

SIGNIFICANT SHIPS OF 2022

A PUBLICATION OF THE ROYAL INSTITUTION OF NAVAL ARCHITECTS www.rina.org.uk/sigships



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SIGNIFICANT SHIPS OF 2022

Welcome to the 2022 edition of RINA's *Significant Ships*. As customary the following is a selection of some of the most significant ships over 100m in length delivered during 2022. By significant we mean ships that are the first in a series or type for a particular shipowner or builder, vessels that may be one-offs or those which differ in some important way from an earlier sister ship.

To be included in the collection requires information to be supplied by the yard or owner and in some cases this has not been forthcoming so some ships which we would have liked to include have been omitted. Even so this year's selection does contain a cross section of ship types with several including new technologies.

As ever, some of the ships that were considered candidates early in the selection process have had their delivery delayed until 2023 and so could not be included. Offsetting these are a small number of ships delivered in late 2021 and not included in the previous edition of *Significant Ships*.

These are exciting times in the shipping industry as it comes to terms with the requirements to decarbonise. There are IMO targets in place but not all of these are mandatory, and ship operators necessarily move at different speeds with voluntary measures for operational and economic reasons. Often a pioneering owner may be thwarted by lack of technology maturity and settle instead for the best available options.

In recent years we have seen an accelerating trend in ships powered by LNG and methanol has moved from being the preserve of methanol carriers to several other ship types. LPG only became a viable marine fuel in 2018 when MAN introduced the ME-LGIP engine but already almost 150 vessels have been built or are on order with the ability to run on LPG. This year's *Significant Ships* features several vessels that are operating on non-oil fuels, dual-fuel ships and ships ready for future fuels.

LNG dual-fuel ships are especially strongly represented with VLCCs, Ro-pax, Ro-Lo, LNG

carriers and bunker barges all featuring. The environmental aspirations of the owner of one of these, the Ro-Lo *Bore Way* even going so far as to have the christening champagne bottle contained in a bag so as to prevent broken glass entering the water.

As yet there are no ammonia-fuelled or hydrogen burning ships included but it will only be a matter of a short time before the first does feature. Included in this year's selection is *Amore Mio*, an ammonia ready VLCC. To take advantage of that fuel, the ship will need some modifications but it highlights how forward thinking owners are considering future flexibility of their vessels.

Whilst many would like to see the end of oil-burning vessels this is not practical, for a whole variety of reasons, and this fuel will dominate for some time. Rising fuel costs have once again made operating on conventional HFO an attractive proposition so scrubbers are still being specified for new ships as a means of meeting the 2020 SOx regulations.

Wind power has become a feature in recent years with many ships being retrofitted with Flettner rotors or suction sails. A new means of capturing the wind is represented in this selection by *Shofu Maru*, a 99,000dwt bulker and the first ship to feature the Japanese Wind Challenger hard sail system. There are also some hybrid vessels including *Pointe de Caux* a Turkish-built chemical tanker with dimensions suited to its unique trade route. Another is the *Finneco I* ro-ro vessel built for Finnlines.

On the passenger vessel front, *Norwegian Prima* bucks the trend of ever larger cruise ships but brings a new level of luxury to its owner's fleet. Ro-pax vessels are represented by *Nils Holgersson*, the seventh ship to bear the name but the first ever LNG-fuelled vessel in TT Line's fleet. In addition there's *Aura Seaways*, the largest vessel in the DFDS fleet and also the first new vessel purchased by the owner since 1982.

Once again there are no offshore vessels appearing here but looking forward a number

of interesting WTIVs are under construction around the globe and will be candidates for future editions. Unusual vessels are also in short supply with few having been delivered in 2022. There is one in this selection the *Nukumi* a 32,085dwt self-discharging Laker that has the distinction of being both the first ever diesel-electric Laker and the first single point loader to operate in Canada. It has also been designed to operate as silently as possible to protect marine mammals.

Other new classes of bulk carriers to feature are *Kurotakisan Maru III* as the first of Oshima's EeneX coal carrier design, *Theresa Glory*, one of the first of a new design from Shin Kurushima Sanoyas and *Dong Yi 601* as a debut from Jinglu shipyard of SDARI's D76 bulker class for domestic use in Chinese waters.

Although this year there is a slightly smaller selection than previously, the ships can all live up to being described as significant for at least one reason mentioned above.

Malcolm Latarche,
Associate Editor, March 2023

Notes

In the tables which form part of each ship description, all dimensions, also deadweight and displacement tonnages, are metric unless otherwise stated. Machinery powers have been specified as 'bhp' or 'kW' in accordance with information received from the shipbuilder or owner. Emergency alternators are not normally included in the number of alternators. When a dash (-) has been included against an item, this generally denotes lack of information but where it is known that features have not been included, this is indicated by 'nil'. The number of sister ships completed or on order does not include the ship presented. Some ships shown as 'on order' may have been delivered by the time this publication appears.

AMORE MIO – VERY LARGE CRUDE CARRIER



Diameter:..... 10.4
 Speed:.....64rpm
 Diesel-driven alternators
 Number:.....3 sets
 Engine make/type:.....HIMSEN / 8H21/32 x
 3 sets
 Type of fuel:.....LFO / MGO
 Alternator make/type:.....HHI-EES / Marine
 design IP 23 enclosure brushless, 3 sets
 Output/speed of each set:.....1,600kW x
 900rpm

Boilers
 Number:..... 1 set
 Type:..... Automatic, forced draft, heavy fuel
 oil burning, marine boiler
 Make:.....Kangrim
 Output, each boiler:.....4,900kg/hr

Deck machinery
 Cargo cranes/cargo gear
 Number:..... 2
 Make:.....Sangsangin Industry Co., Ltd
 Type:..... Elec-hyd. driven
 Mooring equipment
 Number:.....10 sets
 Make:.....Flutek
 Type:.....Electro-hydraulic

Special lifesaving equipment
 Number of each and capacity:..... 2, 30P
 Make:.....Oriental
 Type:.....Gravity

Cargo tanks
 Number:.....17
 Grades of cargo carried:..... Crude oil carrier
 Cargo pumps
 Number:.....3
 Type:..... Vertical, centrifugal, single stage
 Make:.....HHI-TMC
 Capacity (each):.....5,000m³/h x 150mTH
 Cargo control system
 Make:.....Musasino
 Type:.....CMS

Ballast control system
 Make:.....HHI-TMC
 Type:.....Hydraulic Valve Control
 Ballast water treatment system
 Make:.....Hyundai Welding
 Capacity:.....3,000 * 2

Complement
 Officers:..... 11
 Crew:..... 19

Navigation and other equipment
 Bridge control system
 Make:.....Kongsberg
 Type:.....Autochief-600
 Is bridge fitted for one-man operation?.....N
 Radars
 Number:..... 2 x sets (S-band, X-band)
 Make:.....JRC
 Model(s):.....S-band(JMR-9282-S),
 X-band(JMR-9225-6X)

Fire detection system
 Make:.....B-I Industry
 Type:.....BDS-4000MF
 Fire extinguishing systems
 Cargo deck:.....Low expansion foam/
 Sea water hydrants
 Make/Type:.....NK
 Engine room:.....High pressure CO₂
 Make/Type:.....NK
 Cabins:.....Portable Fire Extinguisher/
 Hydrants
 Make/Type:.....NK

Efficiency
 Attained EEDI value:.....2.004
 Required EEDI value:.....2.072 (Phase 2)
 Energy Saving Technologies*:.....Hi-PSD and
 Hi-Rudder with bulb as Energy Saving Device

Contract date:.....11 December 2020
 Launch/float-out date:..... 28 May 2022
 Delivery date:.....25 July 2022

Shipbuilder:.....**Hyundai Samho Heavy
 Industries Co., Ltd**
 Vessel's name:.....**Amore Mio**
 Owner/Operator:.....**Capital Ship
 Management Corp**
 Country:.....**Greece**
 Designer:.....**HSHI**
 Country:.....**Republic of Korea**
 Flag:.....**Liberia**
 IMO number:.....**9926685**
 Total number of sister ships already com-
 pleted (excluding ship presented):..... **1**
 Total number of sister ships still on order: **Nil**

TECHNICAL PARTICULARS

Length oa:..... 329.98
 Length bp:..... 324
 Breadth moulded:..... 60
 Depth moulded:..... 29.6
 to main deck:..... 29.6
 to upper deck:..... 29.6
 to other decks:.....26.8 (Sunken deck)
 Width of double skin
 side:.....3.0
 bottom:.....2.9
 Draught
 scantling:.....21.7
 design:.....20.5

Gross:..... 154,004
 Displacement:.....342,576
 Lightweight:..... 42,729
 Deadweight
 scantling:..... 299,847
 design:.....278,636
 Block co-efficient (please state relevant
 draught):.....0.7903
 Speed, service:.....14.8 at NCR
 Cargo capacity (m³)
 Liquid volume:..... 339,828
 Bunkers (m³)
 Heavy oil:..... 6,033
 Diesel oil:..... 1,029
 Water ballast (m³):.....89,299
 Tankers:..... 83,969
 Daily fuel consumption (tonnes/day):.....64.3
 Main engine only:.....Yes

Classification society and notations:..... ABS
 +A1, Oil Carrier, ESP, (E), +AMS, +ACCU, CPS,
 CPS-COT, CSR, AB-CM, BWT, CRC(SC, SP), EGC-
 SOx, ENVIRO, HAB(I), IHM, NOx-Tier III, PMA,
 POT, RRD, RW, SPMA, TCM, UWILD, VEC-L,
 LNG Fuel Ready Level 3(S) & Ammonia Fuel
 Ready Level 3(S), CS Ready

Propulsion
 Main engine(s)
 Design:.....MAN Energy Solutions
 Model:.....Hyundai-MAN B&W
 7G80ME-C9.5-HPSCR
 Manufacturer:.....HHI-EMD
 Number:.....1
 Type of fuel:.....HFO/LFO/MGO
 Output of each engine:.....22,200kW x 64rpm
 Is this a diesel-electric or hybrid?:.....N

Propeller(s)
 Material:.....Ni-Al-Bronze
 Designer/Manufacturer:.....Hyundai Heavy
 Industries
 Number:.....1
 Fixed/Controllable pitch:.....Fixed

Delivered by Hyundai Samho in July, *Amore Mio* is the first of a pair of ammonia and LNG ready VLCCs for its Greece-based owner Capital Ship Management. The sister ship – *Altarego* – was delivered in October.

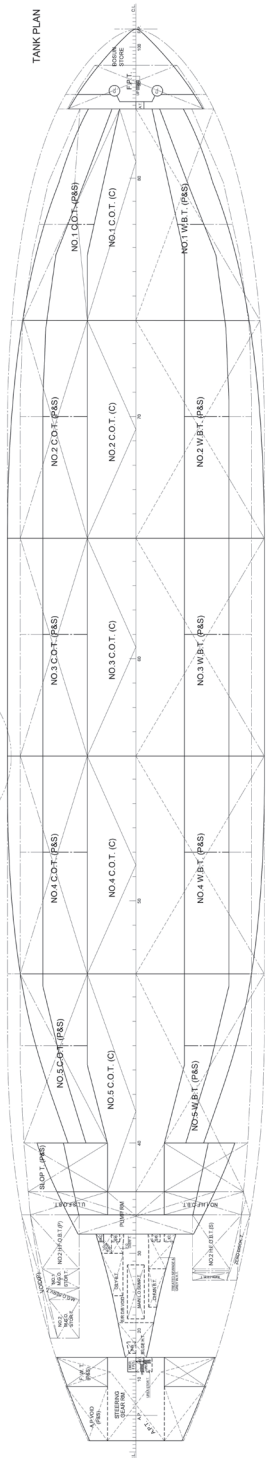
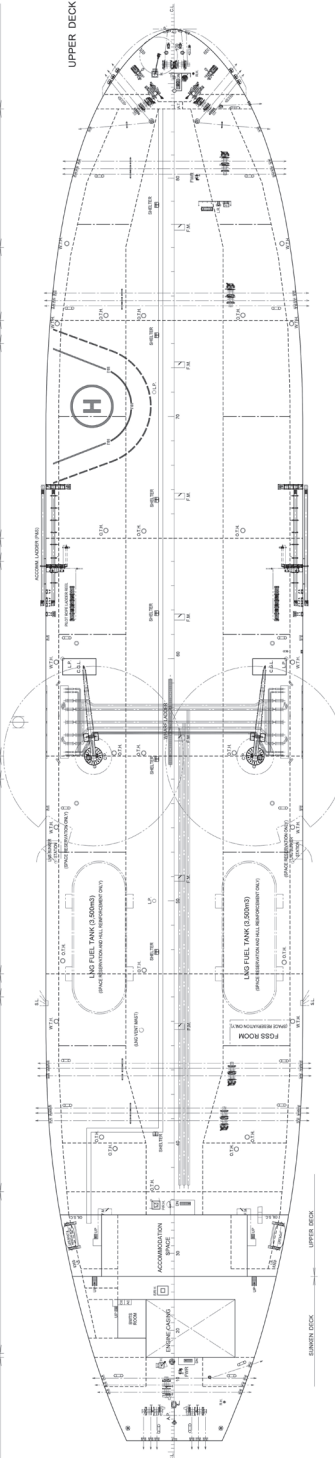
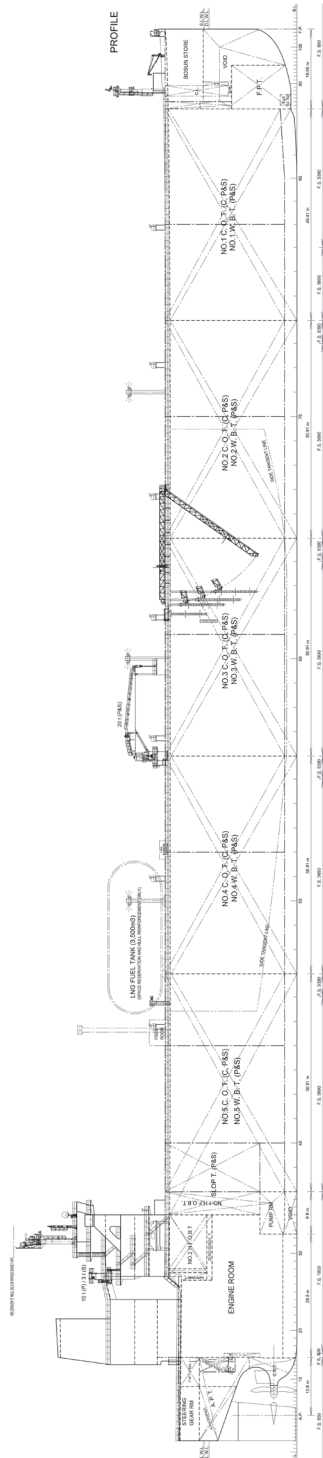
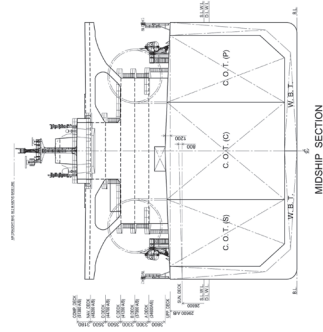
Although alternative fuels are seen as playing a prominent role in the future of shipping, there is much uncertainty over what will be available and when. Capital Ship Management has addressed this uncertainty in the 299,847dwt *Amore Mio* and its sister by selecting a Hyundai-built MAN B&W 7G80ME-C9.5-HPSCR engine that can be converted at a later stage.

The LNG and Ammonia Ready notations given by ABS mean that the ship has the space available for the extra fuel tanks that will be needed to accommodate the conversion. The intention is for a pair of 3,500m³ tanks to be deck mounted for carrying LNG fuel that could be repurposed if ammonia is chosen as the fuel.

The ship's more immediate impact on the environment whilst running on oil fuels has been much reduced by the installation of a hybrid exhaust gas cleaning system to meet IMO 2020 SOX compliance and the HPSCR suffix of the main engine indicates high pressure selective catalytic reduction for NOx Tier III compliance. The hybrid scrubber will allow operation in areas where discharge of scrubber washwater is prohibited.

As built, the ship has an attained EEDI value of 2.004 comfortably inside the required 2.072 but future conversion to LNG will mean CO₂ production is much reduced by around 20% and virtually eliminated if running on ammonia.

In construction the ship is a typical VLCC with 15 cargo tanks, two slop tanks and having a service speed of 14.8kt.



AURA SEAWAYS – RO-RO PASSENGER SHIP



SOURCE: PHILIPPE HOLTFO

Shipbuilder:**Guangzhou Shipyard International**
 Vessel's name:**Aura Seaways**
 Owner/Operator:**DFDS A/S**
 Country:**Denmark**
 Model test establishment used:**SSPA Sweden A/S**
 Designer:**Deltamarin**
 Country:**Finland**
 Flag:**Denmark**
 IMO number:**9851036**
 Total number of sister ships already completed (excluding ship presented):**2**
 Total number of sister ships still on order: **Nil**

Delivered in late December 2021, but too late to appear in the 2021 edition of *Significant Ships*, *Aura Seaways* is the first newbuilding taken by its owner DFDS since the *Scandinavia* was delivered in 1982.

Built by China's Guangzhou Shipyard International the 56,043gt ro-pax with 4,500 lane metres of vehicle capacity is also the largest vessel in the DFDS fleet in terms of cargo space. Some 4,072lm are for trucks and the balance for cars. The vessel has a passenger capacity of 662 with 250 cabins and is currently the largest of its type operating in the Baltic where it runs on the Karlshamn-Klaipeda and Kiel-Klaipeda routes.

Vehicle spaces are served by three stern ramps with trucks accommodated on decks 1, 3, 5 and 7 and cars on decks 7 and 8. Crew cabins are located on decks 7 and 8 and passenger cabins on decks 9 to 11.

Propulsion is provided by a pair each of Wärtsilä 6L46F engines rated at 7,200kW and Wärtsilä 8L46F engines rated at 9,600kW to give a total power of 33,600kW to drive the two 5.3m diameter shaft driven controllable pitch propellers. The 6,120kW of auxiliary power supplied by three 6L26 engines can be supplemented by a pair of shaft generators giving 3,000kW each.

DFDS has announced plans for improving its environmental performance and while the *Aura Seaways* and its sister *Luna Seaways* delivered in February 2022 currently run on oil fuels, the engines are of a type that can be converted to run on LNG. The owner's intentions in this regard are evidenced by the GR(A) 'Gas Ready' class notation assigned by Lloyd's Register.

TECHNICAL PARTICULARS

Length oa: 230.0m
 Length bp: 224.5m
 Breadth moulded: 31.0m
 (including fenders: 31.60m)
 Depth moulded
 to main deck: 9.85m
 to upper deck: 15.925m
 to weather deck: 21.775m
 Draught
 design: 6.80m
 Gross: 56,043t
 Net: 29,708
 Displacement: 32,430t
 Lightweight: 19,583t
 Speed, service:
 Service speed 1: 18.0kts
 Speed service 2: 23.0kts
 Classification society and notations: Lloyd's Register
 LR 100 A1, Roll on-Roll off Passenger ship, ShipRight(ACS(B), CM, SDA), *IWS, Ice Class 1C FS, LI
 *LMC, UMS, IBS, NAV 1, PCAC2.2, ECO(BWT,IHM)
 With descriptive notes: ShipRight(BWMP(T), SCM, SRTP, MPMS, SERS), GR(A)
 Main engine(s)
 Design: Wärtsilä
 Model: 2 x Wärtsilä 6L46F, maximum continuous rating (MCR) each 7,200kW
 2 x Wärtsilä 8L46F, maximum continuous rating (MCR) each 9,600kW

Number: 4
 Output of each engine: 7,200kW (6L46F);
 9,600kW (8L46F)

Propeller(s)
 Material: Ni-Al Bronze
 Number: 2
 Fixed/Controllable pitch: Controllable
 Diameter: 5.3m

Auxiliary engine(s)
 Number: 3
 Make/type: Wärtsilä 6L26, each 2,040kW
 Total installed auxiliary engine power: .. 6,120kW

Shaft Generators (SG1, SG2)
 Number: 2 pcs
 Type: Synchronous
 Rated power PTO: abt. 3,000kW

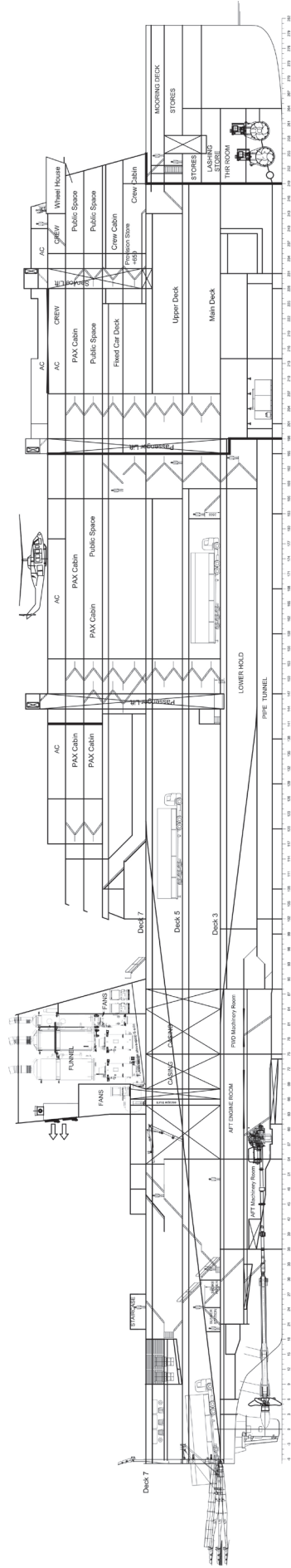
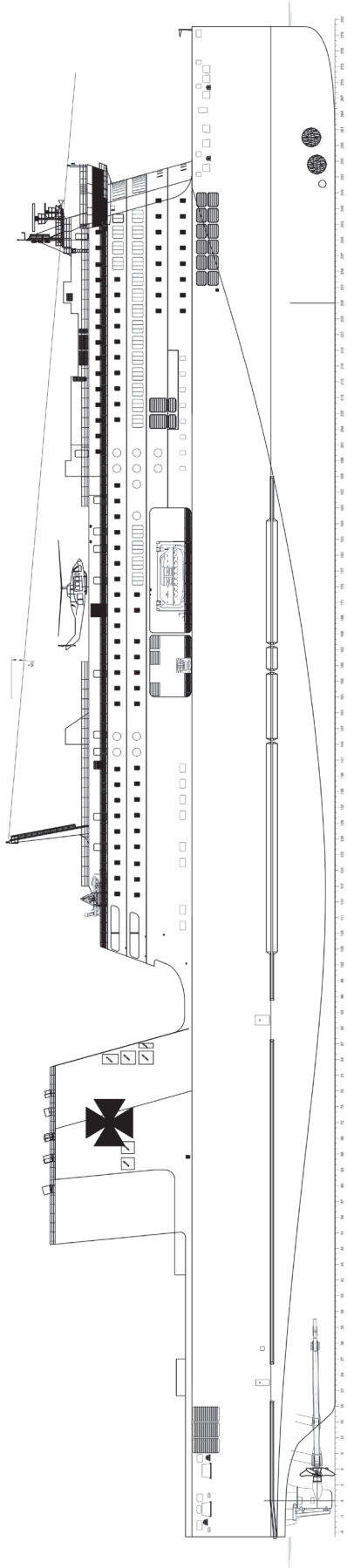
Special lifesaving equipment
 Number of each and capacity: 2 x
 150-person Viking Norsafe lifeboats
 + 2 Viking MCR
 If MES, vertical or sloping chutes?: Vertical

Vehicles
 Number of vehicle decks: 5
 Total lane length: 4,072lm trailers,
 163lm cars (gross)
 Total cars: 28
 Total freight units (specify size): 273

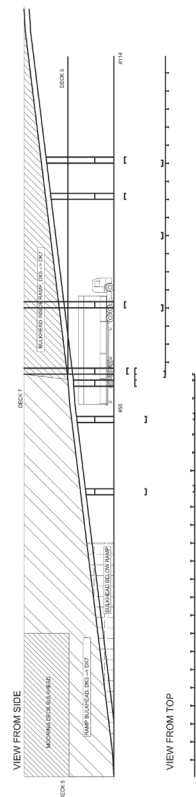
Doors/ramps/lifts/moveable car decks
 Number of each: 3
 Type: Hydraulic stern
 Designer: TTS/MacGregor

Complement
 Crew: 62
 Passengers
 Total: 690
 Number of cabins: 250

Contract date: 12 February 2018
 Steel cutting date: July 2019
 Delivery date: 18 December 2021



RAMP STRUCTURE PRINCIPLES



AVENIR ASPIRATION – LNG CARRIER



Shipbuilder: **Nantong CIMC Sinopacific Offshore & Engineering Co., Ltd**
 Vessel's name: **Avenir Aspiration**
 Owner/Operator: **Avenir LNG Limited**
 Country: **UK**
 Designer: **Shanghai Merchant Ship Design & Research Institute, CSSC (SDARI)**
 Country: **China**
 Flag: **Malta**
 IMO number: **9868962**
 Total number of sister ships already completed (excluding ship presented): **1**
 Total number of sister ships still on order: **Nil**

Built by Nantong CIMC Offshore & Engineering for Avenir LNG (a joint venture of Stolt-Nielsen, Hoegh LNG and Golar LNG) *Avenir Aspiration* was delivered in October 2021 but did not commence service until January 2022 following the maiden voyage from the builders to its Sardinian operation base. *Avenir Aspiration* is the first of two 7,500m³ bunker and short sea LNG carriers with its sister – *Avenir Ascension* – delivered in early 2022.

Designed by SDARI, the 115.8m loa vessel has a beam of 19m, a draught of 6.2m and a vertical bow shape. The ship is designed with unrestricted navigation area, ice Class 1B reinforcement and RP1 propulsion redundancy.

It has exceptional manoeuvring capability suited to its role as a bunker vessel intended to operate at anchorages and in confined port areas. A diesel electric propulsion system comprising a trio of MAN 8 L23/30DF gensets with ABB AMG 500 generators running on cargo BOG each providing 1,140kW at 900rpm and a pair of Kongsberg US 255 azimuthing thrusters with nozzles and fixed pitch propellers provide the requisite flexibility aided by a Kongsberg TT1650 tunnel thruster fitted forward.

The cargo storage arrangements are two cylindrical IMO Type C cargo tanks. The ship is equipped with two sets of high and low manifolds located a midship. Cargo handling rate is a maximum 1,000m³/h. The hull has a double side and three pneumatic fenders as damage limitation safety features suited to the ship's role as a bunkering vessel.

TECHNICAL PARTICULARS

Length oa: 115.8 m
 Length bp: 111.3 m
 Breadth moulded: 19.0 m

Depth moulded
 to main deck: 11.8m
 to other decks: 15.1m to trunk deck
 Width of double skin
 side: 2.35m
 Draught
 scantling: 6.2m
 design: 5.95m
 Gross: 8,366
 Deadweight:
 scantling: 4,716ton
 Speed, service (100%MCR output): 12.5kts
 Cargo capacity (m³)
 Liquid volume: 7,530
 Bunkers (m³)
 Diesel oil: ~300
 Water ballast (m³): ~3,400
 Daily fuel consumption (tonnes/day)
 Main engine only: 9.98
 Classification society and notations: DNV DNV.GL +1A, Tank for Liquefied Gas, Gas bunker(VR, 70), ICE(1B), EO, NAUT(OC), RP(1, 50%), CLEAN(Tier III), RECYCLABLE, COMF(V-3), BIS, BWM(T), COAT-PSPC-B
 Ship register information: Ship type 2G(163°C, 0.45MPa g, 500kg/m³,GF

Propeller(s)
 Designer/Manufacturer: Kongsberg
 Number: 2 sets
 Fixed/Controllable pitch: Fixed pitch
 Special adaptations: Azimuth thrusters with nozzle

Diesel-driven alternators
 Number: 3 sets
 Engine make/type: MAN 8L23/30DF
 Type of fuel: dual fuel
 Alternator make/type: ABB AMG 500
 Output/speed of each set: 1,140kW/900rpm
 Boilers
 Number: 1 set
 Type: Oil fired/elect.heat.hot water boiler
 Make: Heatmaster
 Output, each boiler: 900kW

Bow thruster(s)
 Make: Kongsberg
 Number: 1 set
 Output (each): 870kW

Deck machinery
 Cargo cranes/cargo gear
 Number: 1 set
 Make: Masada
 Type: hydraulic knuckle boom hose crane
 Performance: 5t@18m

Other cranes
 Number: 1 set
 Make: Jiangsu Jiaoyan Marine Equipment Co. Ltd
 Type: hydraulic luffing crane

Tasks: provision and rescue boat davit
 Performance: 3t@6m
 Mooring equipment

Number: 6 sets
 Make: Masada
 Type: electric-hydraulic mooring winch

Special lifesaving equipment
 Number of each and capacity: 1 set
 with capacity 17 persons

Make: Jiangsu Jiaoyan Marine Equipment Co. Ltd
 Type: free-fall lifeboat

Cargo tanks
 Number: 2x IMO type C tanks
 Product range: LNG

Cargo pumps
 Number: 4 sets
 Type: Deep well
 Make: Wärtsilä Svanehøj

Stainless steel: s/s
 Capacity (each): 250m³/h

Cargo control system
 Make: Wärtsilä Svanehøj
 Ballast water treatment system

Make: Desmi
 Capacity: 0~340m³/h
 Complement

Officers: 10 persons (include 1 owner)
 Crew: 6 persons
 Supernumeraries/Spare: 1 person

Navigation and other equipment
 Is bridge fitted for one-man operation? Y
 Radars

Make: Furuno
 Model(s): FAR-3310
 Fire detection system

Make: Consilium
 Fire extinguishing systems
 Cargo holds: Hydrant

Engine room: CO₂+local water mist
 Cabins: Hydrant
 Public spaces: Hydrant

Waste disposal plant
 Sewage plant
 Make: Jowa
 Model: STP2016-25

Efficiency
 Attained EEDI value: 21.45 g CO₂/(t nm)
 Installed Fuel Meters: Coriolis Flow meter for fuel gas

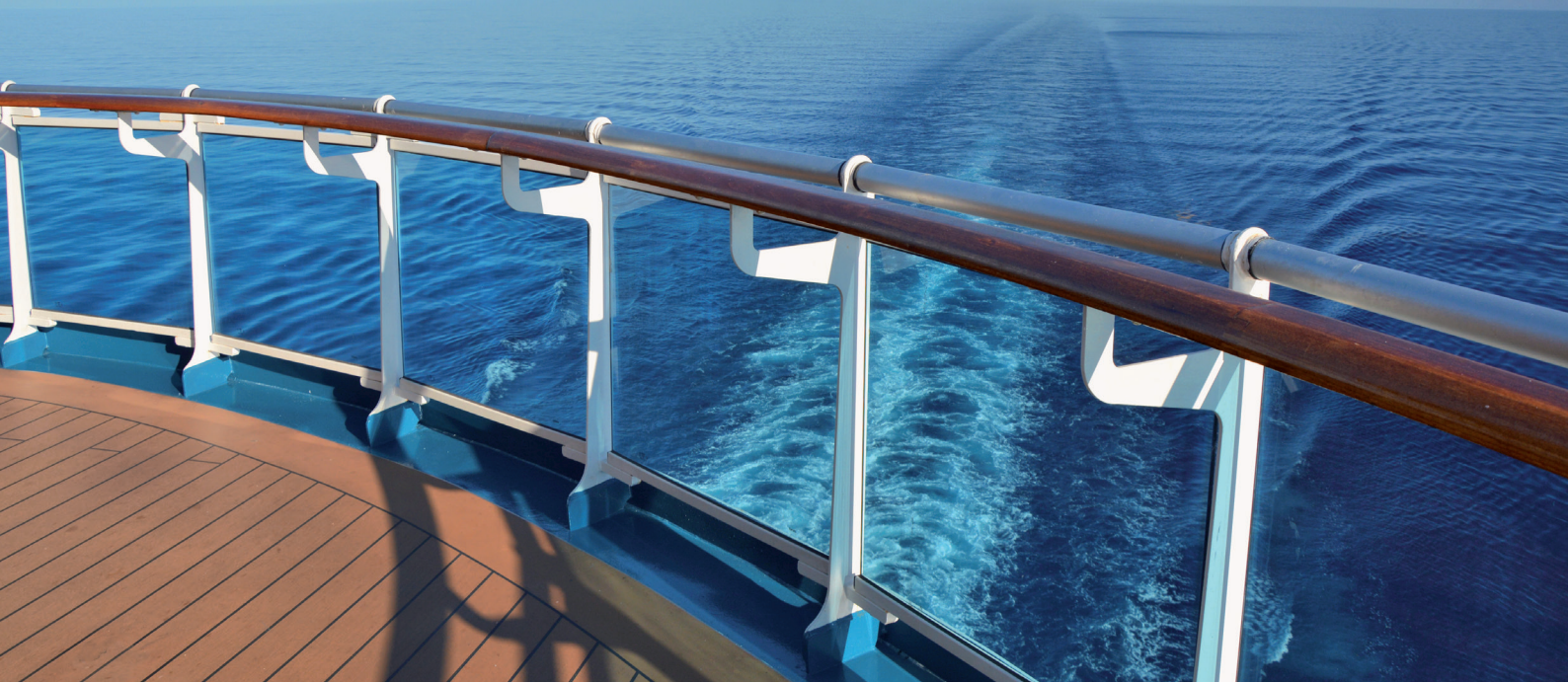
Other installed monitoring tools: 4 points
 draughts sensor

Energy Saving Technologies*: LNG dual fuel, LED lighting, ventilation optimisation, VFD for electric motors

Contract date: April 2019
 Launch/float-out date: 26 December 2020
 Delivery date: 08 October 2021



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This has been a tough period for the entire cruise industry.
But our strength and resilience have **allowed us
to stay close to all Ship-Owners throughout.**

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and we will be by your side every step of the way.

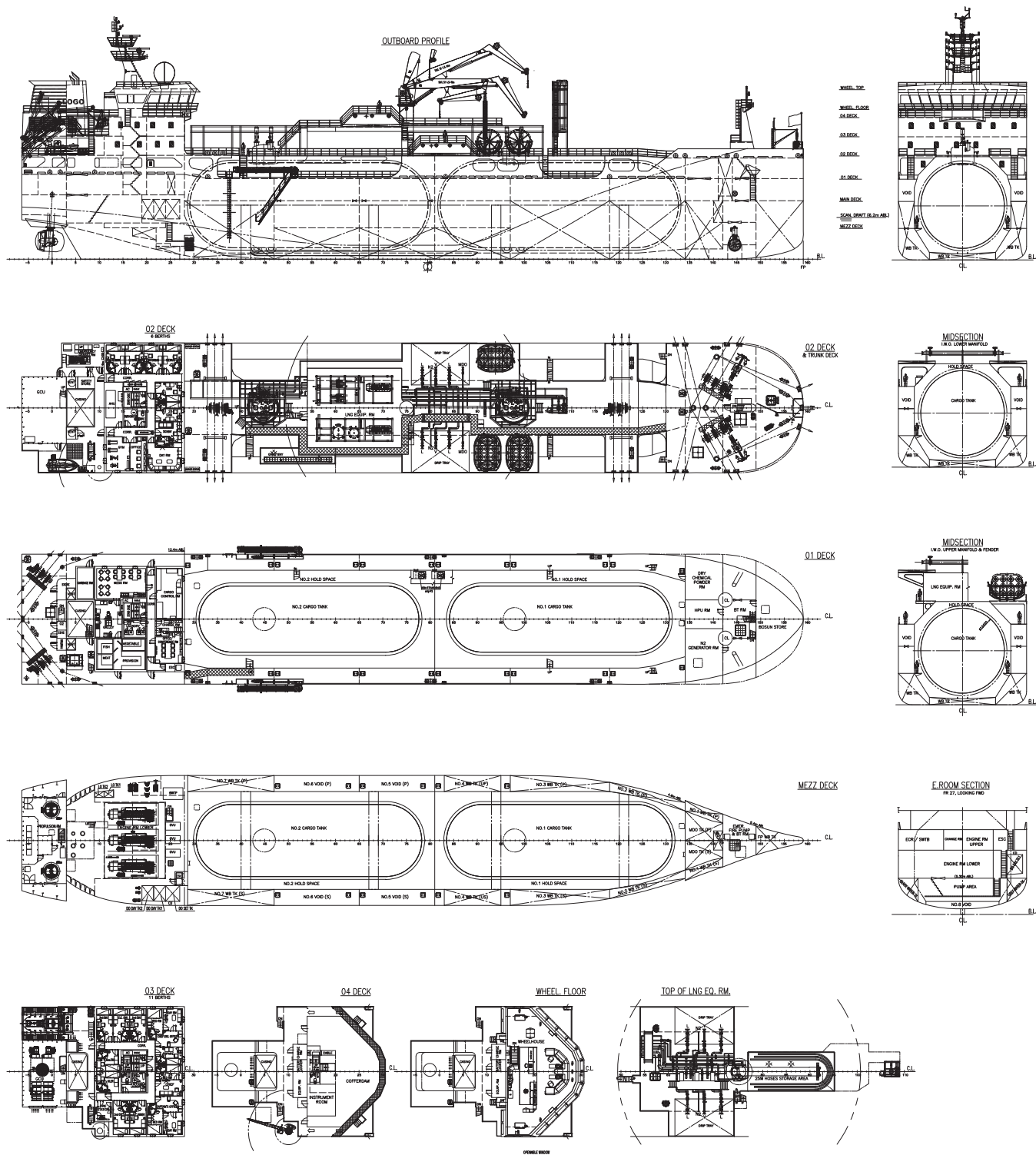
F I N C A N T I E R I . C O M



FINCANTIERI
The sea ahead



AVENIR ASPIRATION



Global Leader



FUTURE BUILDER BEYOND SHIP BUILDER

Hyundai Samho, a pioneer that creates future value
beyond the global leader of Ship Builder

Hyundai Samho leads sustainable growth in shipbuilding
through environmental friendly technologies and
human convenience for future generations.

We build the ships that build our future.



BORE WAY – ROLO CARGO SHIP



Shipbuilder: **Wuhu Shipyard Co.,Ltd**
 Vessel's name: **Bore Way**
 Owner/Operator: **Bore Way OY AB**
 Country: **Finland**
 Designer: ... **Conoship / Shanghai Merchant**
 Country: **Netherlands / China**
 Model test establishment used: **MARIN**
 Flag: **Finland**
 IMO number: **9892884**
 Total number of sister ships already completed (excluding ship presented): **3**
 Total number of sister ships still on order: **1**

Designed by Conoship in conjunction with operator Bore and China's SDARI, *Bore Way* is the first of three RoLo vessels designed for transporting forest products for charterer UPM. Initially intended for delivery in 2021, the completion of the three vessels has been delayed by the Covid pandemic.

The 6,768dwt vessel has a length of 121.89m, a beam of 21m and a draught of 6.75m. The engine room is astern and a forward superstructure houses the wheelhouse and accommodation. It has been designed to be highly flexible as to cargoes.

The stern ramp allows ro-ro access to the lower deck or cargo can be loaded through the MacGregor hatch covers on the weather deck. Under the charter to UPM the predominant cargo will be newsprint in reels, however the ship can also carry 264TEU of containers divided equally between on and under deck. A hydraulic bulkhead that swings down from weather deck level seals the hold allowing for carrying bulk cargoes.

The vessel was designed to be as eco-friendly as possible and as such has been given a dual-fuel propulsion system comprising a Wärtsilä 8L34DF main engine producing 4,000kW and driving a single 3.5m diameter controllable pitch propeller through a Wärtsilä SCV 95-P58 reduction gearbox giving an output 115.7rpm. The 250m³ Type C vacuum insulated LNG fuel tank is housed forward of the engine room under the lower hold. A waste heat recovery system contributes to further efficiency.

The volume of LNG carried allows for a full round trip for the vessel's intended service from Finland to Northern European ports. Running on LNG and the reduced CO₂ emissions means the vessel has an EEDI of just 6.08 against a required 15.24.

The environmental attitude of the owner was highlighted by the christening champagne bottle being placed in a bag to ensure that as little glass as possible spilled into the sea and the scissors used to cut the rope were made from recycled materials.

