

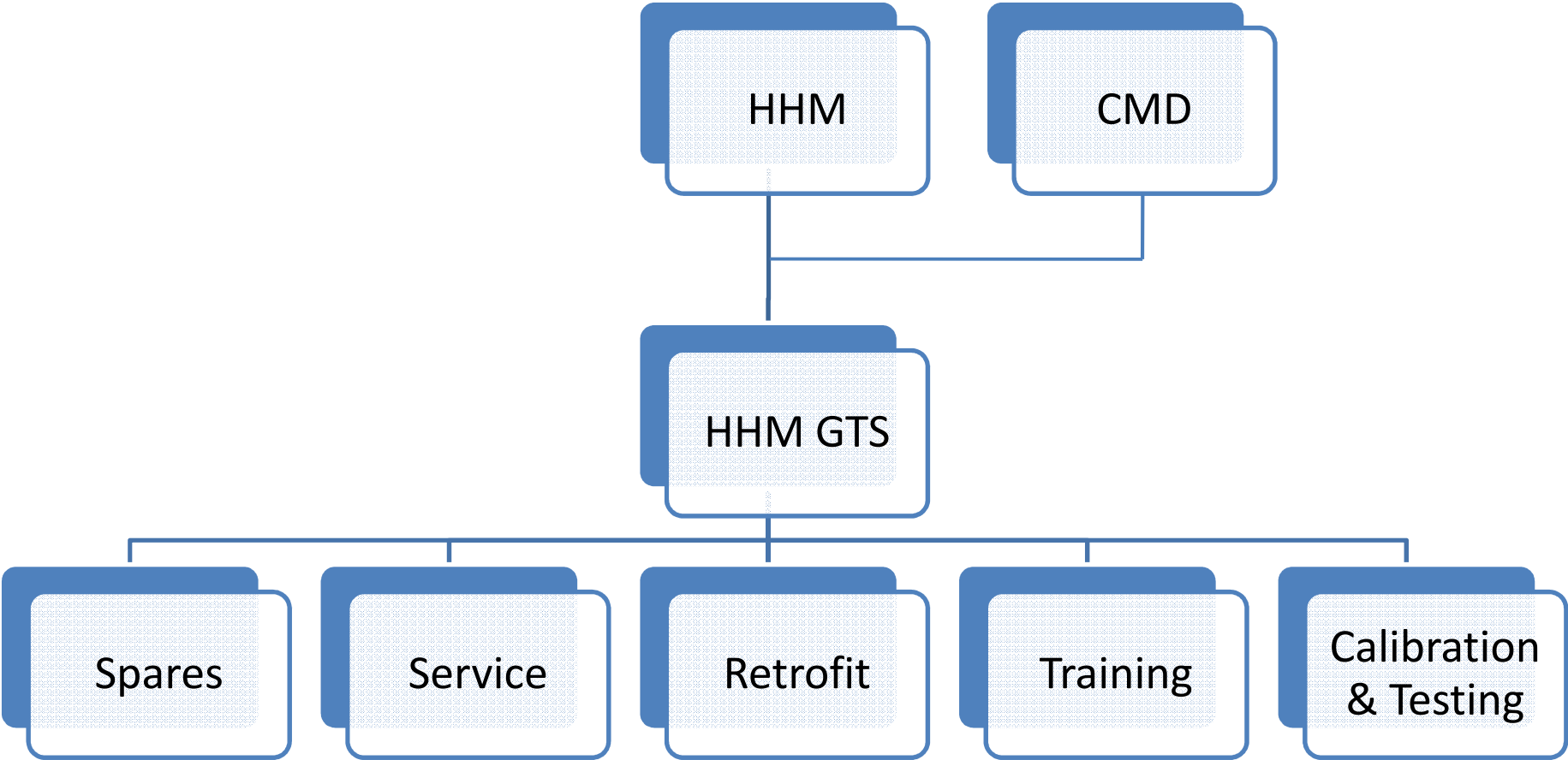
HHM Global TechService

Li Junhua



- ✓ **Brief of HHM and HHM GTS**
- ✓ **Engine Spares supply**
- ✓ **Service**
- ✓ **Engine Retrofit and reference**
- ✓ **Training**

