rugged and reliable, designed with operational efficiency and cost effectiveness in mind, and is well suited for machines like thrusters, turbo-chargers, compressors, generators, motors and pumps.

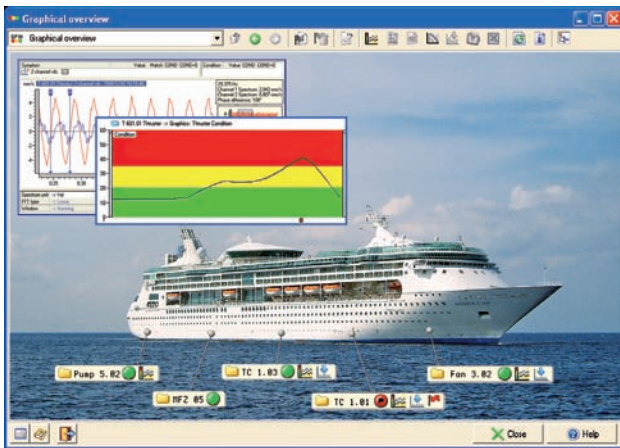




Supported by Class

The major class societies have seen the significant advantages of Condition Based Maintenance (CBM) and in fact recommend this maintenance strategy as the most cost effective. The class approves the CBM implementation and makes sure the organization works according to the strategy. The class will also approve CBM on individual machines so the strategy can be implemented step by step as the costs are reduced. Documented condition information based on trends can show that the machine can continue to operate and flexible maintenance activities can be planned to optimize resources. Fewer open equipment inspections results in fewer breakdowns and reduction of spare part consumption.

- » Fewer work orders
- » Documented machine condition
- » Avoiding catastrophic failures
- » Flexible maintenance intervals
- » Fewer open equipment inspections
- » Reduced stock of spare parts



Additionally, all measurement data can be made available for analysis by an expert on shore for a second opinion.

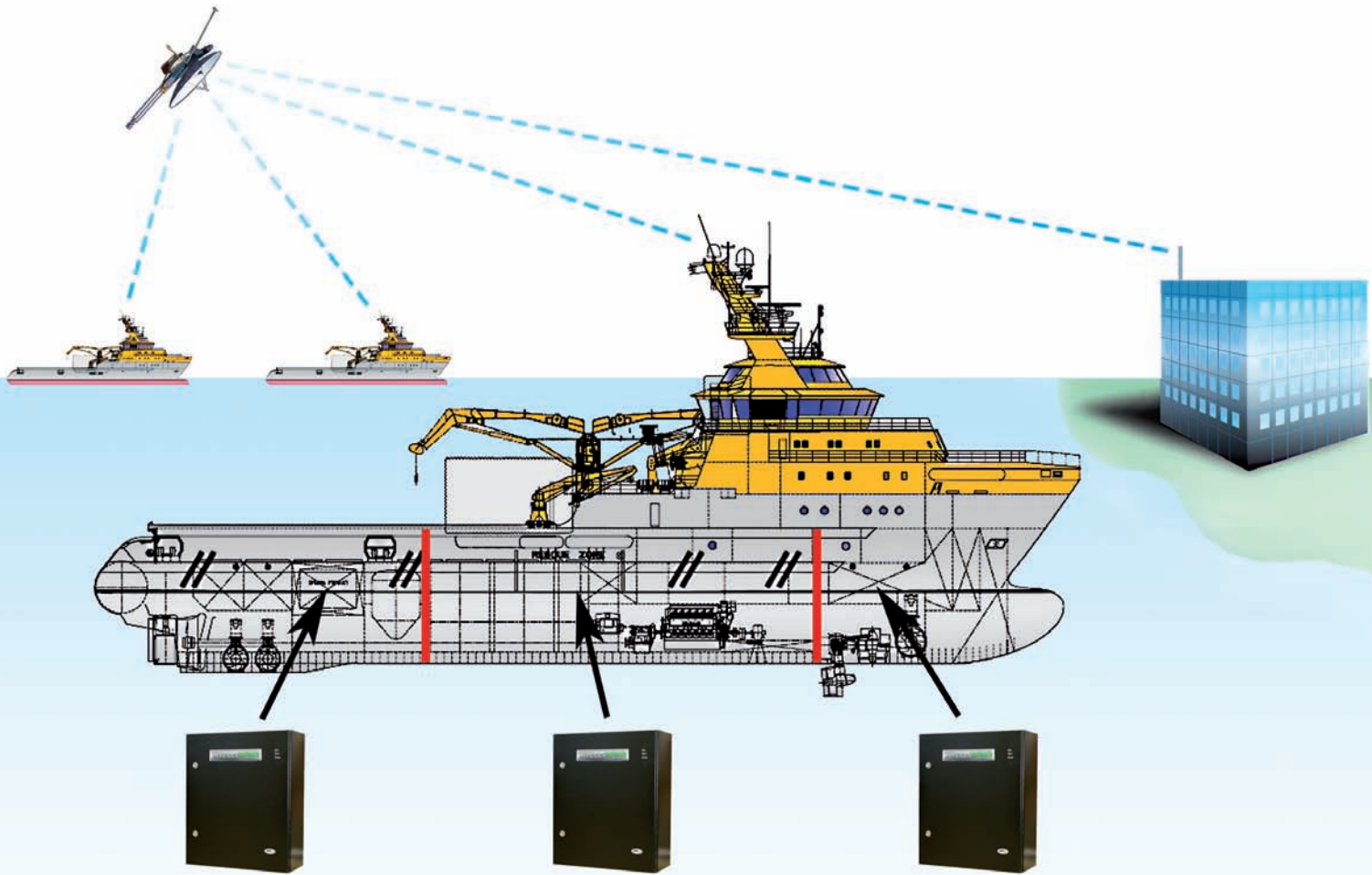
To help visualize the results of CM, the software collects user defined Key Performance Indicators. The reduction in costs by implementing CM can be followed on a regular basis and the savings made clearly visible to management. For instance, by trending average vibration measurements from the entire ship, the quality of shaft alignment procedures and the state of unbalance can be followed. Trending shock pulse will show the quality of the lubrication program and the very common problems with over-lubrication. This way, the effect of better maintenance practices can be measured and visualized by staff and management concerned.