TECHNICAL PARTICULARS

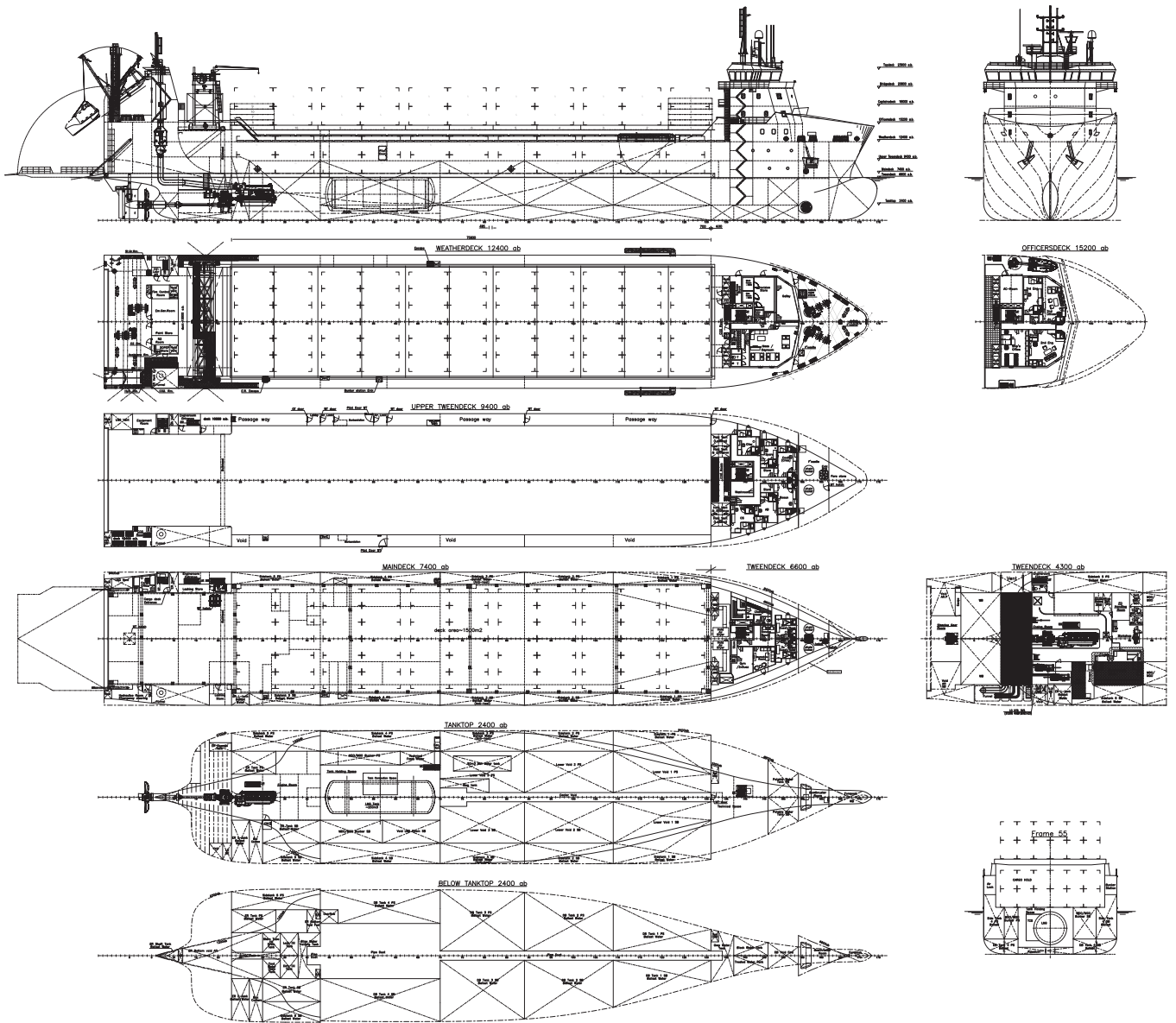
Length oa: 121.89m
 Length bp: 114.39m
 Breadth moulded: 21.00m

Depth moulded
 to main deck: 7.40m
 to upper deck: 12.40m
 to freeboard decks: 9.40m
 Width of double skin
 side: 1.90m
 bottom: 2.40m
 Draught
 design: 6.75m
 Gross: 9,133
 Displacement: 1,1161t
 Lightweight: 4,393.2t
 Deadweight
 design: 6,768t
 Block co-efficient: abt. 0.6733 at 6.75m
 Speed, service: 13.5kn
 Cargo capacity (m³)
 Grain: 8,554
 Bunkers (m³)
 Diesel oil: 330.8
 Type C LNG tank: 250
 Water ballast (m³): 5,463.5
 Daily fuel consumption (tonnes/day)
 Main engine only (including PTO): 250
 13.1 at MDO mode / 9.0 at LNG mode
 Auxiliaries: 0.02
 Classification society and notations: DNV-GL
 +1A, General Dry Cargo Ship, Ro/Ro, Container,
 DG (B, P), Gas fuelled, EO, NAUT (NAV), LCS,
 DBC, Ice (1A), BWM(T), Recyclable, BIS,
 TMON, Unrestricted navigation
 % high-tensile steel used in construction: 43%
 Propulsion
 Main engine(s)
 Design: Wärtsilä
 Model: 8L34DF
 Number: 1
 Type of fuel: LNG/MGO/MDO
 Output of each engine: 4,000kW
 Is this a diesel-electric or hybrid?: N
 Gearbox(es)
 Make: Wärtsilä packaged
 Model: SCV 95-P58
 Number: 1
 Output speed: 115.7rpm
 Propeller(s)
 Designer/Manufacturer: Wärtsilä packaged
 Number: 1
 Fixed/Controllable pitch: Controllable
 Diameter: 3.5m
 Speed: 138.35rpm
 Main-engine driven alternators
 Number: 1
 Make/type: WETECH
 Output/speed each set: 880kW/1,512.1rpm
 Diesel-driven alternators
 Number: 2
 Engine make/type: Volvo
 Type of fuel: MGO/MDO
 Alternator make/type: Stamford HCM534D
 Output/speed each set: 360kW/1,500rpm
 oilers
 Number: 2
 Type: 1 x Aux boiler, 1 x Exhaust gas boiler
 Make: Ulmatec Pyro AS
 Output, each boiler: Fuel section 600kW/
 Exhaust section 800kW

Bow thruster(s)
 Make: Schottel GmbH
 Number: 1
 Output (each): 800kW
 Deck machinery
 Cargo cranes/cargo gear
 Number: 1
 Make: Jiangyin Safety Sea Marine
 Type: Gantry Crane
 Other cranes
 Number: 1
 Make: Viking Norsafe
 Type: Hydraulic slewing crane
 Tasks: for life raft / rescue boat / provision
 Performance: 2.5T-4.0m, 2.0T-6.0m
 Mooring equipment
 Number: 4
 Make: C-Nautical BV
 Type: Elec
 Special lifesaving equipment
 Number of each and capacity: 16P
 Make: Viking Norsafe
 Type: free-fall lifeboat
 Cargo/capacity
 Hatch covers
 Design: MacGregor
 Manufacturer: Wuhu Shipyards
 Type: Weather deck
 Containers
 Lengths: 75.6m
 Heights: 6.85m
 Total TEU capacity: 264TEU
 On deck: 132TEU
 In holds: 132TEU
 Homogeneously loaded to 14tonnes: 264TEU
 Tiers/rows (maximum)
 On deck: 2/6
 In holds: 2/6
 Vehicles
 Number of vehicle decks (fixed/moveable): 1
 Doors/ramps/lifts/moveable car decks
 Number of each: 1 ramp/1 movable
 bulkhead
 Type: hydraulics/ hydraulics
 Designer: MacGregor
 Cargo tanks
 Number: 1
 Ballast control system
 Make: Eitorque Automation (Xiamen) Ltd
 Type: Electric Hydraulic
 Ballast water treatment system
 Make: Headway Technology Co., Ltd
 Capacity: 390m³/h
 Complement
 Officers: 5
 Crew: 5
 Supernumeraries/Spare: 2
 Suez/Repair Crew: 4
 Single/double/other rooms: 12/2
 Navigation and other equipment
 Bridge control system
 Make: Wärtsilä
 Is bridge fitted for one-man operation? Y
 Integrated bridge system: Y
 If yes, make: JRC
 Model: JAN-9202
 Radars
 Number: 2
 Make: JRC
 Model(s): JMR-9225-9X/JMR-9282-S
 Fire detection system
 Make: Consilium
 Type: Salwico Cargo M4.3
 Fire extinguishing systems
 Cargo holds: CO₂
 Make/Type: Firetec
 Engine room: CO₂
 Make/Type: Firetec
 Waste disposal plant
 Sewage plant
 Make: Hamworthy
 Model: STC03-13
 Efficiency
 Attained EEDI value: 6.08
 Required EEDI value: 15.24
 Energy Saving Technologies*: LNG dual fuel,
 waste heat recovery, PTO, wind resistance
 optimized superstructure
 Launch/float-out date: 25 August 2021
 Delivery date: January 2022



BORE WAY



CEMTEX EXCELLENCE – BULK CARRIER



Shipbuilder: ..Oshima Shipbuilding Co., Ltd
 Vessel's name:**Cemtex Excellence**
 Owner/Operator: ..U-Ming Marine Transport Corporation
 Country:**Taiwan**
 Designer:**Oshima Shipbuilding Co., Ltd**
 Country:**Japan**
 Flag:**Republic of China**
 IMO number:**9919371**
 Total number of sister ships already completed (excluding ship presented): **1**
 Total number of sister ships still on order: **2**

Delivered as the first of four Post Panamax bulkers for Taiwan-based U-Ming Marine Transport, *Cemtex Excellence* was handed over in March 2022. The second ship in the series, *Cemtex Dominance* followed in June 2022. The remaining two – *Cemtex Eminence* and *Cemtex Unity* are due for delivery in March and June 2023 respectively. *Cemtex Excellence* has a length of 235m, width of 40m and deadweight of 99,990 metric tonnes. The vessel is in many respects a typical example of the Post Panamax type and is an optimised variant of four similar-sized vessels built by Oshima for other owners. U-Ming has been engaged in a fleet replacement programme for some years and has been disposing of older vessels as new ships are delivered.

Cemtex Excellence has a vertical bow form without bulb and seven cargo holds with side rolling hatch covers. Like most of the larger bulkers it is gearless. Grain cubic is 118,908m³. Holds 2, 4 and 6 can be used for port ballasting and number 4 hold may be flooded for optimum draught and stability purposes when at sea. The tank top is strengthened for heavy cargoes and here holds 2, 4 and 6 can be left empty.

Propulsion is provided by a Mitsui-built MAN B&W 6G60ME-C10.5 main engine producing 10,000kW at 76rpm directly couple to a fixed pitch propeller. Service speed is 14.3kt at 78.1%MCR.

The high quality eco-efficient features and an enhanced digital operation system greatly improves the operating efficiency and safety of the vessel. The increasing size of ships reduces fuel consumption per unit cargo and lowers operating costs. In view of the industry trend towards low-speed operations, speed of navigation is optimised. The narrow streamline design of the bridge also helps to reduce wind resistance.

TECHNICAL PARTICULARS

Length oa:.....235.00m
 Breadth moulded:.....40.00m

Depth moulded
 to main deck:20.00m
 to upper deck:20.00m
 Width of double skin
 side:.....single hull type for all cargo hold
 Draught
 scantling:.....14.441m
 Gross:.....54,244
 Deadweight
 scantling: 99,990MT
 Speed, service (78.1%MCR output):..... 14.30kts
 Cargo capacity (m³)
 Grain:.....118,908m³
 Bunkers (m³)
 Heavy oil:2,664m³
 Diesel oil:406m³
 Water ballast (m³):.....46,729m³

Classification society and notations:CR
 Classification Society / Nippon Kaiji Kyokai.
 CR100+E Bulk Carrier, CSR, BC-A (Holds 2,4 and 6 may be empty), GRAB[30],ESP, PSPC, PMA, GBS, NR-II, Smartship(E,I), IWS, LCS, BWM, EEDI, SEEMP,SRE, SRE-EU, CMS(CAU)+, PCM.
 and
 NS* (CSR, BC-A, BC-XII, GRAB 30, PSPC-WBT, NC)(ESP)(HCM-GBS)(IWS)(PSCM)(IHM) (DSS(CNS, SM)), MNS, Complied with Part CSR-B&T of the Rules for the Survey and Construction of Steel Ships / Strengthened for heavy cargo loading where hold nos.2,4 and 6 may be empty

Propulsion
 Main engine(s)
 Design:.....Mitsui E&S Machinery Co., Ltd
 Model:Mitsui MAN B&W 6G60ME-C10.5
 Manufacturer:Mitsui E&S Machinery Co., Ltd
 Number:1
 Type of fuel:HFO
 Output of each engine:.....10,000kW at 76rpm
 Is this a diesel-electric or hybrid?:.....No
 Propeller(s)
 Material:.....Ni-Al Bronze
 Designer/Manufacturer:.....Nakashima Propeller Co., Ltd
 Number:1
 Fixed/Controllable pitch:.....Fixed
 Diesel-driven alternators
 Number:3
 Engine make/type:.....Yanmar Co., Ltd
 Type of fuel:HFO
 Alternator make/type:.....Nishishiba Electric Co., Ltd

Boilers
 Number:1
 Type:Vertical cylindrical composite type
 Make:Osaka Boiler MFG. Co., Ltd
 Other cranes
 Number:2
 Make:Kyoritsu Kikai Co., Ltd
 Type:Electric motor driven

Tasks:Machinery parts / Provision / Suez boat handling crane
 Performance:4.0MT
 Mooring equipment
 Number:.....6-mooring winch, 2-windlass/mooring winch
 Make:Nippon Pusnes Co., Ltd
 Type:Electro-hydraulic

Special lifesaving equipment
 Number of each and capacity:1-free-fall lifeboat (25P)
 Make:Shigi Shipbuilding Co., Ltd
 Type:F.R.P. totally enclosed

Cargo/capacity
 Hatch covers
 Design:.....Iknow Machinery Co., Ltd
 Manufacturer:Iknow Machinery Co., Ltd
 Type:Weather-tight side rolling type
 Ballast control system
 Make:Nakakita Seisakusyo Co., Ltd
 Type:Multi control panel
 Ballast water treatment system
 Make:Sunrui Marine Environment Engineering Co., Ltd

Complement
 Officers:9
 Crew:14
 Supernumeraries/Spare:.....2

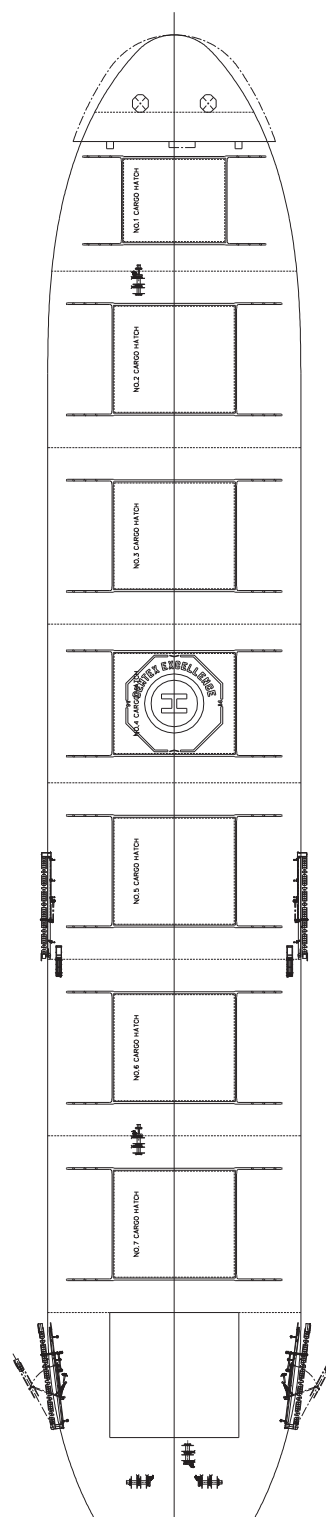
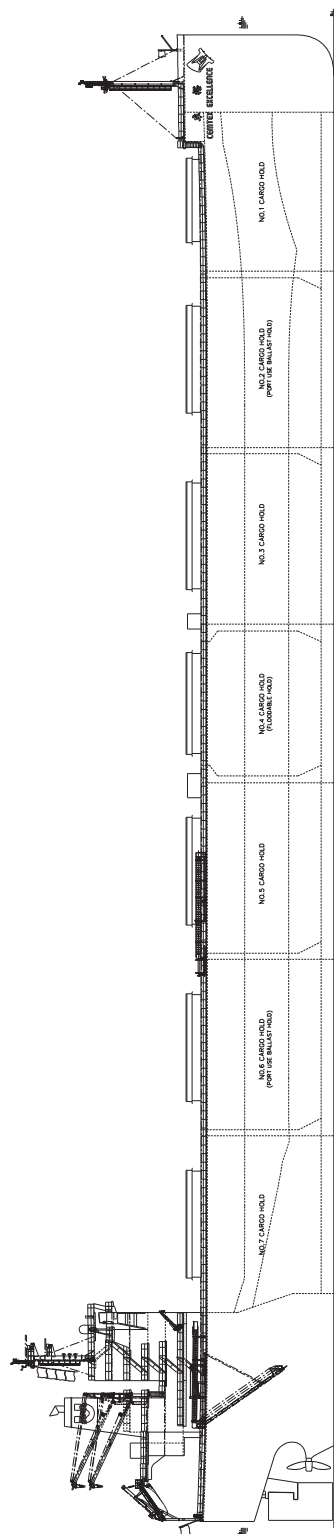
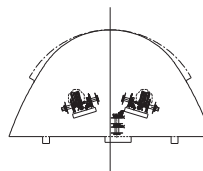
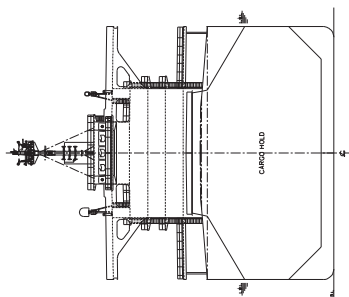
Navigation and other equipment
 Bridge control system
 Make:Japan Radio Co., Ltd
 Is bridge fitted for one-man operation?:No
 Integrated bridge system:.....No
 Radars
 Number:2
 Make:Japan Radio Co., Ltd

Fire detection system
 Make:Consilium Nittan Marine Ltd
 Type:Smoke, Thermal, Flame
 Fire extinguishing systems
 Cargo holds
 Type:Sea water fog/jet
 Engine room
 Make/Type:.....Kashiwa Co., Ltd / Foam fire extinguishing system
 Cabins:as per rule requirement
 Public spaces:.....as per rule requirement

Waste disposal plant
 Waste handled:Garbage and waste oil
 Incinerator
 Make:Sunflame Co., Ltd Waste shredder/crusher
 Make:Mitsuboshi Chuki Mfg. Co., Ltd
 Sewage plant
 Make:Taiko Kikai Industries Co., Ltd

Delivery date:.....14 March 2022





CHANG ZAN – MULTIPURPOSE VESSEL



Boilers	Number: 1
Type: oil-fired and exhaust gas composite steam boiler	
Make: Hailu Shazhou	
Output, each boiler: 1,000/510kg/h	
Stern appendages/special rudders: full spade rudder	
Bow thruster(s)	
Make: Nanjing High Accurate Marine Equipment	
Number: 1	
Output (each): 330kW	
Deck machinery	
Cargo cranes/cargo gear	
Number: 2	
Make: CSSC Nanjing Luzhou	
Type: 2x EH5026	
Performance: 50T-26M	
Other cranes	
Number: 1	
Make: Ninbo New Marine Lifesaving Equipment	
Type: Hydraulic slewing crane	
Tasks: for life raft / rescue boat / provision	
Performance: 2.3T-3.75m, 2.5T-5m	
Mooring equipment	
Number: 4	
Make: Nan Tong Li Wei	
Type: electric	
Special lifesaving equipment	
Number of each and capacity: 1, 23P	
Make: Ninbo New Marine Lifesaving Equipment	
Type: free-fall lifeboat	
Cargo/capacity	
Hatch covers	
Design: Shanghai Goodway Marine	
Type (upper deck/other decks): folding type (upper deck) / lift away (tween deck)	
Containers	
Total TEU capacity: 128	
On deck: 128	
Reefer plugs: 120	
Tiers/rows (maximum)	
On deck: 2 / 6	
Ballast control system	
Make: Shanghai Rongde	
Type: Hydraulic	
Ballast water treatment system	
Make: Shanghai Cyeco	
Capacity: 500m ³ /h	
Complement	
Officers: 9	
Crew: 8	
Suez/Repair Crew: 6	
Single/double/other rooms: 19 / 2	
Navigation and other equipment	
Bridge control system	
Make: Kongsberg	
Type: Autochief 600	
Is bridge fitted for one-man operation? N	
Integrated bridge system: N	
Radars	
Number: 3	
Make: JRC	
Model(s): JMR-9225-9XN/NKE-2215-6/JMR-9230-S	
Fire detection system	
Make: Kexun	
Type: K1302	
Fire extinguishing systems	
Cargo holds: CO ₂ for all C/Hs / Water spray system for No.1 C/H	
Make/Type: Shanghai Luhai	
Engine room: CO ₂ / Fixed Local Water mist system	
Make/Type: Shanghai Luhai / Shanghai Rongde	
Cabins: Water	
Public spaces: Water	
Efficiency	
Attained EEDI value: 10.5165	
Required EEDI value: 15.0081	
Other installed monitoring tools: 4 draughts	
Contract date: July 2020	
Launch/float-out date: September 2021	
Delivery date: March 2022	

Shipbuilder: Damen Yichang Shipyard Co., Ltd
Vessel's name: Chang Zan
Owner/Operator: Shanghai Changjiang Shipping Co., Ltd
Country: China
Designer: Shanghai Merchant Ship Design & Research Institute, CSSC (SDARI)
Country: China
Model test establishment used: CSSRC
Flag: P R China
IMO number: 9916111
Total number of sister ships already completed (excluding ship presented): 1
Total number of sister ships still on order: Nil

TECHNICAL PARTICULARS

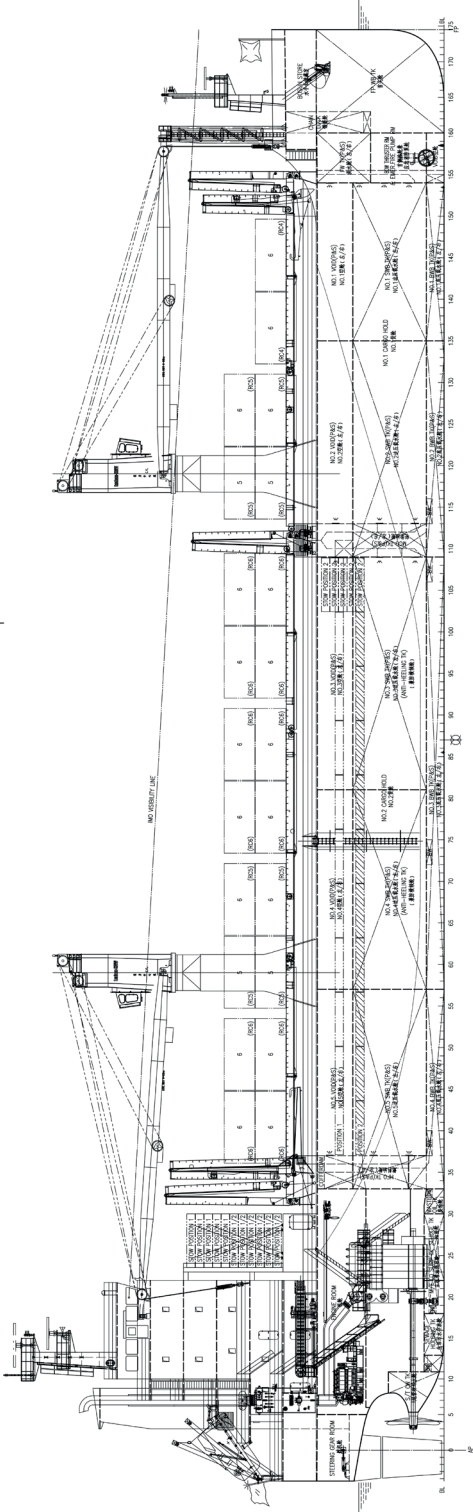
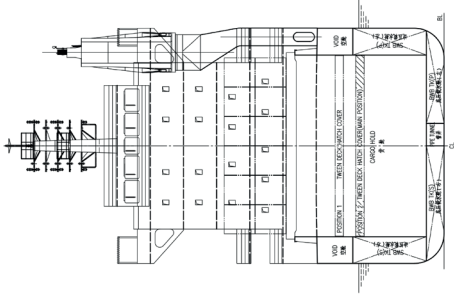
Length oa: 122.20m
Length bp: 119.60m
Breadth moulded: 19.80m
Depth moulded
to upper deck: 10.70m
Width of double skin
side: 2.25m
bottom: 1.5m
Draught
scantling: 7.20m
design: 7.20m
Gross: 7,730
Deadweight
scantling: 9,085
design: 9,085
Speed, service (65%MCR output): 12.0
Cargo capacity (m ³)
Bale: 12,930.7
Grain: 12,930.7
Bunkers (m ³)
Heavy oil: 280
Diesel oil: 170
Water ballast (m ³): 4,210
Daily fuel consumption (tonnes/day)
Main engine only: 8
Classification society and notations: CCS ★
CSA General Dry Cargo Ship, Double Side Skin; Strengthened For Heavy Cargoes; Ice class B; Grab*(20); PSPC(B); SOLAS II-2 Reg.19; Loading Computer(S,I); In-Water Survey; ★
CSM MCC; G-ECO(BWM(T))
% high-tensile steel used in construction: ~50%
Heel control equipment: ballast pump used as anti-heeling pump
Propulsion
Main engine(s)
Design: MAN
Model: 5S35ME-B9.7 Tier II
Manufacturer: CSR
Number: 1
Type of fuel: HFO & MDO
Output of each engine: 3,075kW x 123rpm
Is this a diesel-electric or hybrid?: N
Propeller(s)
Material: Cu3, Ni-Al-Br
Number: 1
Fixed/Controllable pitch: Fixed
Diameter: 4,800mm
Speed: 123rpm
Diesel-driven alternators
Number: 1+2
Engine make/type: 5DK-20e/6DK-20e
Type of fuel: HFO
Alternator make/type: CMXD/HFC
Output/speed of each set: 1x 400kWe / 2x 650kWe, 750rpm

Chang Zan, is a new generation multi-purpose vessel for normal worldwide operation with large box-shape cargo hold, designed by SDARI and built by Damen Yichang Shipyard for Chinese operator Shanghai Changjiang.

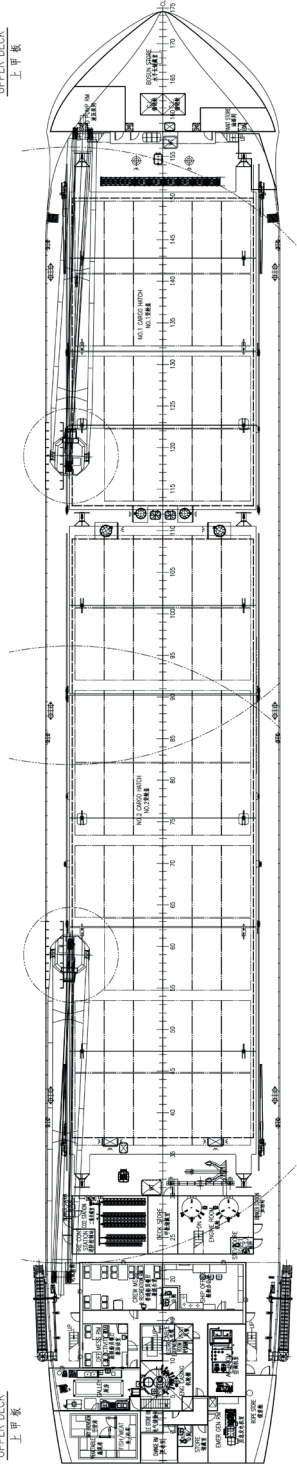
The 122m loa and 7,730dwt ship is a one-off order and was delivered in March 2022. With regard to cargoes, it is highly flexible and is intended for carrying packaged cargo, general cargo, project and bulk cargoes, as well as 128TEU of containerised cargo loaded on hatch cover for which there are 120 reefer plugs installed. Dangerous goods of category 1-9 according to IMDG Code can be loaded. Fire protection in the holds is by CO₂ with No.1 hold also having a water spray system.

The two box shape cargo holds are arranged with a large cargo hold (No.2) over 50.0m and a smaller cargo hold (No.1) about 30.0m in length, both equipped with folding hatch covers. No.2 cargo hold is designed as fully box shape whilst No. 1 tapers towards the bow of the vessel. No.2 hold also has a pontoon tween deck that can be located at two different levels. A pair of CSSC Nanjing Luzhou type EH5026 60-tonne deck cranes are located on the ship's port side. These have a maximum lift of 50tonnes at 26m outreach.

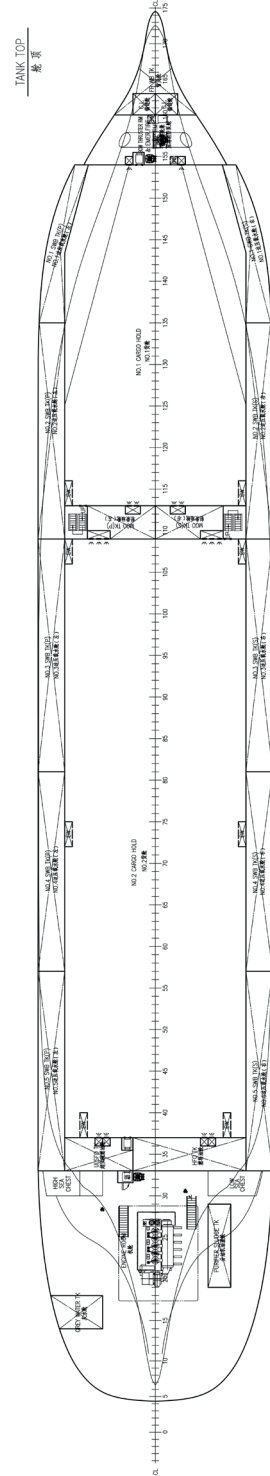
Chang Zan's hull form is optimised to achieve a higher propulsive efficiency and lower resistance for better fuel consumption and reduced emissions. Power comes from a two-stroke five-cylinder MAN B&W S35ME-B9.7 main engine of 3,075kW output at 123rpm directly connected to a 4.8m diameter propeller. Service speed is 12kt. The attained EEDI of 10.5165 is comfortably inside the required value of 15.0081.



UPPER DECK
上甲板



UPPER DECK
上甲板



TANK TOP
舱顶



CMA CGM DIGNITY – CONTAINER SHIP



Mooring equipment	Number: 9
Make:	MacGregor
Type:	Electric
Special lifesaving equipment	Number of each and capacity: 2 (each 32P)
Make:	HLB
Type:	Conventional
Cargo/capacity	
Hatch covers	Design:.....SMS-SME
Manufacturer:	Marine Tech Inc
Type:	Pontoon, non-sequential operation type
Containers	
Lengths: ...	6,058mm (20ft), 12,192mm (40ft)
Heights:	2,591mm (8ft 6inch), 2,896mm (9ft 6inch)
Cell guides:	40ft Cell guide
Total TEU capacity:	15,294TEU
On deck:	9,226TEU
In holds:	6,068TEU
Homogeneously loaded to 14tonnes:	10,315TEU
Reefer plugs:	123
Tiers/rows (maximum)	
On deck:	12 Tiers / 20 Rows
In holds:	11 Tiers / 18 Rows
Cargo valve control system	
Make:	KSB Seil
Type:	Hydraulic type
Ballast valve control system	
Make:	Emerson
Type:	Electro-hydraulic type
Ballast water treatment system	
Make:	(Hi-Ballast) Hyundai Heavy Industries, Engine & Machinery Division
Capacity:	1,000m ³ /h x 2
Complement	
Officers:	12
Crew:	20
Navigation and other equipment	
Bridge control system	
Make:	Nabtesco
Type:	M-800-V
Is bridge fitted for one-man operation?	N
Integrated bridge system:	N
Radars	
Number:	1
Make:	JRC
Model(s):	JMR-9282-S, JMR-9225-7X3
Fire detection system	
Make:	Autronica
Type:	Autosafe 4
Fire extinguishing systems	
Cargo holds:.....	Fixed CO ₂ System & SW Hydrants
Make/Type:.....	Fain / High Pressure CO ₂
Engine room:.....	Fixed CO ₂ System & SW Hydrants & Portable Fire Extinguishers
Make/Type:.....	Fain / High Pressure CO ₂ Fain / Portable Extinguisher
Cabins:	SW Hydrants / Portable Fire Extinguishers
Public spaces:	SW Hydrants / Portable Fire Extinguishers
Make/Type:	Fain / Portable Extinguisher
Waste disposal plant	
Incinerator	
Make/ Model:.....	HMMCO / MAXI 1500SL WS
Sewage plant	
Make/ Model:.....	Jonghap / AEROB – 18N(A)
Efficiency	
Attained EEDI value:	6.63
Required EEDI value:	14.12
Installed Fuel Meters:	Mass flow
Other installed monitoring tools:	Loading Computer, Integrated Automation System, M/E Shaft Power Meter
Energy Saving Technologies*:	Rudder bulb, Propeller boss cap fins
Performance Monitoring Regime: ...	Hyundai – ISS
Contract date:	26 September 2019
Launch/float-out date:	14 October 2021
Delivery date:	10 February 2022

Shipbuilder: **Hyundai Heavy Industries**
 Vessel's name: **CMA CGM Dignity**
 Owner/Operator: **CMA CGM**
 Country: **France**
 Designer: **Hyundai Heavy Industries**
 Country: **Republic of Korea**
 Flag: **Malta**
 IMO number: **9897779**
 Total number of sister ships already completed (excluding ship presented): **2**
 Total number of sister ships still on order: **14**

In 2019, Eastern Pacific made a huge foray into the dual-fuel container ship sector with an order for 22 15,000TEU vessels spread between Hyundai Samho and Hyundai Heavy. The ships were to be taken into long term charters by several of the major container liner operators. *CMA CGM Dignity* handed over in February 2022 is typical of the type and the first built at Hyundai Heavy.

The ships are fully cellular and *CMA CGM Dignity* has a nominal capacity of 15,264TEU which reduces to 10,315 at an homogenous 14tonnes. Hold capacity is 6,068TEU in 11 tiers and 18 rows and on deck 9,226TEU in 12 tiers and 20 rows. There are 123 reefer points. Whilst liner operators do continue with larger ship orders, the 15,000TEU size is increasingly being seen as the ideal due to its flexibility in choice of ports. With its 365.99m loa, beam of 51m and draught of 16m, *CMA CGM Dignity* can use the Panama Canal unlike the larger sizes.

The chosen power and propulsion system for the vessel comprises a 46,360kW output Hyundai-built MAN B&W 11G90ME-C10.5-GI-EGRTC main engine directly connected to a 10m diameter fixed pitch propeller. This allows for a service speed of 21.65kt at 80%MCR. Auxiliary power is supplied by four HIMSSEN 8H35DF engines. The EGRTC suffix denotes the vessel uses exhaust gas recirculation with turbocharger cutout to achieve NOx Tier III requirements.

The use of LNG as fuel along with energy saving rudder bulb and propeller boss cap fin allows the vessel to achieve an EEDI of 6.63 well below the 14.12 required value for a vessel of the size.

A pair of Hyundai HiBallast systems rated at 1,000m³/h each allow the ship to meet the ballast treatment requirements and with these systems approved by IMO and USCG permits worldwide trading.

TECHNICAL PARTICULARS

Length oa: 365.99m
 Length bp: 350m
 Breadth moulded: 51m
 Depth moulded to main deck: 29.85m
 Width of double skin side: 28mm
 bottom: 24mm

Draught
 scantling:.....16m
 design:..... 14.5m
 Gross:150,783
 Deadweight
 scantling:.....160,194t
 design:..... 136,240t

Speed, service (80%MCR output):.....21.65kts
 (NCR with 15% S.M.)
 Cargo capacity (m³)
 Bale:abt. 15,300TEU
 Refrigerated storage:1,000TEU
 Bunkers (m³)
 Heavy oil:5,416.8
 Diesel oil:1,340.8
 Water ballast (m³):43,507.7
 Daily fuel consumption (tonnes/day)
 Main engine only:137.6
 Auxiliaries:111.5

Classification society and notations:....LR (+ 1A
 Container ship BIS BWM(T) CMON COAT-
 PSPC(B) E0 Gas fueled LNG LCS Recyclable
 RSCS RSD TMON(oil lubricated) WIV ER(EGR,
 SCR, TIER III))

% high-tensile steel used in construction: 68.5%
 Propulsion
 Main engine(s)
 Design:..... Electronically controlled two-stroke,
 direct reversible, crosshead type diesel engine
 Model:MAN B&W 11G90ME-C10.5-
 GI-EGRTC

Manufacturer: Hyundai - MAN B&W
 Number: 1
 Type of fuel: LFO / ULSFO / MGO / Gas
 Output of each engine:46,360kW
 Is this a diesel-electric or hybrid?:.....N

Propeller(s)
 Material:Ni-Al Bronze
 Designer/Manufacturer:..... HHI-EMD
 Number: 5
 Fixed/Controllable pitch:Fixed
 Diameter:10,000

Diesel-driven alternators
 Number:4
 Engine make/type:.....Hyundai/HIMSSEN 8H35DF
 Type of fuel:LFO / ULSFO / MGO / Gas

Boilers
 Number:1
 Type:Automatic, forced draft, DF
 burning, marine boiler
 Make:Kangrim
 Output, each boiler:8,000kg/h

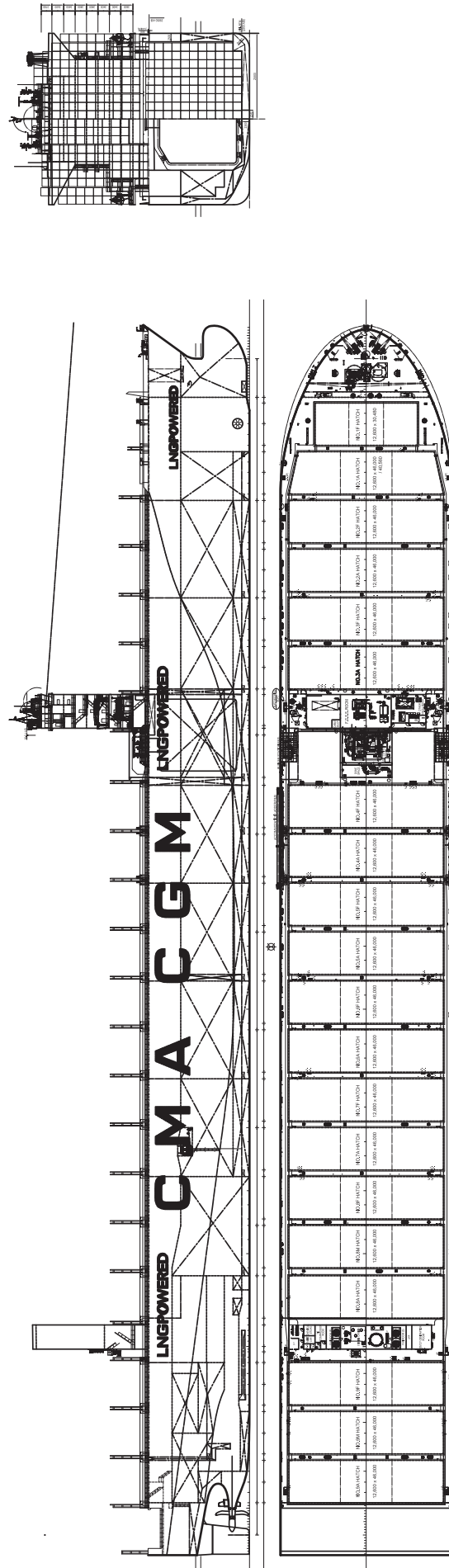
Stern appendages/special rudders:Becker
 Twisted Fin

Bow thruster(s)
 Make:KTE
 Number:1
 Output (each):.....3,000kW AC 6,600V 60Hz

Other cranes
 Number: 2
 Make: Sangsangin Industry
 Type: Jib type
 Tasks: Provision handling, Suez boat
 handling

Performance:3ton x 9.03m (Port), 3ton x
 10.2m (Stbd)





CORAL NORDIC – LNG CARRIER



Shipbuilder: **Jiangnan Shipyard (Group) Co., Ltd**
 Vessel's name: **Coral Nordic**
 Owner/Operator: **Anthony Veder**
 Country: **Netherlands**
 Designer: **Jiangnan Shipyard (Group) Co., Ltd**
 Country: **China**
 Model test establishment used: **SSSRI**
 Flag: **Netherlands**
 IMO number: **9919890**
 Total number of sister ships already completed (excluding ship presented): **Nil**
 Total number of sister ships still on order: **Nil**

Coral Nordic is a handy size scale LNG carrier built by Jiangnan Shipyard for Dutch gas shipping specialist Anthony Veder. The 30,000m³ ship was delivered in October 2022.