Organization



Our Principle

HM • GTS



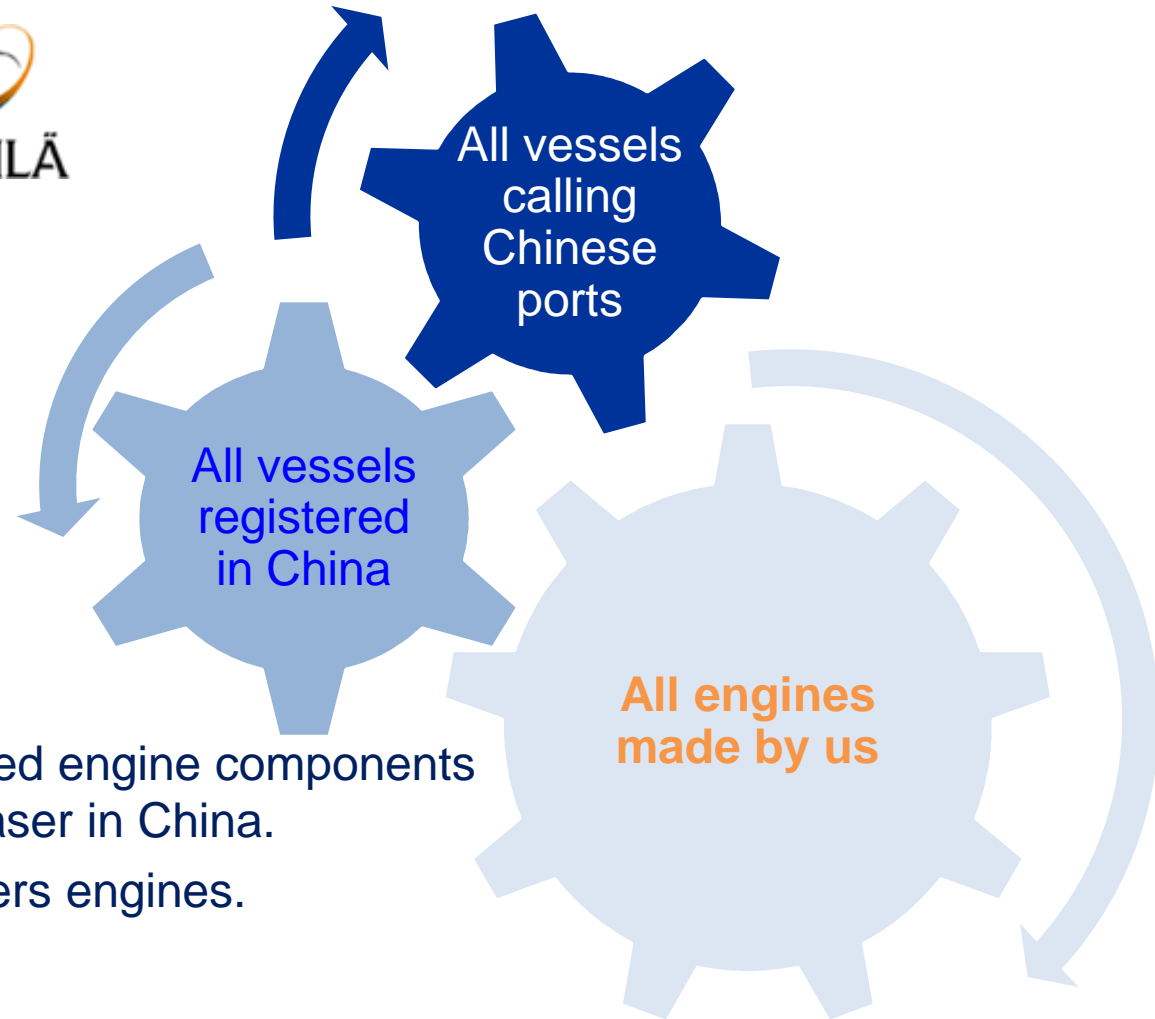
Quality

Professional

Systematic

Service Right

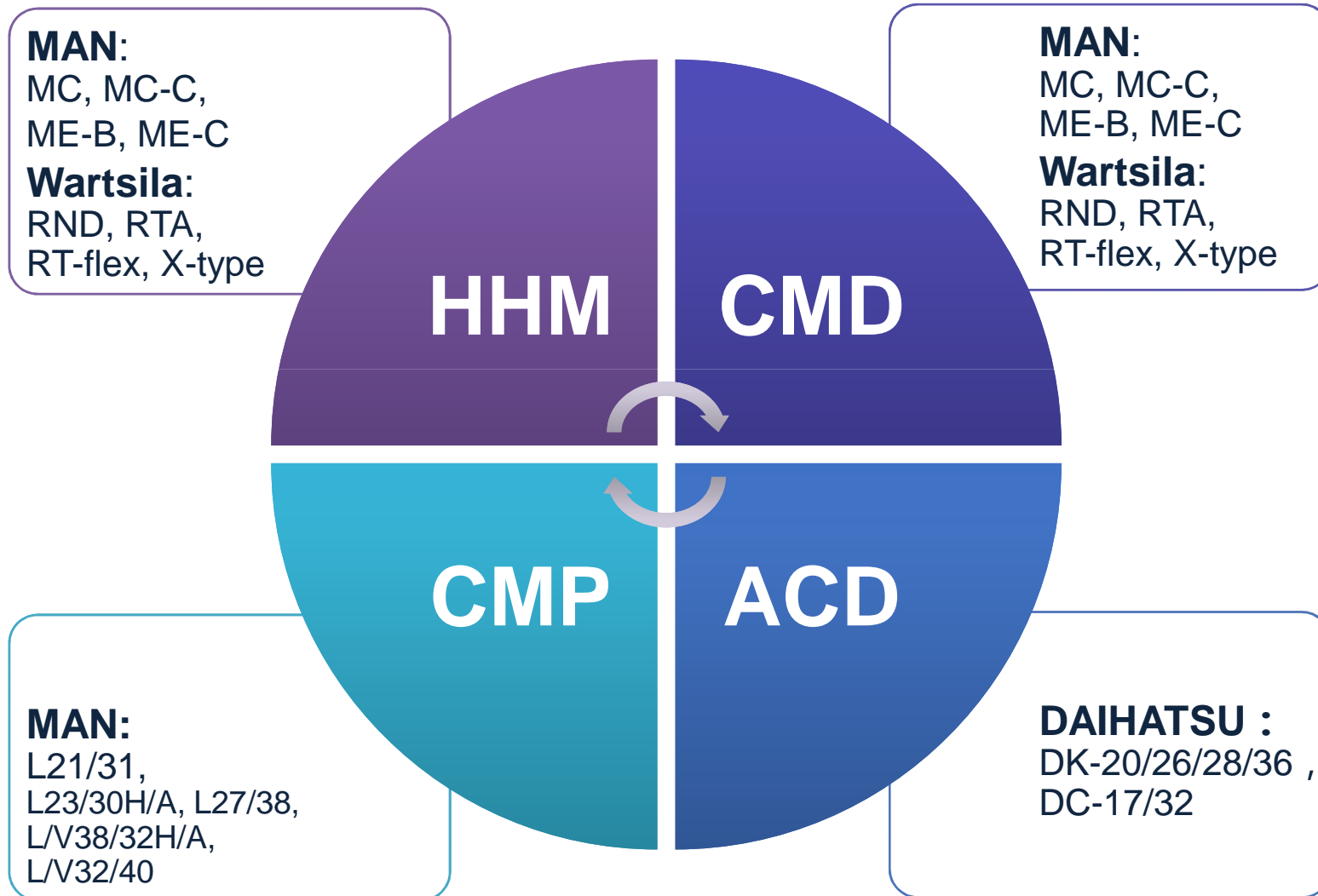
