

ICS Column - Fuel Efficiency Improvement Opportunities

ICS Hong Kong branch organized a seminar on 01st November 2012 at The Foreign Correspondents Club (FCC), Hong Kong on opportunities for improvement of fuel efficiency on the ships along with Alfa Laval a leading provider of specialized products and engineering solutions, a pioneer within energy efficient and environmental solutions. Event was well received.

The presentation was attended by participants of maritime industry professionals. Mr. Ray Field, Executive Vice President of Alfa Laval opened the presentation and introduced the topics to be discussed during the session as well as the expert line up of speakers.

Apart from the introduction of Alfa Laval, the agenda of presentation included discussion of industry trends & heat recovery from exhaust gas by Mr. Sameer Kalra, VP- Marine & Diesel Division Alfa Laval and fuel recovery & operation on HFO in ECA areas by Ms. Stella Ye, VP- Marine & Offshore Systems Alfa Laval.

Fuel oil accounts for more than 50% of the daily ship operating costs and a tremendous increase in the fuel cost over the past 10 years has led to serious thinking and need to innovate new technologies to reduce the fuel related costs by improving fuel efficiency. New energy efficiency measures and future commitments towards lower emissions from ships have also added spark to innovate new technologies.

Turn energy loss into gain

An estimated 50 percent of the energy contained in a vessel' s fuel is lost through exhaust gas; scavenge air cooling, jacket water cooling and other means instead of being used for ship propulsion. It is therefore important to use a Waste Heat Recovery system that takes into account the various aspects that affect the recovery of waste heat and steam production.

New generation of WHR technology from Alfa Laval Aalborg is contributing directly to the efficiency push from the shipping industry. The Alfa Laval Aalborg MXW-TG WHR system recovers the energy contained in waste heat from the main engine and/or auxiliary engines and superheats steam for use in a Turbo generator. This produces additional energy for propulsion and/or electricity for services onboard and thereby reduces load on the engines.

Such waste heat recovery (WHR) systems are in the process of being included in the standard specifications for ship construction. With the current state of the economy, these systems offer ship owners immediate financial relief. This is why ship owners are readily adopting this technology now.

Waste heat recovery saves up to 12% on fuel costs and cuts carbon emission as well.

“Waste heat recovery systems after the main engines have proven lucrative for decades for many ship owners,” says Mr. Sameer Kalra. “Taking advantage of the waste heat from a ship’s auxiliary engines is the natural next step, which is now possible thanks to the Aalborg XS-TC7A. The product has been very well received by the shipping industry, where many of the leading companies are investigating the possibility of optimizing the steam line by installing the Aalborg XS-TC7A onboard.”

Ship owners, hard pressed to boost profits in light of rising fuel costs and stricter emissions regulations, will find welcome relief in the new Aalborg XS-TC7A waste heat recovery (WHR) economizer from Alfa Laval. This system has a low weight for its output as well as reduced maintenance costs. The expected payback period is just 12 to 18 months depending upon the operating profile of the vessel. Alfa Laval reports that a leading Danish ship-owner signed a contract in January 2012 to install the technology on 20 new builds as well as a substantial number of retrofits.

Financial Benefits

The financial benefits of optimizing the steam line by using WHR can be significant, although these vary between technology providers and depend on the efficiency of the engine. The high-efficiency WHR system – which uses both power and steam turbines – could cut exhaust emissions and deliver fuel savings of up to 12%, with a return on investment of less than 5 years.

Take, for example, a very large crude carrier (VLCC) powered by a MAN 6S90ME-C8.2 main engine with a steam turbo generator and an Aalborg MXW-TG WHR system. When the main engine operates at 100% load, an average total electrical load of 1500 kW is available; at 60% load, a total electrical load of 820 kW is available and at 50% load, a total of 670 kW is available.

In this case, estimated savings amount to US\$946,000 per year when operating the VLCC at 80% main engine load or US\$485,000 per year when operating at 50% main engine load. These savings are based on a bunker fuel price of US\$600 per tonne of heavy fuel oil.

A ship-owner who keeps their vessels for 20 years, this would equate to a \$USD 20 million reduction in fuel costs.

Recover waste fuel

Valuable fuel is lost as sludge, in drain from tanks, leakages from filters, purifiers etc. Alfa Laval partners with ship owners to optimize their fuel lines. One example is the PureDry product, it enables the recovery of up to 2% re-useable fuel from waste fuel oil.. This useful recovered fuel may then be used in the engines resulting in fuel savings over long term. Payback of fuel recovery system is less than a year.

ECA environmental aspects

With global cap on sulphur content reducing over time until 2020 to 0.5% in order to reduce the SO_x emissions, need to use low sulphur fuel will arise in future. Estimated fuel cost difference between HFO and MGO is USD 400 by 2020, hence to comply with the global SO_x emission Alfa Laval PureSO_x has been developed to clean the exhaust gas of engines thus allowing HFO to be used in the ECA areas.

Payback time of the investment on exhaust gas cleaning system PureSO_x is highly dependant upon the time spent in ECA areas but for a vessel operating more than 50% in ECA, the payback time could typically be in the range of 1 to 3 years and this is the most modern innovative technology developed to reduce the sulphur emissions at the same time allowing use of high sulphur fuels.

Conclusion

Ship owners have many options when it comes to becoming more energy efficient. There are multiple technological options and multiple providers. Given the scale of the expected fuel savings, various technologies could prove to be a worthy investment and is certainly seeing increased take up.

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