

EEXI TECHNICAL FILE

Vessel's Name: Carl Oldendorff
IMO No.: 9484704

For compliance with

MARPOL Annex VI Regulation 23/25

EXAMINED



This plan has been examined and given the status as shown in the Design Appraisal Document (DAD) number below:

STS/STAB/509720DF2

Date: 06 July 2023

Initials: LLD

Marine and Offshore
Shanghai Technical Support Office
Statutory Section
Lloyd's Register Classification Society China Co Ltd

LR001.2022

1 Data

1.1 General information

Shipowner	Oldendorff Carriers GmbH & Co. KG
Shipbuilder	Taizhou Catic Shipbuilding Heavy Industry Ltd.
Hull no.	TK0206
IMO no.	9484704
Ship type	Bulk Carrier

1.2 Principal particulars

Length overall	229.20 m
Length between perpendiculars	222.00 m
Breadth, moulded	38.00 m
Depth, moulded	20.70 m
Summer load line draught, moulded	14.90 m
Deadweight at summer load line draught	93,028 tons

1.3 Main engine

Manufacturer	Hyundai-MAN B&W
Type	6S60MC-C7
Maximum continuous rating (MCR _{ME})	13,560 kW x 105 rpm
Limited maximum continuous rating with the Engine Power Limitation installed (MCR _{ME,lim})	8,068 kW
SFC at 83% of MCR _{ME,lim}	177.69 g/kWh
Number of sets	1
Fuel type	Diesel Oil

1.4 Auxiliary engine

Manufacturer	Hyundai Heavy Industries Co. Ltd.
Type	7H17/28
Maximum continuous rating (MCR _{AE})	745 kW x 900 rpm
SFC at 50% MCR _{AE}	205.78 g/kWh
Number of sets	3
Fuel type	Diesel Oil