With a loa of 176.8m and a beam of 28.8m, Coral Nordic is not the largest vessel in the Anthony Veder fleet as the two-year older Coral Encanto has a similar capacity and slightly higher hull dimensions. However, Coral Nordic can claim to have the largest Type-C cargo tanks in the world according to the tank manufacturer TGE. It has two bi-lobe shaped cargo tanks of approximately 16,000 and 14,000m³ capacity. The smaller tank is located forward and narrows to the fore following the lines of the ship's hull. The older vessel by comparison has four tanks.

The tanks are designed for a maximum design pressure of 4.80 barg and a minimum design temperature of -164°C. The applied PU spray foam insulation system results in a very low boil-off gas rate of 0.15% / day. A quartet of Svanehøj deepwell pumps provide cargo handling facilities.

In common with most modern gas carriers, the ship has a dual-fuel propulsion system at the heart of which is an 8-cylinder Wärtsilä 50DF four-stroke engine. The power output of 7,800kW is transmitted through a Renk RSVL-1250HR gearbox to a 6.2m controllable pitch propeller operating at 98.7rpm. A shaft generator with power take in capability allows for return to port in event of a main engine failure from the two Wärtsilä 6L20DF auxiliaries.

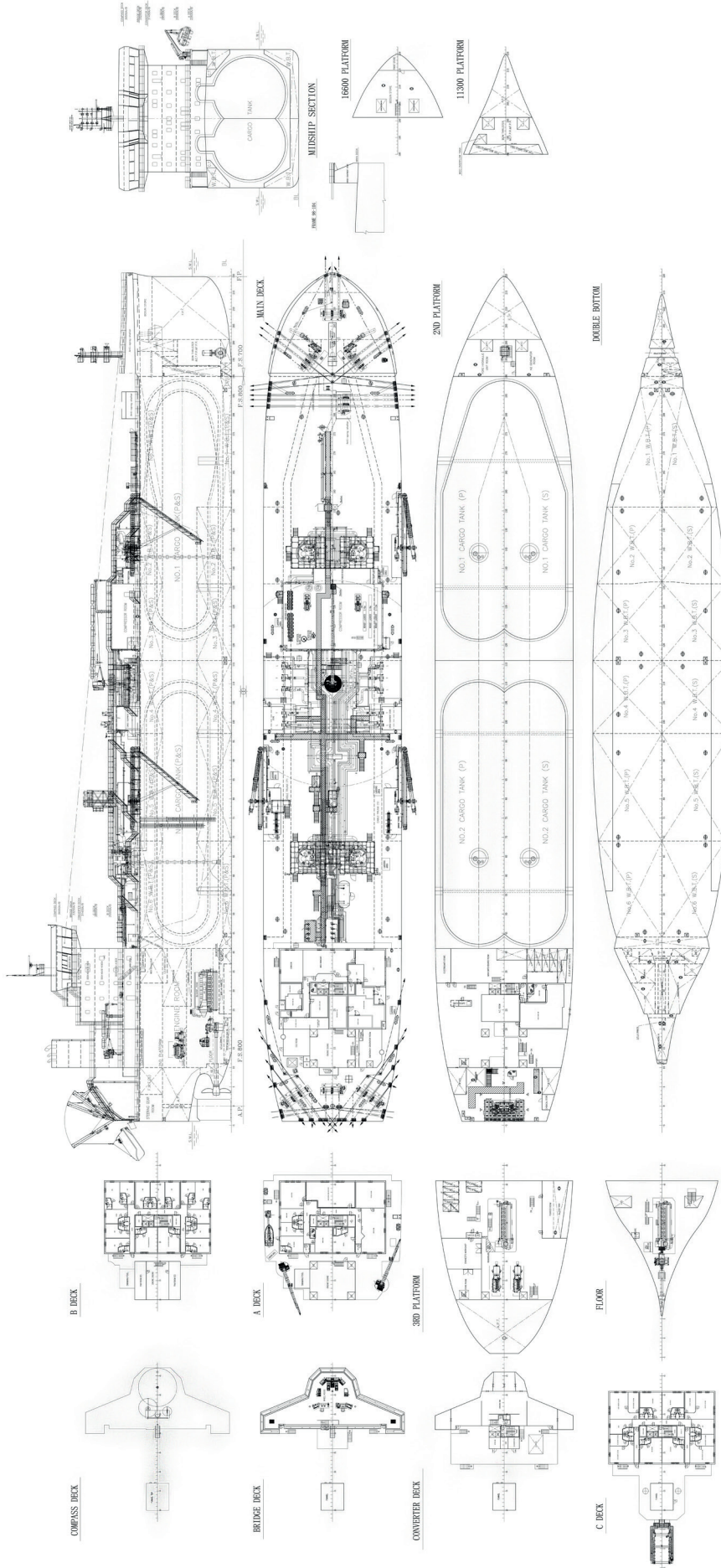
A vertical bow form patented by the builder aids efficiency as does the use of LED lighting and variable frequency drive equipment. The achieved EEDI at 8.63 is less than half of the 19.9 required.

TECHNICAL PARTICULARS

Length oa: 176.80m
 Length bp: 172.80m
 Breadth moulded: 28.80m
 Depth moulded
 to main deck: 19.0m
 to upper deck: 19.0m
 to other decks: to 2nd deck 14.4m, to 3rd deck 9.4m, to floor 3.9m, to tank top 2.6m

Width of double skin
 side: 800-1,000mm
 bottom: abt. 600mm
 Draught
 scantling: 8.20m
 design: 7.70m
 Gross: 26,234gt
 Lightweight: 12,000t
 Deadweight
 scantling: 17,000t
 design: 15,000t
 Block co-efficient: 0.684 at t=7.7m
 Speed, service (–%MCR output): 15.80kts
 Cargo capacity (m³)
 Liquid volume: 30,000m³
 Bunkers (m³)
 Diesel oil: 450m³
 Water ballast (m³): 12,300m³
 Daily fuel consumption (tonnes/day)
 Main engine only: 26.9 t/day (fuel gas)
 Auxiliaries: 5.3t/day (fuel gas)
 Classification society and notations: DNV
 % high-tensile steel used in construction: 19.8%
 Propulsion
 Main engine(s)
 Design: Wärtsilä
 Model: 8L50DF
 Manufacturer: Wärtsilä
 Number: 1
 Type of fuel: LNG/ MGO
 Output of each engine: 7,800kW
 Is this a diesel-electric or hybrid?: N
 Gearbox(es)
 Make: Renk
 Model: RSVL-1250HR
 Number: 1
 Output speed: 98.7rpm
 Propeller(s)
 Material: Ni-Al-Bronze
 Designer/Manufacturer: Wärtsilä
 Number: 1
 Fixed/Controllable pitch: CPP
 Diameter: 6,200mm
 Speed: 98.7rpm
 Diesel-driven alternators
 Number: 2
 Engine make/type: Wärtsilä 6L20DF
 Type of fuel: MGO/LNG
 Alternator make/type: DSG 86 M1-6W
 Output/speed of each set: 1,110kWx1,200rpm
 Boilers
 Number: 1
 Type: HTF3000V
 Make: Heatmaster
 Output, each boiler: 3,000kW
 Stern appendages/special rudders:
 Number: 1
 Make: VDV
 Bow thruster(s)
 Make: Wärtsilä
 Number: 1
 Output (each): 1,100kW
 Deck machinery
 Cargo cranes/cargo gear
 Number: 1 x hose handling crane
 Make: TTS Bohai
 Type: Electro-hydraulic

Performance: SWL 4tonnes
 Other cranes
 Number: 1x provision crane, 1x ER spare crane
 Make: TTS Bohai
 Type: Electro-hydraulic
 Tasks: handle provision + ER spare parts
 Performance: SWL 4tonnes
 Mooring equipment
 Number: 2 windlass, 5 mooring winches
 Make: Kongsberg
 Type: Electro-hydraulic
 Special lifesaving equipment
 Number of each and capacity: 1 x 29P
 Make: Jiangyin Neptune Marine Appliance Co., Ltd
 Type: Free Fall
 Cargo tanks
 Number: 2
 Grades of cargo carried: 1
 Product range: Methane
 Stainless steel – structure/piping: 9% Nickel steel
 Cargo pumps
 Number: 4
 Type: Deepwell type
 Make: Svanehøj
 Stainless steel: 316L
 Capacity (each): 700/800m³/h x 198mlc
 Cargo control system
 Make: TGE
 Type: IMSL
 Ballast control system
 Make: Techcross
 Type: ECS-1200 X 1
 Ballast water treatment system
 Make: Techcross
 Capacity: 1,200m³/h
 Complement
 Officers: 10
 Crew: 19
 Crew: 6/10
 Single/double/other rooms: 25/2/1
 Navigation and other equipment
 Bridge control system
 Make: Alphantron, Yokogawa
 Type: Auto-pilot(Yokogawa), ECDIS (Alphantron)
 Is bridge fitted for one-man operation? Y
 Integrated bridge system: Y
 If yes, make: Alphantron
 Model: Transas 4000 MFD
 Radars
 Number: 2
 Make: Alphantron
 Model(s): JRC JMR-5300
 Fire detection system
 Make: Consilium
 Type: Salwico Cargo
 Fire extinguishing systems
 Engine room: CO₂
 Make/Type: Minimax/High pressure
 Public spaces: Sea water
 Waste disposal plant
 Waste handled (oily water separator):
 Make/Model: Jowa / 3SEP OWS2.5
 Incinerator
 Make/Model: Kangrim / KFB-73
 Waste compactor
 Make/Model: WESCO / IP400
 Waste shredder/crusher
 Make/Model: WESCO / 523
 Sewage plant
 Make/Model: EVAC/ Ecotreat 5C
 Efficiency
 Attained EEDI value: 8.63 g-CO₂/t.nm
 Required EEDI value: 19.9 g-CO₂/t.nm
 Installed Fuel Meters: mass flow meter for fuel oil and lub. oil
 Other installed monitoring tools: torque meter, draughts gauge measuring system
 Energy Saving Technologies*: EnergoProFin, Main exhaust gas economizer, LED lighting, VFD for sea cooling water pump, VFD for fresh cooling water pump
 Performance Monitoring Regime: Data collection and monitoring to the Vessel performance system (VPT).
 Contract date: 16 September 2019
 Launch/float-out date: 15 February 2022
 Delivery date: 12 October 2022



DONG YI 601 – BULK CARRIER



Shipbuilder: **Penglai Zhongbai Jinglu Ship Industry Co., Ltd**
 Vessel's name: **Dong Yi 601**
 Owner/Operator: .. **Fujian Dong Yi Shipping Co., Ltd**
 Country: **China**
 Designer: .. **Shanghai Merchant Ship Design & Research Institute, CSSC (SDARI)**
 Country: **China**
 Model test establishment used..... **China Ship Scientific Research Center**
 Flag: **China**
 Total number of sister ships already completed (excluding ship presented): **3**
 Total number of sister ships still on order: **6**

Delivered in May 2022, *Dong Yi 601* is the leading vessel of the series of new generation of gearless 'DOLPHIN' bulk carrier developed by SDARI for domestic trade in Chinese waters. Three of the vessels, of which this is the first, are being built by Penglai Zhongbai Jinglu Shipindustry for Fujian Dong Yi Shipping with several more being built for other owners.

The five-hold configuration is similar to a Supra or Ultramax design but the hull dimensions of 225m loa, beam of 36.5m, 12.5m draught and deadweight of 76,006tonnes are higher than that class of vessel as is the 99,771m³ grain capacity bringing the ship nearer to the Panamax class. With an average hold length of over 36.3m this is longer than vessels of similar tonnage which would normally have seven holds. The large holds and 26.1m length hatches with side rolling hatch covers ensure high efficiency cargo operations.

The vessel's hull form is optimised to achieve a higher propulsive efficiency and lower resistance in order to reduce fuel consumption and emissions. The vessel's superstructure layout adopts low wind resistance ensuring fuel consumption is about 28% lower than ships of similar capacity.

Power comes from a MAN B&W 6S50ME-C9.7 super long-stroke engine producing 7,512kw at 85rpm and driving a single 7m diameter fixed pitch propeller. Normal service speed at 80% MCR is 13kt. A CSSC XIANDAI / ZFC6 502-84E shaft generator at the engine free end feeds 520kW of power to the ship's systems.

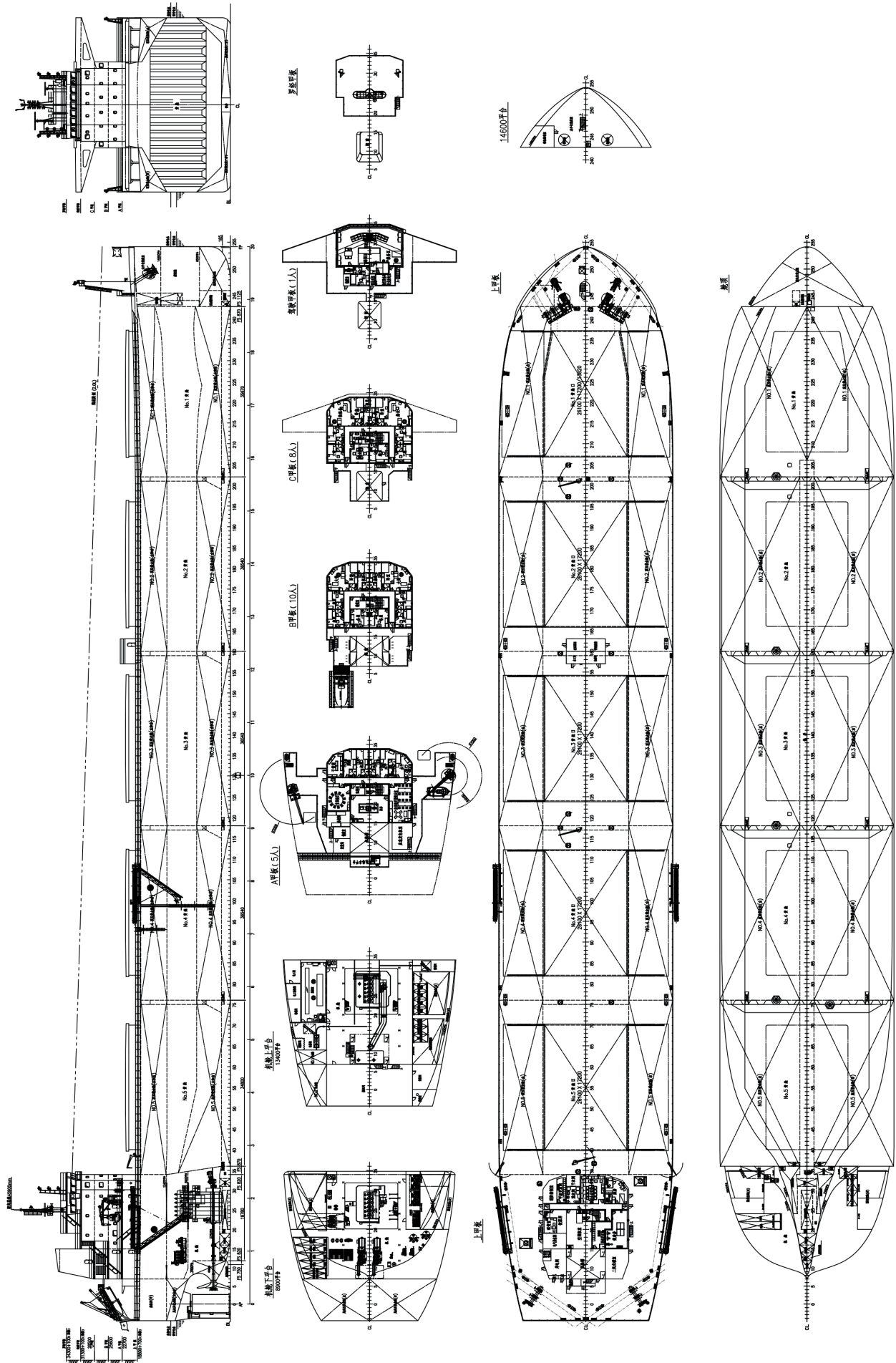
A propeller boss cap further aids efficiency allowing for an attained EEDI of 2.96 comfortably below the domestic required figure 3.93 and the IMO required figure 3.61.

TECHNICAL PARTICULARS

Length oa:225.0m
 Length bp:221.5m
 Breadth moulded:36.5m

Depth moulded to main deck: 18.8m
 Draught scantling:..... 12.5m
 design: 11.3m
 Gross: 45,287
 Displacement: 87,524
 Deadweight scantling:..... 76,006t
 design: 66,707t
 Speed, service (80%MCR output):..... 13
 Cargo capacity (m³)
 Grain: 99,771
 Bunkers (m³)
 Heavy oil: 815
 Diesel oil: 225
 Water ballast (m³):..... 25,740
 Daily fuel consumption (tonnes/day)
 Main engine only: 21
 Classification society and notations: CCS
 ★CSA Ice Class B; In-Water Survey; Loading Computer (S, I, G);R1
 ★CSM Machinery Notation AMP5;AUT-0;Gd-ECO(CD24);Gd-EP;SCM
 % high-tensile steel used in construction:.... 60
 Propulsion
 Main engine(s)
 Design:.....MAN
 Model: 6S50ME-C9.7 Tier II
 Manufacturer: CSSC Marine Power Co., Ltd
 Number: 1
 Type of fuel: VLSFO & MGO
 Output of each engine: 7,512kW
 Is this a diesel-electric or hybrid?:.....N
 Propeller(s)
 Material:.....Copper alloy (Cu3)
 Designer/Manufacturer:.....SMARD
 Number: 1
 Fixed/Controllable pitch: Fixed
 Diameter:.....7.0m
 Speed:.....85rpm
 Main-engine driven alternators
 Number: 1
 Make/type:CSSC Xiandai / ZFC6 502-84E (free end)
 Output/speed of each set: 520kW / 1,450rpm
 Diesel-driven alternators
 Number: 2
 Engine make/type:.....Anqing CSSSE / 6DK-20e
 Type of fuel:VLSFO & MGO
 Alternator make/type:.....CSSC Xiandai / HFC
 Output/speed of each set: 700kWe/ 750rpm

Boilers
 Number: 1
 Type:Exhaust gas & oil-fired composite steam boiler
 Make:Qingdao Marine Boiler
 Output, each boiler: ...oil-fired side 1,300kg/h / exhaust gas side 600kg/h
 Stern appendages/special rudders: ... Flap type rudder
 Other cranes
 Number: 1
 Make: Wuxi Huahai Marine Equipment Co., Ltd
 Type:Hydraulic slewing crane
 Tasks: provision handling
 Performance: SWL 3.5t 1.5-7m
 Mooring equipment
 Number: 2+2
 Make:CSSC Nanjing Luzhou Machine Co. Ltd
 Type: hydraulic
 Special lifesaving equipment
 Number of each and capacity:25P
 Make: Jiangyinshi Beihai LSA Co., Ltd
 Type: free fall
 Cargo/capacity
 Hatch covers
 Design:NSH Poseidon Ships Equipment Co., Ltd
 Manufacturer:NSH Poseidon Ships Equipment Co., Ltd
 Type:side opening type
 Ballast control system
 Make:Nantong Navigation Machinery
 Type:Hydraulic
 Complement
 Officers: 10
 Crew: 12
 Supernumeraries/Spare: 2
 Single/double/other rooms:Single
 Navigation and other equipment
 Bridge control system
 Make:Kongsberg
 Type: Autochief 600
 Is bridge fitted for one-man operation?N
 Integrated bridge system:.....N
 Radars
 Number: 2
 Make: Furuno
 Model(s): FAR-2328 / 2338S
 Fire detection system
 Make: Kexun
 Type:K1302
 Fire extinguishing systems
 Engine room:CO₂ system
 Make/Type: Wuhan Weili
 Waste disposal plant
 Waste shredder/crusher
 Model:CFJ-15B
 Sewage plant
 Make:Shanghai Shijiu
 Model:CSWE-30
 Efficiency
 Attained EEDI value:.....2.96
 Required EEDI value:.....3.93 (Domestic) 3.61 (IMO)
 Installed Fuel Meters:Volume fuel meters have be installed in fuel supply module and in/out of M/E.
 Energy Saving Technologies*: Tank Energy Saving System (TESS) has been installed for FO heating to save steam consumption. VFD for sea cooling water pumps have been installed
 Performance Monitoring Regime:..... Propeller boss cap
 Delivery date: 29 April 2022



EAGLE CAMPOS – CRUDE OIL TANKER



Stern thruster(s)	Make:Brunvoll AS
	Number:1 (aft) / 1 (fwd)
	Output (each):2,200kW
Deck machinery	
Cargo cranes/cargo gear	
Number:	2
Make:	HHC 830-2028
Type:	Elec.-hyd. type
Performance: ...SWL 20t x 10m/min working radius 6.1m ~ 28m	
Other cranes	
Number:	2
Make:	Sangsan Industry Co. Ltd
Type:	Elec.-hyd. type
Tasks:	Provision
Performance:	SWL 6.3/2.0t x 10m/min working radius 3.8m / 5.0 m ~ 18.3m
Mooring equipment (Winches)	
Number:	8
Make:	Fluteck Ltd
Cargo tanks	
Number:	8 (incl. 2 slot tank) 6 pairs of cargo tanks
Coated tanks, make and type of coating:	IPK, Epoxy primer
Cargo pumps	
Number:	3
Type:	Electric motor driven
Make:	Hyundai Heavy Industries Turbomachinery
Capacity (each):	4,000m ³ x 135m
Cargo control system	
Make:	Kongsberg
Type:	Computerised System (Integrated parts of ICMS)
Ballast control system	
Make:	Kongsberg
Type:	Computerised System (Integrated parts of ICMS)
Ballast water treatment system	
Make:	Hyundai Welding Co., Ltd
Capacity:	5,000m ³ /h
Complement	
Officers:	14
Crew:	16
Suez/Repair Crew:	6
Single/double/other rooms:	30 cabins (single), 1 cabin (3-double)
Navigation and other equipment	
Bridge control system	
Make:	Hyundai Global Service
Type:	Bridge control console
Is bridge fitted for one-man operation?	Y
Integrated bridge system:	Y
If yes, make:	JRC
Model:	GRD-921
Radars	
Number:	2
Make:	JRC
Model(s):	JMR-9282-S (S-band) / JMR-9225-6X (X-band)
Fire detection system	
Make:	Salwico Cargo
Type:	Fire alarm central in console mounted cabinet
Fire extinguishing systems	
Cargo holds:	Low pressure CO ₂ system
Make/Type:	NK
Engine room:	High pressure CO ₂ system
Make/Type:	NK
Cabins:	Fire hose box with nozzle
Make/Type:	NK
Waste disposal plant	
Waste handled:	Sludge oil, solid waste
Incinerator	
Make/Model:	Hyundai-Atlas/Maxi T150SL WS
Waste compactor	
Make/Model:	Kwanglim Compact / HP100
Sewage plant	
Make/Model:	Il Seung / ISB-02
Efficiency	
Attained EEDI value:	2.82
Required EEDI value:	3.22
Installed Fuel Meters:	Coriolis, 3,650kg/h
Energy Saving Technologies*:	Rudder bulb, Pre-swirl duct
Contract date:	17 December 2019
Launch/float-out date:	19 August 2021
Delivery date:	22 December 2021

Shipbuilder:	Hyundai Heavy Industries Co., Ltd
Vessel's name:	Eagle Campos
Owner/Operator:	AET
Country:	Malaysia
Designer:	Hyundai Heavy Industries Co., Ltd
Country:	Republic of Korea
Flag:	Malaysia
IMO number:	9902225
Total number of sister ships already completed (excluding ship presented):	3
Total number of sister ships still on order:	Nil

Eagle Campos was delivered by Hyundai Heavy industries to AET on 5 January 2022 as the first of three Suezmax 153,000dwt DP2 shuttle tankers.

The 278m loa, 48m beam and 17.25m draught ship has a cargo capacity of 167,200m³ with six pairs of cargo tanks and a pair of slop tanks. There are three electric cargo pumps each with a capacity of 4,000m³ per hour. A bow loading system is suitable for tandem loading operation. The ship can load and discharge three different kinds of cargo oil simultaneously.

Main propulsion is provided by a Hyundai-built MAN B&W 6G70ME-C10.5-HPSCR engine with an output of 18,600kW 3.6rpm directly coupled to a controllable pitch propeller of 8.7m diameter. The HPSCR suffix denotes that the engine meets NOx Tier III requirements using high pressure selective catalytic reduction.

Auxiliary and power for DP operations comes from five HiMSSEN H32/40 gensets. One is a nine-cylinder unit with an output of 4,430kW at 720rpm and the other four are seven-cylinder units each with an output of 3,440kW at the same operating speed.

Manoeuvrability is conferred by five Brunvoll thrusters. There are single tunnel thrusters fore and aft each rated at 2,200kW and three retractable azimuthing thrusters of 3,100kW.

Fuel efficiency is aided by electrical-driven variable frequency drive cargo pumps and high-power thrusters and by installation of a pre-swirl duct and rudder bulb. Attained EEDI is 2.82 against a required 3.22.

TECHNICAL PARTICULARS

Length oa:	278.0m
Length bp:	269.0m
Breadth moulded:	48.0m
Depth moulded to upper deck:	23.8m
Width of double skin side:	2.5m

bottom:	2.7m
Draught scantling:	17.25m
design:	16.0m
Gross:	84,560
Deadweight scantling:	154,200t
design:	139,600t
Speed, service (–%MCR output):	14.50kts
Cargo capacity (m ³)	
Liquid volume:	167,200m ³
Bunkers (m ³)	
Heavy oil:	3,270m ³
Diesel oil:	570m ³
Water ballast (m ³):	53,200m ³
Daily fuel consumption (tonnes/day)	
Main engine only:	45.4t

Classification society and notations:

DNV +1A, Tanker for Oil, ESP, CSR, E0, DYNPOS(AUTR), BOW LOADING, TMON, NAUT(OC), BIS, BWM(T), SPM, VCS(2), COAT-PSPC(BC), RECYCLABLE, LCS, CMON, CLEAN, ER(SCR, Tier III), SHAFT ALIGN(1).

Propulsion

Main engine(s)

Design:

MAN B&W

Model:

Hyundai-MAN B&W 6G70ME-C10.5-HPSCR

Manufacturer:

Hyundai

Number:

1

Type of fuel:

LFO / MGO

Output of each engine:

18,600kW

Is this a diesel-electric or hybrid?:

N

Propeller(s)

Material:

Ni-Al-Bronze

Designer/Manufacturer:

Wärtsilä

Number:

1

Fixed/Controllable pitch:

Controllable pitch

Diameter:

8,700mm

Speed:

73.6rpm

Diesel-driven alternators

Number:

5

Engine make/type:

Hyundai / HiMSSEN 9H32/40 (1 set), 7H32/40 (4 sets)

Type of fuel:

LFO / MGO

Alternator make/type:

Siemens

Output/speed of each set:

4,430kW @720rpm, 3,440kW @720rpm

Boilers

Number:

3

Type:

2 x oil fired boiler & 1 x composite boiler

Make:

Alfa Laval

Output, each boiler:

25,000kg/h x 2sets, 2,500kg/h (oil fired) 700kg/h (exhaust gas) x 1set

Bow thruster(s) / Azimuth Thruster

Make:

Brunvoll AS

Number:

1 (aft) / 2 (fwd)

Output (each):

3,100kW (fwd) / 3,100kW (fwd)



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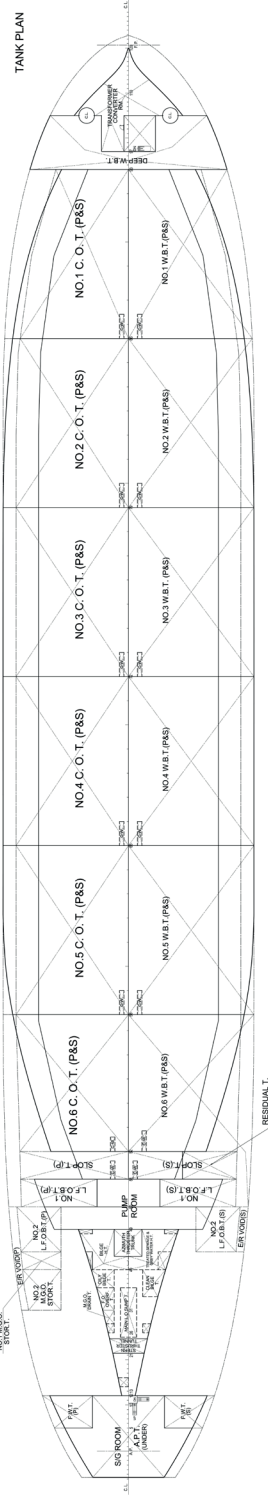
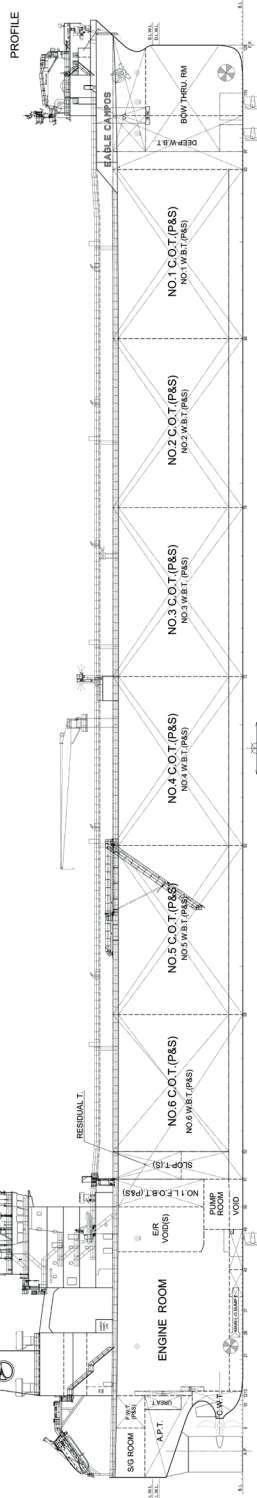
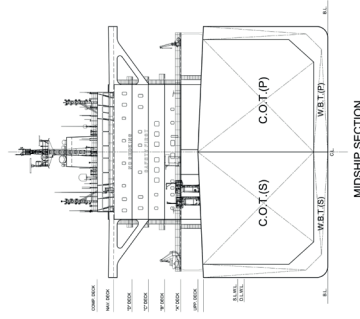


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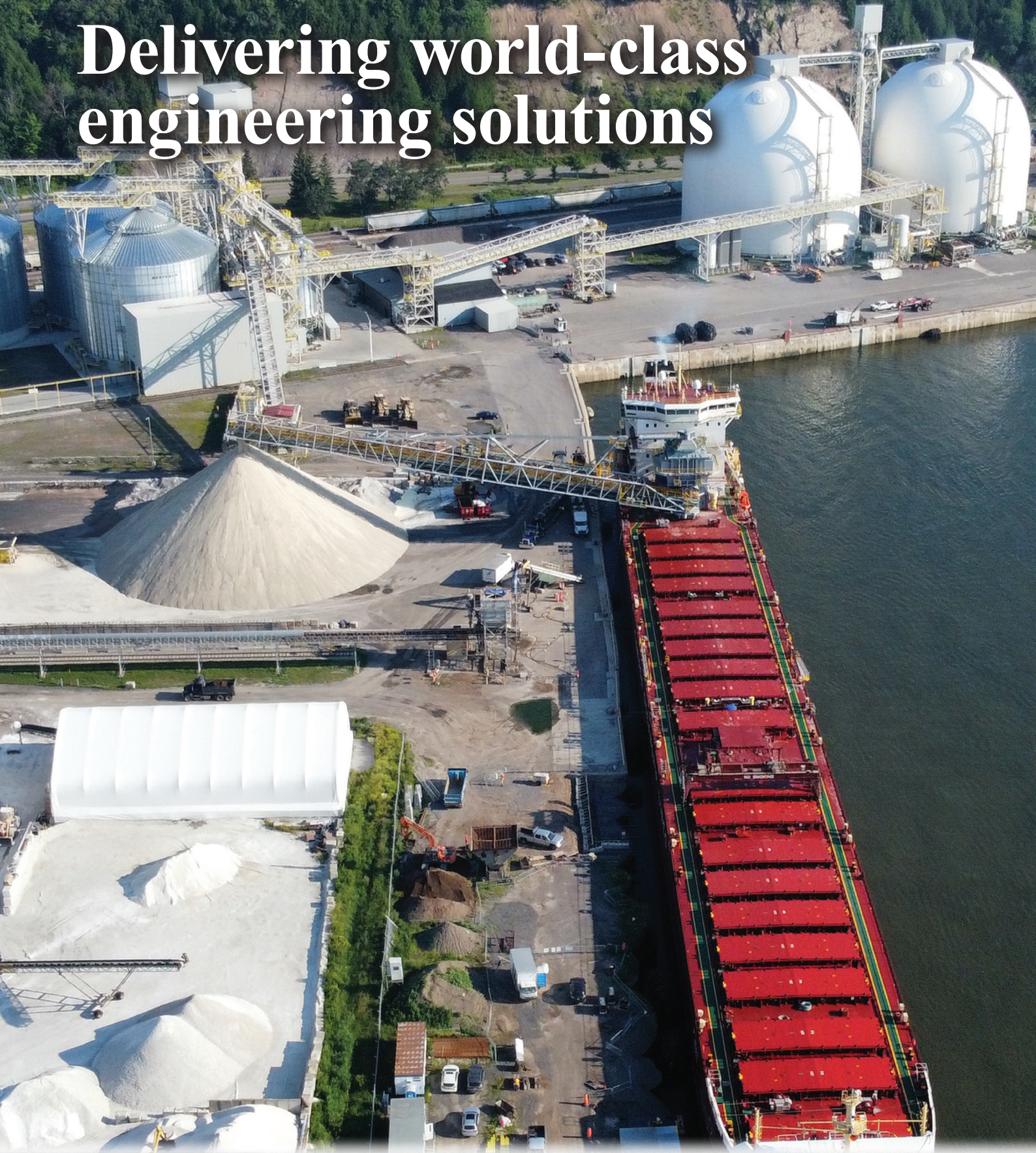
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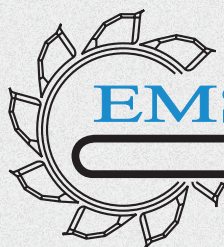


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EAGLE VALENCE – VERY LARGE CRUDE CARRIER



Shipbuilder: **Samsung Heavy Industries Co., Ltd**
 Vessel's name: **Eagle Valence**
 Owner/Operator: **AET**
 Country: **Singapore**
 Designer: **Samsung Heavy Industries**
 Country: **Republic of Korea**
 Flag: **Singapore**
 IMO number: **9910234**
 Total number of sister ships already completed (excluding ship presented): **1**
 Total number of sister ships still on order: **Nil**

Eagle Valence has claimed several 'firsts' since its delivery at the end of February 2022 by Samsung Heavy Industries to AET. It claims to be the first newbuilding VLCC with dual-fuel propulsion; it is the first dual-fuelled VLCC classed by BV and it is the first dual-fuelled VLCC chartered by TotalEnergies. A sister vessel, *Eagle Vallery*, was delivered in late April 2022.

The 329.9m long *Eagle Valence* has a beam of 60m, a draught of 21.6m and a deadweight of 299,240tonnes. In cargo terms it is a typical VLCC with five sets of port, centre and starboard tanks and two slop tanks. Cargo handling is performed by three Shinko steam turbine pumps of 5,000m³/hour capacity.

Eagle Valence is powered by an Otto cycle WinGD 7x82DF engine capable of burning LNG as fuel supplied by two 3,750m³ capacity Type 'C' LNG tanks located on deck, forward of the accommodation block. The engine's output is 22,000kW and drives a 10.4m diameter fixed pitch propeller at 64.6rpm to give a service speed of 14.8kt. Auxiliary genset engines are also dual-fuel models and comprise three HiMSEN 7-cylinder in line H22CDF engines.

Combined, these factors allow the ship to attain an EEDI value of 1.976 against a required 2.074.