Advanced Condition Monitoring designed for ease of use

The Intellinova system has built-in intelligence and is capable of drawing conclusions based on multiple measurement parameters. In clear text, the system can spell out the work order to maintenance and make machine condition visible to the control room. Once the system is set up and running, the staff onboard can focus on the messages from the system and take maintenance action based on these, while the control room gets full overview of the present status of the machines.

In the software, each application is defined and the various measuring points set up in a hierarchy so the function of the application is defined in advance. Intellinova can receive multiple input signals from each application. Any deterioration from this "finger print" is then interpreted and can be shown in clear text for easy understanding.





The measuring units are mounted in different sections of the ship and communicate with each other and the control room via Ethernet. Alarms with instructions on maintenance activities are sent to PCs in the engine room. Onshore expertise can support and manage the system.

Online Monitoring saves time and improves reliability

Intellinova can be integrated with the CMMS system so that work orders can be initiated and verified. Via OPC, Intellinova can also be integrated with the control system to receive and export relevant information.

Intellinova ensures that condition information is measured and collected without any major changes to the organization onboard. The problem of changing crews while maintaining the knowledge is solved by building experience directly into the system. Bearing damages, lack of lubrication, unbalance, misalignment, pump cavitation etc. can be detected early and corrected to avoid failures. Hence, relying on actual machine condition can drastically reduce the number of work orders, because unnecessary inspections and over-maintenance is avoided.

Online system as a fleet solution

From each vessel, the system can send updated measuring data on relevant measuring points via e-mail or, when applicable, broad band. To limit the traffic, it is possible to send only information from selected measuring points in alarm state.

The setup is standardized for the entire fleet and independent from the influence of the human factor. Key performance indicators like comparing the quality of the lubrication, alignment or unbalance between ships can be used to set up best practices. The quality of any repair job can immediately be evaluated and feedback given for continuous improvements.

Because the condition information is available online, the central office can have an onshore expert supporting and developing maintenance practices. When maintenance work is based on the actual condition of the equipment, resources become flexible, leaving ample opportunity to purchase spare parts and plan for repairs and overhauls at the next port.