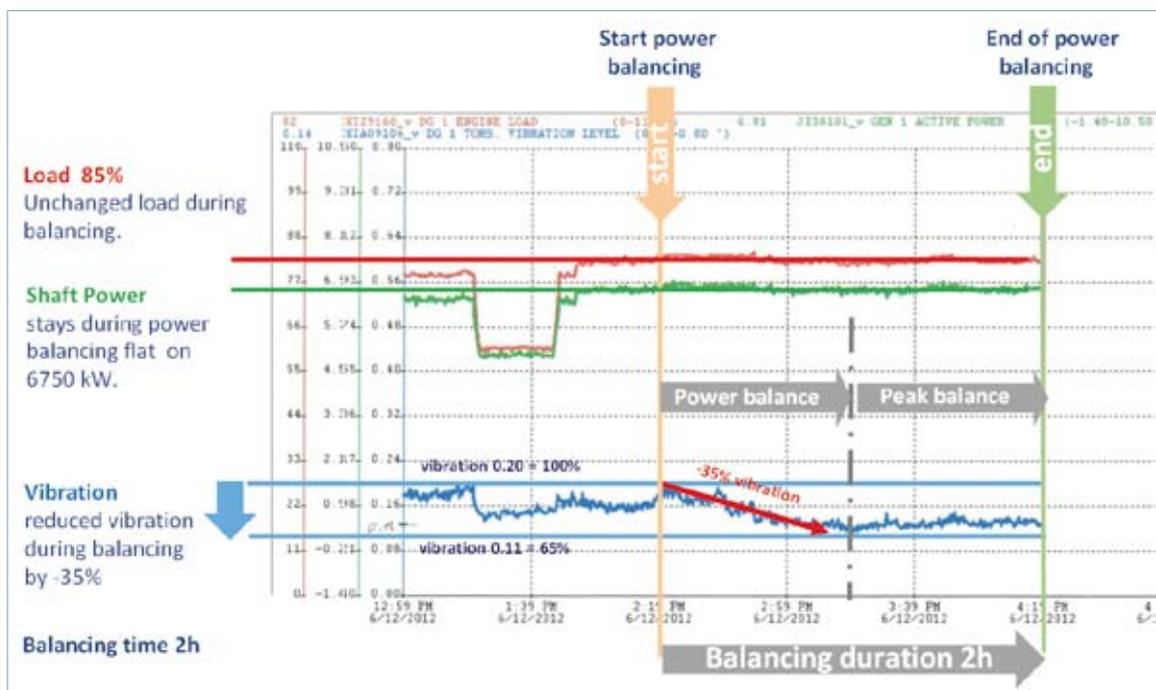


Reducing fuel consumption on cruise vessels

POWER BALANCING With fuel prices rising and environmentally friendly measures a priority, cruise operators – like any shipowner – are facing significant challenges. Switzerland-based International Technology has carried out power-balancing tests on the engines of several cruise ships, achieving controlled fuel savings of up to 3%, writes Walter Fuchs, general manager of the provider of engine monitoring and diagnostics solutions.



The vibration graphic shows a lower engine vibration curve between start and end of power balancing. Even when the indicated power was reduced by 500 kW, the shaft power remained stable at 6750 kW and the load at 85%

Steadily rising fuel prices are forcing cruise operators to optimise their energy costs and keep them low. In the medium and long term, it is expected that fuel prices will soar to USD 1,000 per tonne, including expected carbon dioxide emission allowances. In addition to energy-saving initiatives on a vessel, such as low-energy lighting and hull coating, significantly lower fuel consumption potential can be found in the diesel engine. But due to a lack of appropriate monitoring devices, this has not yet been realised.

Engine monitoring goes online in high accuracy

Only a high-precision power balance allows controlled fuel savings. International Tech-

nology has ushered in a new era of online multi-cylinder engine-monitoring systems for portable and permanent installations. For the first time, these systems can provide a power balance on diesel and gas engines with very high accuracy, replacing conventional measurement methods with single-cylinder systems known as peak meters.