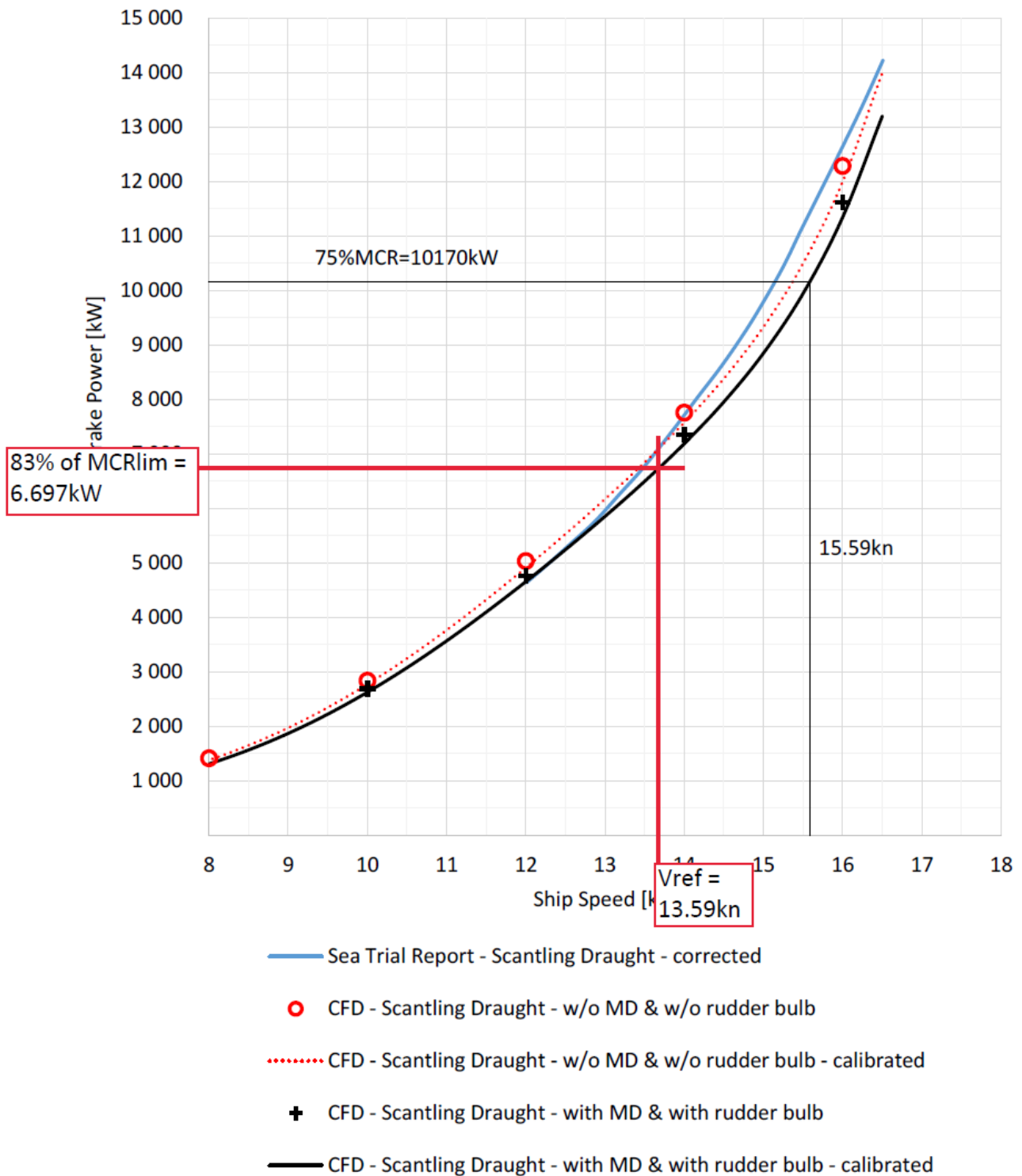
1.5 Ship speed

Ship speed (V_{ref})	13,59 knots
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2 Power curve

Estimated speed-power curve obtained from the sea trial report as shown in figure 1.

Figure 1: Power curve



3 Overview of propulsion system and electric power supply system

3.1 Propulsion system

3.1.1 Main engine

Refer to paragraph 1.3 of this document.

