

Perfect balance

With fuel prices rising and environmentally friendly measures a priority, cruise operators are looking to make savings where they can. **International Technology** carried out power-balancing tests on the engines of several cruise ships, achieving controlled fuel savings of up to 3%.

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 \$1,000/t, including expected carbon dioxide emission allowances.

In addition to energy-saving initiatives within the ship, 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 digital with high accuracy

Only a high-precision power balance allows controlled fuel savings. International Technology has ushered in a new era of online multicylinder 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.

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New multicylinder 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 multicylinder online monitoring system THE DOCTOR DM 8-32 identified additional fuel savings of up to 3%. The test was performed on six cruise ships, with different four-stroke engines of weight to 16 cylinders, which had previously been monitored with the conventional peak-meter method. The average fuel savings for each ship was 5–7t/day heavy fuel oil. This represents significant savings of \$700,000 to \$1.2 million per ship each year, depending on engine performance and engine use.



International Technology's online monitoring system provides engine diagnosis in a cloud application, which collects and stores data from every engine in a fleet.

Effective fuel savings

A very effective power-balancing example of a Wärtsilä 8L46CR engine with common rail injection can be carried out easily within two hours, resulting in fuel consumption being reduced by 2.7%. This represents a total saving of 0.9t/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 reduces maintenance and replacement costs, since the excess energy does not affect the clutch, bearings and piston rings.

Engine diagnosis system

To ensure the effectiveness of fuel economy in the long term, the online monitoring system is offered as a complete package, with a new engine diagnostic system in a modern cloud application called EDSysTem. The system collects various engine parameters from every ship in the entire fleet.

Based on limits, the engine status is displayed in a well-known traffic-light chart, which allows 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 multicylinder power balancing will result in lower costs and smarter operations between ship and ship owner. ■

Further information
International Technology
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