

Improved propulsion with energy efficient and environmentally friendly heat recovery

In addition to the economic benefits sought in today's shipping industry, an ever increasing aspect in propulsion applications is the need for environmentally friendly solutions. A heat recovery solution such as the SISHIP^{CIS} Boost with Waste Heat Recovery System (WHRS) or the Thermo-Efficient System (TES) enables heat energy to be recycled back into the ship's energy supply network, providing significant improvements in propulsion performance and E-power generation.



Five good reasons for SISHIP^{CIS} Boost with WHRS

- Reduces energy costs by approx. 12%
- Requires less auxiliary generator maintenance
- Requires less main engine maintenance
- Green ship (lower emissions)
- More cargo space (less bunker capacity needed)

Powerful yet economical and clean

Increasing fuel costs and growing demands for improved environmental protection technology play an ever greater role in the initial design stage of today's vessels. In addition, requirements for undelayed sailing schedules, safer operation and lower maintenance influence the choice of main propulsion drive systems. Demands for more flexibility and more efficient ship designs will also continue to determine the future of container vessels.

SISHIP^{CIS} Boost with WHRS/TES

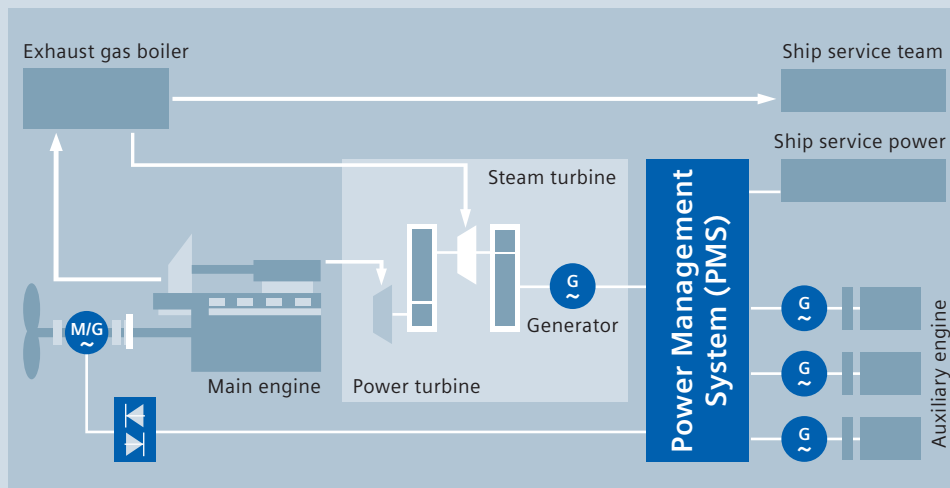
SISHIP^{CIS} Boost with WHRS/TES combines the advantages of SISHIP's Boost and the benefits of the waste heat recovery systems or thermo-efficient systems. The recovery of thermal loss results in significant energy savings and increased propulsion performance. At the same time, it is a clean solution. What's more, the system is compliant with large main engine designs of manufacturers such as Wärtsilä Sulzer and MAN B&W.

SISHIP^{CIS} Boost Hybrid propulsion with Waste Heat Recovery

Completely Integrated Solutions for cargo vessels



2 PTI motors of EMMA class OSS



Waste Heat Recovery System – overview

SISHIP^{CLIS} Boost with WHRS/TES our solution in detail

The recovery of thermal loss from the 2-stroke direct drive takes the form of superheated steam (HP+LP), which is used to drive the integrated steam turbine. In addition, with the help of a self-shifting coupling, a bypass-gas power turbine acts on the same turbine shaft which drives the E-generator. Surplus E-power can be fed back as mechanical power onto the propeller shaft (shaft motor operation). PTO operation is also possible (shaft generator operation).

High performance – safe operation

The heat recovery plant can also be operated at low main engine load. In this case, permanent parallel operation with a DG set is possible. In case of opera-

tion at full engine load, the surplus generated power can be used in full to assist the main engine by feeding back shaft power onto the propeller shaft via the shaft motor. The shaft motor acts as a variable consumer. In case of a turbogenerator trip, the shaft motor switches over to generator operation and keeps the mains alive without blackout.

An innovative cooperation

The excellent results on the first series of container vessels of APM (built at Odense (DK)) motivated a group of system component suppliers to a closer cooperation. A technology group with associated partners, including Siemens, Peter Brotherhood and Aalborg Industries, offers ship owners and shipyards the complete system with clarified interfaces, harmonized installation documents and guaranteed performance levels. Within the group Siemens has assumed the leadership.

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The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases. The required features should therefore be specified in each individual case at the time of closing the contract.