TECHNICAL PARTICULARS

Length oa: 330 m
 Length bp: 323.4m
 Breadth moulded: 60.0m
 Depth moulded
 to main deck: 29.6m
 to upper deck: 29.6m (same as above)
 Width of double skin
 side: 3.4m
 bottom: 3.0m
 Draught
 scantling: 21.6m
 design: 20.5m
 Gross: 158,240
 Displacement: 343,400MT at scantling draught
 Lightweight: 44,165MT

Deadweight
 scantling: 299,240MT
 design: 278,000MT
 Speed, service: 14.8knots including 15% power margin (75.7% of DMCR)
 Cargo capacity (m³)
 Liquid volume: 340,000
 Bunkers (m³)
 LNG: 7,500
 Heavy oil: 5,900
 Diesel oil: 1,000
 Water ballast (m³): 91,500
 Tankers – percentage segregated ballast: .100%
 Daily fuel consumption (tonnes/day)
 Main engine only: 55.8(LNG) or 68.7(HFO)

Classification society and notations: BV
 I, *HULL, *MACH, Oil tanker, Unrestricted navigation, CSR, ESP, CPS(WBT), CPS(COT), *VeriSTAR-HULL CM, LI-HG-S3, *AUT-UMS, CLEANSHIP, PROTECTED FO TANK, VCS-TRANSFER, BWT, INWATERSURVEY, dualfuel(LNG), Fatigue PLUS spectral (worldwide) DFL 30, MON-SHAFT, ERS-S, GREEN PASSPORT, SPM, COMF-NOISE(3), SYSCOM(SVESSEL)

Propulsion
 Main engine(s)
 Design: WinGD
 Model: 7X82DF
 Number: 1
 Type of fuel: LNG / HFO / MGO
 Output of each engine: 22,000kW

Propeller(s)
 Designer/Manufacturer: Samsung / Silla metal
 Number: 1
 Fixed/Controllable pitch: FPP
 Diameter: 10.4m
 Speed: 64.6rpm
 Diesel-driven alternators
 Number: 3
 Engine make/type: HHI-EMD / 7H22CDF
 Type of fuel: LNG and HFO/MGO
 Alternator make/type: Hyundai electric & Energy system / HFJ7 568-08P
 Output/speed of each set: 1,350KWe / 900rpm

Boilers
 Number: 2 x aux. boiler, 1 x comp. boiler
 Type: 1 x Dual fuel, 1 x conventional for aux. boiler, conventional for comp. boiler
 Make: Alfa Laval
 Output, each boiler: 2 x 40ton/h for aux. boiler, 1 x 2.0ton/h+1.0ton/h for comp. boiler
 Deck machinery
 Cargo cranes/cargo gear
 Number: 2
 Make: Tech Flower
 Type: High pressure, self-contained elec-hyd. single jib type
 Performance: 20tons SWL, each
 Other cranes
 Number: 2 sets, Provision crane

Make: Tech Flower
 Type: High pressure, self-contained elec-hyd. single jib type
 Tasks: For provision and equipment handling
 Performance: 12.5tons SWL (P), 3tons SWL (S)

Mooring equipment
 Number: 2 x mooring winches combined with windlass (1 C/L + 2 M/D + 1 W/H, each), 8 x mooring winches (2 M/D + 1 W/H, each) 1 x SPM winch (2 M/D)
 Make: Flutek
 Type: Elec-hyd. driven (high pressure type), non-auto tension

Special lifesaving equipment
 Number of each and capacity: 2 x 30P
 Make: HLB / OPCO
 Type: Totally enclosed hinged gravity type

Cargo tanks
 Number: 15 tanks for cargo tank and 2 tanks for Slop tank
 Grades of cargo carried: Crude oil
 Coated tanks – make and type of coating: International Paint / Epoxy A/C

Cargo pumps
 Number: 3 sets
 Type: Steam turbine
 Make: Shinko
 Capacity (each): 5,000m³/h S.G 1.025/h x 150MWC

Cargo control system
 Make: KSB Seil
 Type: Hydraulic system

Ballast control system
 Make: KSB Seil
 Type: Hydraulic system

Ballast water treatment system
 Make: Samsung S&S Purimar
 Capacity: 2 x 3,000m³/h + 1 x 400m³/h
 Complement
 Officers: 14 persons
 Crew: 16 persons
 Suez/Repair Crew: 6 persons
 Single/double/other rooms: Total 30 cabins (Single 30) + 1 cabin (for Suez)

Navigation and other equipment
 Bridge control system
 Make: Nabutesco
 Is bridge fitted for one-man operation? Y
 Integrated bridge system: Y
 If yes, make: JRC
 Model: JAN-9202

Radars
 Number: 3
 Make: JRC
 Model(s): 1 x JMR9282S + 2 x JMR92256X
 Fire detection system
 Make: Consilium
 Type: Salwico Fire Alarm System

Fire extinguishing systems
 Engine room: Foam fire fighting system
 Make/Type: Survitec/High expansion foam
 Cabins: Seawater fighting system
 Make/Type: SHI
 Public spaces: Seawater fighting system
 Make/Type: SHI

Waste disposal plant
 Incinerator
 Make/Model: HMMCO / MAXI T150SL WS
 Sewage plant
 Make/Model: Il-Seung / ISB -03

Efficiency
 Attained EEDI value: 1.976g-CO₂ / ton.mile (95.3%)
 Required EEDI value: 2.074g-CO₂ / ton.mile (Phase 2)

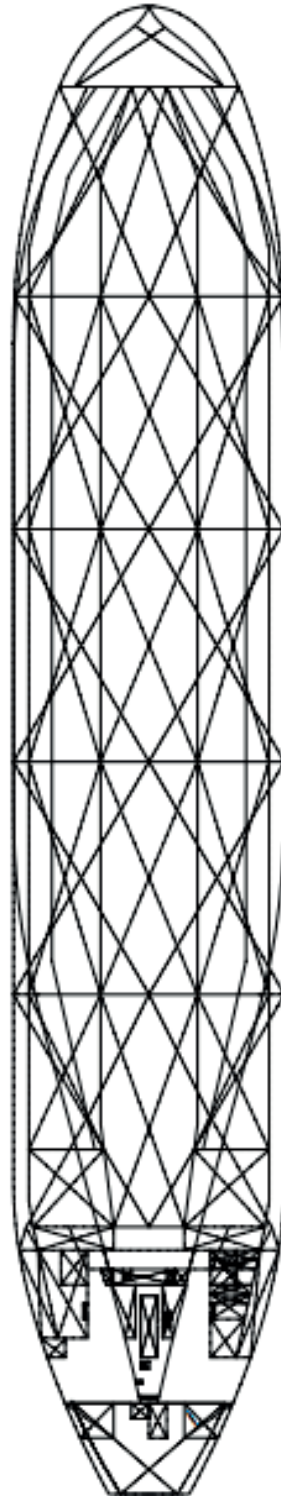
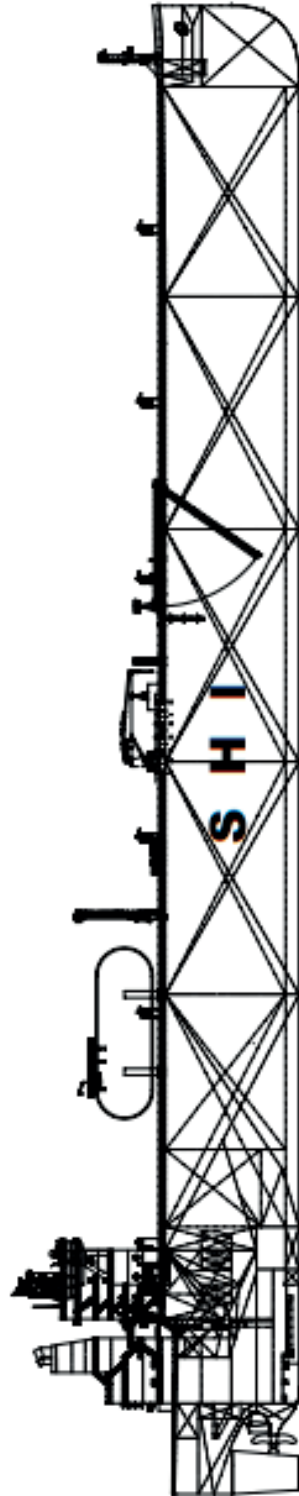
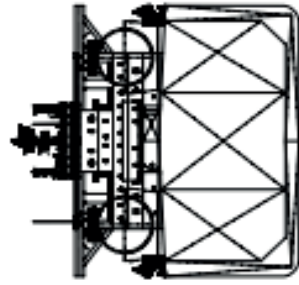
Installed Fuel Meters: 2 sets, Coriolis Meter for LNG fuel
 Energy Saving Technologies: SAVER-Fins (SAVING Vibration and Energy Reduction Fins); SARB (SAVING Advanced Rudder Bulb); SAVER-StatorD (SAVING Vibration and Energy Reduction Stator with partial Duct)
 Hull coatings: Tin-free SPC anti-fouling coating (Intersmooth 7465HS, International Paint)

Contract date: 10 April 2020
 Launch/float-out date: 20 November 2021
 Delivery date: 28 February 2022





EAGLE VALENCE



FINNECO I – RO-RO FERRY



Type: Open loop
 On main engines?: yes
 On auxiliary engines?: no

Bow thruster(s)
 Number: 2
 Output (each): 1,800kW

Special lifesaving equipment
 Number of each and capacity: ..2 x Lifeboats,
 for 38 persons
 Type: Enclosed

Vehicles
 Number of vehicle decks (fixed/moveable): 4
 including weather deck plus 1 fixed deck for
 cars in forward part of Deck 2 and hoistable
 deck on Deck 3
 Total lane length: 5,800
 Total freight units (specify size): 400

Container capacity: 520TEU on weather
 deck

Doors/ramps/lifts/moveable car decks
 Number of each: 3 stern ramps – port,
 starboard and centre

Ballast water treatment system
 Make: Alfa Laval Aalborg

Complement
 Single/double/other rooms: Single
 Passengers
 Total: 12
 Number of cabins: 12

Waste disposal plant
 Sewage plant
 Make: Gertsen & Olufsen A/S
 Model: BR 7400BG

Efficiency
 Attained EEDI value: 9.18
 Required EEDI value: 10.32
 Energy Saving Technologies*: Air lubrication,
 battery pack 2*2,500kWh, waste heat
 recovery, solar panels 600m²
 Hull coatings: TBT-Free Self-Polishing
 Copolymer Antifouling

Contract date: 26 April 2018
 Launch/float-out date: 26 April 2021
 Delivery date: 28 April 2022

Shipbuilder: **China Merchants Jinling Shipyard**
 Vessel's name: **Finneco I**
 Owner/Operator: **Finnlines Plc**
 Country: **Finland**
 Designer: **Knud E. Hansen**
 Country: **Denmark**
 Flag: **Finland**
 IMO number: **9856830**
 Total number of sister ships already completed (excluding ship presented): **2**
 Total number of sister ships still on order: **Nil**

Designed by Knud E Hansen and built by China Merchants Jinling Shipyard, Finnline's first hybrid ro-ro was delivered to Finnlines on 28 April 2022. The ship is one of a trio with *Finneco II* and *Finneco III* also delivered in 2022. The trio have Ice Class 1A Super and are a modified version of parent company Grimaldi's Eco Valencia class of nine ships altered to suit trading on the Baltic services operated by Finnlines.

The Finneco name was well chosen given the vessel's innovative use of multiple technologies to increase efficiency and reduce emissions. To begin with, at 238m long and with a capacity for 400 trailers in its 5,800 lane metres, the ship can carry 40% more cargo than the previous largest vessel in the owner's fleet. Freight trailers are accommodated in three holds and on the weather deck. There is a fixed car deck in the forward part of number two deck and a hoistable deck in number three. Access is by three stern ramps. The tank top and main deck are designed free of pillar areas to accommodate paper and sto-ro concept. The flexibility offered permits the vessel to be able to load high and heavy and long and wide cargoes. This will make them attractive propositions for project cargoes destined for wind farm construction for example. High cargoes up to 7m high can be accommodated. A total of 520TEU can be loaded on the weather deck further increasing the flexibility of the ship.

Main engines are a pair of Hyundai-built MAN B&W 9S50ME-C9.6 super long stroke engines each producing 12,780kW directly connected to a pair of Kongsberg supplied Promas Lite rudder/propeller systems with controllable pitch propellers.

Outwardly the ship is a typical ro-ro other than the messages HYBRID RORO and ZERO EMISSIONS IN PORT emblazoned on the superstructure and hull respectively. These indicate that the vessel is equipped with a Corvus Energy storage system comprising two 2,500kWh battery packs.

Other energy saving and environmental equipment includes 600m² of solar panels installed on the vessel to provide clean energy for use and storage onboard, a Silverstream Technologies air lubrication

system and a waste heat recovery system. Each main engine has its own Langh Tec open loop exhaust gas cleaning system to remove SOx.

Finneco I has three auxiliary engines with a power output of 1,540kW each. The vessel is also equipped with two Wärtsilä shaft generators with a power rating of 2,000kW each which can charge the battery system. Wärtsilä also provided the hybrid power conversion system, energy management system, PTO/PTI converters and transformers and the bow thrusters. The two-stroke hybrid shaft generator system was the first devised by Wärtsilä and the first in the Finnlines fleet.

TECHNICAL PARTICULARS

Length oa: 238.0
 Length bp: 229.75
 Breadth moulded: 34.0
 Depth moulded
 to main deck: 9.30
 to upper deck: 25.6

Draught
 design: 7.20

Gross: 60,515
 Deadweight
 design: 17,358tons

Speed, service (–%MCR output): 19.0

Bunkers (m³)
 Heavy oil: 1,764
 Diesel oil: 280.1

Water ballast (m³): 110,44.6

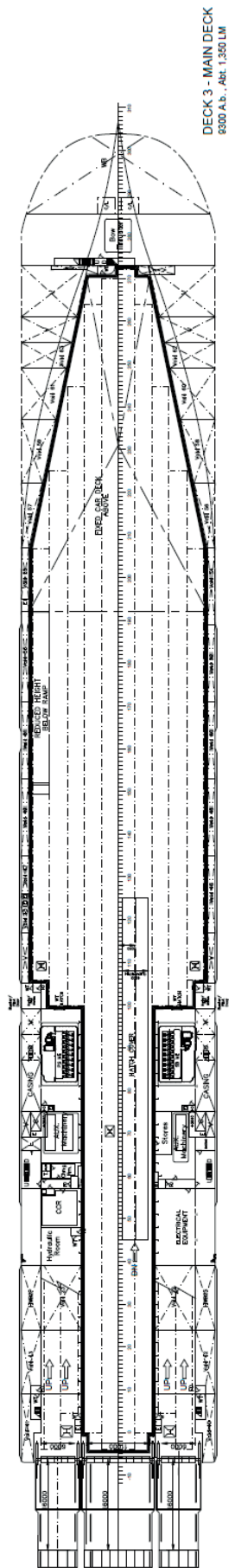
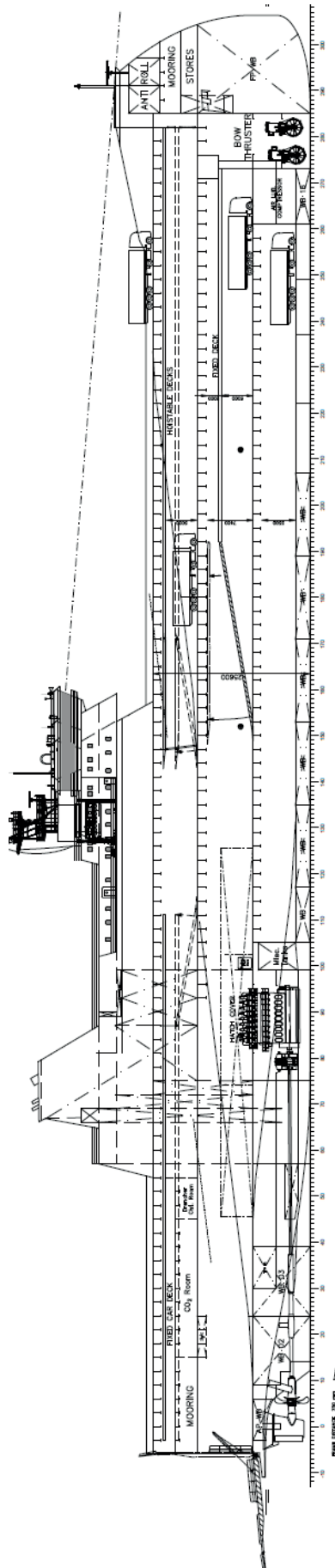
Daily fuel consumption (tonnes/day)
 Main engine only: abt 54.7 when speed
 18kts
 Auxiliaries: When working abt 7.0 MGO

Classification society and notations: Rina
 C+, ro-ro cargo ship, inwatersurvey, BWM-T,
 AUT-UMS, SYS-NEQ-1, SYS-IBS, Green Plus,
 unrestricted navigation, mon-shaft, Ice 1A
 Super

Propulsion
 Main engine(s)
 Design: Hyundai-MAN 2x12,780kW
 Model: Hyundai-MAN B&W 9S50ME-C9.6
 Number: 2
 Type of fuel: HFO
 Output of each engine: ..12,780kW @117rpm
 Is this a diesel-electric or hybrid?: Hybrid

Propeller(s)
 Designer/Manufacturer: Kongsberg
 Number: 2 x Promas Lite
 Fixed/Controllable pitch: Controllable pitch

Exhaust-gas scrubbing equipment
 Manufacturer: Langh Tec



DECK 3 - MAIN DECK
8000 Ab., Abt. 1,350 LM



FRIDA KNUTSEN – OIL TANKER



Shipbuilder: **Daewoo Shipbuilding & Marine Engineering Co., Ltd (DSME)**
 Vessel's name: **Frida Knutsen**
 Owner/Operator: **KNOT (Knutsen NYK Offshore Tankers)**
 Country: **Norway**
 Designer: **DSME**
 Country: **Republic of Korea**
 Model test establishment used: **KRISO, MARIN and Force Technology**
 Flag: **Norway**
 IMO number: **9905916**
 Total number of sister ships already completed (excluding ship presented): **1**
 Total number of sister ships still on order: **0**

Designed and built by DSME, the 123,602dwt *Frida Knutsen* delivered in August 2022 allowed owner Knutsen NYK Offshore Tankers to join the ranks of operators of dual-fuel shuttle tankers. Sister ship *Sindre Knutsen* was delivered less than four weeks later.

It is the power and propulsion system of the vessel which makes it significant. Dual-fuel vessels are becoming common across ship types but the smaller of the two deck tanks on *Frida Knutsen* are not for LNG but for storing VOC emissions from the cargo. The stored VOC is for use both as fuel and to meet a forthcoming Norwegian requirement to limit VOC release to the atmosphere.

The main power supply comes from a pair of WinGD 6X52DF of 6,705kW output engines each connected to a Wärtsilä controllable pitch propeller. Two Wärtsilä 9L34DF engines power the Hyundai Electric generators. Each set produces 4,150kW at 720rpm. Surplus energy from the auxiliaries and main engines is stored in an ABB energy storage battery system for use in positioning during cargo operations.

TECHNICAL PARTICULARS

Length oa: 277,548m
 Length bp: 264,5m
 Breadth moulded: 46,0m
 Depth moulded
 to upper deck: 22,9m
 Width of double skin
 side: 2,53m
 bottom: 2,7m
 Draught
 scantling: 14,9m
 design: 14,9m
 Gross: 85,504 MT
 Displacement: 154,500MT
 Deadweight
 scantling: 123,602MT
 design: 124,000MT
 Speed, service: 12,9kts
 Cargo capacity (m³)
 Liquid volume: 144,000

Bunkers (m³)
 Heavy oil: 2,800
 Diesel oil: 890
 Water ballast (m³): 52,000
 Daily fuel consumption (tonnes/day)
 Main engine only: 51,7 (Oil) / 41,7 (Gas)
 Classification society and notations: DNV +1A, Tanker for Oil ESP, CSR, EO, COAT-PSPC(B, C), BIS, TMON, LCS, DYNPOS(AUTR), BWM(T), Clean(Design), HELDK(S, H), NAUT(AW), Bow Loading, VCS(2, 3), PLUS, CSA(FLS2), COMF(C-3, V-3), CCO, Recyclable, SPM, Gas fuelled, Battery(Safety), F(A,M,C)##

Propulsion
 Main engine(s)
 Design: Winterthur Gas & Diesel Ltd
 Model: WinGD 6X52DF
 Manufacturer: Hyundai Heavy Industries
 Number: 2
 Type of fuel: ... HFO, LSMGO, FG, vaporized LVOC
 Output of each engine: 6,705kW
 Is this a diesel-electric or hybrid?: No

Propeller(s)
 Material: Ni-Al Bronze
 Designer/Manufacturer: DSME / Wärtsilä
 Number: 2
 Fixed/Controllable pitch: Controllable
 Diesel-driven alternators
 Number: 2
 Engine make/type: .. Wärtsilä / 4-stroke, trunk piston, in-line, dual fuel 9L34DF type
 Type of fuel: ... HFO, LSMGO, FG, vaporized LVOC
 Alternator make/type: Hyundai Electric / HSJ9 811-10P, Synchronous generator
 Output/speed of each set: 4,150kW (5,187,5kVA) / 720rpm

Turbo generator
 Number: 1
 Make/type: Mitsubishi Heavy Industries / Horizontal, impulse type condensing turbine
 Output/speed of each set: 3,600kW (4,500kVA) / 1,800rpm

Boilers
 Number: 1 x Aux. boiler, 1 x Donkey boiler
 Type: Vertical, composite
 Make: Aux, Mitsubishi Heavy Industries; donkey boiler, Kangrim Heavy Industries
 Output, each boiler: Aux. boiler: 35tons/h x 16bar g; donkey boiler: Oil-fired section 5tons/h x 6bar g, Exh. gas section: 2 x 0,7ton/h x 6bar g
 Stern appendages/special rudders:
 Type: 2 x High lift fish tail rudder
 Make: Becker Marine

Bow thruster(s)
 Make: Brunvoll
 Number: 4 / 2 x tunnel, 2 x retractable
 Output (each): Tunnel (1,7MW) / retractable (2,5MW)

Stern thruster(s)
 Make: Brunvoll
 Number: 1 x tunnel
 Output (each): 1,7MW
 Deck machinery
 Cargo cranes/cargo gear
 Number: 2

Make: Oriental
 Type: Ele. Hyd cylinder luffing
 Performance: 15MT SWL
 Other cranes

Number: ... 2 x 5MT SWL for Provision crane / 1 x 5MT SWL for Bow loading system

Make: Oriental
 Type: Ele. Hyd cylinder luffing
 Tasks: Provision / BLS
 Performance: 5MT SWL each

Mooring equipment
 Number: Total 8 x sets
 Windlass: 2 - 1C/L +2 M/D+1W/H
 Mooring winches: 6 - 2M/D +1W/H (Capacity: 25MT)

Make: Flutek
 Type: Hydraulic high pressure
 Special lifesaving equipment
 Number of each and capacity: 1 x lifeboat & 1 x fast rescue boat

Make: Viking
 Type: Lifeboat (freefall)/Rescue (pivot hinged)

Cargo/capacity
 Bow loading system (Green line only)
 Design: In-board loading, 5th generation
 Manufacturer: MacGregor
 Loading rate: up to 9,000m³/h
 Pulling force of traction winch: 130MT
 Brake capacity: 170MT

Cargo tanks
 Number: 12 (in six pairs) + 2 Slop tanks
 Coated tanks: International Paint, Epoxy anti-corrosive as per IMO PSPC-COT

Structure/piping: carbon steel/carbon steel

Cargo pumps
 Number: 4
 Type: Centrifugal, vertical, single stage
 Make: Shinko
 Stainless steel: Bronze
 Capacity (each): 3,000m³/h x 135mTH

Cargo control system
 Make: Shinko

Ballast control system
 Make: Shinko

Ballast water treatment system
 Make: HHI

Complement
 Officers: 13
 Crew: 17

Suez/Repair Crew: 6 Suez crew

Navigation and other equipment
 Bridge control system

Make: Kongsberg
 Type: Bridge Manoeuvring System
 Is bridge fitted for one-man operation? Y
 Integrated bridge system: N

Fire detection system
 Make: Consilium
 Type: Addressable

Fire extinguishing systems
 Engine room: ... CO₂ fire extinguishing system
 Make/Type: NK / CO₂

Waste disposal plant
 Incinerator

Make: Hyundai Marine Machinery Co
 Model: MAXI NG150SL WS

Waste compactor
 Make: EVAC
 Model: UBP-30S

Sewage plant
 Make: Il-Seung
 Model: ISB-06

Efficiency
 Attained EEDI value: 2,51 g/ton-mile
 Required EEDI value: 3,19 g/ton-mile

Installed Fuel Meters: Coriolis type gas flow meter for ME, GE and Aux. boiler

Positive displacement type FO flow meter for ME, GE, Aux. boiler and Donkey boiler

Other installed monitoring tools: Ship performance monitoring system

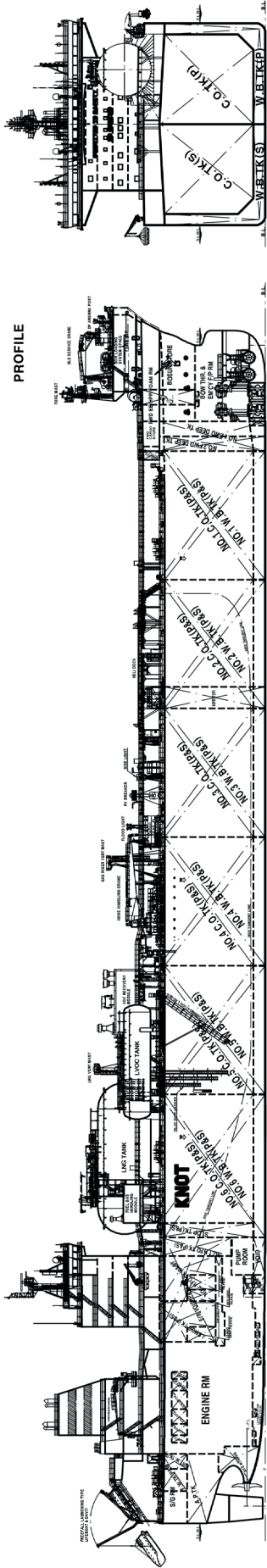
Energy Saving Technologies*: Partial LED lighting, VFD for thrusters, Main CSW pumps, ER fans and cargo pumps, Shaft generators, ABB Energy storage system

Hull coatings: High performance, TBT free, low friction self polishing anti-fouling paint

Contract date: 6 February 2020

Launch/float-out date: 4 December 2021

Delivery date: August 2022



MIDSHIP SECTION

F'CLE DECK

NAV. DECK

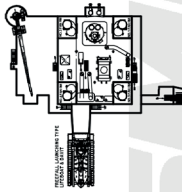
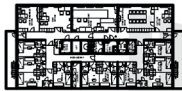
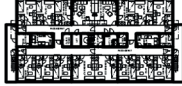
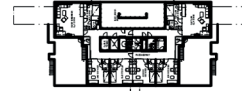
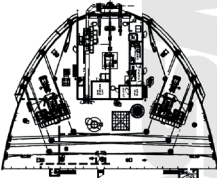
D DECK

C DECK

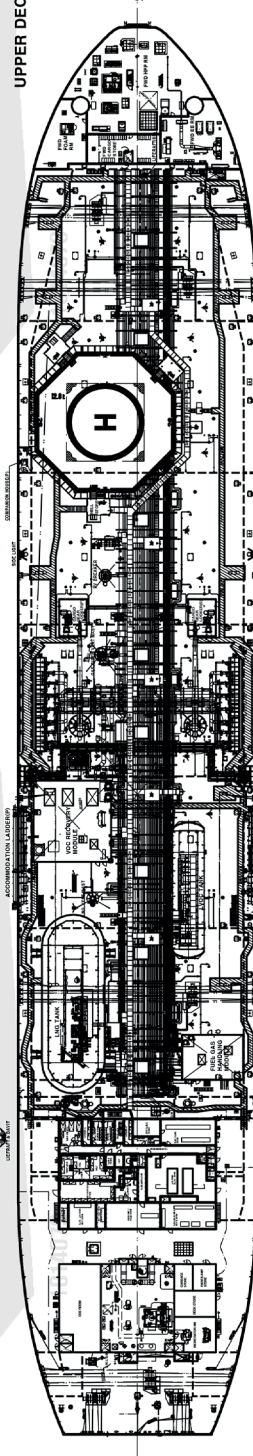
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A DECK

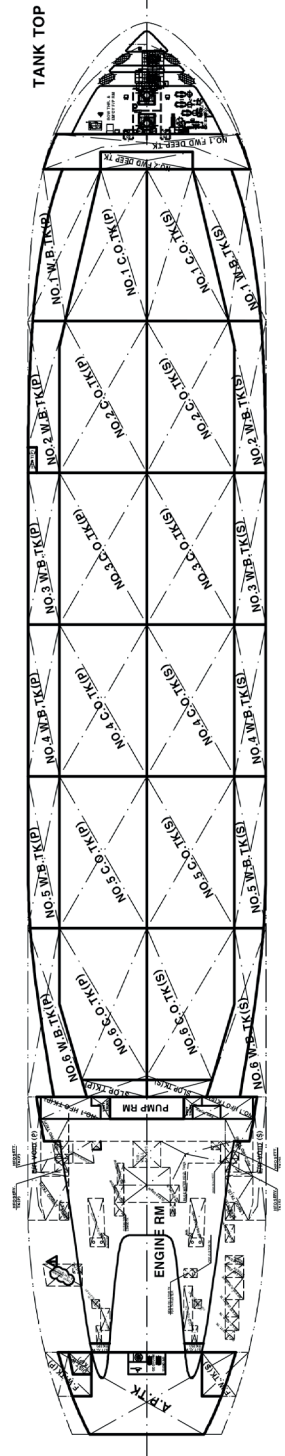
PLATFORM DECK



UPPER DECK



TANK TOP



GREENWAY – CHEMICAL/PRODUCTS TANKER



Output, each boiler:	
Fuel mode:	2,585kg/h
Gas mode:	2,121kg/h
Fuel mode:	182.6kg/h
Gas mode:	153.5kg/h
Deck machinery	
Cargo cranes/cargo gear	
Number:	2
Make:	TTS Bohai
Type:	GP 680-20t-20m
Performance:	Electro-hydraulic cylinder luffing jib crane
Other crane:	Provision Crane
Number:	2
Maker:	TTS Bohai
Type:	GP 260-8-15/ GP 80-3-14
Tasks:	provision and equipment handling
Performance:	Electro-hydraulic cylinder luffing jib crane
Other crane:	Engine room crane
Number:	1
Make:	Jiangsu Masada Heavy Industries Co., Ltd
Type:	6.5t Engine room crane
Tasks:	dismantled and inspected for main engine
Performance:	6.5tonnes SWL
Mooring equipment	
Number:	9
Make:	Flutek
Type:	Electro-hydraulic
Special lifesaving equipment:	2 x 5.7m totally enclosed fire-protected life/rescue boats
Number of each and capacity:	1 x port (include equipment/spare part of engine); 1 x starboard (include equipment/spare part of engine)
Maker:	Jiangyinshi Beihai LSA Co., Ltd
Type:	JYB57F
Cargo tanks:	
Number:	12
Grades of cargo carried:	Crude oil
Cargo pumps	
Number:	3
Make:	Shinko
Type:	KV450-3
Capacity (each):	3,500m ³ /h
Cargo control System	
Make:	Emerson
Type:	Electro-hydraulic
Ballast control System	
Make:	Emerson
Type:	Electro-hydraulic
Ballast water treatment system	
Make:	Sunrui
Capacity:	2,000m ³ /h x 2 + 300m ³ /h x 1
Complement	
Officers:	11
Crew:	19
Radars	
Number:	2
Make:	JRC
Model(s):	JMR-9282-SN/JMR-9225-9XN
Fire detection system	
Make:	Consilium
Type:	Salwico
Fire extinguishing system	
Engine room:	Foam fire fighting system
Make/Type:	Fain/Foam liquid
Cabins:	Seawater fighting system
Make/Type:	fix-water fighting system
Public spaces:	Seawater fighting system
Make/Type:	fix-water fighting system
Waste disposal plant	
Make/Model:	CSSC Nanjing Luzhou Machine Co., Ltd / STD-3 Marine Sewage Treatment Unit
Incinerator	
Make/Model:	Kangrim Heavy Industries Co., Ltd / KFB-110S
Sewage plant	
Make/Model:	CSSC Nanjing Luzhou Machine Co., Ltd / STD-3 Marine Sewage Treatment Unit
Contract date:	03 December 2019
Launch/float-out date:	30 December 2021
Delivery date:	28 June 2022

Shipbuilder: **Guangzhou Shipyard International Company Limited**
 Vessel's name: **Greenway**
 Owner/Operator: **Eastern Pacific Shipping**
 Country: **Singapore**
 Designer: **CSSC**
 Country: **China**
 Model test establishment used: **Hydrodynamic Department of MARIC**
 Flag: **Liberia**
 IMO number: **9900796**
 Total number of sister ships already completed (excluding ship presented): **2**
 Total number of sister ships still on order: **Nil**

TECHNICAL PARTICULARS

Length oa:	274.0m
Length bp:	269.0m
Breadth moulded:	48.0
Depth moulded	
to main deck:	29.7m
to upper deck:	29.7m
Width of double skin	
side:	2.4m
bottom:	2.78m
Draught	
scantling:	17.15m
design:	17.15m
Displacement:	184,318t
Lightweight:	27,000t
Deadweight	
scantling:	157,320t
design:	157,320t
Speed, service (CSR output):	14.2kts with 15% sea margin
Cargo capacity (m ³)	
Liquid volume:	176,900
Bunkers (m ³)	
LNG:	5,100
Diesel oil:	2,400
Water ballast (m ³):	53,000
Tankers - percentage segregated ballast:	100%
Daily fuel consumption:	SFOC 164.2g/kWh
Classification Society and notations:	ABS
✱ A1, Oil Carrier, (E), CSR, AB-CM, TCM, UWILD, PMA, ESP,CPS, VEC, BWI, ENVIRO,IHM,RW, GFS(DFD) ✱ AMS, ✱ACCU	
Propulsion	
Main engine(s)	
Design:	CMD
Model:	CMD-MAN B&W 6G70ME-C10.5-GI HP-SCR
Manufacturer:	CSSC-MES Diesel Co., Ltd
Number:	1
Type of fuel:	MGO / LNG
Output of each engine:	70% SMCR 1,0878kW at 62.2rpm
Propeller(s)	
Material:	Bronze
Designer/ Manufacturer:	702/dpcc
Number:	1
Fixed/Controllable pitch:	Fixed
Diameter:	9.4m
Speed:	70rpm
Main-engine driven alternators	
Number:	3
Make/type:	Hyundai / x7H22CDFx900rpm
Output/speed of each set:	MCR 1,505kW at 900rpm
Boilers	
Number:	3
Type:	Oil and LNG fired
Make:	Kangrim Heavy Industries Co., Ltd

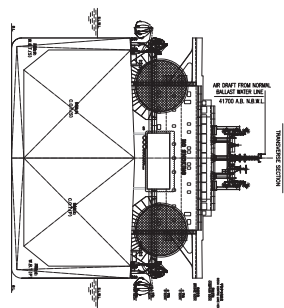
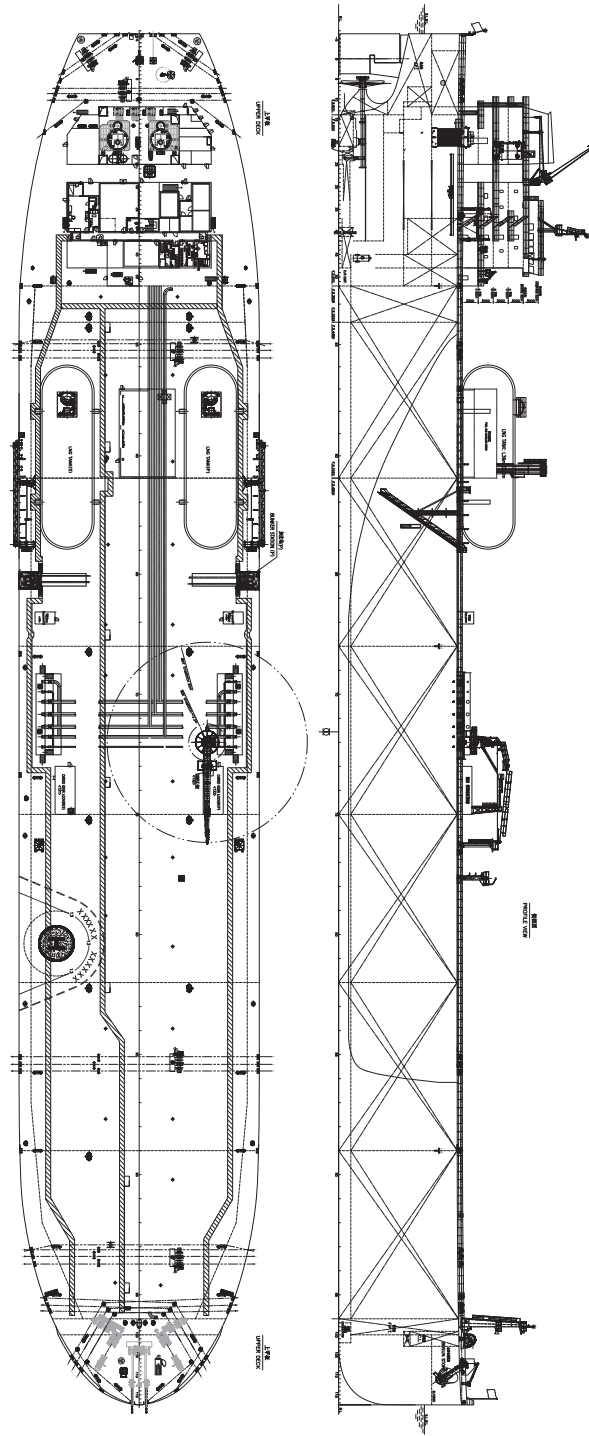
The first of a pair of dual-fuel Suezmax tankers for Eastern Pacific Shipping, the 157,320dwt *Greenway* was delivered by Guangzhou Shipyard International in June 2022. The ship was followed by its sister *Starway* delivered in August 2022. The owner and the builder claim that *Greenway* is the world's first dual-fuel Suezmax.

Greenway's hull dimensions are 274m loa, 48m beam and draught of 17.15m putting it in the mid-range level for Suezmax tankers. The ship has a vertical bow form without bulb. The two type C LNG tanks for fuel with a combined capacity of 5,100m³ are located on the weather deck just forward of the accommodation superstructure. As well as the main engine. The LNG fuel is also used in the ship's gensets and its three boilers. Two TTS Bohai hose handling cranes are fitted.

Greenway's cargo capacity is 176,900m³ in six pairs of tanks and two slop tanks. Cargo pumps are three Shinko KV450-3 models each with a pumping capacity of 3,500m³/h.

The ship's main engine is a CMD-built MAN B&W 6G70ME-C10.5-GI HP-SCR producing 10,878kW at 70%MCR and 62.2rpm. The propeller is a 9.4m diameter type supplied by Dalian Propeller. Service speed is 14.2kt. Auxiliary power comes from three HiMSEN seven cylinder H22CDF gensets each producing 1505kW at 900rpm.

The main engine meets NOx Tier III requirements when running in gas mode and the high pressure selective catalytic reduction system also allows this when running on MGO. Running in LNG mode, it can reduce CO₂ emissions about 20% NOx by about 85%, and particulate matter and SOx emissions by about 99%. The main engine is supplied by a high pressure LNG system with internal gas piping pressure up to 350bar, and 525bar in double-walled pipe pressure test.



HAI GANG WEI LAI – LNG BUNKERING VESSEL



Bow thruster(s)	
Make:	Kongsberg
Number:	1
Output (each):	1,300kW
Stern thruster(s)	
Make:	Kongsberg
Number:	1
Output (each):	750kW
Deck machinery	
Cargo cranes/cargo gear	
Number:	2
Make:	Masada
Type:	Hydraulic knuckle boom crane
Performance:	5t@23m
Other cranes	
Number:	1
Make:	Masada
Type:	Hydraulic slewing single arm crane
Tasks:	Provision
Performance:	3t@8m
Mooring equipment	
Number:	6
Make:	TTS Marine
Type:	Elec.-Hydraulic

Special lifesaving equipment	
Number of each and capacity:	1 for 24P
Make:	Jiangsu Jiaoyan Marine
Type:	fire-protected type free-fall lifeboat

Cargo tanks	
Number:	3, IMO Type C
Grades of cargo carried:	1
Product range:	LNG

Cargo pumps	
Number:	6
Type:	DW 200-4-K-I
Make:	Wärtsilä Svanehøj
Capacity (each):	350m ³ /h

Cargo control system	
Make:	Wärtsilä

Ballast water treatment system	
Make:	Optimařin
Capacity:	800m ³ /h

Complement	
Officers:	11
Crew:	12
Supernumeraries/Spare:	1
Suez/Repair Crew:	6
Single/double/other rooms:	single rooms

Navigation and other equipment	
Bridge control system	
Make:	Furuno
Is bridge fitted for one-man operation?	Y
Integrated bridge system:	N
Radars	
Number:	2
Make:	Furuno
Model(s):	FAR-3310; FAR-3330S-SSD

Fire detection system	
Make:	Consilium
Type:	CCP
Fire extinguishing systems	
Engine room	
Make/Type:	Lingjack / High pressure CO ₂

Waste disposal plant	
Incinerator	
Make:	Hansun
Model:	HSINC-50A
Sewage plant	
Make:	Jowa
Model:	STP2016-25

Efficiency	
Attained EEDI value:	10.36
Required EEDI value:	20.65
Installed Fuel Meters:	Mass flow
Energy Saving Technologies*:	Rudder bulb, LNG dual fuel
Hull coatings:	5 years fouling protection

Contract date:	December 2018
Delivery date:	December 2021

Shipbuilder:	Austal
Vessel's name:	Bajamar Express
Owner/Operator:	Fred Olsen Express
Country:	Spain
Designer:	Austal
Country:	Australia
Flag:	Spanish Maritime Authority
IMO number:	9874296
Total number of sister ships already completed (excluding ship presented):	Nil
Total number of sister ships still on order:	1

Depth moulded	
to main deck:	16.75m
Width of double skin	
bottom:	1.45m
Draught	
scantling:	8.20m
design:	8.00m
Gross:	18,664
Deadweight	
scantling:	13,135.5t
Speed, service (---%MCR output):	15.50kts
Cargo capacity (m ³)	
Liquid volume:	20,355
Bunkers (m ³)	
Diesel oil:	603
Water ballast (m ³):	7,468

Daily fuel consumption (tonnes/day)	
Main engine only:	17.0t/d at LNG mode 20.9t/d at MGO mode

Classification society and notations:	DNV GL +1A Tanker for Liquefied Gas, EO, RP (1, 22%), GAS BUNKER (VR 140), CLEAN (Tier III), COMF (V-3), TMON, NAUT (OC), BWM (T), RECYCLEABLE, BIS
---	---

Ship register information: Ship type 2G (-163°C, 500 kg/m ³ , 4.5bar g), GF % high-tensile steel used in construction:	5%
---	----

Propulsion	
Main engine(s)	
Design:	Winterthur Gas & Diesel
Model:	5RT-flex50DF
Manufacturer:	Yuchai Marine Power Co., Ltd
Number:	1
Type of fuel:	LNG and MGO
Output of each engine:	5,800kW
Is this a diesel-electric or hybrid?:	N
Propeller(s)	
Material:	Cu-Ni-Al
Designer/Manufacturer:	Wärtsilä
Number:	1
Fixed/Controllable pitch:	Controllable
Diameter:	6,000mm
Speed:	100rpm
Diesel-driven alternators	
Number:	+1
Engine make/type:	Wärtsilä/8L20DF and Wärtsilä/6L20
Type of fuel:	LNG and MGO
Alternator make/type:	Fenxi/IFC6 568-6
Output/speed of each set:	1,420kW / 1,200rpm and 1,065kW / 1,200rpm

Boilers	
Number:	1
Type:	CMB-VS-2.0+0.92/7
Make:	Saacke
Output, each boiler:	2,000kg/h
Stern appendages/special rudders:	rudder with bulb x 1

Delivered initially as *Avenir Allegiance* in late December 2021, *Hai Gang Wei Lai* was designed by SDARI and constructed by Nan Tong CIMC Sinopacific Offshore & Engineering. For almost a year its 20,355m³ cargo capacity allowed it to claim to be the largest LNG bunkering vessel in the world. The vessel was sold almost immediately after delivery to Shanghai SIPG Energy Service.

Hai Gang Wei Lai is an ocean-going LNG carrier / bunkering vessel of type 2G under the IMO's Gas Carrier Code. It has three IMO type C bi-lobe cargo tanks with No.1 narrowing forward following the hull contours towards the ship's vertical bulbless bow.

Minimum cargo temperature is -163°C and maximum operating pressure 4.5bar g @ maximum cargo density of 500kg/m³. The ship has a reliquefaction plant to reduce losses through boil off. To ensure compatibility with shore and ship connections, the vessel has three manifolds. Cargo handling is performed by six Svanehøj pumps each with a capacity of 350m³/h.

The main engine is a WinGD 5RT-flex 50DF with an output of 5,800kW and the auxiliaries three Wärtsilä L20DF engines of which two are eight-cylinder models and one a six-cylinder. Outputs are 1,420kW and 1,065kW respectively. Fuel will normally be BOG from the cargo, but the engines can also run on MGO when necessary.