HHM • GTS

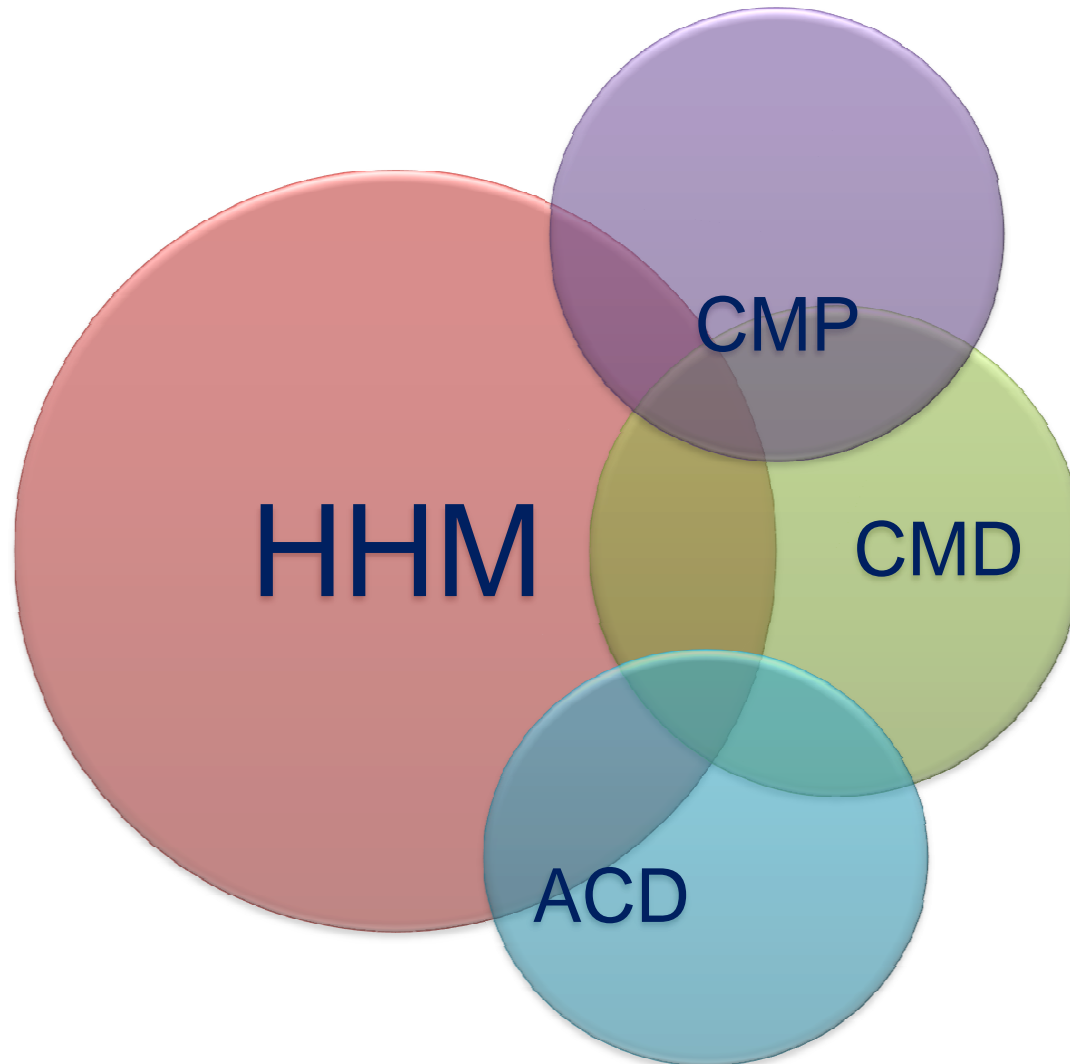


HHM GTS Merit:

- The biggest low speed engine components producer and purchaser in China.
- Produce both licensors engines.

