

Slow steaming on 2-stroke engines

We have recently seen that shipowners and charters, due to current market conditions, seek to mitigate more expensive bunker consumption by reducing the vessels' steaming speed. (Slow steaming)

The main engine is designed for continuous operation between 80-100% load, and a reduced load is normally only used for shorter periods of time, for example during manoeuvring.

Unless the slow steaming procedures are well managed there will always be a risk of machinery failure, and several factors must be taken into consideration once it has been decided to reduce the engine load for longer periods of time.



Reduced load primarily results in increased carbonisation and low temperature corrosion. Reduced load will also affect the combustion system, and lead to poor atomisation of the fuel nozzles.

Slow steaming will also lead to reduced scavenging air pressure and maximal cylinder pressure.

The efficiency of the turbocharger will also be affected resulting in a reduced air flow, which will lead to increased deposits and carbonisation problems. Serious engine damage as a result of deposits appears to occur when increasing the engine back to full load after longer periods of slow steaming.

Unless special precautions have been taken, the thermal load will also increase. This is due to:

1. Reduced air flow due to reduced efficiency of the turbocharger
2. Reduced combustion efficiency due to increased carbon deposits on injection nozzles
3. Piston rings' efficiency have been reduced due to carbon deposit
4. Reduced heat transfer due to insulated carbon deposit.

Low load will also affect the exhaust gas temperature, which again reduces the efficiency of the exhaust boiler, which will increase the risk of low temperature corrosion in the exhaust system.

As the efficiency of the exhaust gas boiler is reduced, it may be necessary to use an oil fired boiler, which again will result in additional costs.

For more information please contact: Loss Prevention Executive Marius Schønberg, email marius.schonberg@gard.no

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Recommendations

To reduce or minimise the risks involved in slow steaming it is important to maintain the cooling water temperature on the cylinder unit at optimal level.

Avoid condensation in scavenging air system due to low temperatures.
Increasing the scavenging air temperature will influence the combustion efficiency.

Keep the correct level of cylinder oil consumption based on load.

The above precautions are only for temporary slow steaming, and only for shorter periods of time.

For longer periods of slow steaming it is important to contact the engine manufacturer to obtain more permanent modifications which may be required.

Most engine manufacturers have introduced upgrading kits for slow steaming, and it is recommended that all modifications are undertaken in accordance with the manufacturer's instructions.

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