The main engine drives a Wärtsilä controllable pitch propeller of 6m diameter. Service speed is 15.5kt.

As a bunkering vessel, manoeuvrability is essential and to aid in this regard the vessel is fitted with a Kongsberg retractable azimuthing bow thruster and a Kongsberg tunnel thruster aft. The ship also has a full spade rudder with bulb.

The attained EEDI value of 10.36 is almost half the required value of 20.65.

TECHNICAL PARTICULARS

Length oa:	159.70m
Length bp:	157.00m
Breadth moulded:	24.00m



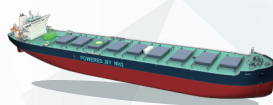
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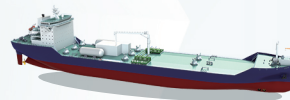
SDARI offers not only ship design, but also lifecycle service, powerful marine equipment, digital operation support system and inspection& measurement to make sure we are always at your disposal to work out your customized ship design solution.



20K CBM LNG BUNKERING/ CARRIER



AMMONIA DF 210K DWT BULK CARRIER



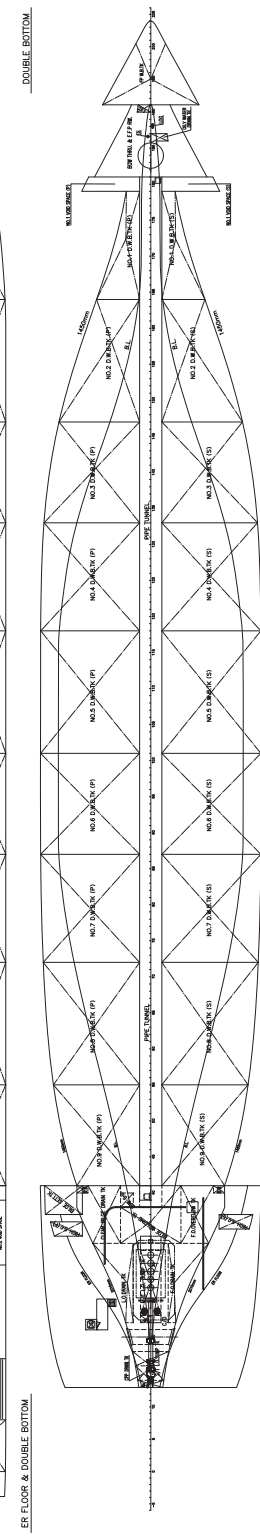
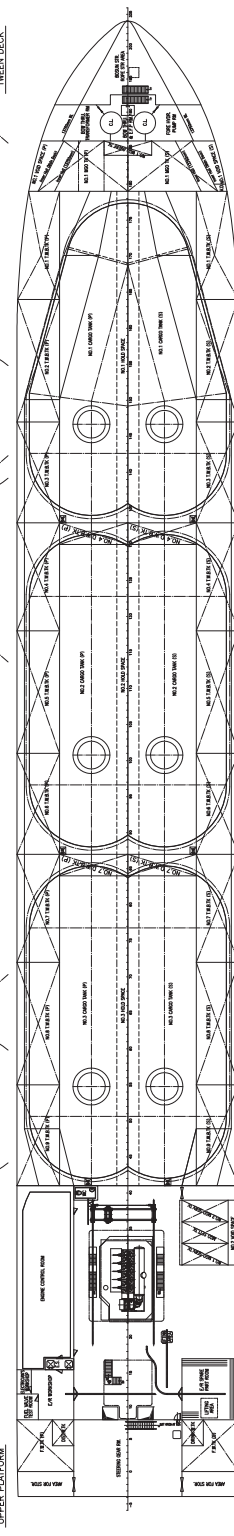
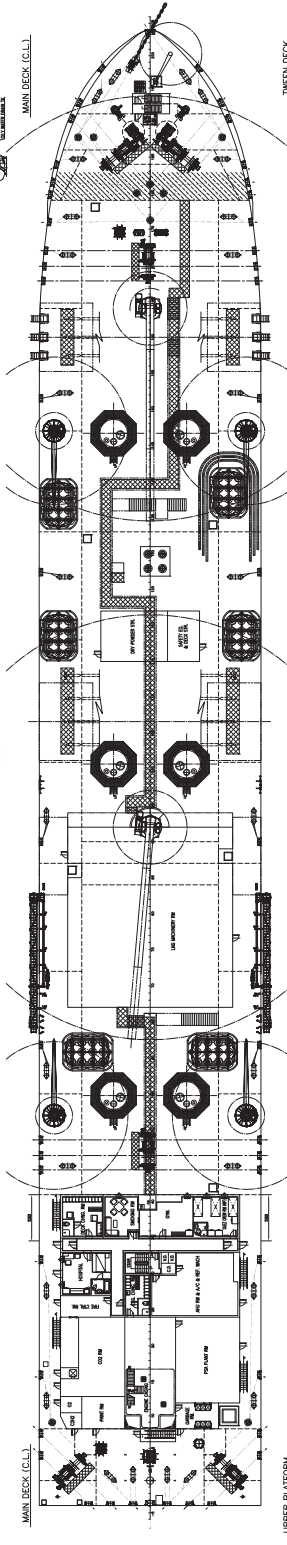
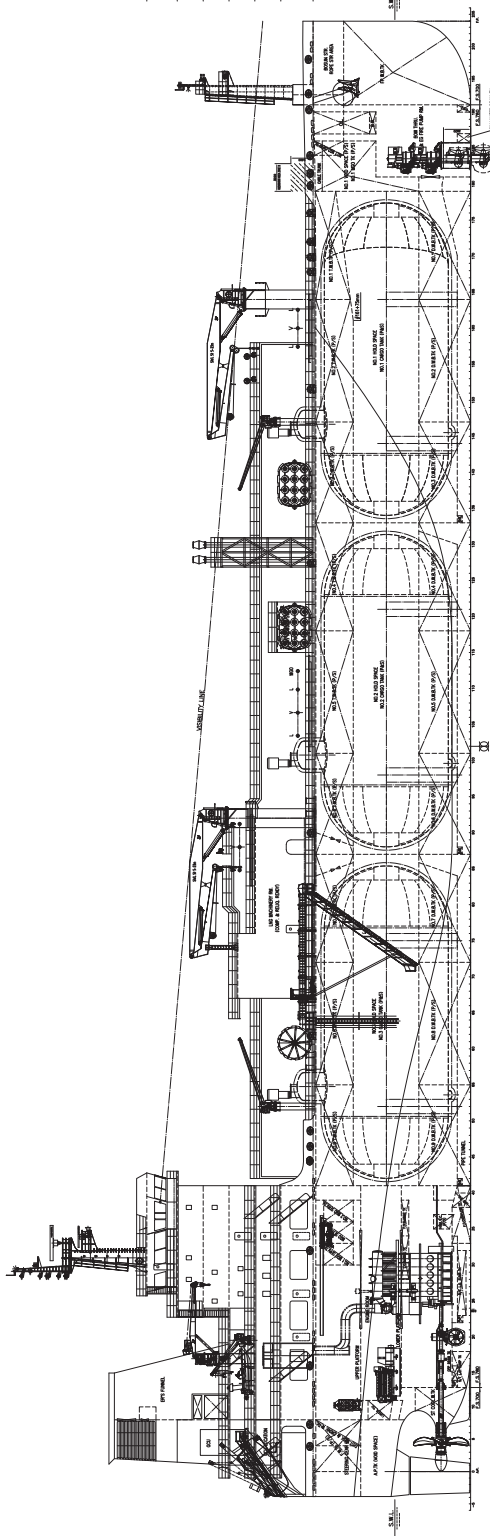
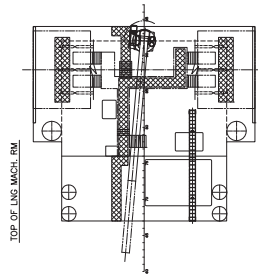
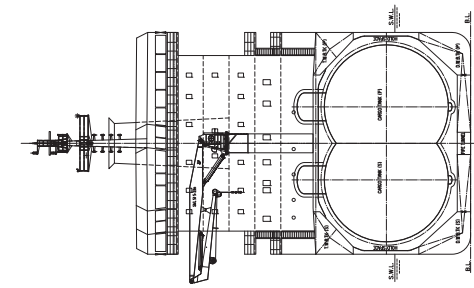
LNG DF 30K CBM LCO2 CARRIER



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HLS BLUE SAPPHIRE – VERY LARGE GAS CARRIER



Shipbuilder: **Hyundai Samho Heavy Industries Co., Ltd**
 Vessel's name: **HLS Blue Sapphire**
 Owner/Operator: **Hyundai LNG Shipping**
 Country: **Korea**
 Designer: **HSHI**
 Country: **Korea**
 Flag: **Liberia**
 IMO number: **9938573**
 Total number of sister ships already completed (excluding ship presented): **Nil**
 Total number of sister ships still on order: **2**

Delivered by Hyundai Samho as the first of three 86,000m³ VLGCs, *HLS Blue Sapphire* marks the expansion of Hyundai LNG Shipping's venture into LPG shipping begun in 2020 with delivery of *HLS Amber*. Until then the owner had concentrated on LNG carrier operation and is South Korea's largest operator in that field.

The vessel is the first dual-fuel gas carrier owned by HLS and is being managed by Wilhelmsen Ship Management as the first vessel in a new relationship between the two organisations.

HLS Blue Sapphire has hull dimensions of 229m loa, 32.25m beam and a draught of 12.25m. Its cargo capacity is a popular size in the ship's sector and can carry cargoes with a minimum temperature down to -52°C. It has eight cargo tanks in four pairs. Tanks 3 and 4 house deepwell fuel pumps for the ship's MAN B&W 6G60ME-C10.5-LGIP-HPSCR main engine allowing it to run on LPG. It also has tank space for MDO and MGO and for urea for the vessel's high pressure SCR NOx control system that allows compliance with NOx Tier III when not running on LPG.

The Hyundai-built, dual-fuel main engine is directly connected to a 7.2m diameter fixed pitch propeller and running at 92.3rpm gives the vessel a service speed of 16.5kt. Energy saving features include the builder's proprietary Hi-Rudder with bulb, a boss cap fin and Hi-PSD (pre-swirl duct)

In addition, the yard's special quality management construction process called "Hi-TRUST (Truthful, Reliable, Ultimate, Satisfactory and Technology)" is applied for the first time to a newbuilding.

TECHNICAL PARTICULARS

Length oa: 229.96m
 Length bp: 223.45m
 Breadth moulded: 32.25m
 Depth moulded
 to main deck: 23.75m
 to upper deck: 23.75m

to other decks: 18.50m (Sunken deck)
 Width of double skin bottom: 1.85m
 Draught
 scantling: 12.25m
 design: 11.75m
 Gross: 48,805
 Displacement: 73,872t
 Lightweight: 18,489t
 Deadweight
 scantling: 55,383
 design: 52,026
 Block co-efficient: 0.8139
 (at scantling draught)
 Speed, service: 16.5kts at design draught and at NCR (90% of MCR) with 15% sea margin

Cargo capacity (m³)
 Liquid volume: 86,092
 Bunkers (m³)
 Light oil: 2,137
 Diesel oil: 270
 Water ballast (m³): 20,025
 Daily fuel consumption (tonnes/day)
 Main engine only: 40.4

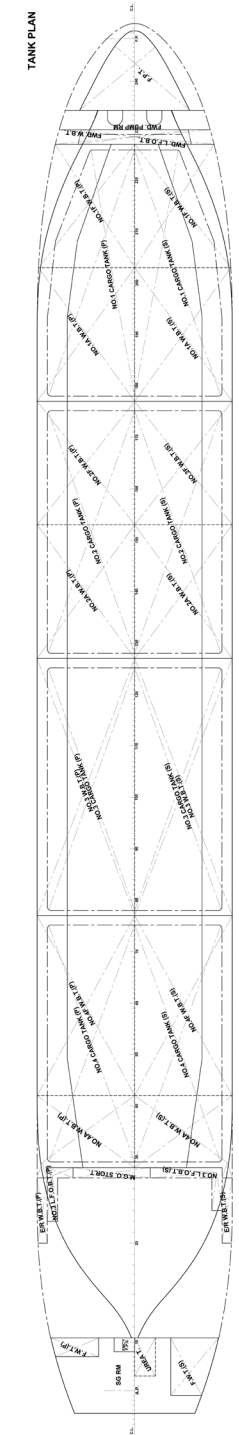
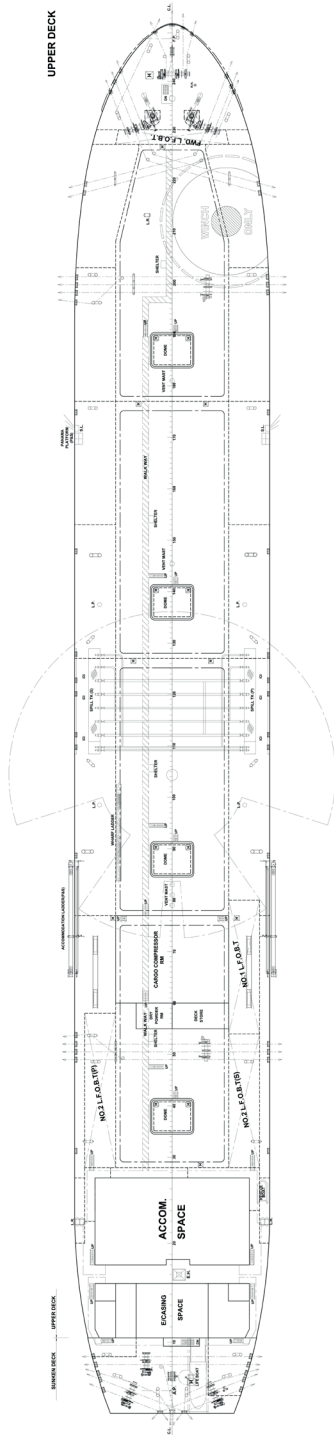
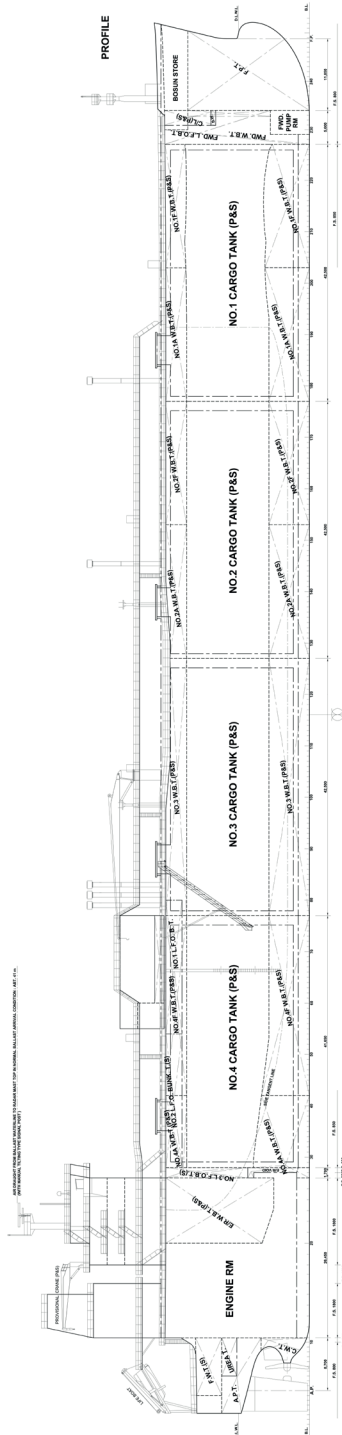
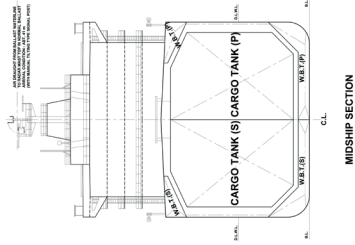
Classification society and notations: LR + ABS
 LR: +100A1, Liquefied gas carrier, Ship Type 2G, Butane, Butane/Propane mixture, Maximum Specific Gravity 0.61, Maximum Vapour Pressure 0.0275 MPa, Minimum Cargo Temperature Minus -52°C, ShipRight(ACS(B), SDA, FDA plus(25,WW), CM), *IWS, LI, +LMC, BWTS, UMS, +Lloyd's RMC(LG), LFPF(GC, PG) with the descriptive notes ShipRight(BWMP(T), SCM)
 KR: +KRS1- Liquefied Gas Carrier, 2G, 1A (R)/0.275 bar, -52°C, 0.61SG(NIGC), SeaTrust(DSA1, FSA1[WW, 25 years], HCM), CLEAN1, IWS, ERS, IHM, PSPC, CEmN-SCR, LG, LI, +KRM1- UMA, BWT, STCM, IGS, Reliquefaction, DFDE(LPG) (KR involves in relevant works according to the BBCHP requirements.)
 % high-tensile steel used in construction: 83.98% (include LT steel)

Propulsion
 Main engine(s)
 Design: MAN Energy Solutions
 Model: Hyundai-MAN B&W 6G60ME-C10.5-LGIP-HPSCR
 Manufacturer: HHI-EMD
 Number: 1 set
 Type of fuel: LFO / MGO / LPG
 Output of each engine: 11,900kW x 92.3rpm
 Is this a diesel-electric or hybrid?: N
 Propeller(s)
 Material: NI-Al-Bronze
 Designer/Manufacturer: HMRI / HHI-EMD
 Number: 1
 Fixed/Controllable pitch: Fixed
 Diameter: 7.2m

Speed: 92.3rpm
 Special adaptations: Hi-Fin
 Diesel-driven alternators
 Number: 3 sets
 Engine make/type: HIMSEN / 6H21/32
 Type of fuel: LFO / MGO
 Alternator make/type: GPC / 4-stroke, in-line, water cooled
 Output/speed of each set: 1,320kW x 900rpm
 Boilers
 Number: 1 set
 Type: Automatic, forced draft, heavy fuel oil burning, marine composite boiler
 Make: Kangrim
 Output, each boiler: 3,000kg/h (Oil-fired section), 850kg/h (Exhaust gas section)
 Deck machinery
 Cargo cranes/cargo gear
 Number: 1
 Make: Oriental
 Type: Elec.Hyd. type
 Performance: SWL 5t
 Other cranes
 Number: 2
 Make: Oriental
 Type: Elec.Hyd. type
 Tasks: Provisional crane
 Performance: SWL 4T(Port), SWL 2T(Stbd)
 Mooring equipment
 Number: 8
 Make: Flutek
 Type: Hydraulic
 Cargo tanks
 Number: 8
 Grades of cargo carried: Butane, Butane/Propane mixture, Propane, Propylene, Butylene
 Cargo pumps
 Number: 2 sets
 Type: Electric motor driven, Deepwell
 Make: Svanehøj
 Capacity (each): 4.5m³/h
 Cargo control system
 Make: HiCONiS
 Make: KSB
 Type: Electro-Hydraulic remote control system
 Make: KSB
 Ballast water treatment system
 Make: Techcross
 Capacity: 750m³/h X 2 sets
 Complement
 Officers: 13
 Crew: 12
 Navigation and other equipment
 Bridge control system
 Make: Kongsberg
 Type: Autochief-600
 Is bridge fitted for one-man operation? N
 Integrated bridge system: N
 Radars
 Number: Two(2) sets (S-band, X-band)
 Make: Furuno
 Model(s): S-Band radar: FAR-3330S-SSD, X-Band radar: FAR-3320-NXT
 Fire detection system
 Make: B-I Industrial
 Type: BDS-4000
 Fire extinguishing systems
 Cargo deck: Dry Powder/Water Spray/ Hydrants
 Make/Type: Fain, Tanktech
 Engine room: Local Fire Fighting CO₂ Fire extinguishing system
 Make/Type: Fain
 Make/Type: Seaplus
 Cabins: Portable Fire Extinguisher/Hydrants
 Make/Type: Fain
 Efficiency
 Attained EEDI value: 4.92
 Required EEDI value: 6.16
 Energy Saving Technologies*: Hi-Rudder with bulb, Boss cap fin & Hi-PSD
 Contract date: 09 April 2021
 Launch/float-out date: 21 September 2022
 Delivery date: 04 January 2023



HLS BLUE SAPPHIRE



JULIUS CAESAR – VERY LARGE CRUDE CARRIER



Exhaust-gas scrubbing equipment
 Manufacturer: Hyundai Power Systems
 Type: Open Loop Type
 On main engines?: Yes
 On auxiliary engines?: Yes

Boilers
 Number: 3
 Type: Aux. boiler x 2 sets / Composite boiler x 1 set
 Make: Kangrim Heavy Industries
 Output, each boiler: 40,000kg/h x 2 sets, 2,500 (oil fired section) / 1,300 (exh. gas section) kg/h x 1 set

Deck machinery
 Cargo cranes/cargo gear
 Number: 2
 Make: Oriental
 Type: Electro-Hydraulic
 Performance: SWL 20ton
 Other cranes
 Number: 2
 Make: Oriental
 Type: Electro-Hydraulic
 Tasks: Provision
 Performance: SWL 10ton / 3ton

Mooring equipment
 Number: Foreship – 2 Windlass, 1 Mooring Winch; Upper Deck – 2 Mooring Winch
 Stern Deck – 3 Mooring Winch
 Make: Flutek
 Type: Electro-Hydraulic

Cargo tanks
 Number: 17
 Cargo pumps
 Number: 3
 Type: Vertical centrifugal single stage, Three stage steam turbine driven
 Make: Shinko
 Capacity (each): 5,000m³/h x 150m³TH

Cargo control system
 Make: Scana
 Type: Hydraulic type valve remote control

Ballast control system
 Make: Scana
 Type: Hydraulic type valve remote control
 Ballast water treatment system
 Make: Sunrui
 Capacity: 3,000m³/h x 2 set, 360m³/h x 1 set

Complement
 Officers: 12
 Crew: 18
 Suez/Repair Crew: 6

Navigation and other equipment
 Bridge control system
 Make: Nabtesco
 Type: M-800-V
 Is bridge fitted for one-man operation? N
 Integrated bridge system: N
 Radars
 Make: JRC
 Model(s): JMR-9282-S / JMR-9225-6X

Fire detection system
 Make: Consilium
 Type: Salwico
 Fire extinguishing systems
 Engine room: High pressure CO₂
 Make/Type: Fain

Waste disposal plant
 Incinerator
 Make: HMMCO
 Model: MAXI T150SL WS

Efficiency
 Attained EEDI value: 2.05
 Required EEDI value: 2.07
 Energy Saving Technologies*: Pre-swirl duct
 Hull coatings: Hydrolysing self-polishing coating (SEA GRANDPRIX 880HS PLUS)

Contract date: 19 May 2020
 Launch/float-out date: 20 November 2021
 Delivery date: 14 January 2022

Shipbuilder: **Hyundai Heavy Industries**
 Vessel's name: **Julius Caesar**
 Owner/Operator: **TOP Ships**
 Country: **Greece**
 Designer: **Hyundai Heavy Industries**
 Country: **Republic of Korea**
 Model test establishment used: **Hyundai Maritime Research Institute (HMRI)**
 Flag: **Marshall Islands**
 IMO number: **9912244**
 Total number of sister ships already completed (excluding ship presented): **1**
 Total number of sister ships still on order: **Nil**

TECHNICAL PARTICULARS

Length oa: 329.99m
 Length bp: 324.00m
 Breadth moulded: 60.00m
 Depth moulded
 to upper deck: 29.70m
 to other decks: 26.72m (Sunken deck)
 Width of double skin
 side: 3.0m
 bottom: 2.8m
 Draught
 scantling: 21.70m
 design: 20.50m
 Gross: 154,449
 Deadweight
 scantling: 299,937t
 design: 278,730t
 Speed, service (–%MCR output): 14.8kts
 Cargo capacity (m³)
 Liquid volume: 341,509m³
 Bunkers (m³)
 Heavy oil: 6,218m³
 Diesel oil: 1,014m³
 Water ballast (m³): 88,191m³
 Daily fuel consumption (tonnes/day)
 Main engine only: 66.6t

Classification society and notations: DNV +1A, Tanker for oil, BIS, BWM(T), Clean, CMON, COAT-PSPC(B,C), CSR, EO, ESP, LCS, Recyclable, SPM, TMOM(Oil lubricated), VCS(2,B), ER(EGCS Open, SCR, TIER III), Gas ready(MEc), BMON, Shaft align(1)

Propulsion
 Main engine(s)
 Design: MAN B&W
 Model: Hyundai-MAN B&W 7G80ME-C9.5-HPSCR
 Manufacturer: Hyundai Heavy Industries (Engine & Machinery Division)
 Number: 1
 Type of fuel: HFO / ULSFO / MGO
 Output of each engine: 22,200kW
 Is this a diesel-electric or hybrid?: N
 Propeller(s)
 Material: Ni-Al-Bronze
 Designer/Manufacturer: Hyundai Heavy Industries (Engine & Machinery Division)
 Number: 1
 Fixed/Controllable pitch: Fixed
 Diameter: 10.4m
 Speed: 64.0rpm

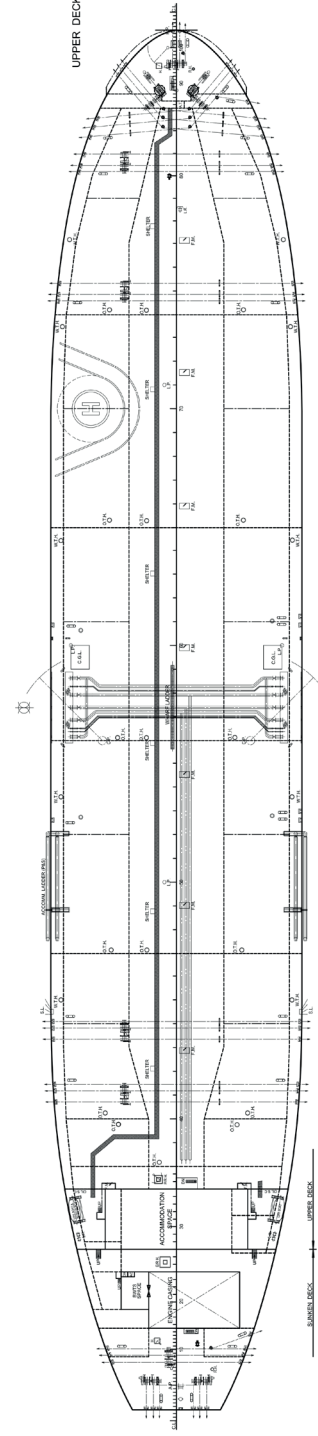
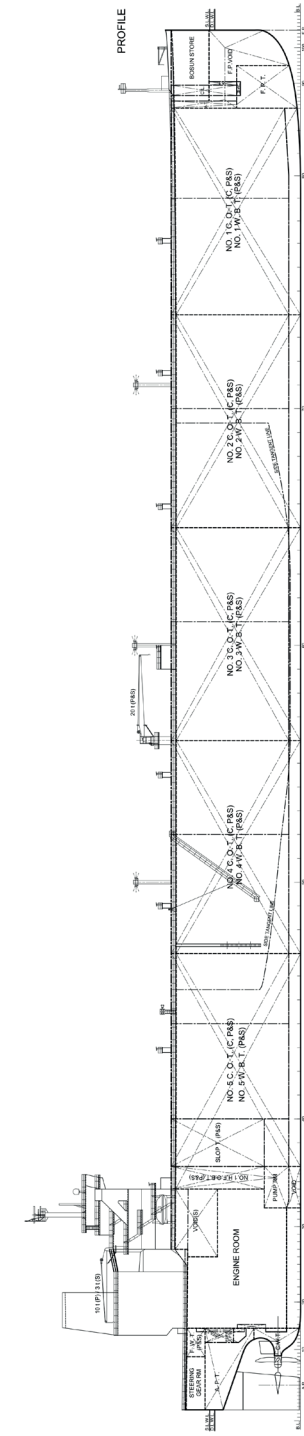
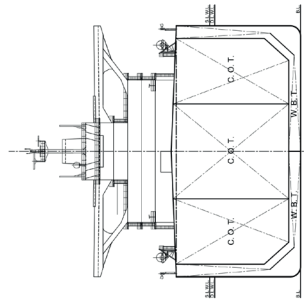
Diesel-driven alternators
 Number: 3
 Engine make/type: Hyundai HIMSEN 8H21/32
 Type of fuel: HFO / ULSFO / MGO
 Output/speed of each set: 1,760kW x 900rpm

Built by Hyundai Heavy, the 299,937dwt *Julius Caesar* was delivered in January 2022 as the first VLCC in owner TOP Ships fleet. A sister vessel, *Legio X Equestris*, was delivered three months later. Initially, TOP Ships had a 35% stake in the vessels but acquired the remaining 65% from CEO Evangelos Pistiolis prior to delivery. Both vessels were chartered to Trafigura for at least three years upon delivery. The TOP Ships fleet is among the youngest in the tanker sector with an average age of less than two years.

The vessel has a vertical bow without bulb and dimensions are an overall length of 329.99m, a beam of 60m and depth of 29.7m with a design draught of 20.5m and scantling draught of 21.7m. It has five pairs of side cargo oil tanks, five centre cargo oil tanks and two slop tanks. Cargo capacity is 341,509m³ and the vessel is able to load and discharge three different grades of cargo simultaneously. The three cargo pumps are Shinko steam turbine driven, vertical centrifugal types each with a 5,000m³/h pumping capacity.

Julius Caesar is propelled by a Hyundai-built MAN B&W 7G80ME-C9.5-HPSCR engines with MCR of 22,200kW at 64.6rpm directly connected to a 10.4m diameter fixed pitch propeller with a pre-swirl duct. This combination permits it to sail at a service speed of 14.8knots at design draught when running at 80.5% MCR with 15% sea margin. The high-pressure selective catalytic reduction system allows the ship to meet NOx Tier III levels and a Hyundai Power Systems open loop scrubber linked to main and auxiliary engines satisfies SOx requirements and allows the ship to run on HFO.

The vessel is equipped with Hyundai-ISS (Integrated Smart Ship Solution) to aid in voyage monitoring, route optimisation, fuel/energy flow monitoring, performance analysis and reporting.



K. LOTUS – LNG BUNKERING VESSEL



Performance:SWL 4ton / Working radius
6.8~25.5m

Other cranes
Number: 1
Make:Masada
Type: Electro-hydraulic driven, cylinder
luffing type jib crane
Tasks:Provision and machinery part
handling in engine room
Performance:SWL 1ton / Working radius
2.2~9m

Mooring equipment
Number: 4
Make: Fluteck
Type:Hydraulic

Special lifesaving equipment
Number of each and capacity:1 x 24P
Make: Jiangyin Beihai
Type: Free fall type

Cargo tanks
Number:3
Grades of cargo carried: 1
Product range:LNG
Stainless steel – structure/piping:piping
(SUS304L)

Cargo pumps
Number: 6 (2/TANK)
Type:Submersible
Make:Cryostar
Capacity (each): 300m³/hr

Cargo control system
Make: Wärtsilä
Type:Hydraulic control (VRC)

Ballast control system
Make: Hanla IMS(VRC)
Type:Hydraulic control (VRC)

Ballast water treatment system
Make:Techcross
Capacity:600m³/h

Complement
Officers: 8P
Crew: 14P
Suez/Repair Crew: 4P (Suez)
Single/double/other rooms: 22 Cabins /
- / 1 Gymnasium & Suez room

Navigation and other equipment
Bridge control system
Make: HGS
Is bridge fitted for one-man operation?:N
Integrated bridge system:N
Radars
Number: 2
Make: Furuno
Model(s): FAR-2338S-NXT / FAR-2329-NXT

Fire detection system
Make: Consilium
Type: Fire Alarm System Salwico Cargo
Fire extinguishing
Engine room: Fixed local fire extinguishing
system
Make/Type: NK/High pressure CO₂
Seaplus / Water based type

Cabins: Accommodation
Make/Type: Hydrant & port fire
extinguisher

Public spaces:
Make/Type: Hydrant & port fire
extinguisher

Waste disposal plant
Sewage plant
Make: Jonghap
Model: AEROB-12N

Efficiency
Attained EEDI value: 13.58
Required EEDI value: 23.3
Installed Fuel Meters:
For MGO: Positive displacement type
For LNG: Mass Flow
Hull coatings: EgisPacif(L)
Type: Silyl methacrylate antifouling
coating

Contract date: 18 November 2019
Launch/float-out date: 5 July 2021
Delivery date: 16 March 2022

Shipbuilder: **Hyundai Mipo Dockyard Co., Ltd**
Vessel's name: **K. Lotus**
Owner/Operator: **K-Line**
Country: **Korea**
Designer: **Hyundai Mipo Dockyard Co., Ltd**
Country: **Korea**
Flag: **Panama**
IMO number: **9901362**
Total number of sister ships already completed (excluding ship presented): **Nil**
Total number of sister ships still on order: **1**

Width of double skin
side: 2.9m
Draught
scantling: 6.8m
design: 6.4m
Gross: 18,750
Deadweight
scantling: 12,300mt
design: 10,900mt
Speed, service: 12.0kts

Cargo capacity (m³)
Liquid volume: 18,000
Bunkers (m³)
Marine gas oil: 260
Water ballast (m³): 6,800
Daily fuel consumption (tonnes/day)
Auxiliaries: 17.1 on Gas (50,035 kJ/kg),
19.7 on MGO (42,600kJ/kg)

Classification society and notations:LR
+100A1, Liquefied Gas Carrier, Ship Type 2G,
Methan(LNG) in Independent Tanks Type C,
Max. S.G. 0.5, Max. Vapour Pressure 0.36 Mpa,
Min Cargo Temperature -163°C, ShipRight (CM,
SDA, ACS(B)), *IWS, LI, +LMC, UMS, PSMR,
BWTs, LFPF (GC, NG), +Lloyd's RMC(LG)
Descriptive Notes: ShipRight (BWMP(T), IHM-
EU), UWN
KR +KRS1-Liquefied Gas Carrier 2G
1C(P)/3.6bar,-163degree,0.5SG(IG) IWS IHM
CLEAN1 P5PC RP2 LI
+KRM1-UMA BWT DFDE LNG Bunker

Propeller(s)
Material: Ni-Al Bronze
Designer/Manufacturer: Kongsberg Maritime
Number: 2 EA / 4 Blade on each propellers
Fixed/Controllable pitch: Fixed pitch
Diameter: 2.6m
Speed: 250rpm
Special adaptations: Part of Azimuth
thruster

Diesel-driven alternators
Number: 3
Engine make/type: HiMSEN / 6H35DF
Type of fuel: LNG / MGO
Stern appendages/special rudders: Azimuth
thruster

Bow thruster(s)
Make: Kawasaki
Number: 1
Output (each): 1,500kW
Deck machinery
Cargo cranes/cargo gear
Number: 1
Make: Tech Flower
Type: Electro-hydraulic driven, cylinder
luffing type jib crane

Designed and built by Hyundai Mipo and delivered to owner K-Line in March 2022, the 18,000m³ LNG bunkering ship has been described by the builder as the world's largest LNG bunkering vessel.

With an overall length of 166m, a beam of 24.4m and a gross tonnage of 18,750, *K. Lotus* is indeed larger than *Hai Gang Wei Lai* (launched as *Avenir Allegiance*) although its cargo capacity of 18,000m³ is 2,355m³ less. *K. Lotus* is the largest bunkering vessel owned by K-Line and the ship's long-term charter to Shell which will see it operating in European waters is K-Line's first venture into LNG bunkering outside of South Korea. A sister vessel named *FuelLNG Venosa* was completed in February 2023 and will operate from Singapore.

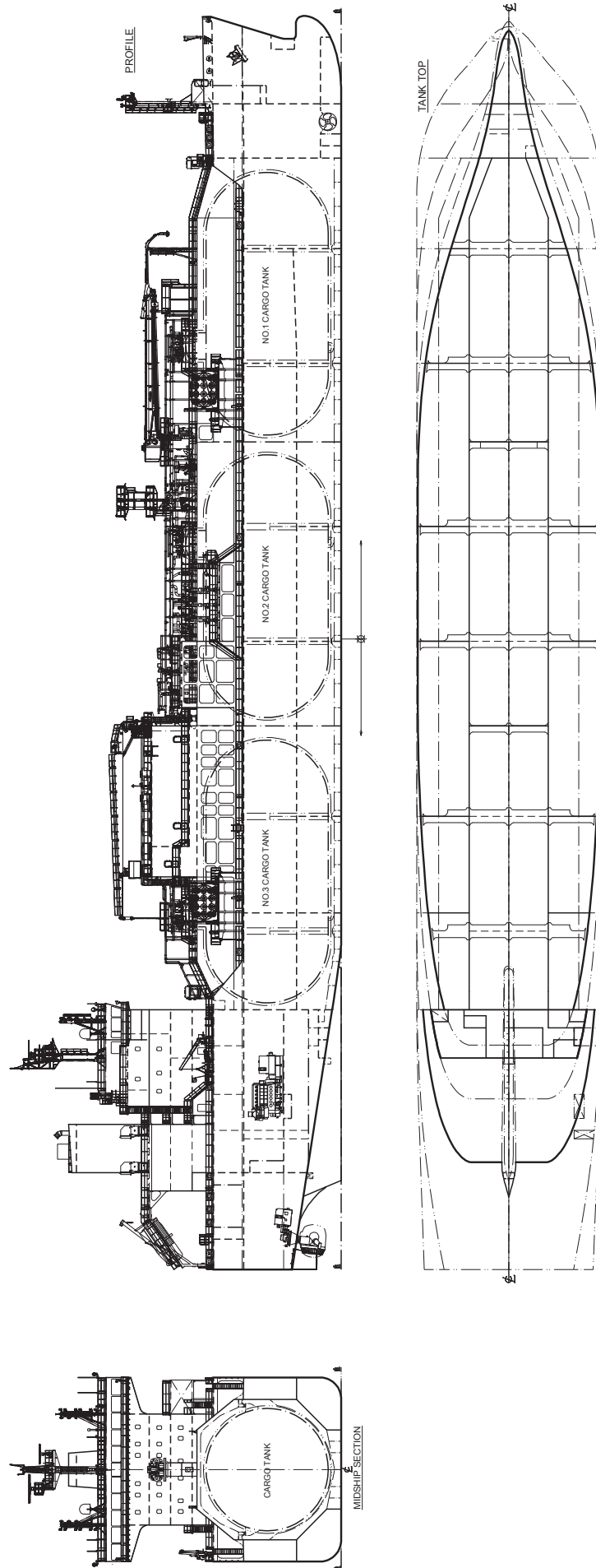
As with most of the LNG bunkering vessels of similar size, *K. Lotus* is equipped with three Type C cargo tanks. Each tank has a pair of Cryostar pumps each with a capacity of 300m³/h. Fuel for the ship's dual-fuel engines is supplied from the cargo through a reliquefaction system handling boil off gas from the cargo.

The ship has a diesel electric propulsion system powered by three HiMSEN 6H35DF gensets each with an output of 2,779kW. These supply electric power for the pair of Kongsberg Maritime azimuthing thrusters that propel the ship at a service speed of 12kt. A 1,500kW Kawasaki bow thruster aids manoeuvrability.

The ship has been designed to be comfortably with the required EEDI rating of 23.3 and its 13.58 achieved rating is confirmation of this.