New multi-cylinder online monitoring systems, such as "The Doctor" DM 8-32 and DM 10-TP, determine in real time and with high precision the exact performance differences between the cylinders in one cycle. Such differences are caused when the cylinders brake against each other, which means that the engine is not perfectly balanced and

leads to a significant increase in fuel consumption. Crucial to this issue is Det Norske Veritas' guidance, which states: "1% difference in performance is 1% higher fuel consumption."

The efficiency of the new system was proven on the vessels of well-known cruise companies with very effective power balancing. As expected, the multi-cylinder online monitoring system "The Doctor" DM 8-32 identified additional fuel savings of up to 3%.

The test was performed on six cruise ships having different four-stroke engines with eight to 16 cylinders, which had previously been monitored with the conventional peak-meter method. The average fuel savings on

each ship accounted for five to seven tonnes of heavy fuel oil per day. This represents significant savings of between USD 700,000 and 1.2 million per ship per year, depending on engine performance and engine use.

Effective fuel savings

A very effective power-balancing example of a Wärtsilä 8L46CR engine with common rail injection can be carried out easily in two hours, resulting in a fuel consumption reduction of 2.7%. This represents total savings of 0.9 tonnes per day. The controlled reduction of the fuel supply increased the efficiency of the engine by 4.5%, while generating the same amount of electricity.

Significantly lower vibrations lead to lower maintenance costs.

The effectiveness of power balancing was demonstrated by the fact that the engine vibrations fell by a remarkable 35%. Such a reduction minimises maintenance and replacement costs, since the excess energy does not affect the clutch, bearings and piston rings.

Engine diagnosis system in cloud

To ensure the effectiveness of fuel economy in the long term, the online monitoring system is offered as a complete package, with a new online engine diagnostic system in a modern cloud application

called "EDSystem". The system collects various engine parameters of every ship in the entire fleet. Based on limits, the engine status is displayed in a well-known traffic light chart, allowing easy navigation through the company structure down to the ship and engine level. The system continuously analyses the fuel consumption and indicates when savings can be achieved.

With fuel costs reaching new highs and the push towards sustainable practice gathering momentum, the right approach in the direction of multi-cylinder power balancing will result in lower costs and smarter shipping operations.

Kit monitors condition of marine machinery

SKF | Gothenburg-based SKF has announced the availability of the SKF Marine Condition Monitoring Kit. The kit includes everything needed to carry out reliable, simplified condition monitoring on board ships and enables ship operators to take a first step towards condition-based maintenance, the company said. "The SKF Marine Condition Monitoring Kit is easy to set up, use and understand and can give early indication of possible problems. It simplifies maintenance and reduces maintenance costs," remarked Anders Welin, business engineer in the SKF Marine segment.

With the SKF Marine Condition Monitoring Kit, even a non-trained user may interpret the results of vibration data measurements and locate the source of the fault in the machinery. The marine-specific software with marine-typical equipment models is loaded in the SKF Microlog Advisor Pro and preconfigured to convert the measured data into an easy-to-understand colour-coded result. The kit also includes a comprehensive step-by-step

user guide to simplify the implementation and training of the crew.

The SKF Marine Condition Monitoring Kit is more than a data collector as it has capability to do additional analysis of the machine, based on FFT (fast Fourier transform) frequency band analysis, to detect the most likely root cause of the fault, such as unbalance, bearing failures, gear failures, electrical failure in motors, hydraulic and aerodynamic problems. Developed specifically for the demanding requirements of the marine industry and tough onboard conditions, it is well suited for use on a wide range of vessels including container ships, ferries, RoRo ships, dredging vessels, tug boats and offshore supply vessels.

The SKF Marine Condition Monitoring Kit contains SKF Microlog Advisor Pro, a handheld monitoring device; SKF marine library models; work instructions for setting up and operating the system; and, optionally, an ARM (analysis and reporting) software package for reporting and trending.

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