3.1.2 Propeller

Type	Fixed pitch propeller
Diameter	7.15 m
Number of blades	4
Number of sets	1

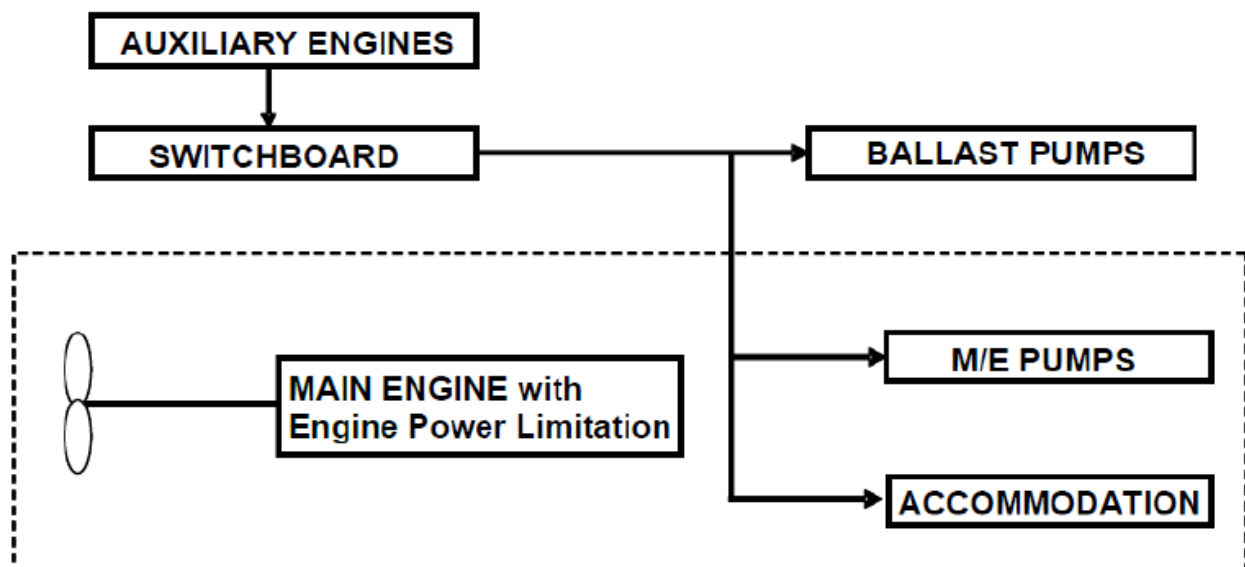
3.2 Electric power supply system

3.2.1 Auxiliary engines

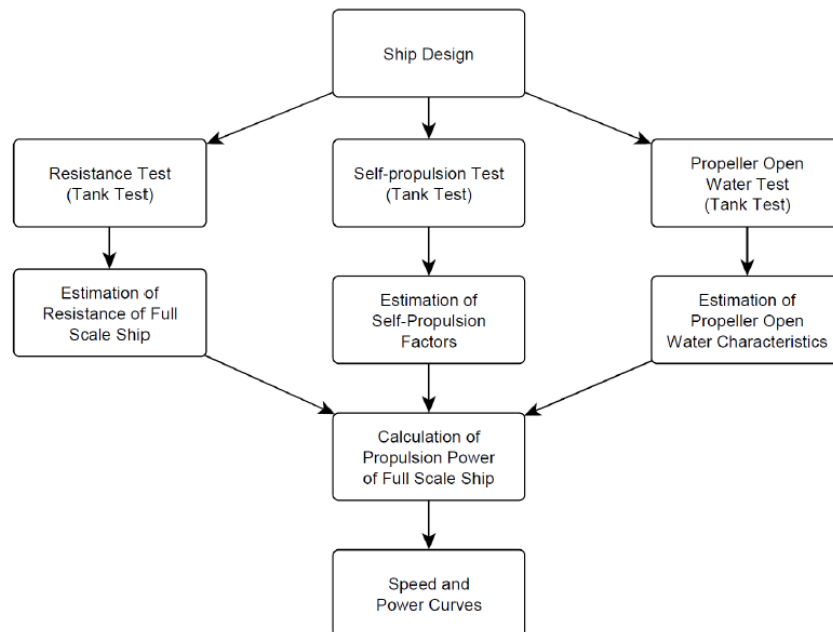
Refer to paragraph 1.4 of this document.

3.2.2 Main generators

Manufacturer	Daihatsu
Rated output	750 kW x 900 rpm
Voltage	AC 450 V
Number of sets	3



4 Estimation process of speed-power curve



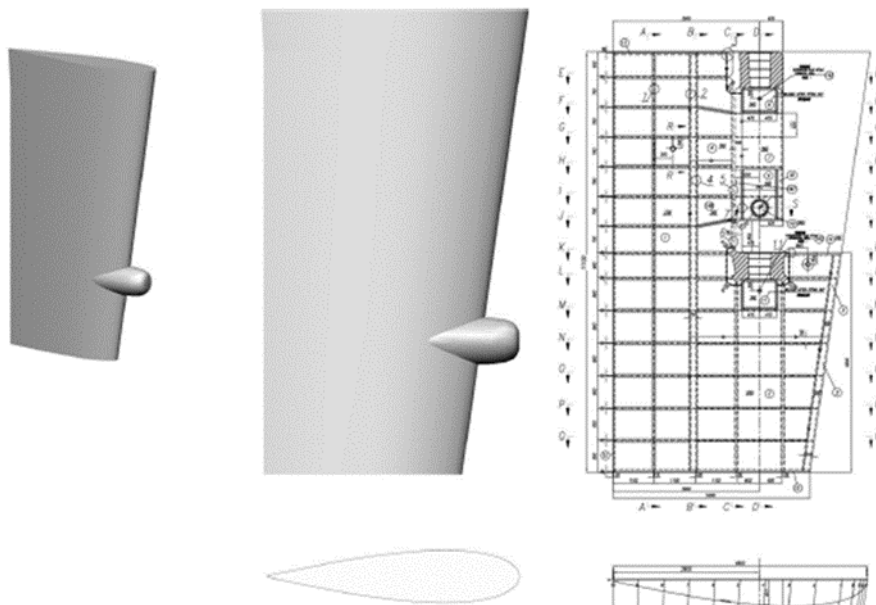
5 Description of energy saving equipment