TECHNICAL PARTICULARS

Length oa:abt. 166m
Length bp: 159.0m
Breadth moulded: 24.4m
Depth moulded
to upper deck: 12.9m



KAUPANG – LPG CARRIER



Shipbuilder: **Hyundai Mipo Dockyard Co., Ltd**
 Vessel's name: **Kaupang**
 Owner/Operator: **EPS**
 Country: **Singapore**
 Designer: **Hyundai Mipo Dockyard Co., Ltd**
 Country: **Korea**
 Flag: **Liberia**
 IMO number: **9914620**
 Total number of sister ships already completed (excluding ship presented): **3**
 Total number of sister ships still on order: **0**

TECHNICAL PARTICULARS

Length oa:abt. 180m
 Length bp: 173.5m
 Breadth moulded: 28.7m
 Depth moulded to upper deck: 18.7m
 Width of double skin side: 1.4m
 bottom: 1.7m
 Draught scantling: 9.5m
 design: 10.5m
 Gross: 26,614MT
 Deadweight scantling: 25,000MT
 design: 29,600MT
 Speed, service: 15.95kts

Cargo capacity (m³)
 Liquid volume: 39,500m³
 Bunkers (m³)
 Light oil: 930m³
 Gas oil: 350m³
 Water ballast (m³): 12,800m³
 Daily fuel consumption (tonnes/day)
 Main engine only: 25.0t/d (42,700kg/kg)
 Classification society and notations:LR

Propulsion
 Main engine(s)
 Design:Hyundai-MAN B&W diesel engine
 Model:6G50ME-C9.6-LGIP-HPSCR
 Make:Hyundai Heavy Industries Co., Ltd
 Number:1EA
 Type of fuel:LPG/LFO/MGO
 Output of each engine:10,320kW x 100.0rpm
 Is this a diesel-electric or hybrid?:N

Propeller(s)
 Material:Ni-Al Bronze
 Designer/Manufacturer:HMD/HHI-EMD
 Number:1 EA
 Fixed/Controllable pitch: Fixed
 Diameter:6.7m
 Speed: 91.7rpm at MCR
 Main-engine driven alternators
 Number:1
 Make/type: Wärtsilä/Inline type Shaft generator
 Output/speed of each set:1,600kW / 64.2-91.7rpm

Diesel-driven alternators
 Number:3
 Engine make/type: Hyundai Heavy Industries / 6H21/32
 Type of fuel:HFO & MDO
 Alternator make/type:Hyundai Electric / HFC7 508-08P
 Output/speed of each set:1,130kW / 900rpm

Boilers
 Number:1EA
 Type:Composite Boiler
 Make:Kangrim Heavy Industries Co., Ltd
 Output, each boiler: 3,500kg/h (Oil fired side) / 400kg/h (Exh. gas side)
 Stern appendages/special rudders: Full spade with bulb

Bow thruster(s)
 Make: KTE
 Number: 1
 Output (each): ... 900kW AC 3,300V 3Ø 60Hz

Deck machinery
 Cargo cranes/cargo gear
 Number: 1
 Make:Sangsangin
 Type:Hydraulic type
 Performance:SWL 5.0Ton, Working radius Max. 29m ~ Min. 6.4m

Other cranes
 Number: 1
 Make:Sangsangin
 Type:Electro-Hydraulic type
 Tasks:Provision crane
 Performance: SWL 3.0Ton, working radius Max. 10m ~ Min. 2.6m

Mooring equipment
 Number: 8
 Make:Flutek
 Type:Elec.-Hyd. type

Special lifesaving equipment
 Number of each and capacity: 25P x 2
 Make:HLB
 Type:Gravity type Lifeboats

Cargo tanks
 Number:3EA
 Grades of cargo carried: 2 Grades of cargo simultaneously
 Product range:LPG, Anhydrous ammonia, Vinyl Chloride Monomer (~ -50°C)
 Stainless steel:Piping: SUS304L

Cargo pumps
 Number: 6 EA
 Type:Deepwell
 Make:Svanehøj
 Capacity (each): 400m³/hr X 120mlc
 Cargo control system
 Make:LGE
 Type: Workstation on cargo control panel

Ballast control system
 Make:KSB Seil(VRC)
 Type:Hydraulic
 Ballast water treatment system
 Make:Hyundai Heavy Industries Co., Ltd
 Capacity:1,000m³/h (Electrolysis Unit)

Complement
 Officers: 8
 Crew: 16
 Supernumeraries/Spares: 1

Navigation and other equipment
 Bridge control system
 Make: Hyundai Global Service
 Is bridge fitted for one-man operation?: Y
 Integrated bridge system: Y
 If yes, make: JRC
 Model: JRD-921

Radars
 Number: 2
 Make: JRC
 Model(s):JMR-9282-S/JMR-9225-6X

Fire detection system
 Make:Consilium
 Type:Addressable type
 Fire extinguishing systems
 Engine room:
 Make/Type:NK/High pressure CO₂

Efficiency
 Attained EEDI value: 6.23g/ton-nm
 Required EEDI value: ... 8.19 g/ton-nm(Phase 2)
 Energy Saving Technologies*:Rudder bulb

Contract date: 27 May 2020
 Launch/float-out date: 24 November 2021
 Delivery date: 16 March 2022

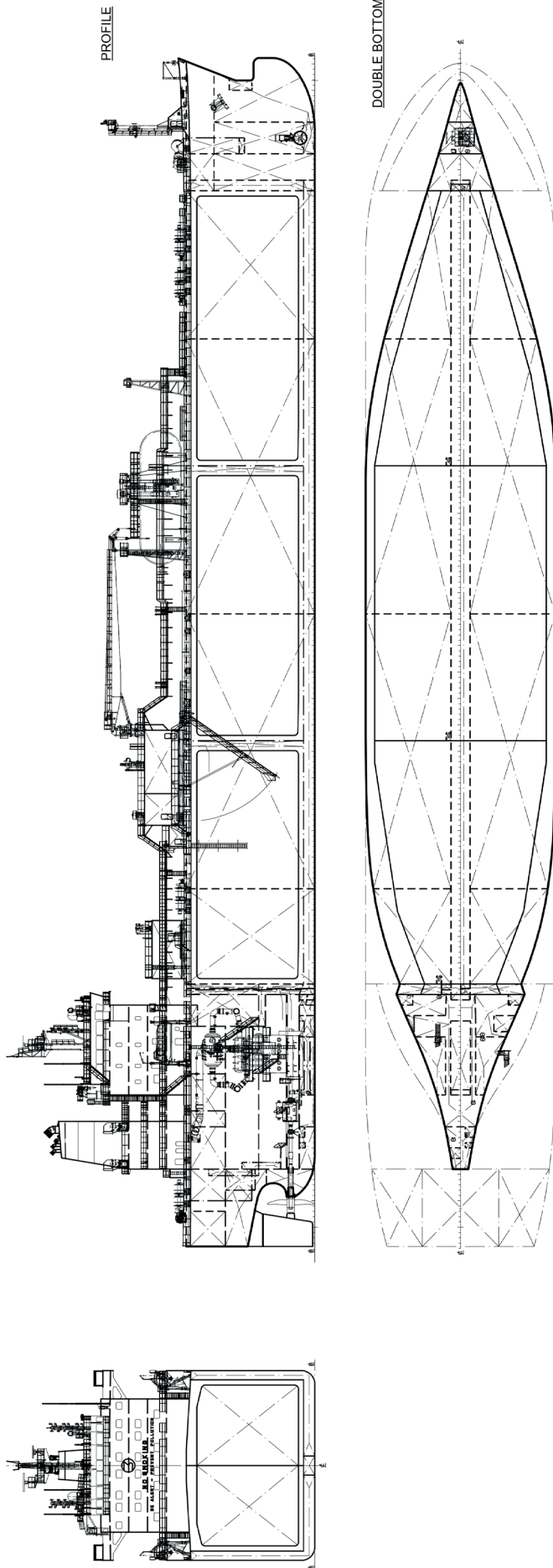
Singapore-based Eastern Pacific Shipping has embarked on a course of building various types of dual-fuel newbuildings in recent years. The mid-size LPG carrier *Kaupang* built by Hyundai Mipo and delivered in March 2022 is another example of this policy. It is the first of four sisters and is the first dual-fuel LPG carrier in the EPS fleet. The three sister ships, *Myklebust*, *Sticklestad* and *Cartier* were all delivered later in 2022. *Kaupang* and *Myklebust* are classed by Lloyd's Register while the other two are with DNV.

With hull dimensions of 179.86m loa, 28.7m beam, draught of 9.5m and a cargo capacity of 39,500m³, the ships are based upon a design that Hyundai Mipo has been building for some time but these ships are the first dual-fuel examples using LPG as fuel.

The ships have three Type A cargo tanks with a minimum cargo temperature of -50°C and are suitable for carrying LPG, anhydrous ammonia and vinyl chloride monomer. Two different grades can be carried simultaneously. Cargo handling is performed by six Svanehøj deepwell pumps with a 4,000m³/h capacity.

The main engine is a Hyundai-built MAN B&W 6G50ME-C9.6-LGIP-HPSCR ultra-long stroke engine with the LGIP and HPSCR suffixes denoting the ship can run on LPG and has high pressure selective catalytic reduction for NOx control respectively. The engine will run on LPG from the cargo for most of the time but there is a 930m³ tank for LFO and another of 350m³ for MGO, both for use by the main engine when appropriate and for the 3 HiMSen 6H21/32 powered gensets.

Power output of the main engine is 10,320kW at 100rpm and a further 1,600kW from the Wärtsilä shaft generator. Each of the three gensets output 1,130kW. Propulsion is from a 6.7m diameter fixed pitch propeller and efficiency is further improved by a rudder bulb. The attained EEDI of 6.23 is comfortably below the 8.19 required.



KUROTAKISAN MARU III – BULK CARRIER



Shipbuilder: ..Oshima Shipbuilding Co., Ltd
 Vessel's name: **Kurotakistan Maru III**
 Owner/Operator: **Caribstar Shipping S.A**
 Country: **Japan**
 Designer: **Oshima Shipbuilding Co., Ltd**
 Country: **Japan**
 Flag: **Panama**
 IMO number: **9908205**
 Total number of sister ships already completed (excluding ship presented): **1**
 Total number of sister ships still on order: **Nil**

Designed by builder Oshima Shipbuilding with input from MOL, *Kurotakistan Maru III* is the first vessel in the EeneX series of new generation coal carriers. The 89,999dwt vessel was delivered to MOL in December 2021 but is now operated by Chugoku Sougyo.

At the time of delivery MOL said it will operate the vessel transporting coal for J-POWER plants. The name of the ship reflects the first ever coal carrier *Kurotakistan Maru* operated by MOL and acquired in 1981.

With dimensions of 234.96m loa, 38m beam and a draught of 13.765m a vertical bow form without bulb and seven holds, the ship is in line with a typical New Panamax bulk carriers. However, it has some design features particularly suited to its role as a coal carrier. A double-hull structure allows the cargo holds to be built with completely flat sides rather than the conventional corrugated structure. This feature eliminates the work of scraping out coal, which boosts the efficiency of discharging operations and speeds up cargo handling. Unlike conventional coal carriers, in which the cargo holds are sometimes filled with ballast water to maintain the ship's stability during ballast voyages, the EeneX carrier has only dedicated cargo holds reducing the risk of pollution and minimising cargo contamination with salt and rust.

As often with Japanese bulkers, the main engine is a Japan Engine Corporation unit and in this case a six cylinder UEC60LSE-Eco-A2-EGR outputting 9,700kW at 84rpm. Service speed is 14kt. Auxiliary power is supplied by Daihatsu gensets. A Mitsubishi exhaust gas cleaning system serving the main engine and auxiliaries allows the ship to operate on HFO and meet 2020 IMO SOx rules.

TECHNICAL PARTICULARS

Length oa:.....234.96m
 Breadth moulded:..... 38.00m
 Depth moulded
 to main deck: 20.50m
 to upper deck: 20.50m

Draught
 scantling:..... 13.765m

Gross:.....51,793
 Deadweight
 scantling:.....89,999MT

Cargo capacity (m³)
 Grain:107,260m³

Bunkers (m³)
 Heavy oil:2,275m³
 Diesel oil: 356m³

Water ballast (m³):..... 37,380m³

Classification society and notations:.....Nippon Kaiji Kyokai
 NS* (BCM, BC-XII, GRAB, PSPC-WBT, NC)(IHM) (EEDI-p2) (EA+FOTP,STS,GW) (SOx(EGCS)) (NOx-III(SCR,EGR)), MNS*, Double hull construction applied to all cargo holds, SOx-EGCS-M/E, G/E(Nos.1,2,3), NOx-III(2021) (M/E:EGR),(G/E(Nos.1,2,3):SCR)

Propulsion
 Main engine(s)
 Design:.....Japan Engine Corporation
 Model:6UEC60LSE-Eco-A2-EGR
 Manufacturer:Japan Engine Corporation
 Number: 1
 Type of fuel: HFO
 Output of each engine:.....9,700kW at 84rpm (ClassNK)

Is this a diesel-electric or hybrid?:.....No
 Propeller(s)
 Material:.....Ni-Al Bronze
 Designer/Manufacturer:.....Nakashima Propeller Co., Ltd
 Number: 1
 Fixed/Controllable pitch:.....Fixed pitch
 Diesel-driven alternators
 Number:3 (ClassKk records says 4)
 Engine make/type:.....Daihatsu Diesel Mfg. Co., Ltd
 Type of fuel: HFO
 Alternator make/type:.....Taiyo Electric Co., Ltd

Exhaust-gas scrubbing equipment
 Manufacturer:Mitsubishi Kakoki Kaisha, Ltd
 Type: Venturi
 On main engines?:.....1 set of main engine exhaust gas line
 On auxiliary engines?:.....3 sets of main generator engine exhaust gas line

Boilers
 Number: 1
 Type:Vertical cylindrical composite type
 Make:Alfa Laval K.K.

Other cranes
 Number: 1
 Make:Kyoritsu Kikai Co., Ltd

Type:Electric motor driven
 Tasks:Machinery parts / Provision / Suez boat handling crane

Performance:.....4.0MT
 Mooring equipment
 Number:..... 6-mooring winch, 2-windlass/mooring winch
 Make:Nippon Pusnes Co., Ltd
 Type:Electro-hydraulic

Special lifesaving equipment
 Number of each and capacity:.....2- lifeboats (25P)
 Make:Shigi Shipbuilding Co.,Ltd
 Type:F.R.P. totally enclosed

Cargo/capacity
 Hatch covers
 Design:Iknow Machinery Co., Ltd
 Manufacturer:Iknow Machinery Co., Ltd
 Type:Weather-tight side rolling type

Ballast control system
 Make:Nakakita Seisakusyo Co., Ltd
 Type:Multi control panel
 Ballast water treatment system
 Make: Techross Inc

Complement
 Officers: 8
 Crew:13
 Supernumeraries/Spare:..... 4

Navigation and other equipment
 Bridge control system
 Make:Japan Radio Co., Ltd
 Is bridge fitted for one-man operation?:N
 Integrated bridge system:.....N
 Radars
 Make:Japan Radio Co., Ltd

Fire detection system
 Make:Consilium Nittan Marine Ltd
 Type:Smoke, Thermal, Flame
 Fire extinguishing systems
 Cargo holds:
 Make/Type:..... - / Sea water fog/jet
 Engine room:
 Make/Type:.....Kashiwa Co., Ltd / Foam fire extinguishing system

Cabins:as per rule requirement
 Public spaces:.....as per rule requirement

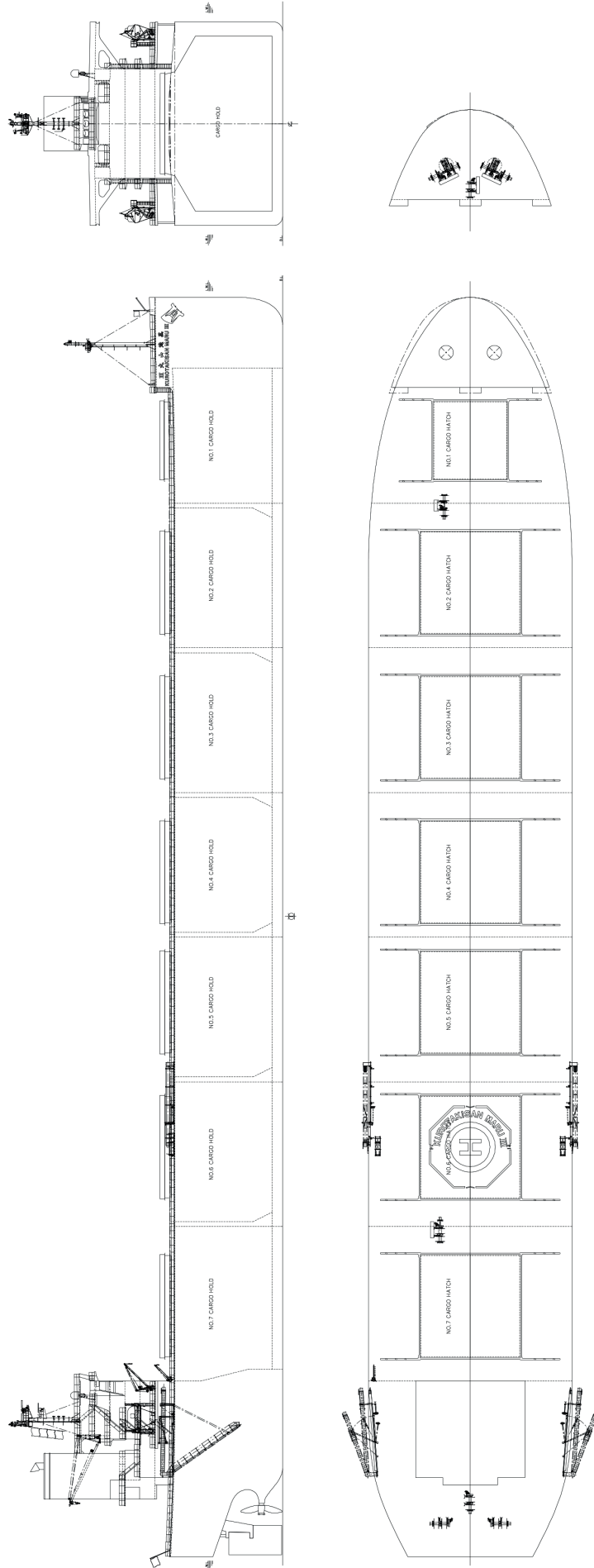
Waste disposal plant
 Waste handled:Garbage and waste oil
 Incinerator
 Make:Sunflame Co., Ltd
 Waste shredder/crusher
 Make:Mitsuboshi Chuki Mfg. Co., Ltd
 Sewage plant
 Make:Taiko Kikai Industries Co., Ltd

Delivery date:.....2 December 2021





KUROTAKISAN MARU III



LADY MARIE CHRISTINE – MULTIPURPOSE VESSEL



Number: 1
 Fixed/Controllable pitch: Controllable
 Diameter: 3.5m
 Speed: 138.35rpm

Main-engine driven alternators
 Number: 1
 Make/type: Wärtsilä packaged
 Output/speed of each set: 400/1,500

Diesel-driven alternators
 Number: 2
 Engine make/type: Scania
 Type of fuel: MGO
 Output/speed of each set: 200/1500

Bow thruster(s)
 Make: Schottel GmbH
 Number: 1
 Output (each): 350kW

Deck machinery
 Cargo cranes/cargo gear
 Number: 1
 Make: Coops & Nieborg BV
 Type: Gantry Crane

Mooring equipment
 Number: 4
 Make: C-Nautical BV
 Type: Elec.Hydr

Cargo/capacity
 Hatch covers
 Design: Coops & Nieborg BV
 Manufacturer: Wuhu Shipyards
 Type: Upper deck

Containers
 Lengths: 91.825m
 Heights: 5.21m
 Total TEU capacity: 155TEU
 On deck: 155TEU
 Homogeneously loaded to 14tonnes: 91TEU
 Tiers/rows (maximum)
 On deck: 2 / 6

Complement
 Officers: 5
 Crew: 4
 Single/double/other rooms: Switchboard
 room-bedroom

Navigation and other equipment
 Bridge control system
 Make: Wärtsilä
 Is bridge fitted for one-man operation?: N

Integrated bridge system: N

Radars
 Number: 2
 Make: Furuno
 Model(s): FAR-2318&2338S-NXT

Fire detection system
 Make: Consilium
 Type: Salwico Cargo M4.3

Fire extinguishing systems
 Cargo holds: CO₂
 Make/Type: Firetec
 Engine room: CO₂
 Make/Type: Firetec

Waste disposal plant
 Sewage plant
 Make: Hamworthy
 Model: STC03-13

Efficiency
 Attained EEDI value: 6.87
 Required EEDI value: 15.87

Energy Saving Technologies*: LNG dual fuel,
 waste heat recovery, PTO, wind resistance
 optimised superstructure

Launch/float-out date: 25 August 2021
 Delivery date: January 2022

Shipbuilder: **Wuhu Shipyard Co., Ltd**
 Vessel's name: **Lady Marie Christine**
 Owner/Operator: **Wijnne Barends**
 Country: **Netherlands**
 Designer: **Conoship / Shanghai Merchant
 Ship Design & Research Institute, CSSC
 (SDARI)**
 Country: **Netherlands / China**
 Model test establishment used: **HSVA**
 Flag: **Netherlands**
 IMO number: **9904326**
 Total number of sister ships already completed (excluding ship presented): **4**
 Total number of sister ships still on order: **Nil**

TECHNICAL PARTICULARS

Length oa: 115.20m
 Length bp: 107.59m
 Breadth moulded: 16.50m
 Depth moulded
 to main deck: 8.50m
 to upper deck: 11.30m
 Width of double skin
 side: 1.35m
 bottom: 1.20m
 Draught
 scantling: 6.20m
 design: 6.20m
 Gross: 4,966
 Displacement: 8,440.5t
 Lightweight: 2,536.5t
 Deadweight
 scantling: 5904t
 design: 5904t

Block co-efficient: abt. 0.7455 at 6.20m
 draught
 Speed, service: 14.0kts
 Cargo capacity (m³)
 Bale: 8,568
 Grain: 8,925
 Bunkers (m³)
 Diesel oil: 223.3
 Type C LNG tank: 212.8
 Water ballast (m³): 2,275.5

Daily fuel consumption (tonnes/day)
 Main engine only (including PTO): 12.5 at
 MDO mode, 7.6 at LNG mode
 Auxiliaries: 0.02

Classification society and notations: DNV
 +1A Multi Purpose Dry Cargo Ship, Grab
 (2-20), Strengthened(1B), Gas Fuelled, E0,
 LCS, Container, Hatchcoverless, DG(B,P) DBC,
 Ice (1A), BWM (T), Recyclabe, BIS, TMON

% high-tensile steel used in construction: 65%

Propulsion
 Main engine(s)
 Design: Wärtsilä
 Model: 6L34DF
 Number: 1
 Type of fuel: LNG/MGO
 Output of each engine: 2,550
 Is this a diesel-electric or hybrid?: N

Gearbox(es)
 Make: Wärtsilä packaged
 Model: SCV 75-P48
 Number: 1

Propeller(s)
 Designer/Manufacturer: Wärtsilä packaged

First in a series of four dual-fuelled MPVs for use in the European short-sea shipping arena, the 5,904dwt, *Lady Marie Christine* was built by Wuhu Shipyard for Dutch operator Wijnne Barends to a design from Conoship in conjunction with SDARI.

With a length of 115m and a beam of 16.5m the single hold ship has a forward superstructure arrangement with engine room aft. There is a traveling gantry crane for cargo handling. Unlike many dual-fuel vessels, the type C fuel tank is located under deck on the port side of the vessel above the main engine level, freeing up deck space for cargo.

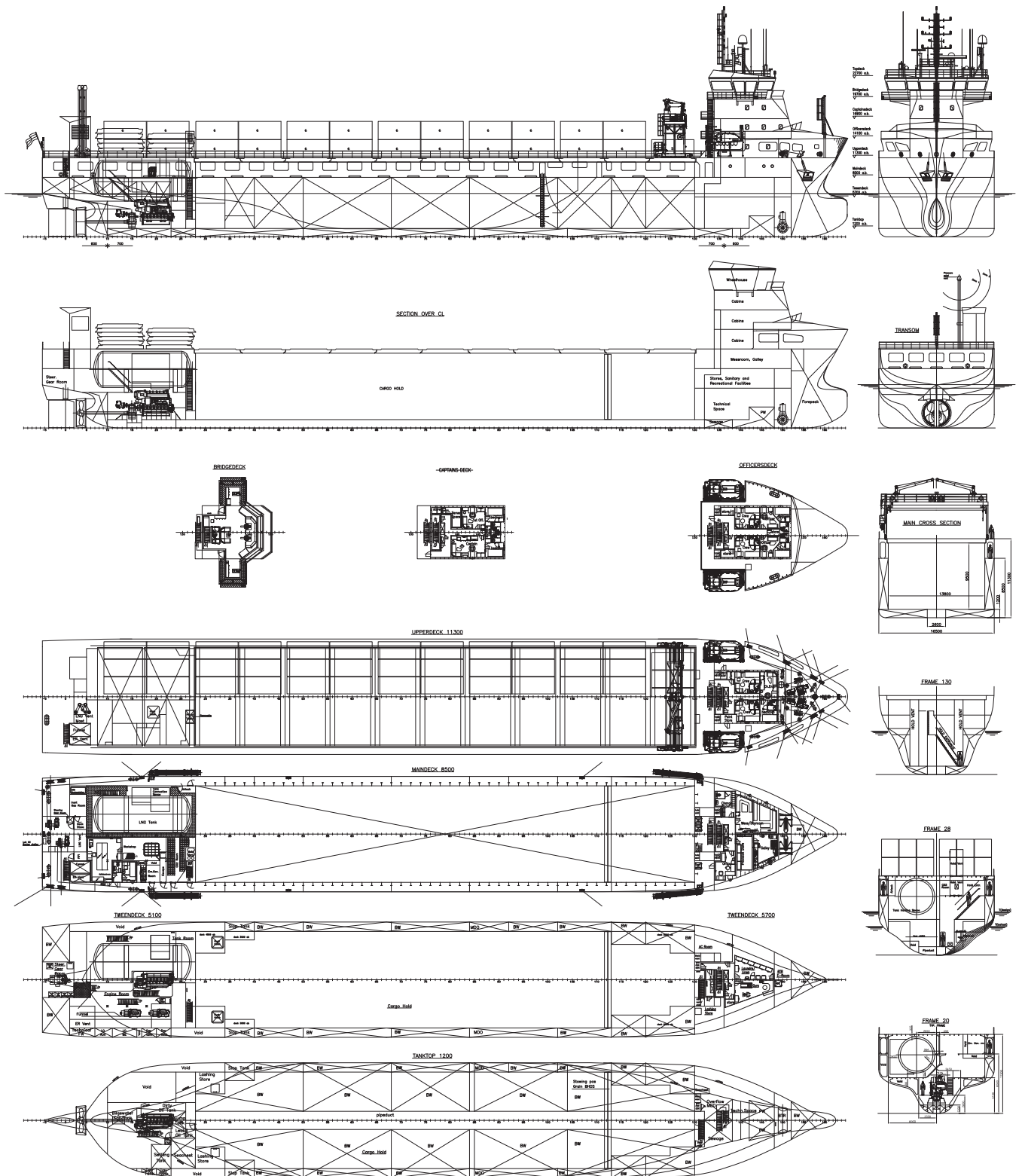
The ship is planned to operate mainly in the Baltic and is therefore ice-classed to Swedish-Finnish 1A standard. Main cargoes will be timber and paper products, but the ship can also carry bulk cargoes and has moveable grain bulkheads. The ships pontoon hatch covers can be stored on deck above the engine room allowing for carriage of high project cargo when the ship can sail with open holds. With the hatch covers in place, the ship can accommodate 155teu on deck.

Lady Marie Christine is powered by a Wärtsilä 6L34DF engine with a 2,550kW power output driving a 3.5m controllable pitch nozzle propeller through a reduction gearbox. A frequency-controlled, PTO-driven shaft generator allows the main engine to run at optimum speed and the propeller with optimum pitch and provides all needed power when at sea. The two Scania gensets are needed only when in port. There is also a waste heat recovery system that provides hot water and space heating for the ship.

The efficiency of the ship's power and propulsion system is such that it has an achieved EEDI of 6.87 against a required 15.87.



LADY MARIE CHRISTINE



LUPINUS PLANET – LPG GAS CARRIER



Type: Electro-Hydraulic
 Performance: 10t(98kN)
 Other cranes
 Number: 2 x Engine parts and provision
 handling crane
 Make: Oriental Precision & Engineering
 Co., Ltd
 Type: Electric
 Performance: S-side 4t(39.2kN), P side
 1.5t(14.7kN)
 Mooring equipment
 Number: 2 x Mooring winch/Windlass, 6 x
 Mooring winch
 Make: Kawasaki Heavy Industries, Ltd
 Type: Electro-Hydraulic
 Special lifesaving equipment
 Number of each and capacity: 2 x 36-person
 Make: Jiangsu Jiaoyan Marine Equipment
 Co., Ltd
 Type: Fire protected type, Totally enclosed

Cargo tanks
 Number: 4
 Grades of cargo carried: LPG
 Product range: propane, butane, Propylene
 Cargo pumps
 Number: 8
 Type: centrifugal deep well
 Make: Svanehøj Danmark A/S
 Capacity (each): 600m³/h
 Cargo control system
 Make: JRCs Co. Ltd
 Type: Integrated into Data logger
 Ballast control system
 Make: JRCs Co. Ltd
 Type: Integrated into Data logger
 Ballast water treatment system
 Make: Techcross
 Capacity: 2,000m³/h
 Complement
 Officers: 10
 Crew: 14
 Supernumeraries/Spare: 6

Navigation and other equipment
 Bridge control system
 Make: Nabtesco Corporation
 Type: M-800-V
 Is bridge fitted for one-man operation? N
 Integrated bridge system: N
 Radars
 Number: 2
 Make: Japan Radio Co., Ltd
 Model(s): JMR-9225-9X3 JMR-9272-S
 Fire detection system
 Make: Consilium Nittan Marine Ltd
 Type: Salwico CCP
 Fire extinguishing systems
 Engine room
 Make/Type: Johnson Controls International
 Korea, Inc. / Fixed Local Application Fire
 Extinguishing System, High Expansion Foam
 System

Cabins
 Make/Type: Shinko., Ltd / Fire & Wash Deck
 System; Yamato Protec / Portable fire
 extinguishers
 Waste disposal plant
 Incinerator
 Make: Sunflame Co., Ltd
 Model: OSV-600SAI
 Sewage plant
 Make: Sasakura Engineering Co., Ltd
 Model: SD-3R

Efficiency
 Attained EEDI value: 4.99
 Required EEDI value: 6.17
 Installed Fuel Meters: Mass type flow
 meter(FO, LPG)
 Energy Saving Technologies*: Semi-duct
 system with contra fins, Rudder bulb system
 with fins
 Hull coatings: Antifouling paint

Contract date: 30 October 2020
 Launch/float-out date: 4 February 2022
 Delivery date: 22 September 2022

Shipbuilder: **Kawasaki Heavy Industries,
 Ltd. Sakaide Shipyard**
 Vessel's name: **Lupinus Planet**
 Owner/Operator: **Akiakari Shipholding S.A**
 Country: **Panama**
 Designer: **Kawasaki Heavy Industries, Ltd**
 Country: **Japan**
 Flag: **Panama**
 IMO number: **9929209**
 Total number of sister ships already com-
 pleted (excluding ship presented): **Nil**
 Total number of sister ships still on order: **Nil**

Draught
 scantling: 11,60m
 design: 10,98m
 Gross: 49,943t
 Deadweight
 scantling: 55,091t (Summer)
 design: 50,540t
 Speed, service (---%MCR output): abt 17.0kts
 at 85%MCR output with 15% S.M.
 Cargo capacity (m³)
 Liquid volume: 84,171.8m³ (100% full at
 20°C, including dome)
 Bunkers (m³)
 Heavy oil: abt 2,100m³
 Gas oil: abt 630m³
 Water ballast (m³): abt 22,800m³
 Tankers – percentage segregated ballast: 100%

Classification society and notations: NK,
 NS*/ MNS* (Liquefied Gas Carrier Type 2G,
 PSPC-WBT, NC1C) (IWS) (PSCM) (EA) (IHM)
 (EEDI-p3) (NOx-III(SCR,EGR)) (SOx(LFF))(GF/
 DF)

Propulsion
 Main engine(s)
 Design: Dual-fuel LPG marine diesel engine
 Model: Kawasaki-MAN B&W
 7S60ME-C10.5 LGIP
 Manufacturer: Kawasaki Heavy Industries,
 Ltd
 Number: 1
 Type of fuel: LSHFO, MDO, MGO, LPG
 Output of each engine: 12,600kW at MCO
 Is this a diesel-electric or hybrid?: N
 Propeller(s)
 Material: Ni-Al-Bronze
 Designer/Manufacturer: Nakashima Propeller
 Co., Ltd
 Number: 1
 Fixed/Controllable pitch: Fixed

Diesel-driven alternators
 Number: 3
 Engine make/type: Yanmer Power
 Technology Co., Ltd / 6EY22ALWS
 Type of fuel: LSHFO, MDO, MGO
 Alternator make/type: Taiyo Electric Co.,
 Ltd / FE653B-8
 Output/speed of each set: 1,220kW/900rpm

Boilers
 Number: 1
 Type: Oil fired and exhaust gas heating
 marine composite type
 Make: Alfa Laval K.K.
 Output, each boiler: Oil fired section:
 1,600kg/h, exhaust gas section: 1,100kg/h
 Deck machinery
 Cargo cranes/cargo gear
 Number: 1 x Hose handling crane
 Make: Oriental Precision & Engineering
 Co., Ltd

Delivered by Kawasaki Heavy Industries' Sakaide Shipyard in September, *Lupinus Planet* is the first LPG-fuelled VLGC in NYK's fleet.

The ship fits well with NYK's new Sail GREEN ESG strategy introduced in March 2022 as the use of LPG as a fuel will reduce CO₂ emissions by 15% and SO_x by 85% compared to burning oil fuel. The ability to run on LPG is enabled by the installation of a Kawasaki-built MAN B&W 7S60ME-C10.5 LGIP main engine with a power output of 12,600kW at MCR. Compliance with Tier III NO_x rules is allowed by the installation of a SCR system for the main engine.

Energy saving features including a Kawasaki rudder bulb system with fins (RBS-F) and the semi-duct system with contra fins (SDS-F) contribute to reducing fuel consumption. At 84rpm, the single fixed pitch propeller moves the vessel at a service speed of 17kt.

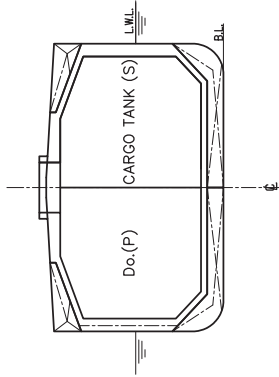
At 229.9m in length and with a beam of 37.2m, *Lupinus Planet* has a total gas capacity of 86,500m³ of which 2,500m³ is carried on deck in a pair of tanks dedicated to fuelling the main engine. The tanks are located above the number two (of four) cargo tanks. Installation of LPG fuel tanks on the ship's upper deck makes it possible to load fuel-use LPG separate from the ship's cargo LPG. A piping system connecting the LPG fuel tanks and LPG cargo tanks enables transferring of extra LPG to the LPG fuel tanks if necessary.

TECHNICAL PARTICULARS

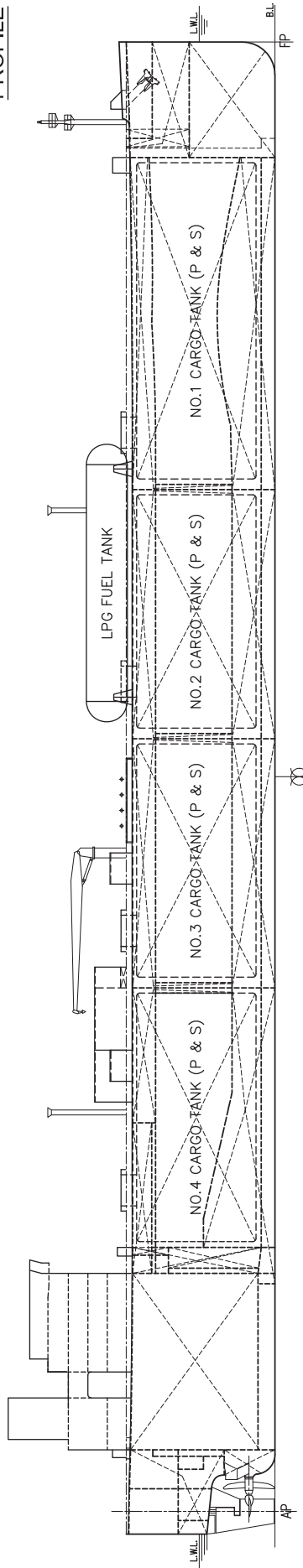
Length oa: 229.90m
 Length bp: 226.50m
 Breadth moulded: 37.20m
 Depth moulded: 21.90m
 to main deck: 21.90m
 to upper deck: 21.90m
 Width of double skin
 bottom: 2.10m



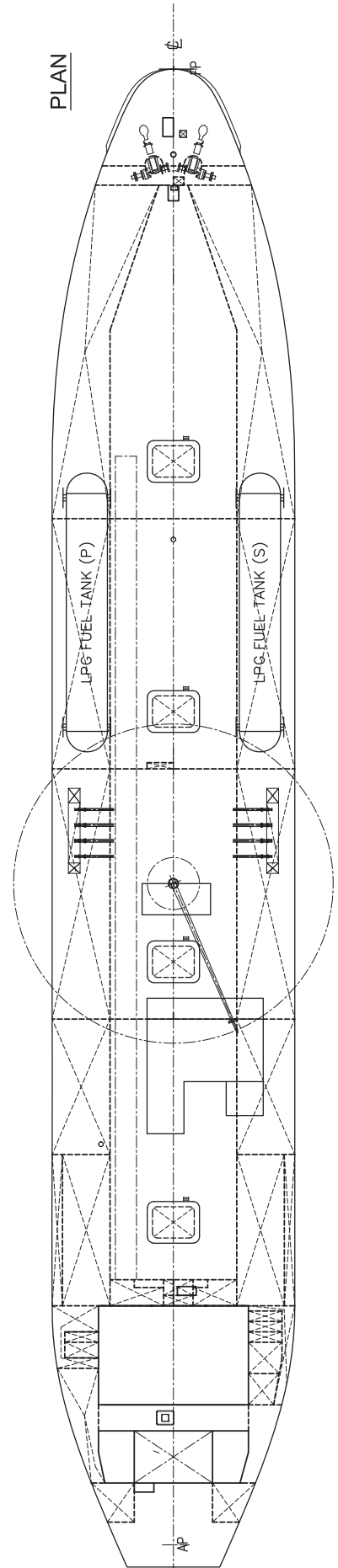
SECTION



PROFILE



PLAN



MELODY HOPE – VERY LARGE CRUDE CARRIER



Type:Water tube type / water tube
(Oil fired side), smoke tube (Exh gas
side) type
Make:Mitsubishi Heavy Industries /
Kangrim Heavy Industries
Output, each boiler:40ton/h x 2sets /
6ton/h (Oil fired side), 1.1ton/h(Exh gas
side) x 1set
Stern appendages/special rudders:Full
spade rudder

Deck machinery
Cargo cranes/cargo gear
Number:2
Make:Oriental
Type:Electro-Hydraulic
Performance:SWL 20ton

Other cranes
Number:2
Make:Oriental
Type:Electro-Hydraulic
Tasks:Provision
Performance:SWL 10ton / 3ton

Mooring equipment
Number:Foreship – 2 Windlass, 1 Mooring
Winch / Upper Deck – 2 Mooring Winch /
Stern Deck – 3 Mooring Winch
Make:Flutek
Type:Electro-Hydraulic

Cargo tanks
Grades of cargo carried:3 Groups
Product range:Crude Oil

Cargo pumps
Number:3
Type:Vertical centrifugal single stage,
Three stage steam turbine driven
Make:Shinko
Capacity (each):5,000m³/h x 150mTH

Cargo control system
Make:Scana
Type:Hydraulic type valve remote control

Ballast control system
Make:Scana
Type:Hydraulic type valve remote control

Ballast water treatment system
Make:Hi-Ballast
Capacity:3,000m³/h x 2 set, 360m³/h
x 1 set

Complement
Officers:9
Crew:18
Single/double/other rooms:1

Navigation and other equipment
Bridge control system
Make:MRC
Type:Floor mounting and self standing
Is bridged fitted for one-man operation? :N

Integrated bridge system:Y
If yes, make:Y
Model:EC-3000

Radars
Number:2
Make:Furuno
Model(s):FAR-2338S, FAR-2328

Fire detection system
Make:B-I Industrial
Type:BDS-4000

Efficiency
Attained EEDI value:1.97
Required EEDI value:2.07
Energy Saving Technologies:Pre-swirl Duct
Hull coatings:EGIS Pacific (HS)

Contract date:22 October 2020
Launch/float-out date:24 February 2022
Delivery date:30 June 2022

Shipbuilder:**Hyundai Heavy Industry Co., Ltd**
Vessel's name:**Melody Hope**
Owner/Operator:**Majesty**
Country:**Hong Kong**
Designer:**Hyundai Heavy Industry Co., Ltd**
Country:**Republic of Korea**
Model test establishment used:**Hyundai Maritime Research Institute (HMRI)**
Flag:**Marshall Islands**
IMO number:**9789271**
Total number of sister ships already completed (excluding ship presented):**1**
Total number of sister ships still on order: **Nil**

Breadth moulded:60m
Depth moulded:29.6m
Width of double skin
side:3m
bottom:2.8m
Draught
scantling:21.7m
design:20.5m
Gross:152,509
Deadweight
scantling:300,927ton
design:279,962ton
Speed, service (–%MCR output):14.8kts
Cargo capacity (m³)
Liquid volume:340,736.3
Bunkers (m³)
Heavy oil:6,344.7
Diesel oil:572.9
Water ballast (m³):84,778.5
Daily fuel consumption (tonnes/day)
Main engine only:60.2
Classification society and notations:ABS,
+A1(E), Oil Carrier, ESP, CSR, AB-CM, UWILD,
CPS, +AMS, +ACCU, TCM,BWT, VEC-L, RW,
SPMA, LNG Fuel Ready(S), CPS-COT, IHM,
CRC(SC-PL, SP), RRDA

Propulsion
Main engine(s)
Design:Hyundai-MAN B&W
Model:7G80ME-C10.5
Manufacturer:HHI Engine & Machinery
Division

Number:1
Type of fuel:LFO / ULSFO / MGO
Output of each engine:MCR: 22,200kW x
64.0rpm / NCR: 16,440kW x 57.9rpm
Is this a diesel-electric or hybrid?:N

Propeller(s)
Material:Ni-Al Bronze
Designer/Manufacturer:HHI Engine &
Machinery Division

Number:1
Fixed/Controllable pitch:Fixed
Diameter:10.4m

Diesel-driven alternators
Number:3
Engine make/type: Hyundai HIMSSEN 7H21/32
Type of fuel:LFO / ULSFO / MGO
Alternator make/type:Hyundai Electric &
Energy Systems 1 x HFC7 568-08P, 2 x HFC7
636-08P
Output/speed of each set:1 x 1,420kW,
2 x 1,670kW

Exhaust-gas scrubbing equipment
Manufacturer:Hyundai Power Systems
Type:Open
On main engines?:Yes
On auxiliary engines?:Yes (3)

Boilers
Number:Aux. boiler x 2sets / composite
boiler x 1set

Designed and built by Hyundai Heavy Industries, *Melody Hope* is a 300,927dwt VLCC and was ordered by the Hong Kong office of Cido Shipping in 2020 as one of a pair. At the time it was said to have been the first order by Cido after many years of fleet downsizing. The vessel is scrubber fitted to meet 2020 SOx rules and now operates in Tankers International VLCC Scrubber Pool.