Licensee Engine Type Under CSSC





- Over **2000** engines delivery by HHM & CMD in service, 30% of these vessel installed auxiliary engine from CMP or ACD.

- HHM GTS could supplier main engine and auxiliary engine spares.

The **benefits** of one window (HHM Global TechService) to customer:

Offer one-stop service for both main engine and auxiliary engine

Reduce the intermediary business cost

Save logistics fee

Satisfy your needs through simplicity

Distribution-Domestic



Distribution-Overseas

HHM·GTS



It plan to set up over 20 oversea service station or representative within next 5 years.



Spare Parts

Spare Parts

MAN • GTS

Engine Type

S26MC
L35MC S35MC
L42MC S42MC
S46MC-C S46ME-B
L50MC S50MC/-C
S50ME-B
L60MC
S60MC/-C S60ME-C
L70MC S70MC/-C
S70ME-C
K80MC-C K80ME-C
S80MC S80ME-C G80ME-C
K90MC-C S90ME-C
K98MC

Description

Cylinder cover;Cooling jacker;O-rings
Piston ring,crown,skirt,rod,O-rings
Stuffing box spare parts
Cylinder liner;Cooling jacket;O-rings
Cylinder lubricator system
Connecting rod and crosshead spare parts
Hydraulic cylinder unit,rubber membranes
Main starting valve and cylinder starting valve
Starting air distributor spare parts
Exhaust valve spindle,seat,etc.
Exhaust roller guide spare parts
High pressure pipe,complete
Suction valve,compl.;Puncture vlave,compl.;non-return valve,compl.;etc.
Fuel pump roller guide,compl.
Reversing mechanism spare parts
Fuel valve;nozzle;spindle guide compl.;non-return valve compl.,etc.
High pressure pipe,complete
Overflow valve,complete
Air cooler spare parts
Safty valve,complete
Relief valve
Safety valve,complete



Spare Parts



Engine Type

RTA38
RTA48 RTA48T
RT-flex48D
RT-flex50B/D
RTA52 RTA52U
RLB56
RTA58 RTA58T-B
RT-flex58T-B/D/E
RT-flex60C/B
RTA62 RTA62U
RT-flex68B/D
RMD68M
RT-flex82T
RTA84

Description

Thrust bearing,main bearing,connecting rod bearing.
Cylinder liner, cover and O-rings
Exhaust valve spindle,seat and O-rings
Piston ring,crown,skirt,rod
Water guide jacket
Lubricating quill with accumulator,complete and parts
Lubricating pump and accumulator for Pulse lubrication
Gland box for piston rod,complete and parts
Fuel injection valve and parts
Spill,suction and delivery valves and springs
Regulating linkage for injection pump
Camshaft drive,camshaft and control elements
Servo oil pumps
Starting valve complete and parts
Safety valve,indicator on cylinder cover
Harmonica valve group
High pressure fuel/servo oil pipe/hose
Various rubber O-rings
Various safety valves
Injection Control Unit(ICU)
Crank angle sensor,complete and parts
WECS-9520 components



Spare Parts

Co-operate with supplier to supply high quality spares in competitive price to clients



Fuel valve



Piston rings



Warehouse

- **12** Millions Euros components consist of
 - 2 stroke engine parts
 - 4 stroke engine parts
- **5,000** m² warehouse with **10,000** different parts
- New engine parts can be transferred in **emergent** case

