



## Benefits from Energy Management by installing data log

### Capt. Pär Brandholm

Laurin Maritime AB, Sweden

The rationale to monitor vessel performance in high resolution with data log can be summarized as follows:

- The fuel cost is now the highest operating cost which also offers to largest potential for savings
- New vessels will enter the market with 20 to 30 % less baseline fuel consumption making the effective operation of existing vessels even more important to stay competitive
- The analysis of ship performance is very difficult due to the dynamic environment
- The traditional noon reporting regime using 24 hour average values is virtually useless for performance analysis
- High resolution automatically logged data gives much improved possibilities for performance analysis
- Onboard access to real time performance data offers the opportunity for the crew to understand and act on energy usage
- On shore access to performance data makes it possible to interact much faster with vessel to initiate actions on energy usage

The energy savings potential by installing a data log system is in the order of 5-10 %.

### Dynamics of ship energy systems – Measurement challenges

Ships are operated in many modes such as voyages at sea loaded or in ballast with different speeds, staying in port loading or discharging cargo, tank-cleaning and heating cargoes etc. At the same time the vessels are subjected to environmental forces such as currents, wind, waves and swell.

The energy systems of a ship are therefore subjected to very dynamic conditions. The technical systems on board have to cope with many operational requirements that make design optimizations difficult.

The power used to propel the vessel is roughly proportionate to the power of three of the speed of the vessel at normal operating speeds. The energy consumption of a ship will therefore be very dependant of the speed. Increasing the speed with 3 % will increase the power requirement with about 10 %. When having a data log system on board any small change of the speed is directly visible on a screen showing FO consumption in kg/nm and this will, in real time, show the master and crew if they suddenly are over consuming.

### Noon Reporting

The industry standard is that the vessel reports their position with some key data once every day at noon, a so-called noon report. This means that the performance of the vessel is described in 24-hour average values. The possible analysis of the vessel performance becomes then limited considering firstly the non-linear behaviour of ships in relation to speed and environmental forces and secondly the weather dynamics. In practical terms, noon reporting data can show that performance differs between ships and that performance deteriorates substantially over time, but not due to which factors making it difficult to prioritize measures.

Ship owners spend a lot of resources to monitor and control the daily costs. We have accounting systems breaking down the cost into its elements, we budget the various cost elements and follow up these in detail. We use the maintenance system to plan and follow up not only the maintenance in itself but also to some extent the associated spare parts costs. The initial cost of a maintenance system is about USD 40 000 per vessel as an example.

Previously ship owners have followed up the fuel cost in a much more coarse way, basically only by follow-up of the fuel purchase and the fuel used during each voyage.

But ship owners have not had any system to assess if the fuel have been used in an effective way; this is where a data log will play its role.

By the recent implementation of the Ship Energy Efficiency Plan (SEEMP) most ship owners now require that the use of energy (fuel) also is quantified in several important fields. Probably ship owners will never be able to measure and present accurate figures by using data from only the daily noon reports, but with a data log system they will.

The potential to further reduce the daily costs is probably rather limited, possibly with the exception for crew costs. However the potential to reduce the cost for energy use is quite large and should be in the order of 5-10% if we have the right tools to follow up. The correct tool for this is a data log system.

August 2013 – Present (2 months) working as Environmental & Nautical Manager in the Laurin Maritime Gothenburg office.

*Capt. Pär Brandholm worked from October 1990 till August 2011 for almost 21 years as Master in Laurin Maritime. During these years he was also responsible for the following Projects: ISM code implementation, ISPS code implementation and TOTS implementation. Further on he have been working in the Site Team during new buildings in Spain, South Korea and Croatia. Then from September 2011 till August 2013 he worked as Environmental & Nautical Manager in the Laurin Maritime Houston office. The main task was to create and implement an Energy Management System in line with the ISO 50 001 standard. From August 2013 till Present he was working as Environmental & Nautical Manager in the Laurin Maritime Gothenburg office.*