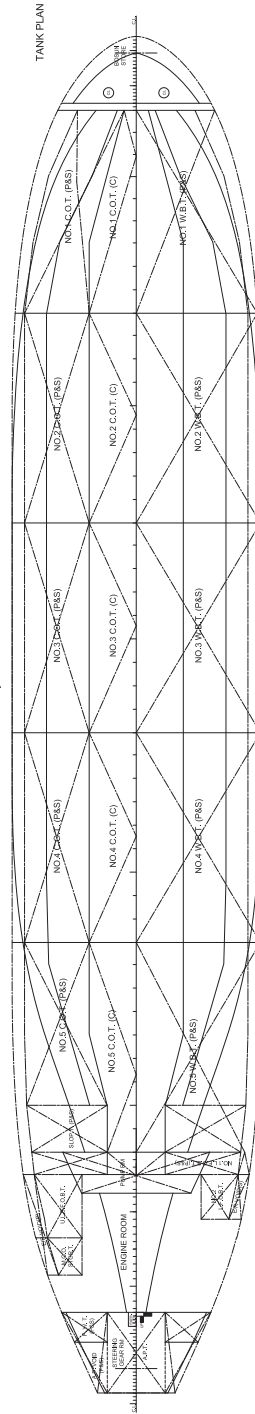
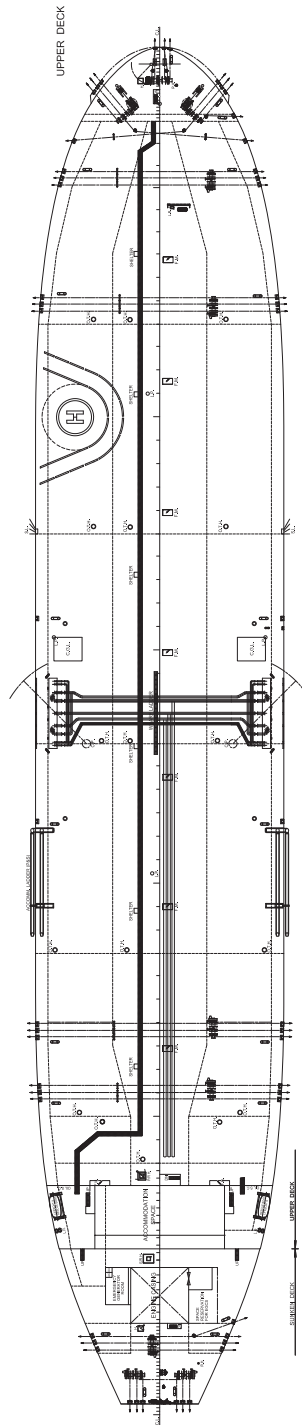
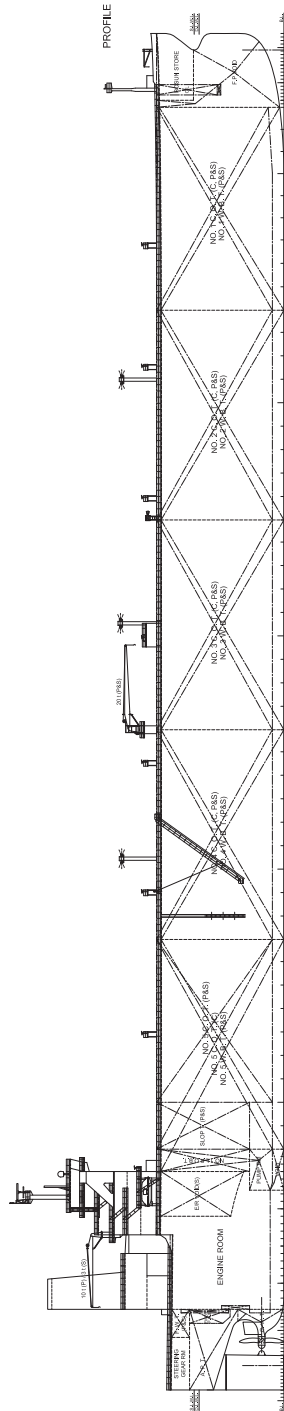
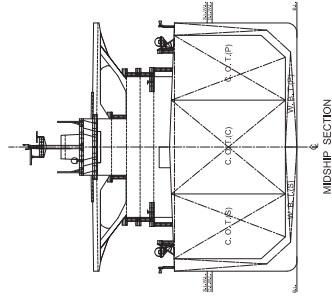
The vessel is 328m in length, has a beam of 60m, a moulded depth of 29.6m and a scantling draught of 21.7m. The hull form is conventional with a bulbous bow. Its cargo capacity is 340,736.3m³ and there are five sets of port, centre and starboard cargo tanks and two slop tanks. Cargo pumping is by three 5,000m³/h Shinko three stage steam turbine driven, vertical centrifugal pumps.

Melody Hope has been equipped with a Hyundai HiBallast ballast water management system comprising two 3,000m³ per hour models and one 360m³/h unit. The system is type approved by IMO and USCG allowing world-wide trading.

Power is supplied by the Hyundai-built MAN B&W ultra-long stroke 7G80ME-C10.5 engine with a power output of 22,200kW at 64 rpm that will operate at 57.9rpm to give 16,440kW. The directly linked propeller is a fixed pitch type of 10.4m diameter. Service with a pre-swirl duct installed to aid efficiency. There are three auxiliary gensets all driven by HIMSSEN 7H21/32 engines. One has an out put of 1,420kW and the other two 1,670kW each. A Hyundai Power Systems open loop scrubber is attached to the main engine and the three auxiliaries to allow the ship to operate on HFO fuel rather than low-sulphur fuel oil.

TECHNICAL PARTICULARS

Length oa:328m
Length bp:318m



NILS HOLGERSSON – RO-PAX FERRY



Make:Saacke
Output, each boiler: ...2,500kg/h +2,500kg/h
Stern appendages/special rudders: Twisted Flap Rudder

Bow thruster(s)
Make:Brunvoll
Number:3
Output (each):.....2,500kW

Mooring equipment
Number:10
Make:SEC
Type: Electric

Special lifesaving equipment
Number of each and capacity:..... Davit launched lifeboat, 2 sets, 150 Persons/set / Fast rescue boat, 2 sets, 6 persons/set / MES, 2 sets, 357 Persons/set

Make:lifeboat & rescue boat made by Norsafe; MES made by Viking
Type: Lifeboat type is Davit launched:..... MES
If MES, vertical or sloping chutes?: vertical
Reefer plugs:.....76 Pieces

Vehicles
Number of vehicle decks:.....4 fixed deck
Total lane length:4,850m
Total cars:261 trailers

Doors/ramps/lifts/moveable car decks
Number of each:.....Stern ramp 3 set bow door 1 set, bow ramp 1 set, side ramp door 3 sets, bunker door 2 sets, LNG bunker door 2 sets, pilot door 2 sets, passenger door 1 set, ramp cover 1 set, movable ramp 3 sets, Engine room hatch cover 1 set, lifting platform 2 sets.
Type: Electric Hydraulic type
Designer:..... MacGregor

Ballast control system
Make:S-two GmbH & Co. KG
Type: Poseidon EH

Ballast water treatment system
Make:Panaflex
Capacity:7,000m³/h
Complement

Officers:8
Crew:58
Single/double/other rooms:40/163/89

Passengers
Total:800
Number of cabins:239
Percentage/number outboard:39.9%

Navigation and other equipment
Bridge control system
Make:Furuno
Type:BR-500

Is bridge fitted for one-man operation?: Y
Integrated bridge system: Y
If yes, make:Furuno
Model:Voyager INS

Radars
Number:4
Make:Furuno
Model(s):XN-36CF, XN-24CF, XN-12CF, XN-12CF

Fire detection system
Make:Consilium
Type:Salwico Cargo

Fire extinguishing systems
Cargo holds:Drencher system
Make/Type:MINIMAX

Engine room:HP water mist
Make/Type:HI-FOG

Vehicle spaces:Drencher system
Make/Type:MINIMAX
Cabin:HP water mist
Make/Type:HI-FOG

Public spaces:HP water mist
Make/Type:HI-FOG
Waste disposal plant
Waste handled:Cardboard, plastic, paper, glass

Efficiency
Attained EEDI value:17.38
Required EEDI value:20.35
Installed Fuel Meters:Mass flow meters, volume flow meters

Other installed monitoring tools: ... Trim, draughts
Hull coatings:Antifouling paint
Contract date:22 June 2018
Launch/float-out date:10 November 2020
Delivery date:7 March 2022

Shipbuilder:China Merchants JinLing Shipyard (JiangSu) Co., Ltd
Vessel's name:Nils Holgersson
Owner/Operator:TT-Line
Country:Germany
Designer:OSK/JinLing Shipyard
Country:Denmark/China
Model test establishment used:Hamburg Ship Model Basin
Flag:Germany
IMO number:9865685
Total number of sister ships already completed (excluding ship presented):1
Total number of sister ships still on order: Nil

Gross:56,138
Displacement:31,453.6
Lightweight:20,402.64
Deadweight
scantling:11,050.96
design:8,697.26
Block co-efficient:0.6745(Design) / 0.6856(Scantling)
Speed, service):17.6kts (10,875kW / MCR: 29,400kW)

Cargo capacity (m³)
Gross Lane Meter:abt.4,864m
Bunkers (m³)
Diesel oil:523.3
LNG Tank:1,000
Water ballast (m³):5,216.1
Daily fuel consumption (tonnes/day)
Main engine only:126.4
Auxiliaries:35.06
Classification society and notations:DNVGL + 1A Passenger ship RO/RO ship, BIS CLEAN, COMF(C-1,V-2), E0, Gas Fuelled, NAUT(AW), LCS (DC), Ice (1B), TMON(Oil lubricated), BWM(T)

% high-tensile steel used in construction: ...99.67%
Heel control equipment:1
Roll-stabilisation equipment:Fin stabiliser

Propulsion
Main engine(s)
Design:MAN
Model:6L51/60DF&8L51/60DF
Manufacturer:MAN
Number:6L51/60DF *2 &8L51/60DF *2
Type of fuel:LNG/<MGO
Output of each engine:6,300kW/8,400kW
Is this a diesel-electric or hybrid?:N

Gearbox(es)
Make:Renk
Model:NDSHL-3400
Number:2
Output speed:127.6rpm

Propeller(s)
Material:Ni-Al Bronze
Designer/Manufacturer:MAN
Number:2
Fixed/Controllable pitch:Controllable
Diameter:5,100
Speed:127.6rpm

Main-engine driven alternators
Number:2
Make/type:AMG 0630LS04 LSE
Output/speed of each set:2,750kW / 1,500rpm

Diesel-driven alternators
Number:4
Engine make/type:Wärtsilä/9L20DF
Type of fuel:MGO/LNG
Alternator make/type:CMXD-Siemens/ CMS0828-8AW03-Z

Output/speed of each set:1,384kW/1,000rpm
Boilers
Number:2
Type:Fired marine boiler +2 exhaust gas economiser

Delivered by China Merchants jingling Shipyard in March, the dual-fuel ro-pax *Nils Holgersson* is the first in a pair of ships ordered by German ferry operator TT-Line in mid-2018. The sister ship *Peter Pan* was handed over in November 2022. The names of the two vessels have been used by TT-Line many times with the latest *Nils Holgersson* being the seventh to bear that name.

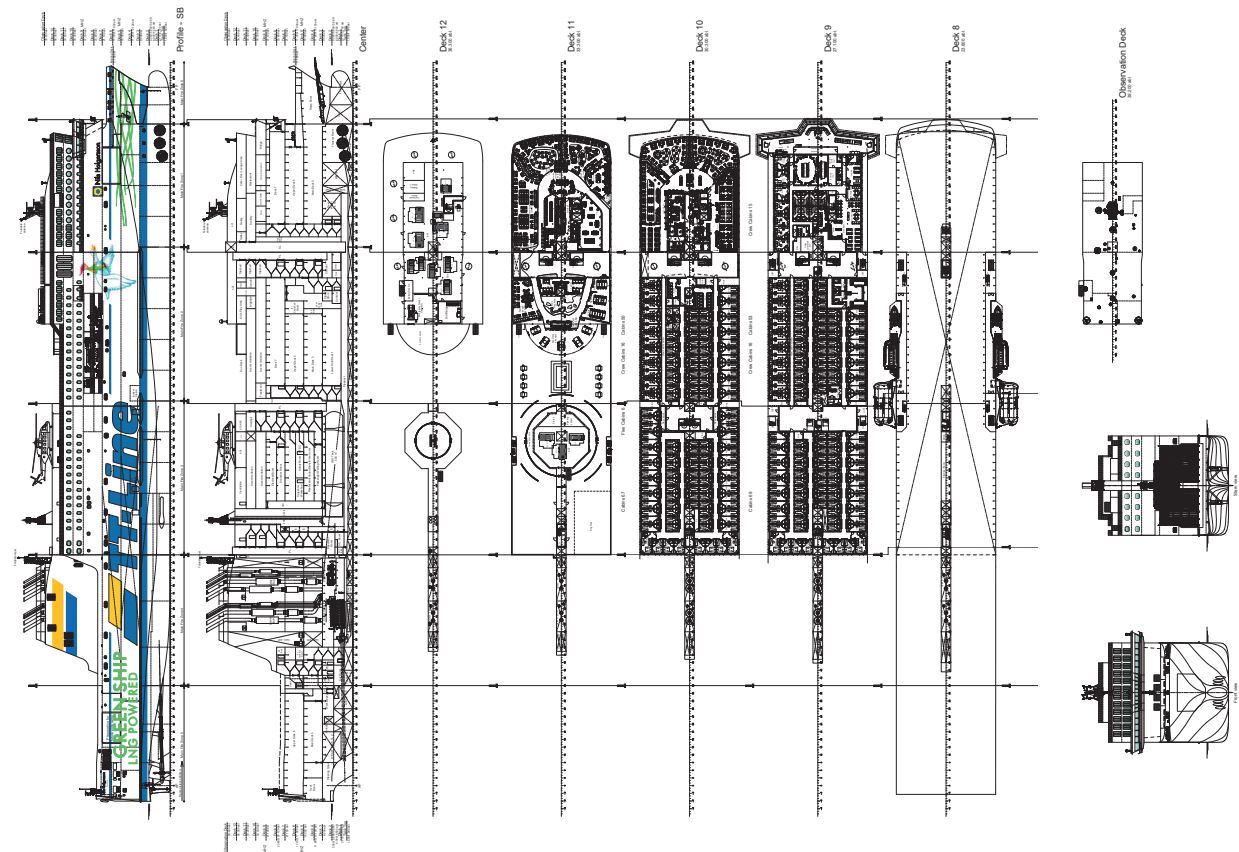
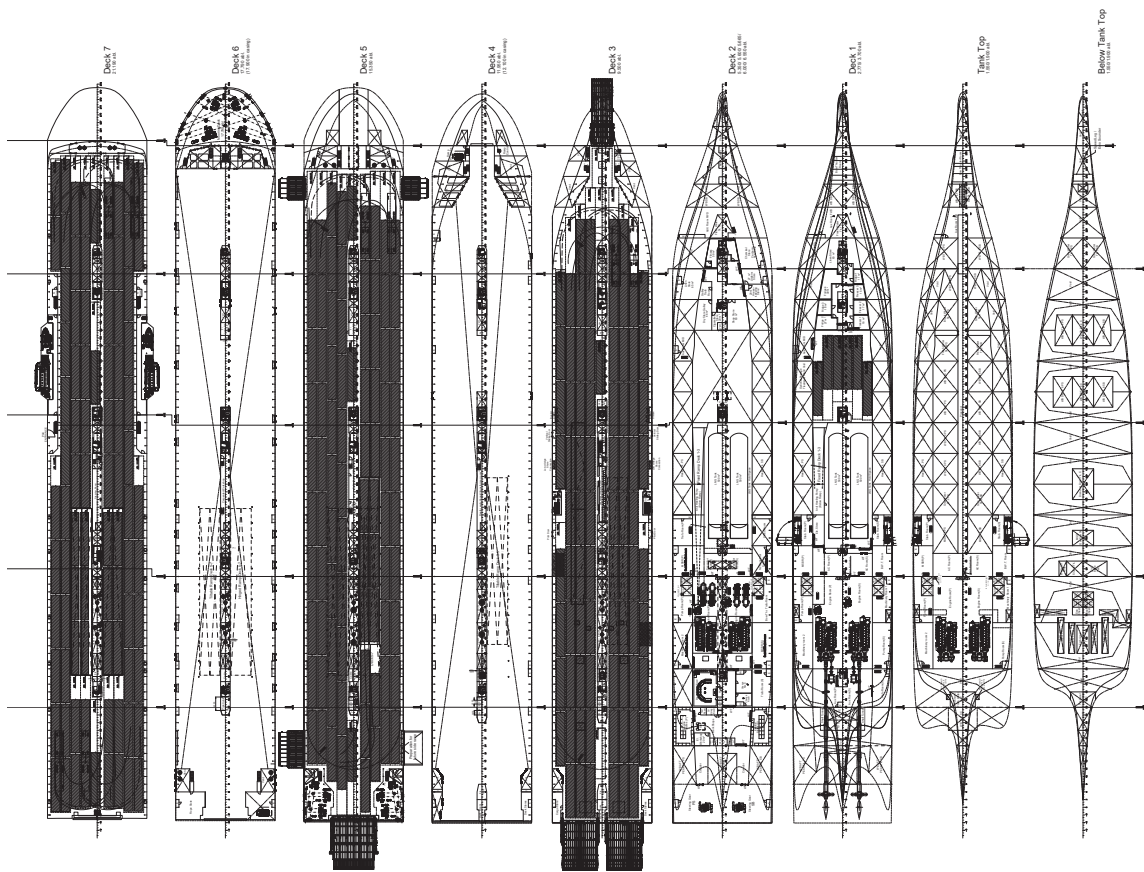
At 229m in length and with a beam of 31m, the 56,163gt vessels are the largest in owner's fleet. The 4,864 lane meters on four fixed decks allow a maximum of 261 trailers and 80 cars with 40 charging points provided for electric vehicles. There are also 76 reefer plugs for trailers. Twin stern ramps and a bow ramp allow for rapid discharging and flexibility in port operations. For operations mainly in the Baltic Sea the vessel has been assigned ice class 1B.

There are three accommodation decks for passengers with 292 passenger and crew cabins allowing berths for 644 passengers and 66 crew. Total passenger capacity is 800. Typical for this type of ship, there are the usual bars, cafeterias, shopping and play areas.

TECHNICAL PARTICULARS

Length oa:abt.229.4
Length bp:217.867
Breadth moulded:31.0
Depth moulded:9.5
to main deck:9.5
to upper deck:17.79 (Mooring deck)
to other decks:11.95 (Deck 4) / 15.35 (Deck 5) / 17.79 (Deck 6) / 21.19 (Deck 7) / 23.8 (Deck 8) / 27.1 (Deck 9) / 30.3 (Deck 10) / 33.3 (Deck 11) / 36.3 (Deck 12) / 39.2 (Observation Deck)

Width of double skin
side:6.03
bottom:1.55
Draught
scantling:6.7
design:6.3



NORWEGIAN PRIMA – CRUISE SHIP



Shipbuilder: **Fincantieri**
 Vessel's name: **Norwegian Prima**
 Owner/Operator: **Norwegian Cruise Line**
 Country: **USA**
 Designer: **Fincantieri**
 Country: **Italy**
 Flag: **Bahamas**
 IMO number: **9823986**
 Total number of sister ships already completed (excluding ship presented): **Nil**
 Total number of sister ships still on order: **5**

Built at Fincantieri's Marghera shipyard, *Norwegian Prima* is the first of six vessels in its owner Norwegian Cruise Line's Prima class. The 145,535gt ship was delivered in June and the remaining five vessels due at yearly intervals with *Norwegian Viva* being due in 2023.

This is the owner's first new ship in three years and while it offers a more luxurious experience than other ships in the fleet, the design bucks the trend of ever larger cruise ships and is not the largest in the NCL fleet. It is 293.4m in length, has a beam of 40.5m and a reverse bow form unusual in cruise ships but a feature that should reduce pitching and aid efficiency. When all are delivered the six-ship class will be the most numerous in the NCL fleet.

Norwegian Prima has 20 decks in total with cabins for its 3,215 passenger on decks 5 and 9-16. It is claimed to offer more open air decks than any other new cruise vessel.

Norwegian Prima has a diesel electric propulsion system featuring two 16.5MW ABB Azipods with power supplied by five Wärtsilä W46F engines two of which are 12-cylinder units and the other three nine-cylinder types. Total power output is 57.6MW.

Whereas many new cruise ships are dual-fuel or LNG ready, NCL has opted for conventional oil fuel but has said it has plans in future to use biofuels and/or methanol in its ships. The engines use SCR to meet NOx rules and a Wärtsilä hybrid scrubber for SOx reduction.

TECHNICAL PARTICULARS

Length oa: 293.4m
 Length bp: 282.1m
 Breadth moulded: 40.5m
 Depth moulded
 to main deck: Bulkhead Deck 11.6m
 to upper deck: Lido Deck 49.6m
 Draught
 scantling: 8.70m
 design: 8.49m
 Gross: 143,535grt
 Displacement: 69,000t
 Deadweight
 design: 9,480t

Block co-efficient: at draught 7.4m is 0.72
 Speed, service (87%MCR output): 20.5kts
 Bunkers (m³)
 Heavy oil: 3,400m³
 Diesel oil: 750m³
 Water ballast (m³): 3,800m³
 Classification society: Lloyd's Register
 % high-tensile steel used in construction: 98%
 Heel control equipment: two couples of Heeling Tanks
 Roll-stabilisation equipment: Fin Stabilizers
 Propulsion
 Main engine(s)
 Model: 3x9 + 2x12 W46F with selective catalytic reduction
 Manufacturer: Wärtsilä
 Number: 5
 Type of fuel: HFO and MGO
 Output of each engine: 9.6/14.4MW
 Is this a diesel-electric or hybrid?: Y
 Propulsion concept: PODs
 Make: ABB
 Number: 2
 Power: 2x16.5MW each
 Propeller(s)
 Material: Ni-Al Bronze
 Designer/Manufacturer: ABB
 Number: 2
 Fixed/Controllable pitch: Fixed
 Diameter: 5.7m
 Speed: 131rpm
 Main-engine driven alternators
 Number: 5
 Make/type: ABB
 Output/speed of each set: 600rpm
 Diesel-driven alternators
 Number: 5
 Engine make/type: Wärtsilä
 Type of fuel: HFO or MGO
 Alternator make/type: ABB
 Output/speed of each set: 600rpm
 Exhaust-gas scrubbing equipment
 Manufacturer: Wärtsilä
 Type: Hybrid
 On main engines?: Y
 On auxiliary engines?: N
 Boilers
 Number: 2 + 5
 Type: Oil Fire Boilers + Exhaust Gas Boilers
 Make: Alfa Laval
 Output, each Oil Fired Boiler: 2 x 15,000kg/h
 Output, each Exhaust Gas Boiler: 2 x 5,600kg/h + 3 x 2,590kg/h
 Bow thruster(s)
 Make: Brunvoll
 Number: 3
 Output (each): 2.5MW
 Deck machinery
 Cargo cranes/cargo gear
 Number: 4
 Make: Contech / Navalimpianti
 Type: Electric
 Performance: n.1 Bosun crane store

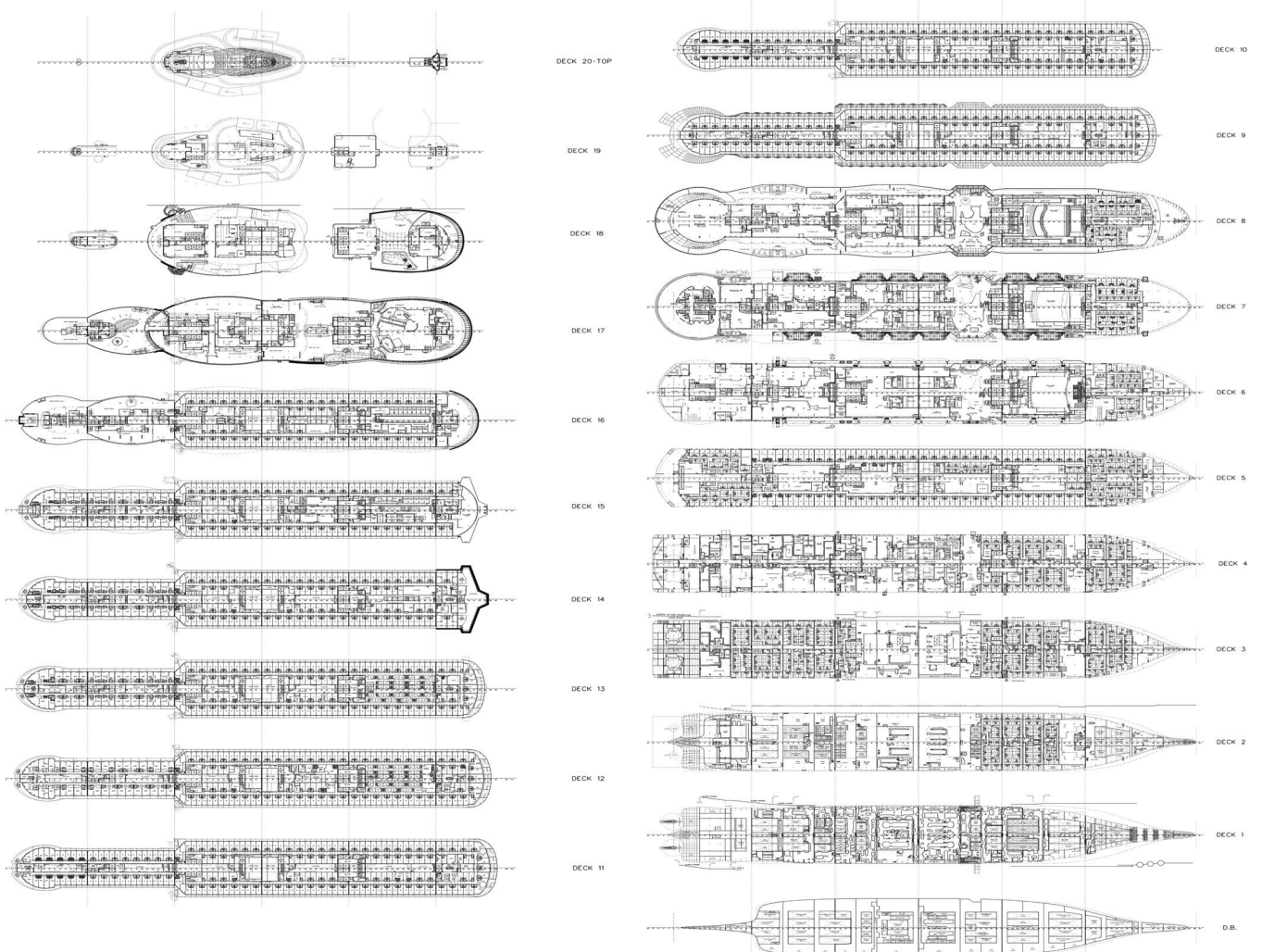
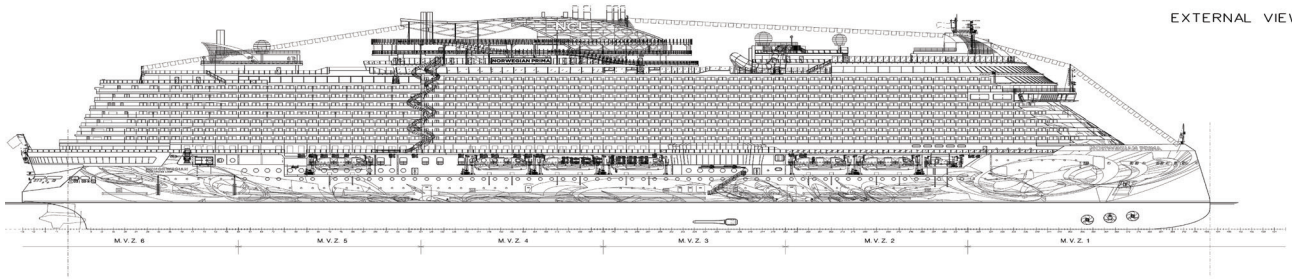
SWL: 2t, n.2 Suez cranes SWL: 4t, n.1 Theatre crane SWL:1t

Other cranes
 Number: 5
 Make: Fuchs
 Type: Single girder overhead crane with electric chain hoist
 Tasks: Diesel Generators
 Performance: SWL 2,000kg
 Mooring equipment
 Number: 8
 Make: Kongsberg
 Type: electric
 Special lifesaving equipment
 Number of each and capacity: 12 Lifeboats (355 pax) + 2 Rescue (60 pax) + 2 MES (2x4x158 pax)
 Make: Hatecke
 Type: Lifeboats are "semi-enclosed", rescue boats are "totally enclosed"
 If MES, vertical or sloping chutes?: Vertical
 Ballast water treatment system
 Make: Alfa Laval
 Capacity: 500m³/h
 Complement
 Crew: 1,389
 Single/double/other rooms: 912
 Passengers
 Total: 3,219
 Number of cabins: 1,646
 Navigation and other equipment
 Bridge control system
 Make: Wärtsilä SAM
 Is bridge fitted for one-man operation? N
 Integrated bridge system: Y
 If yes, make: Wärtsilä SAM
 Model: NACOS
 Radars
 Number: 5
 Make: Wärtsilä SAM
 Model(s): X-S Band
 Fire detection system
 Make: Martec
 Fire extinguishing systems
 Engine room: Water mist
 Make/Type: Marioff HI-FOG
 Cabins: Water mist
 Make/Type: Marioff HI-FOG
 Public spaces: Water mist
 Make/Type: Marioff HI-FOG
 Waste disposal plant
 Waste handled: wet and dry garbage, grey and black water (MEPC 227(64), incl. section 4.2 standard Special area)
 Incinerator
 Make/Model: Scanship / SE-2400
 Waste compactor
 Make: Scanship
 Waste shredder/crusher
 Make: Scanship
 Sewage plant
 Make: Scanship
 Efficiency
 Attained EEDI value: 8.60
 Required EEDI value: 10.77
 Installed Fuel Meters: Mass flowmeters on Diesel Engines and Oil Fired Boilers fuel inlet and outlet
 Other installed monitoring tools: flowmeters on potable water delivery and return lines
 Energy Saving Technologies*: heat recovery system, cooling systems pumps under variable speed control, fresh water generators with preheaters and variable speed control, variable flow chilled water system, variable flow chiller sea water pumps, variable flow ventilation fans above 15kW, interface between cooking appliances in main galleys and relevant ventilation system (airflow according to cooking appliances heat load), HVAC energy saving strategies based on time schedules and public space occupancy.
 Performance Monitoring Regime: Real Time
 Performance Tool, CETENA Assist Energy Simulator Module for Carbon Intensity Indicator (CI) evaluation and prediction
 Contract date: September 2016
 Launch/float-out date: 04 August 2021
 Delivery date: 29 July 2022



NORWEGIAN PRIMA

EXTERNAL VIEW



NUKUMI – LAKER BULK CARRIER



Boilers	Number: 2
Type: Oil fired and waste heat recovery system	
Make: Gesab	
Output, each boiler: 500kW	
Stern appendages/special: Twin rudders with bulb and flap (Becker)	
Bow thruster(s)	Make: Kawasaki
Number: 1	
Output (each): 1,200kW	
Deck machinery	
Cargo cranes/cargo gear: Self-Unloading & single point loading Cargo Handling System	
Number: self-unloading twin tunnel belt single boom conveyors. Single point loading system one belt	
Make: EMS Tech	
Type: 2 x tunnel conveyors, C-Loop elevating conveyor; 79m discharge boom conveyor	
Performance: 4,000t/hr loading; 5,450t/hr discharge	
Other cranes	Number: 2 store cranes
Make: SCM Machinery	
Type: Electric	
Tasks: Stores and machinery spares lifting from shoreside	
Performance: 10m/min; 4.5tonne at 11m	
Mooring equipment	Number: 7 x winches; 2 x bow windlass; 1 x stern windlass;
Make: Windlass: Kongsberg; Winches: Magneto	
Type: Hydraulic	
Special lifesaving equipment	Number of each and capacity: 2 rescue boats (6 person) and life rafts davit launched
Make: 2 x 25-person rafts; 1 x 6-person raft forward; 30 x immersion suits	
Type: Rescue boats: Jianyin Neptune; rafts: Viking	
Cargo/capacity	Hatch covers
Design: Pontoon panels lifted by gantry style deck crane; Gantry crane 11tonne capacity	
Manufacturer: TTS pontoon panels	
Cargo control system:	Make: EMS Tech
Type: remote control of hydraulic cargo feeding gates and conveyor belts	
Ballast control system	Make: 2 x 1,800m ³ /hr
Ballast water treatment system	Make: Alfa Laval – UV system
Capacity: two systems Pure Ballast 3.1 2000	
Complement: 22	
Navigation and other equipment	Bridge control system
Make: Sperry/Northrop Grumman	
Radars	Number: 2
Make: Sperry	
Model(s): 25kW X-Band; 20kW S-Band	
Fire detection system	Make: Tyco
Fire extinguishing systems	Cargo holds: tunnel: water and water spray
Engine room: CO ₂ / water mist	
Waste disposal plant	Sewage plant
Make: JETS vacuum	
Efficiency	Other installed monitoring tools: Draught measurement, torque/thrust
Energy Saving Technologies*: High efficiency hull form (twin-Fin); waste heat recover system	
Contract date: 23 October 2019	
Launch/float-out date: keel laid: 20 May 2021	
Delivery date: 10 January 2022	

Shipbuilder: Chengxi Shipyard Co. Ltd	Width of double skin
Vessel's name: Nukumi	side: 1.3m
Owner/Operator: CSL & Windsor Salt	bottom: 1.2m
Country: Canada	Draught
Designer: Delta Marin	scantling: 8.5m
Country: Finland / China	Gross: 22,715GT
Model test establishment used: Hsva	Deadweight:
Flag: Canada	scantling: 32,085tonne in SW
IMO number: 9914711	Speed, service: 14kts
Total number of sister ships already completed (excluding ship presented): Nil	Cargo capacity (m ³)
Total number of sister ships still on order: Nil	Grain: 36,171m ³
	Bunkers (m ³)
	Heavy oil: 775m ³
	Diesel oil: 112m ³
	Water ballast (m ³): 15,773m ³

Nukumi has been designed to carry deicing salt in Canada's Great lakes and in coastal waters on the country's eastern coast. It was designed by Delta Marin and built by Chengxi Shipyard in China for Canadian operator CSL. The 32,085dwt self-discharging bulk vessel is the first ever diesel-electric Laker and the first single point loader to operate in Canada.

Cargoes of salt from the Magdalen Islands in the Gulf of St Lawrence are loaded into the vessel's five cargo holds by a single point loading system and cargo is transferred from the loading hopper above cargo hold No.3 by a single conveyor trolley. The vessel is discharged by two conveyor systems below a hoppers hold, and the cargo is elevated to a 79m discharge boom conveyor by a 'C-loop conveyor. Cargo can be loaded at 4,000t/h and discharged at 5,450t/h. The single point system allows the vessel to avoid shifting along the quay during loading operations.

The hull of the 225.5m long and 23.76m wide vessel has been designed for efficiency and the machinery selected to operate as silently as possible so as to protect the area's North Atlantic right whales and other marine mammals. It has a vertical bow form and a twin screw Caterpillar Twin-Fin propulsion system with ducted propellers behind a hydrodynamic fin and located in front of the twin bulb and flap Becker rudders. A Kawasaki bow thruster aid manoeuvrability in the shallow waters where the ship will operate.

Power comes from three 8M25E MaK four stroke engines. Three are 8-cylinder M25E engines rated at 2,800kW each and one is a six-cylinder M20C engine of 1,140kW. To meet IMO 2020 SOx regulations, the ship is fitted with a Yara hybrid scrubber.