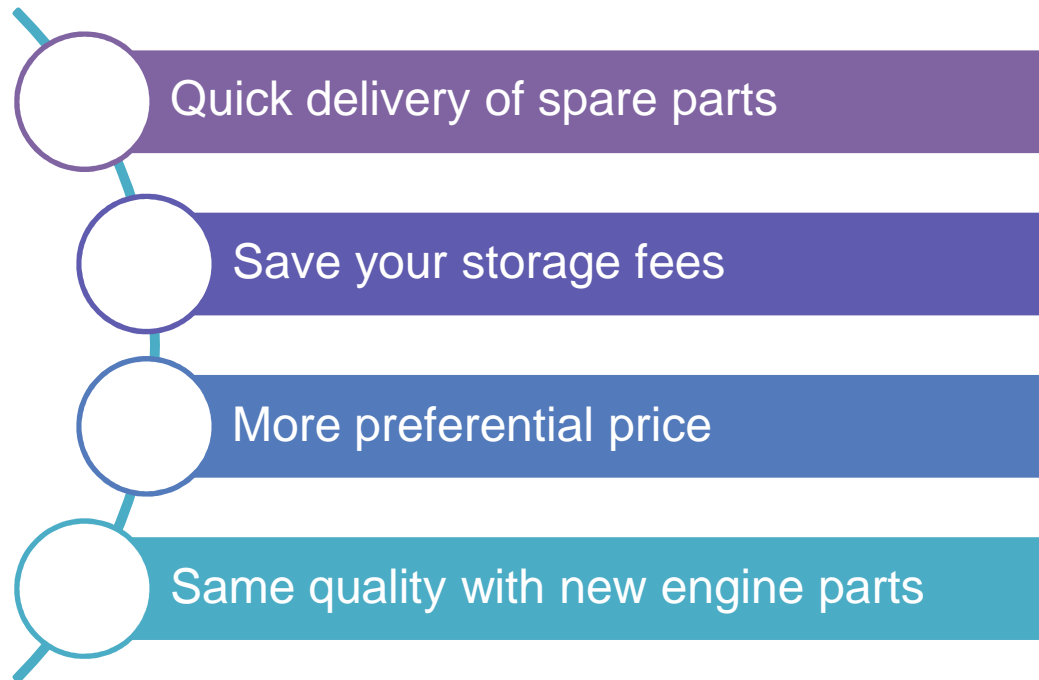


For key customers

HMM • GTS

Pre-fabrication based on client's engine types, quantities, components life time and running hours.

Benefits



Service

24hrs/7 days

Professional service

- Maintenance
- Consulting
- Trouble shooting
- Performance evaluation



Annual on board to inspect engine operating condition, main components **on behalf of** ship owner; to review engine performance in professional.

Field service

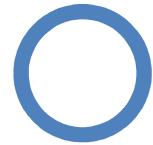
Crankshaft repairing



Crack repairing on A-frame



Thrust bearing repairing



Engine overhaul

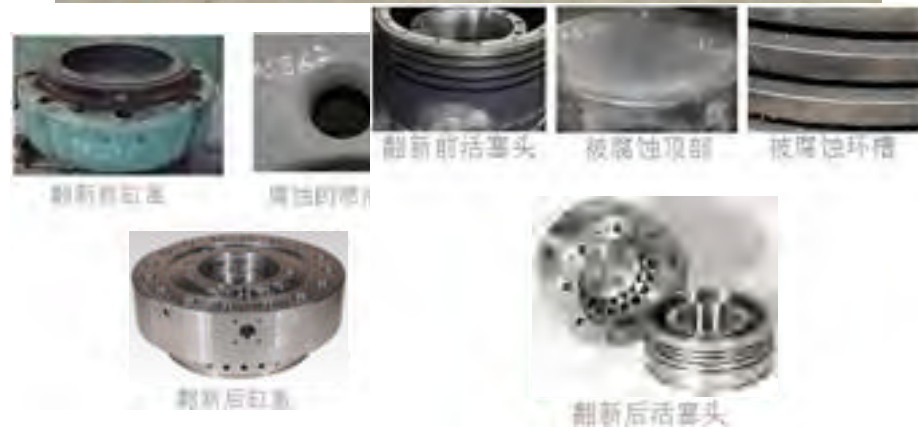


Bedplate replacement



Recondition

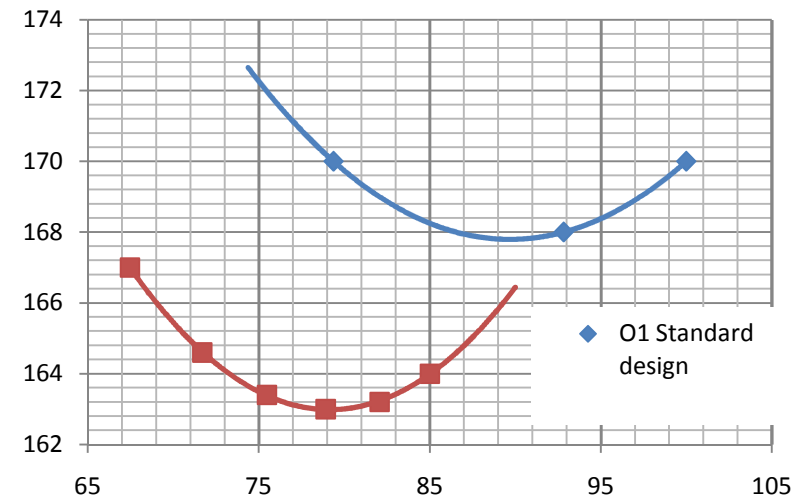
- Piston crown
- Piston rod
- Cylinder cover
- Exhaust valve
- Fuel pumps



Engine Retrofit

Engine technical upgrade

- Engine D-rating for slow steaming
- Electric lubricating
- Slide type fuel valve
- Cold corrosion solutions
- Oil mist detector system
- Bearing monitoring system
- Oil water detecting system
- Others
 - Operation on Distillate Fuels
 - Ballast Water Management System