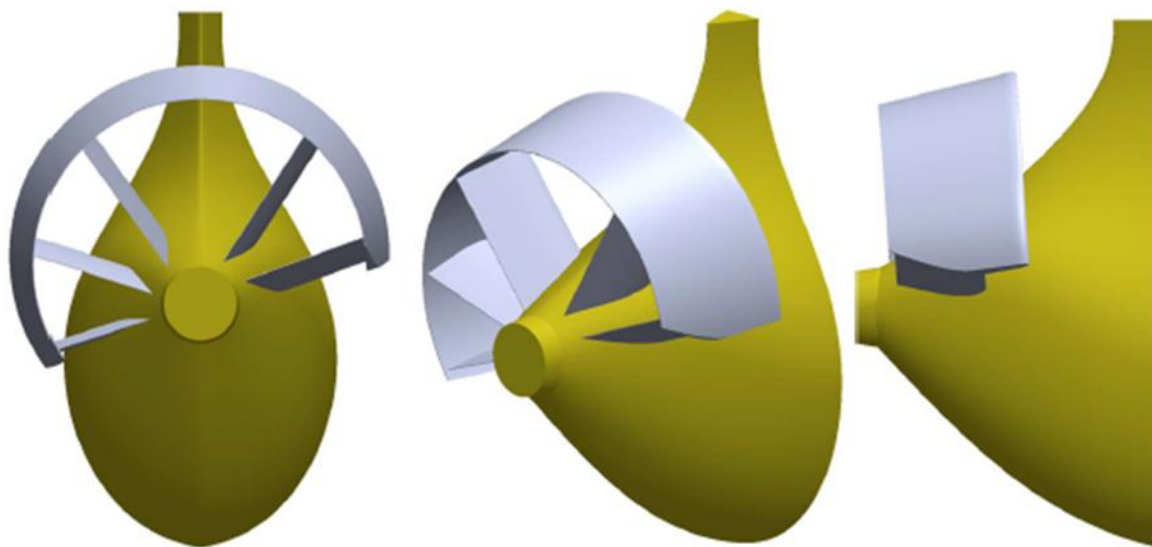
5.1 Energy saving equipment the effects of which are expressed as $PAE_{eff}(i)$ and/or $Pe_{eff}(i)$ in the EEXI calculation formula

N/A

5.2 Other energy saving equipment

Becker Mewis duct and rudder bulb





6 Calculated value of attained EEXI

6.1 Basic data

Type of ship	Capacity DWT	Speed Vref (knots)
Bulk Carrier	93,028 tons	13.59

6.2 Main engine

MCRME (kW)	MCRME,lim (kW)	PME (kW)	Type of fuel	CFME	SFCME (g/kWh)
13,560	8,068	6,697	Diesel Oil	3.206	177.69

6.3 Auxiliary engines

PAE (kW)	Type of fuel	CFAE	SFCAE (g/kWh)
589	Diesel Oil	3.206	205.78

6.4 Innovative electrical energy-efficient technology

N/A

6.5 Innovative mechanical energy-efficient technology

N/A

6.6 Cubic capacity correction factor

N/A

6.7 CSR

$$f_{iCSR} = 1 + \left(0.08 \cdot \frac{LWT_{CSR}}{DWT_{CSR}} \right) = 1 + \left(0.08 \cdot \frac{15,682}{93,028} \right) = 1.0135$$

6.8 Calculated value of the required EEXI

$$\begin{aligned} \text{Required EEXI} &= \left(1 - \frac{20}{100} \right) \cdot (961.79 \cdot 93,028^{-0.477}) \\ &= 3.282 \text{ g} - \text{CO}_2/\text{ton} \cdot \text{mile} \end{aligned}$$

7 Calculated value of the attained EEXI

$$\begin{aligned} \text{Attained EEXI} &= \frac{(\prod_{j=1}^M f_j) (\sum_{i=1}^{nME} P_{ME(i)} \cdot C_{FME(i)} \cdot SFC_{ME(i)}) + (P_{AE} \cdot C_{FAE} \cdot SFC_{AE})}{f_i \cdot f_c \cdot f_l \cdot \text{Capacity} f_w \cdot V_{ref} \cdot f_m} \\ &+ \frac{\{(\prod_{j=1}^M f_j \cdot \sum_{i=1}^{nPTI} P_{PTI(i)} - \sum_{i=1}^{neff} f_{eff(i)} \cdot P_{AEff(i)}) \cdot C_{FAE} \cdot SFC_{AE}\}}{f_i \cdot f_c \cdot f_l \cdot \text{Capacity} f_w \cdot V_{ref} \cdot f_m} \\ &- \frac{(\sum_{i=1}^{neff} f_{eff(i)} \cdot P_{eff(i)} \cdot C_{FME} \cdot SFC_{ME})}{f_i \cdot f_c \cdot f_l \cdot \text{Capacity} f_w \cdot V_{ref} \cdot f_m} \\ &= \frac{1 \times (6,697 \times 3.206 \times 177.69) + (589 \times 3.206 \times 205.78) + 0 - 0}{1.0135 \times 1 \times 1 \times 93,028 \times 1 \times 13.59 \times 1} \\ &= 3.281 \text{ g} - \text{CO}_2/\text{ton} \cdot \text{mile} \end{aligned}$$

attained EEXI: 3.28 g-CO₂/ton mile**7.1 Comparison of the required EEXI and the attained EEXI**

$$\text{Attained EEXI} \leq \text{Required EEXI} = 3.28 \leq 3.28 = \checkmark$$

Thus, this vessel is complying with the MARPOL Annex VI Regulation 23/25