

Workboat fuel watchdog

There are many reasons to monitor fuel consumption, like saving fuel, customer demand, port requirements, predicting and scheduling maintenance. The most important reasons however, are fuel accounting and optimizing operation. This is what experience shows, three years after Aquametro introduced the CONTOIL® Fuel Monitoring – Tug (CFM-T) system.

The requirements for tugboats and other offshore vessels are different from ocean going vessels. Certainly measures like optimized engine tuning and hull design absolutely make sense, but due to the nature of operation with rather short trips, most benefit can be made with improved and accountable cost awareness.

Measurement

The key to any optimization is the measurement itself. CFM-T uses the well established Contoil mechanical flow meters, with a precision of 0.1-0.3%. The central PLC processes pulses from flow meters in supply and return line of up to 8 engines, as well as two Pt100 temperature sensors, analogue inputs from two tank level sensors and a GPS signal.

A 5.7 inch touch screen PLC, see figure 1, displays real-time consumption, speed and rpm, and is located either in the engine room or in the wheel house. Additionally, trip and tank information, distance and noon-to-noon reporting are displayed.

Optionally, an 8.4 inch touch screen panel PC can be connected in the wheelhouse, for trending and detailed reporting, see figure 2. Tamper proof data and reports are transferred to local computers via LAN Ethernet or to shore via e-mail.



Figure 1: CFM-T Central PLC showing real time data

Watchdog

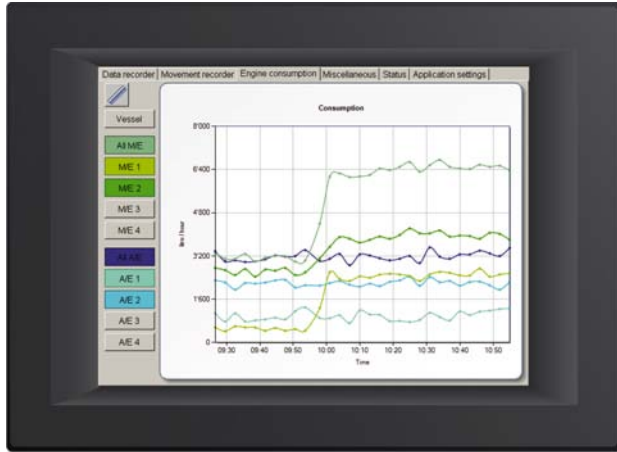
Swire Pacific Offshore from Singapore already installed 15 CFM-T systems, all equipped with additional panel for graphic trending. They identified two main problems which can be tackled with fuel monitoring: fuel theft and fuel waste. Basically, both problems are due to the tendering and chartering character of their business, which leads to conflicting interests. The CFM-T can be regarded as a watchdog, which compares the bunkered with the consumed amount of fuel, and identifies unnecessary trips.

The GPS-assisted voyage administration records all trips and enables customer tailored trip reports. The various operation modes (e.g. waiting, standby, working and anchor) simplify data analysis. The reports generated with CFM-T have many advantages over more desperate measures which are sometimes taken in the business, such as fuel dying, satellite tracking, intensive reporting or even physical presence.

More customers appreciate that accountable fuel monitoring raises awareness of fuel consumption, by showing exactly what money is burnt – and where. Further savings are achieved by analysing speed and optimising fuel purchasing and voyage logistics. The captain can respond immediately using real-time engine and consumption data, and can be rewarded accordingly. Other measures require on-shore analysis of (automated) voyage reports.

Using experience

Detailed on-shore analysis can be used to schedule and optimize voyages, but may also reveal e.g. leak-ages and inefficiencies of hull, paint, propeller and engines. Long term trending and experience with fuel monitoring enables fleet managers to calculate accurately whether investing in overhauls or efficiency improvement pays off.



Easy to find is a sudden efficiency deterioration, e.g. due to a cable wrapped around the propeller or an engine problem which needs to be addressed and corrected promptly, as e.g. in figure 2. More difficult is to determine the right time for machinery overhauls.

Normal consumption is a strong indicator of good machinery condition, whereas a slow increase points at a problem which may require a closer look and possibly a small repair. Otherwise this problem could go undetected and lead to major damage and down-time.

Figure 2: CFM-T Panel showing engine consumption trends

With experience, recognizing such behaviour can be used to schedule required engine overhauls. Extended overhaul periods give an enormous potential for additional savings. However, this experience is not required to still enjoy a payback time of already less than a year.

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