D-Rating Engine Power



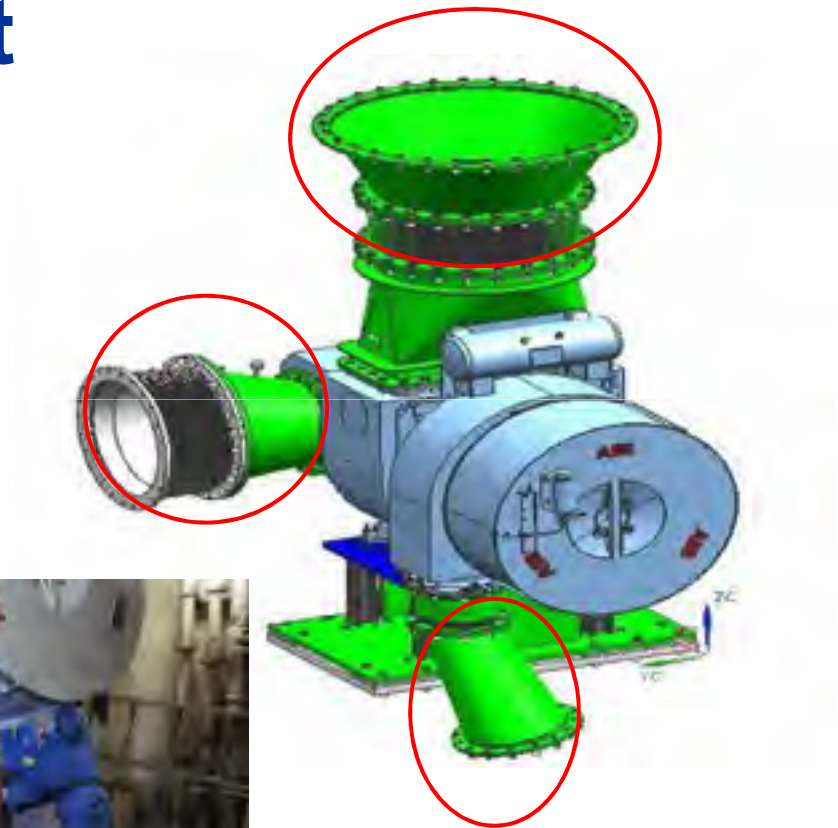
Reference:

- 6S60MC Mark5 engine , output information as below.
- Signed main engine D-rating commercial contract on August of 2013, carry out retrofit on January of 2014.

	Before	After
SMCR	11,680kW, 100rpm	6,500kW, 85rpm
MEP	18bar	11.8bar
CSR	10,510kW, 96.5rpm	5,800kW, 81.8rpm
Current service point	5,760kW, 79rpm	

Modification content

- Re-match engine
- Renew T/C,
- Compressing shim,



D-Rating Engine Power



Fuel oil Cost saving:

aft. retrofit CSR5800kW	bef. SFOC g/kWh (measuring value)	aft. Retrofit g/kWh	saving g/kWh	annual saving fuel	annual saving cost
SFOC	206	187	18	676t	318,000€

Annual running 260 days, fuel oil 470 € /t.

Cost saving

This project vessel also retrofit the propeller, so the total costing saving as below.

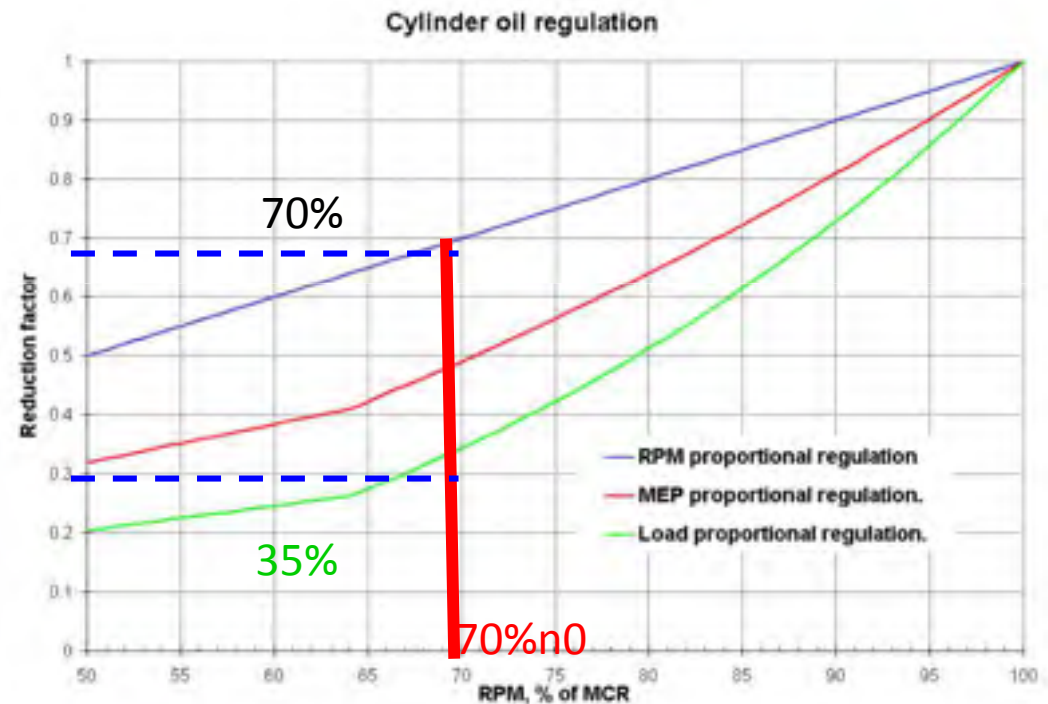
State	Rpm/min	Speed/ mile	Fuel oil t/day	Saving percent	Annual cost saving
Before	78	14.5	25.9		
After 1	78.1	13.9	20.2	18.6%	697,000€
After 2	75	13.7	18.2	25.6%	942,000€

Annual running 260 days, fuel oil 470 € /t.

- About 10 days to carry out the modification.
- The project invest pay back time about 10 months.

Principle

- Mechanical lubricating oil rating related with rpm
- Electric lubricating oil rating related with engine load



Options

- Hans Jensen Lubricator
 - ◆ Mechtronic => target feed rate 0,9g/kwh
easy retrofit on engine with Hans Jensen mechanical lubricating system
 - ◆ Lubtronic + SIP valve=> target feed rate 0,6 g/kwh
- MAN Alpha lubricator



Lubricating upgrade



Cost saving:

6S50MC-C Engine

CSR 5358KW	Former cyl. oil consumption		Setting value	Aft retrofit cyl. oil	Saving amount	Saving cost
	l/year	t/year	g/kwh	t/year	t/year	€/year
Cyl. oil consumption	73,000	67.9	0.8	25.7	42.2	78,407
			1.3	41.8	26.1	48,493

6000hrs/year , density 930g/l , 1,858 € /t.

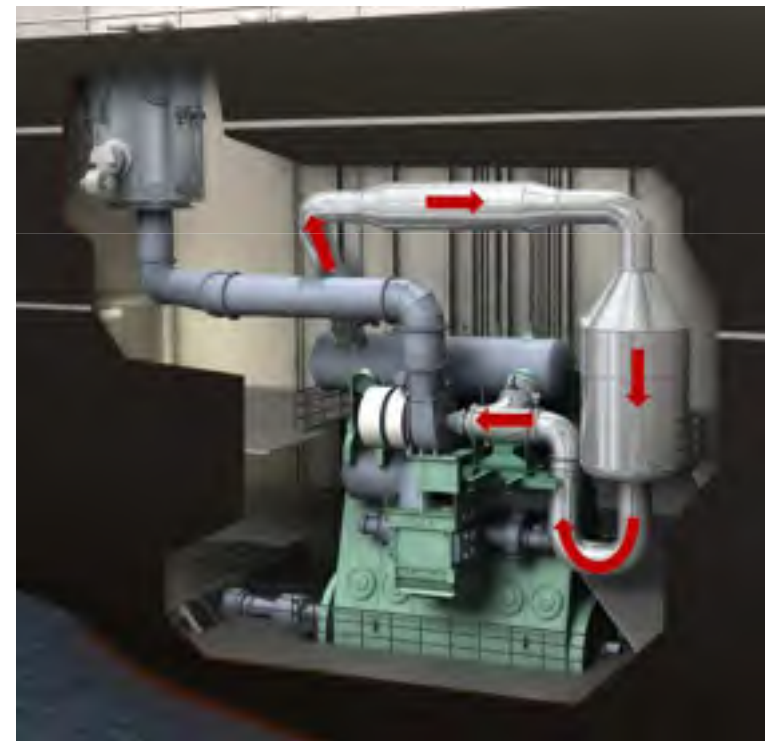
- About 5 days to carry out the modification.
- The invest pay back time about 1 to 1.2 year.

Retrofit engine to fulfill Tier III by SCR

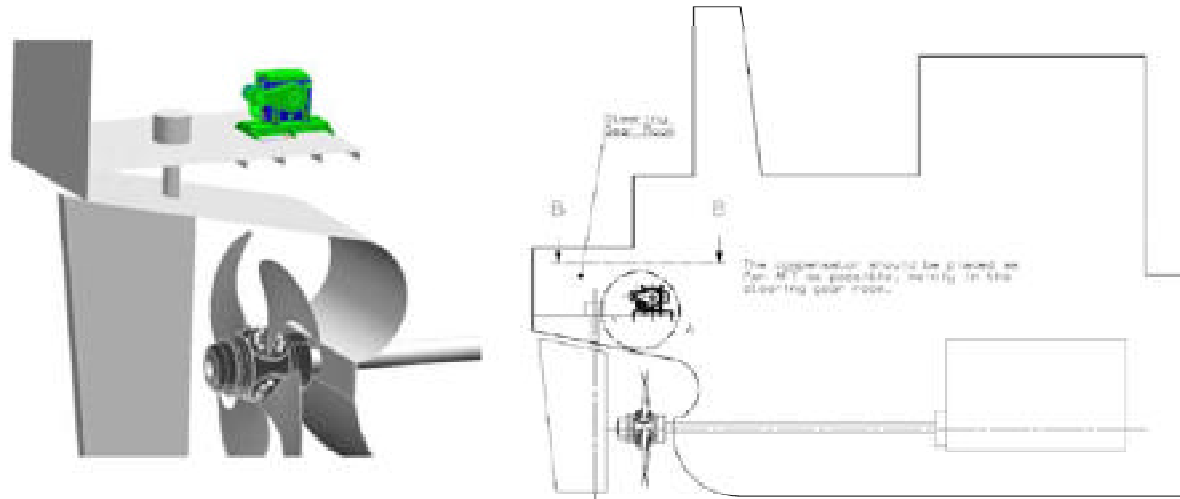
Selective Catalytic Reduction:

Nitrogen oxides (NO_x) are reduced into nitrogen (N_2) and water vapour (H_2O) using ammonia or urea at a suitable temperature on the surface of a SCR catalyst.

SCR could be arranged before or after T/C.



2nd Moments Compensation



- 2nd order vibration compensation required if hull-modes resonate with excitation from main engine, and result in excessive hull vibration.
- Electrically driven moment compensation outside of engine.
- It was cancel mechanical 2nd compensation design on engine type S50ME-B9 and S50ME-C.

Ballast Water Management System



HHM Global TechService was Sales and Service Agent for Cyeco BWMS production in worldwide.

Cyeco BWMS Features:

- UV + Filter principle, Safe operation without chemical additives or generation;
- Compact design with minimized footprint;
- Automatic & easy operation;
- Minimum Maintenance and long service life etc.

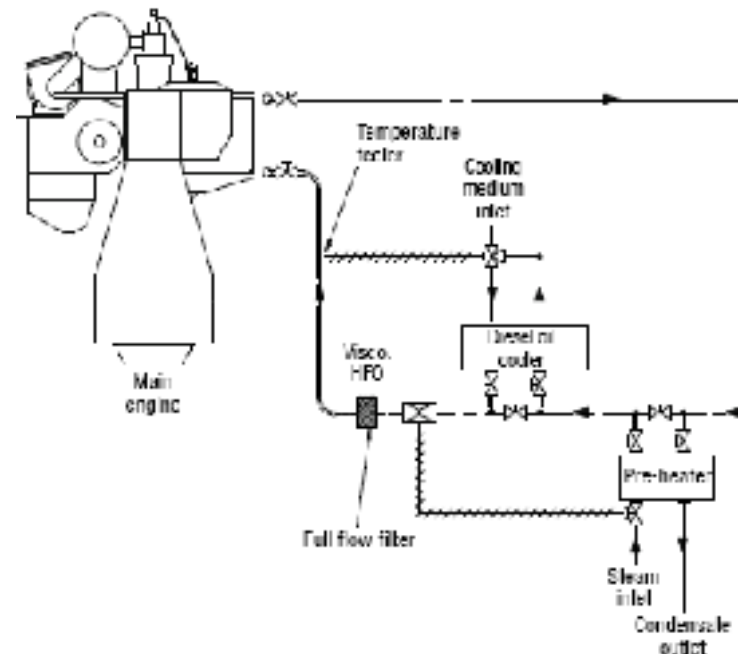


Retrofit for Operation on Distillate Fuels

Engine will operate on distillate fuels, i.e. MGO and MDO within Control area according to Marpol73/78 rules required.

HHM GTS could offer the related retrofit package:

- Free of technical proposal
- Short-term of retrofit period



Training

Training Center

HMA•GTS

- Founded in *2010*
- CCS approved
- Over **300** persons trained every year



服务

Training Center

- Practice training center opened on 2014
- Focused on Electric Engine special components overhaul training



Training Course



Tailor-made for customer request.

2-stroke course:



ME-C Operation & Practice



ME-B Operation & Practice



RT-flex Operation & Practice



Alpha Operation

Automation course:

- SAM
- KONGSBERG



T/C:
ABB T/C



Trainee

HHM • GTS



Over 60 shipping company, management corporation and shipyard send their engineers to HHM for training.

Other training services

培训服务

Other training services

培训期间，我们提供指定的酒店至培训中心的交通；同时，也提供酒店预定及代叫租车业务。

During the training registration, the customer can choose the car and hotel freely, the related protocol information that our company provided is as follows:



上海中远阳光大酒店
Grand Soluxe Zhongyuan Hotel Shanghai



睿悦城市酒店
Ruiyue City Hotel



Help trainee for call “airport pick up service” and “hotel reservation”

Station Engineer Training



- The first group of overseas engineers were trained in March of 2014.
- Training will be arranged regularly in future.



Calibration & Testing Center



HHM-CTC approved by **CNAS** (China National Accreditation Service for Conformity Assessment). Various professional testing and facility, such as:

- Strength testing
- **3D** measurement
- Physical & chemical laboratory
- Precision measurement
- NDT
- **Vibration** or noise measurement



If you have any question or any interested topic for engine technical upgrade, Please don't hesitate to contact us or HHM GTS Athens:

李军华

Li Jun Hua

市场总监 CMO

E-mail ljh-spore@hhm.com.cn

Mb +86 13917076968

Tel +86 21 5131 0006-6602

Fax +86 21 6087 1260 +86 21 6075 6160



The Window of HHM to serve the World!

For Spares: spare.gts@hbm.com.cn

For Service: service.gts@hbm.com.cn

SUMMARY