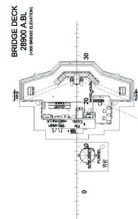
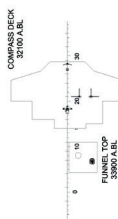
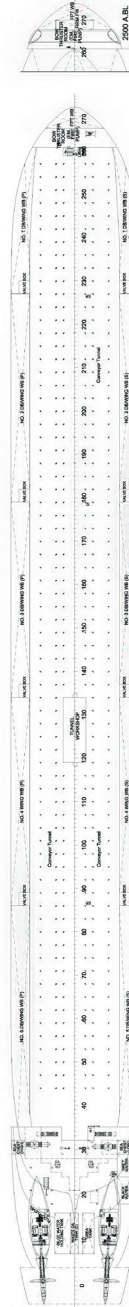
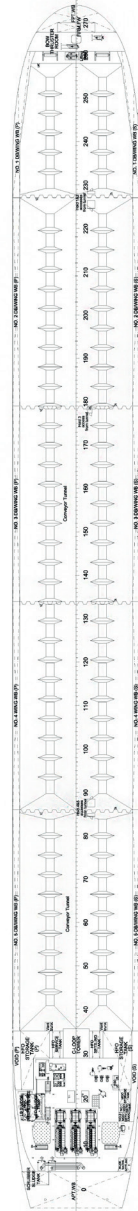
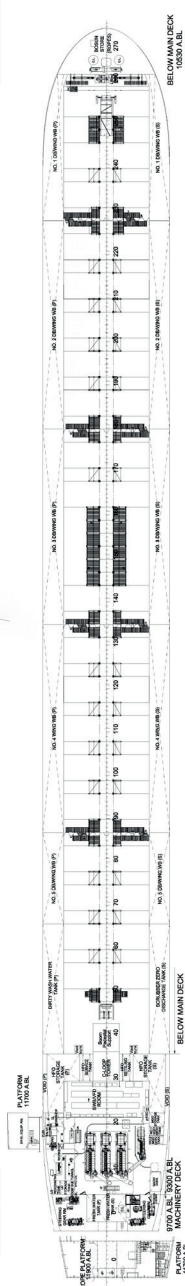
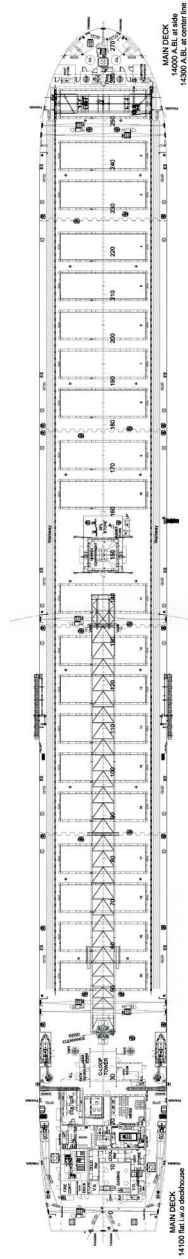
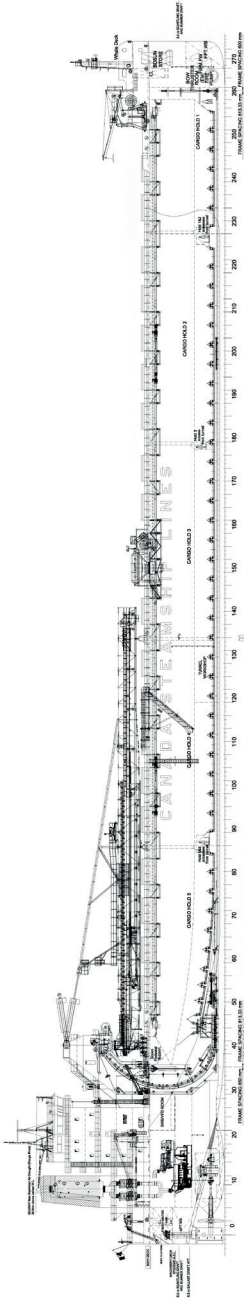
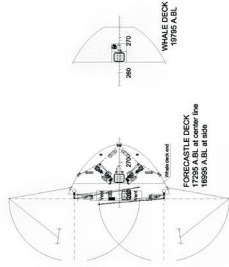
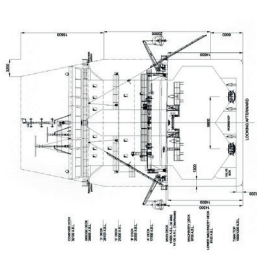
TECHNICAL PARTICULARS

Length oa: 225.5m
Length bp: 223.76m
Breadth moulded: 23.76m
Depth moulded
to main deck: 14.0m

Daily fuel consumption (tonnes/day):	191g/kWh
Main engine only: 191g/kWh	
Classification society and notations: Lloyd's;	
Great Lakes and limited Coastal +100A1 Great Lakes Bulk Carrier, *IWS, LI, ECO(GW, IBTS, OW, P), UWN-M, For Service on the Great Lakes and River St. Lawrence, also Strait of Belle Isle and Coasting along Eastern Seaboard of Newfoundland Not More than 25 Nautical Miles off the Coast Line and Coasting South from St. John's Newfoundland and Voyages in the Waters of Cabot Strait, up to 25 Nautical Miles Seaward of a Straight Line Joining Cape Canso at 45° 18.36' N, 60° 56.28' W and Cape Pine at 46° 36.81' N, 53° 32.50' W, Eastern Seaboard Canada Only.	
Machinery +LMC, CCS, ICC, UMS, BWTS, NAV1, CAC3	
% high-tensile steel used in construction: yes	deck and bottom

Propulsion	
Main engine(s)	Design: MaK Diesel electric
Model: 3x8M25E; 1x6M20C	
Manufacturer: MaK	
Number: 4	
Type of fuel: HFO	
Output of each engine: 3 x 2,800kW; 1 x 1,140kW	
Is this a diesel-electric or hybrid?: Y	
Gearbox(es)	Make: Electric motor twin screw CAT "twin-Fin" design; 2 x 3,000kW propulsion motors

Propeller(s)	Material: Cu-Ni-Al Bronze
Number: 2	
Fixed/Controllable pitch: Controllable	
Diameter: 4,950mm	
Speed: 95rpm	
Special adaptations: Inward turning	
Exhaust-gas scrubbing equipment	Manufacturer: Yara
Type: In-line type Open / Close loop (hybrid)	
On main engines?: yes	



POINTE DE CAUX – CHEMICAL/PRODUCTS TANKER



Mooring equipment
 Make:Gürdesan
 Fore mooring windlass
 Number: 2
 Tasks:Combined windlass and mooring winch
 Type: Electric driven
 Performance:.....Windlass: 54kN at 0-12m/min (Nominal load) (Hoisting) / Mooring: 60kN at 0-12m/min (Nominal load) (Hauling)
 Aft mooring windlass:
 Number: 2
 Tasks:Mooring winch
 Type: Electric driven
 Performance:.....60kN at 0-12m/min (Nominal load) (Hoisting)
 Special lifesaving equipment
 Number of each and capacity:..... Lifeboat: 1 x enclosed, freefall type, inboard diesel engine driven, GRP hull for 12 persons / Rescue Boat: 1 x GRP hull, rescue boat for 6 persons / Life Raft: 2 x throw-out type liferaft for 12 persons, 1 x davit launcher type for 12 persons
 Lifeboat:Gepa
 Rescue Boat:.....Gepa
 Life Raft: Viking
 Cargo tanks
 Number:.....10 Cargo Tanks, 2 Slop Tanks
 Grades of cargo carried:.....Oil products
 Product range:.....IMO II type chemical substances according to IBC Code
 Coated tanks:..Cargo Tanks (excl. Slop Tanks), Epoxy coated
 Stainless steel – structure/piping: ..Piping: St. St. 316L
 Cargo pumps
 Number:..10 x Cargo Pumps, 2 x Slop Pumps
 Type: Deepwell, hydraulic driven
 Make:Framo
 Stainless steel: St. St. AISI 316L
 Capacity (each): ..150m³/h for Cargo Pumps, 50m³/h for Cargo Pumps
 Cargo control system
 Make: Honeywell
 Type:Cargoboss
 Ballast control system
 Make: Honeywell
 Type:Cargoboss
 Ballast water treatment system
 Make:Alfa Laval
 Capacity: 1 x 300m³/h, 1 x 85m³/h (for BT in aft ship area)
 Complement
 Officers: 5
 Crew:7
 Navigation and other equipment
 Bridge control system
 Make:Sperry
 Type:Vision Master
 Is bridge fitted for one-man operation? Y
 Integrated bridge system:..... Y
 If yes, make:Sperry
 Model:Vision Master
 Radars
 Number:..... 3 (1 S-Band + 2 X-Band)
 Make:Sperry
 Model(s):..... 2 pcs X Band, 65608/A 1 pcs S Band, 65612A
 Fire detection system
 Make:Minimax
 Type: Combined and Addressable
 Fire extinguishing systems
 Engine room - Make/Type:.....Minimax
 Waste disposal plant:.....Jowa STP-2016 Series
 Sewage plant
 Make/Model:.....Jowa / STP-2016
 Efficiency
 Installed Fuel Meters:..... Turbine type, Maker Teksens
 Other installed monitoring tools:..... Honeywell
 Energy Saving Technologies*:..... Rudder Bulb, batteries 314kWh, 84m² solar panels on bridge deck
 Hull coatings: Jotun/Jotacote
 Performance Monitoring Regime:.....GreenSteam
 Contract date:.....24 December 2020
 Launch/float-out date:.....24 March 2022
 Delivery date:.....31 August 2022

Shipbuilder: **RMK Marine**
 Vessel's name: **Pointe de Caux**
 Owner/Operator: **Sogestran Group**
 Country: **France**
 Designer: **Delta Marine Engineering & Computer Trade Co**
 Country: **Turkey**
 Flag: **France**
 IMO number: **9931460**
 Total number of sister ships already completed (excluding ship presented): **Nil**
 Total number of sister ships still on order: **Nil**

Cargo capacity (m³)
 Liquid volume: 5,720m³
 Bunkers (m³)
 Diesel oil (MGO):90.80m³
 Water ballast (m³):.....2,710m³
 Tankers – percentage segregated ballast: ...100%
 Daily fuel consumption (tonnes/day)
 Main engine only:.....5.15t/day (DE)

Classification society and notations:..... I *Hull *Mach, Oil Tanker, Chemical Tanker IMO Type 2, ESP, *AUT-PORT, *AUT-UMS, *AVM-APS, CleanShip, CPS(WBT), Electric Hybrid(PM, PB), ERS-S, Green Passport EU, IG, Inwatersurvey, LI-HG-S3, Mon-Shaft, *SYS-COM, *SYS-NEQ-1, VCS, *Veristar-HULL-CM

% high-tensile steel used in construction:.....20%
 Propulsion
 Main engine(s)
 Model:.....MAN D2862LE328
 Manufacturer:.....MAN
 Number:.....3
 Type of fuel:.....MGO
 Output of each engine:.....600kW / 1,500rpm
 Is this a diesel-electric or hybrid?.....Diesel Electric

Propeller(s)
 Material:.....CuAl10Fe5Ni5-C-GS
 Designer/Manufacturer:.....Schottel SRE270
 Number: 2
 Fixed/Controllable pitch:.....FP Rudder Propeller
 Diameter:.....1,850mm
 Speed:.....1,200rpm
 Special adaptations:.....Azipull

Diesel-driven alternators
 Number:.....3
 Engine make/type:.....MAN D2862LE328
 Type of fuel:.....MGO
 Alternator make/type:.....LSA 49.3
 Output/speed of each set:565kWe, 400V, 1,500rpm

Boilers
 Number: 2
 Type: Thermal Oil Heater
 Make:Aalborg H4-TFO-010
 Output, each boiler:1,000kW, each
 Bow thruster(s)
 Make:Schottel
 Number: 1
 Output (each):.....400kW

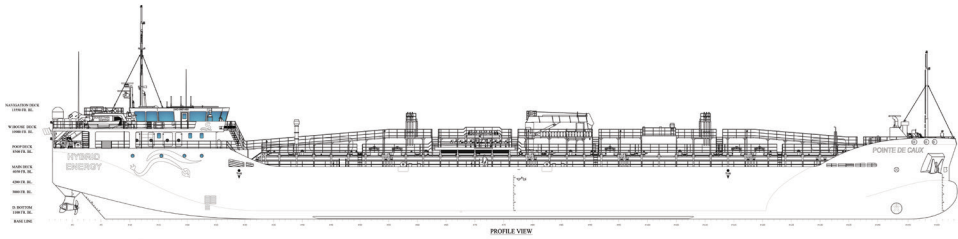
Deck machinery
 Cargo cranes/cargo gear
 Number: 1
 Make:Gürdesan
 Type: Telescopic service crane
 Performance:SWL: 6T-2T
 Hook speed:.....10m/min
 Outreach: 12m-18m
 Other cranes
 Number: 1
 Make:Gürdesan
 Type:Hydraulic fixed boom
 Tasks:Rescue boat & Life raft crane
 Performance:SWL 16Kn / 3.5m

TECHNICAL PARTICULARS

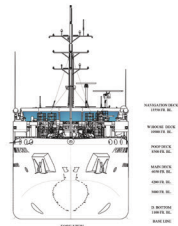
Length oa: 110.0m
 Length bp:106.7m
 Breadth moulded:14.0m
 Depth moulded:
 to main deck: 6.05m
 Width of double skin
 side:.....1,015mm
 bottom:.....1,100mm
 Draught
 scantling:..... 4.85m
 design:.....4.80m
 Gross:.....3,138
 Deadweight
 scantling:..... 6,588t
 design:.....6,521t
 Block co-efficient:.....0.89
 Speed, service (–%MCR output):.....10.00kts



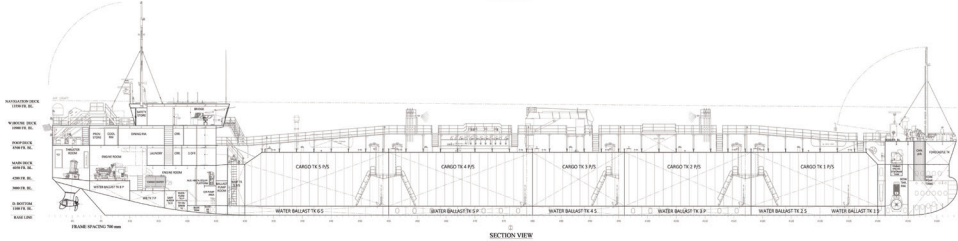
POINTE DE CAUX



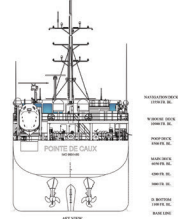
PROFILE VIEW



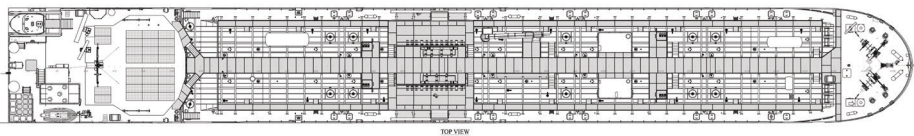
STARBOARD VIEW



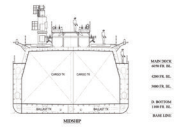
SECTION VIEW



PORT VIEW



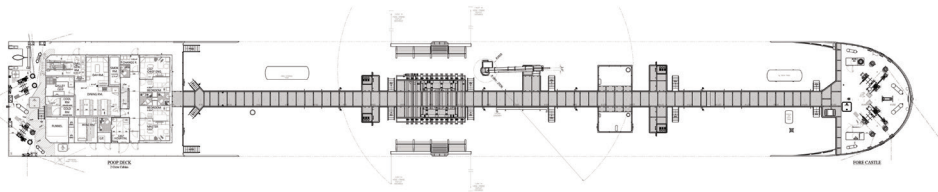
TOP VIEW



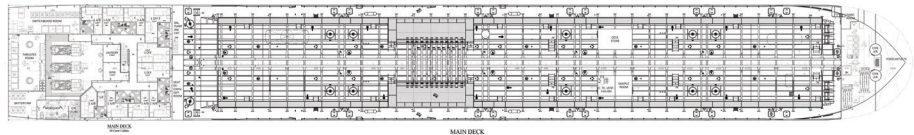
STARBOARD VIEW



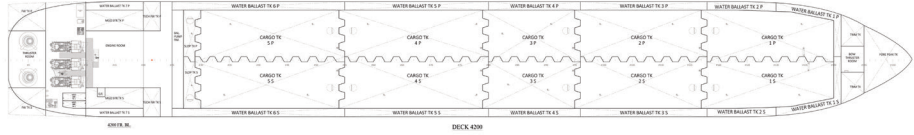
SUPERSTRUCTURE BOX



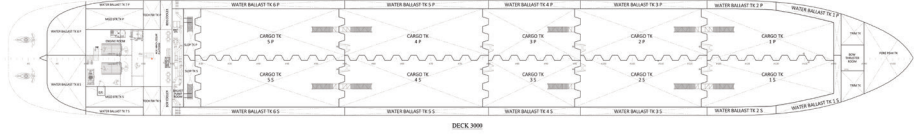
DECK LAYOUT



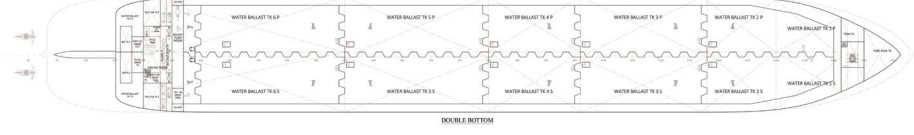
DECK LAYOUT



DECK LAYOUT



DECK LAYOUT



DECK LAYOUT



SANTANDER KNUTSEN – LNG CARRIER



Main-engine driven alternators	Number:.....2
Make/type:.....WEtech / PWM converter type	Output/speed of each set:1,800kW * 2
Diesel-driven alternators	Number:.....3 sets
Engine make/type:.....HiMSEN / 7H35DF * 2 / 6H35DF * 1	Type of fuel:.....LFO / MGO
Alternator make/type:.....HHI-EES / HSJ9	807-109 x 2 sets, HSJ9 803-109 x 1 set
Output/speed of each set:.....3,360kW x 720rpm x 2 sets, 2,880kW x 720rpm x 1 set	Boilers
Number:.....1 set	Type:.....Automatic, forced draft, heavy fuel oil burning, marine boiler
Make:.....Kangrim	Output, each boiler:.....7,500kg/hr
Stern appendages/special rudders:.....Hi-Rudder with bulb & Boss cap fin	

Deck machinery	Cargo cranes/cargo gear
Number:.....2 sets	Make:.....Oriental
Type:.....Electro-hydraulic	Performance:.....SWL 5ton
Mooring equipment	Number:.....15 sets
Make:.....Flutek	Type:.....Electro-hydraulic
Special lifesaving equipment	Number of each and capacity:.....2 sets / 34 persons
Make:.....BADA	Type:.....Gravity
Cargo tanks	Number:.....4 GTT Mark III Flex
Grades of cargo carried:.....Pure methane	Cargo pumps
Number:.....8	Type:.....Vertical centrifugal, submerged
Make:.....Shinko	Capacity (each):.....1,850m ³ /hr x 165mlc
Cargo control system	Make:.....Kongsberg
Type:.....Intergrated Automation System	Ballast water treatment system
Make:.....Hi-ballast	Capacity:.....2,600m ³ /h x 2

Complement	Officers:.....14
Crew:.....18	Suez/Repair Crew:.....6

Navigation and other equipment	Bridge control system
Make:.....Kongsberg	Type:.....Autochief-600
Is bridge fitted for one-man operation?.....N	Integrated bridge system:.....N
Radars	Number:.....2 sets (S-band, X-band)
Make:.....Furuno	Model(s):.....S-band(SN36CF-RSB133), X-band(XN24CF-RSB128)
Fire detection system	Make:.....Autronica
Type:.....BS-420M	Fire extinguishing systems
Cargo deck:.....Dry chemical powder/sea water hydrants	Make/Type:.....NK
Engine room:.....High pressure CO ₂ , sea water hydrants	Make/Type:.....NK
Cabins:.....Portable Fire Extinguisher/Hydrants	Make/Type:.....NK

Efficiency	Attained EEDI value:.....3.78
Required EEDI value:.....8.84(Phase 1)	Energy Saving Technologies*:.....Hi-Rudder with bulb & Boss cap fin

Contract date:.....19 February 2021	Launch/float-out date:.....14 October 2021
Delivery date:.....16 June 2022	

Shipbuilder:.....Hyundai Samho Heavy Industries Co., Ltd	Vessel's name:.....Santander Knutsen
Owner/Operator:.....Knutsen OAS Shipping	Country:.....Norway
Designer:.....HSHI	Country:.....Republic of Korea
Flag:.....NIS	IMO number:.....9904170
Total number of sister ships already completed (excluding ship presented):.....4	Total number of sister ships still on order:.....10

TECHNICAL PARTICULARS

Length oa:.....298.97m	Length bp:.....291.96m
Breadth moulded:.....46.40m	Depth moulded
to main deck:.....26.3m	to upper deck:.....26.3m
to other decks:.....21.05m(Sunken)	Width of double skin
bottom:.....2.55m	Draught(moulded)
scantling:.....12.50m	design:.....11.50m
Gross:.....114,180	Displacement:.....127,645t
Lightweight:.....32,500t	Deadweight
scantling:.....95,500t	design:.....84,000

Block co-efficient:.....0.7365(at Scantling draft)	Speed, service (---MCR output):.....18.0kts at design draft and at NCR with 20% sea margin
Cargo capacity (m ³)	Liquid volume:.....173,990

Bunkers (m ³)	Heavy oil:.....4,730
Diesel oil:.....610	

Water ballast (m ³):.....62,550

Classification society and notations:.....Lloyd's Register	+100A1 Liquefied Gas Tanker, Ship Type 2G, Methane (LNG) in Membrane Tanks, Maximum Vapour Pressure 0.35 bar, Minimum Cargo Temperature minus 163degC, ShipRight(SDA, FDA plus(40,NA), CM, ACS(B)), *IWS, LI, +LMC, UMS, BWTS, EGCN(SCR), LFPF(GC, NG) +Lloyd's RMC(LG) ShipRight(BWMP(T), IHM, SCM)
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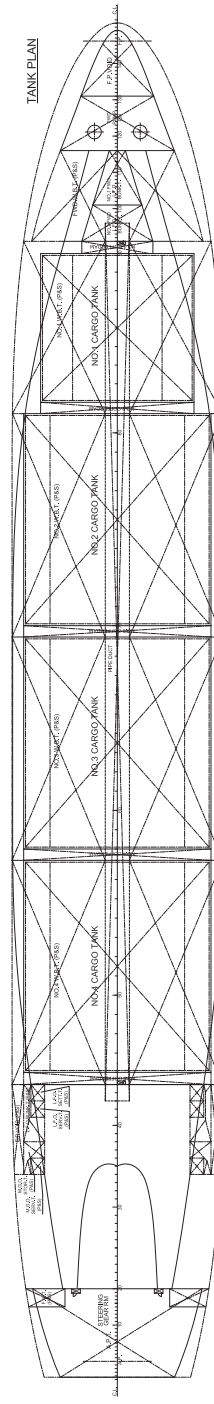
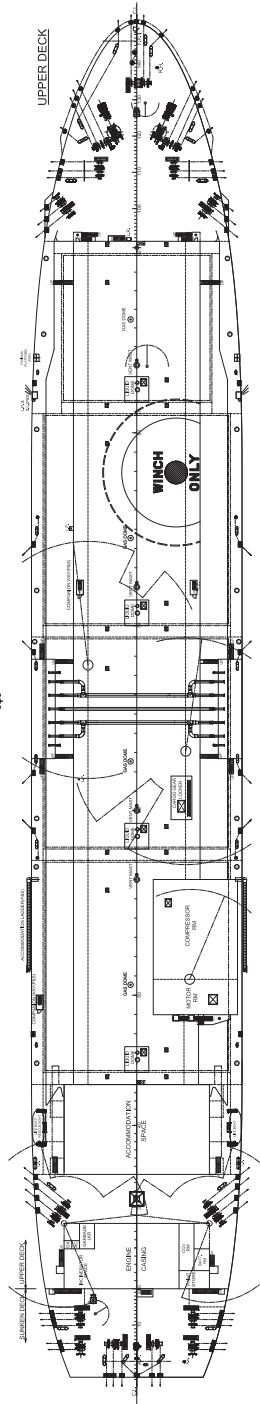
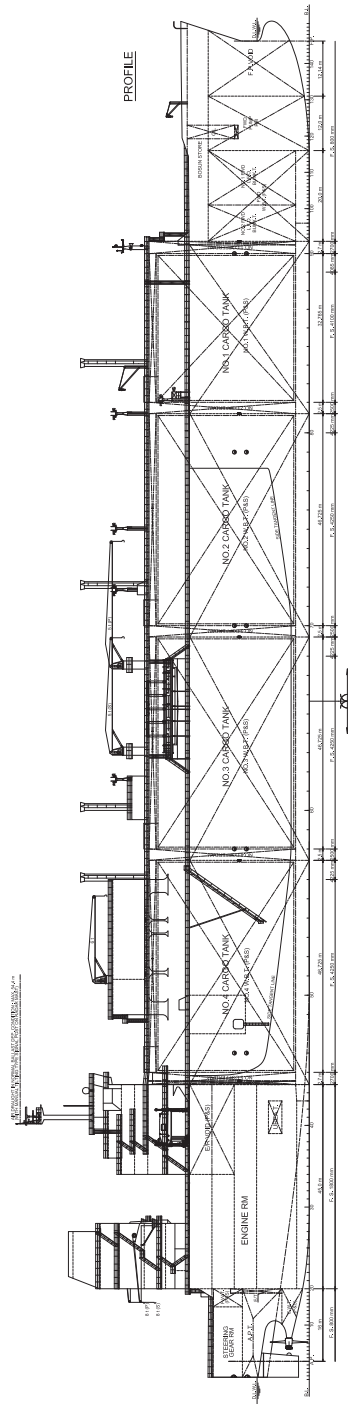
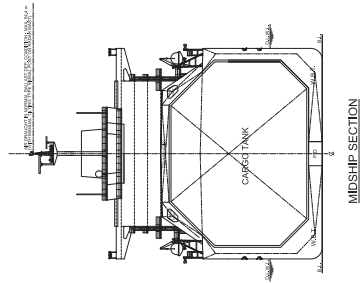
Propulsion	Main engine(s)
Design:.....WinGD	Model:.....Hyundai-WinGD 5X72DF
Manufacturer:.....HHI-EMD	Number:.....2
Type of fuel:.....LNG / LFO / MGO	Output of each engine:.....22,000kW x 73rpm
Is this a diesel-electric or hybrid?:.....N	Propeller(s)
Material:.....Ni-Al-Bronze	Designer/Manufacturer:.....Hyundai Heavy Industries
Number:.....2 twin Skeg ship	Fixed/Controllable pitch:.....Fixed
Diameter:.....8,400mm	Speed:.....73rpm at MCR

Built as the first in what could be a 15-ship order, the 174,000m³ LNG Carrier *Santander Knutsen* was delivered to Knutsen OAS by Hyundai Samho in June 2022. At the time of its ordering in February 2021, Hyundai Samho had said it would build up to 15 vessels of the type in an order worth US\$2.8 billion – the largest ever project for the shipbuilder. The ship along with several of its sisters will be operating under contracts with Shell.

Santander Knutsen is a membrane type LNG carrier featuring a GTT Mark III Flex system from GTT with four tanks. Cargo handling equipment comprises eight Shinko vertical submerged centrifugal pumps. While the cargo capacity of the ship has become an industry standard in recent years, the *Santander Knutsen* features some innovations that mark out its owners' intention to reduce fuel use and improve the efficiency of the vessel.

The hull dimensions are a length overall of 298.97m, a beam of 46.4m and a draught of 12.5m. It is a twin skeg type with Hyundai Hi Rudders with bulb. The ship also features a Silverstream Technologies air lubrication system that reduces friction when underway saving fuel and reducing emissions.

The ship's propulsion power comes from two WinGD 5X72DF main engines each producing 22,000kW at 73rpm. Each engine drives an 8.4m diameter fixed pitch propeller equipped with boss cap fins. Three HiMSEN H35DF engines provide auxiliary power. Two are seven-cylinder versions with an output of 3,360kW each and the third a six cylinder unit with an output of 2,880kW. The main engines are also fitted with shaft generators that can output 1,800kW each. Depending upon ship's hotel demand it is possible to run only the shaft generators with no auxiliaries needed.



SHOFU MARU – BULK CARRIER



Shipbuilder: ..Oshima Shipbuilding Co., Ltd
 Vessel's name: **Shofu Maru**
 Owner/Operator: **Mitsui O.S.K. Lines, Ltd**
 Country: **Japan**
 Designer: **Oshima Shipbuilding Co., Ltd**
 Country: **Japan**
 Flag: **Japan**
 IMO number: **9919395**
 Total number of sister ships already completed (excluding ship presented): **Nil**
 Total number of sister ships still on order: **Nil**

Shofu Maru built by Oshima Shipbuilding for Mitsui O.S.K. Lines (MOL) and delivered in October 2022, is in many respects a typical New Panamax bulk carrier and its claim to significance is in being the first ever vessel to be fitted with the Wind Challenger hard sail system. Built specifically for carrying coal its normal trading pattern will be with coal from Australia, Indonesia and North America to Japan.

The single-screw vessel has hull dimensions of 235m in length, 43m beam and a draught of 13.91m. Its deadweight is 100,422 tonnes and grain cubic is 115,304m³. It is a seven hold ship with side rolling hatch covers and a vertical bow form. What marks the ship out from its peers is the installation on the fo'c'sle of a single telescopic hard sail.

Shofu Maru's main propulsive power will come from the Mitsui-built MAN B&W 6S60ME-C10.5-EGRBP super long stroke main engine which produces 9,180kW power at 84rpm. The main engine and the ship's three Daihatsu gensets are all connected to an Alfa Laval scrubber to meet IMO SOx 2020 regulations even when running on HFO.

The concept of the Wind Challenger hard sail system was studied by a joint industry project lead by the University of Tokyo over a period of 10 years. Its rigid sail has a crescent wing section and also has vertically telescopic reefing and self-rotating mechanisms. The system on Shofu Maru has four vertical sections. The sail will be retracted and turned to present the least resistance when sailing into the wind or when conditions dictate.

The introduction of the Wind Challenger is expected to reduce CO₂ emissions by around 5% on a Japan-Australia voyage and about 8% on a Japan-North America West Coast voyage, compared to a conventional vessel of the same type. An 81.1% sail utilisation rate was reported for the sail during the ship's first round trip voyage from Japan to Newcastle NSW.

TECHNICAL PARTICULARS

Length oa:.....235.00m
 Breadth moulded:.....43m
 Depth moulded
 to main deck:.....20.05m
 to upper deck:.....20.05m
 Draught
 scantling:.....13.91m
 Gross:.....58,209
 Deadweight
 scantling:.....100,422MT

Cargo capacity (m³)
 Grain:.....115,304m³
 Bunkers (m³)
 Heavy oil:.....3,294m³
 Diesel oil:.....312m³
 Water ballast (m³):.....43,795m³

Classification society and notations:.....Nippon Kaiji Kyokai
 NS* (BCM, BC-XII,GRAB, PSPC-WBT, NC, EQ WAPS-S, 1C)(IWS)(PSCM)(IHM)(NOx-III(SCR,EGR)) (SOx(EGCS)), MNS*, Double hull construction applied to all cargo holds, (SOx(EGCS-M/E, G/E(Nos.1,2,3))), (NOx-III(2021)(M/E:EGR),(G/E(Nos.1,2,3):SCR))

Propulsion
 Main engine(s)
 Design:.....Mitsui E&S Machinery Co., Ltd
 Model:.....Mitsui MAN B&W 6S60ME-C10.5-EGRBP
 Manufacturer: ..Mitsui E&S Machinery Co., Ltd
 Number:.....1
 Type of fuel:.....HFO
 Output of each engine:.....9,180kW @84rpm
 Is this a diesel-electric or hybrid?:.....No

Propeller(s)
 Material:.....Ni-Al Bronze
 Designer/Manufacturer:.....Nakashima Propeller Co., Ltd
 Number:.....1
 Fixed/Controllable pitch:.....Fixed

Diesel-driven alternators
 Number:.....3
 Engine make/type:.....Daihatsu Diesel Mfg. Co., Ltd
 Type of fuel:.....HFO
 Alternator make/type:.....Taiyo Electric Co., Ltd

Exhaust-gas scrubbing equipment
 Manufacturer:.....Alfa Laval
 Type:.....Venturi
 On main engines?:.....1 set of main engine exhaust gas line
 On auxiliary engines?:.....3 sets of main generator engine exhaust gas line

Boilers
 Number:.....1
 Type:.....Vertical cylindrical composite type
 Make:.....Alfa Laval K.K.

Other cranes
 Number:.....1
 Make:.....Kyoritsu Kikai Co., Ltd
 Type:.....Electric motor driven
 Tasks:.....Mach. Parts / Prov. /Suez Boat / IBC container Handling Crane
 Performance:.....4.OMT

Mooring equipment
 Number:.....6-mooring winch, 2-windlass/
 mooring winch
 Make:.....Nippon Pusnes Co., Ltd
 Type:.....Electro-hydraulic

Special lifesaving equipment
 Number of each and capacity:....2 x lifeboats (25P)
 Make:.....Shigi Shipbuilding Co., Ltd
 Type:.....F.R.P. totally enclosed

Cargo/capacity
 Hatch covers
 Design:.....Iknow Machinery Co., Ltd
 Manufacturer:.....Iknow Machinery Co., Ltd
 Type:.....Weather-tight side rolling type

Ballast control system
 Make:.....Nakakita Seisakusyo Co., Ltd
 Type:.....Multi control panel
 Ballast water treatment system
 Make:.....Techross Inc

Complement
 Officers:.....8
 Crew:.....13
 Supernumeraries/Spare:.....4

Navigation and other equipment
 Bridge control system
 Make:.....Furuno Electric Co., Ltd
 Is bridge fitted for one-man operation?:...No
 Integrated bridge system:.....Y
 If yes, make:.....Furuno Electric Co., Ltd

Radars
 Make:.....Furuno Electric Co., Ltd

Fire detection system
 Make:.....Consilium Nittan Marine Ltd
 Type:.....Smoke, Thermal, Flame

Fire extinguishing systems
 Cargo holds
 Make/Type:.....-/ Sea water fog/jet
 Engine room
 Make/Type:.....Kashiwa Co., Ltd / Foam fire extinguishing system
 Cabins:.....as per rule requirement
 Public spaces:.....as per rule requirement

Waste disposal plant
 Waste handled:.....Garbage and waste oil
 Incinerator
 Make:.....Sunflame Co., Ltd
 Waste shredder/crusher
 Make:.....Mitsuboshi Chuki Mfg. Co., Ltd
 Sewage plant
 Make:.....Taiko Kikai Industries Co., Ltd

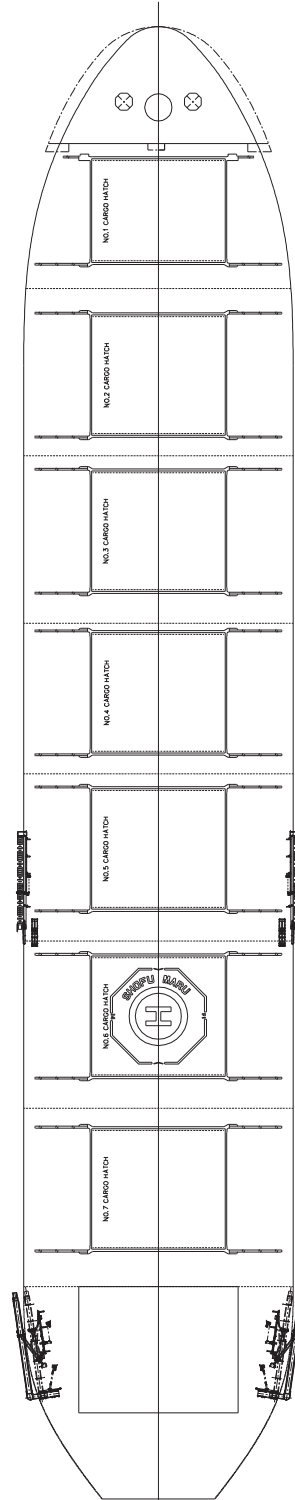
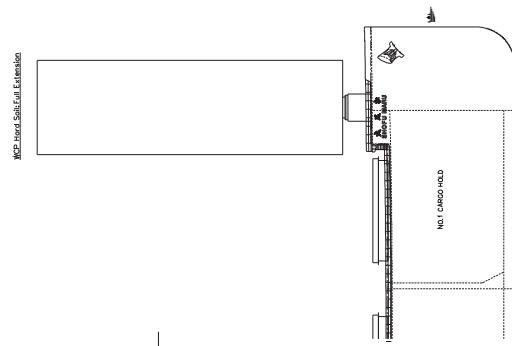
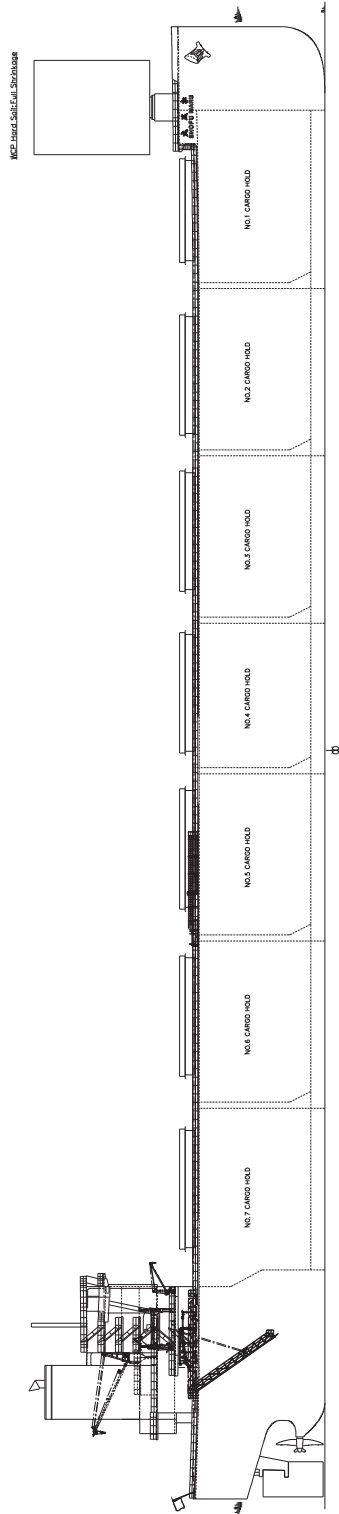
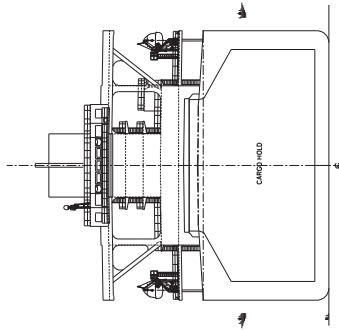
Efficiency
 Wind Challenger Hard Sail
 • Height:.....Max. about 53m (4-stage telescoping)
 • Width:.....about 15m
 • Sail material:.....FRP

Installation of one hard sail on the vessel is expected to reduce GHG emissions by about 5%-8%(*) compared to a conventional vessel of the same type.
 (*) • about 5% on a Japan-Australia voyage
 • about 8% on Japan-North America West Coast voyage.

Delivery date:.....7 October 2022



SHOFU MARU



STENA CONVOY – CHEMICAL/PRODUCTS TANKER



Make:Kangrim
Output, each boiler:Auxiliary boiler (18,000kg/h), Composite boiler (2,000kg/hr / 300kg/h)

Deck machinery
Cargo cranes/cargo gear
Number:1
Make:Oriental
Type:Elec.-Hyd.Type
Performance:SWL 10ton (with Personnel Handling SWL 1ton), Working Radius – 5.3m ~ 24m

Other cranes
Number:1
Make:Jiangsu Masada
Type:Elec.-Hyd.Type
Tasks:Provision Crane
Performance:SWL 4ton, Working Radius – 2.4m ~ 10m

Mooring equipment
Number:2 x Windlass / 6 x Mooring Winch
Make:Flutek
Type:Hydraulic

Special lifesaving equipment
Number of each and capacity:1 x Lifeboat / 1 x Lifeboat combined with Rescue boat
Make:Hyundai Lifeboat
Type:Gravity Type

Cargo tanks
Number:12 cargo tanks and 2 No.7 / slop tanks
Grades of cargo carried:IMO ship type 2 and 3

Product range:Crude oil / Petroleum products / Chemical cargoes compatible with ship type 2 & 3 / Caustic Soda (Sodium Hydroxide Solution) (S.G. = 1.55)
Stainless steel – structure/piping:Mild steel / SUS316L

Cargo pumps
Number:12 cargo / 2 No.7 / slop tanks
Type:Submerged
Make:Framo
Stainless steel:EN 1.4432 stainless steel
Capacity (each):600m³/h (cargo tanks), 300m³/h (No.7/slop tank)

Cargo control system
Make:Framo
Type:Piano type control console

Ballast control system
Make:Framo
Type:Piano type control console

Ballast water treatment system
Make:Panasia
Capacity:1,500m³/h 1 set

Complement
Officers:4
Crew:13
Suez/Repair Crew:1
Single/double/other rooms:8

Navigation and other equipment
Bridge control system

Make:Hyundai Global Service
Type:Bridge Control Console (floor mounting and self standing)
Is bridge fitted for one-man operation?:N
Integrated bridge system:N

Radars
Number:2 sets
Make:Furuno
Model(s):FAR-2338S-NXT, FAR-2338-NXT

Fire detection system
Make:Autronica
Type:Fire Alarm System, Autroprime

Fire extinguishing systems
Engine room:CO₂ fire extinguishing system local fire extinguisher
Make/Type:NK / High pressure, fixed / Seaplus

Cabins:Fire extinguisher
Make/Type:Fain / Portable
Public spaces:Fire extinguisher
Make/Type:Fain / Portable

Efficiency
Attained EEDI value:4.05 gCO₂/tnm
Required EEDI value:4.97 gCO₂/tnm

Contract date:12 October 2020
Launch/float-out date:22 December 2021
Delivery date:17 March 2022

Shipbuilder:Hyundai Mipo Dockyard Co., Ltd
Vessel's name:Stena Convoy
Owner/Operator:Mitsui & Co., Ltd
Country:Japan
Designer:Hyundai Mipo Dockyard Co., Ltd
Country:Korea
Model test establishment used:Korea Research Institute of Ships and Ocean Engineering
Flag:Panama
IMO number:9543110
Total number of sister ships already completed (excluding ship presented):7
Total number of sister ships still on order:1

TECHNICAL PARTICULARS

Length oa:abt. 183m
Length bp:175.15m
Breadth moulded:32.2m
Depth moulded
to upper deck:19.1m
Width of double skin
side:2.0m
bottom:2.15m
Draught
scantling:13.237m
design:11.0m
Gross:29,950
Deadweight
scantling:49,999
design:38,100
Speed, service:14.5kts
Cargo capacity (m³)
Liquid volume:54,400
Bunkers (m³)
Heavy oil:1,610
Diesel oil:250
Water ballast (m³):20,900
Daily fuel consumption (tonnes/day)
Main engine only:FO – 21.9
Classification society and notations:ClassNK NS*(CSR, TOB/CT II & III, PSPC-WBT,NC) (ESP) (HCM-GBS) (IWS) (PSCM) (EA) (IHM) (NOx-III(SCR)) (SOx(EGCS)) MNS*(MO)
Propulsion
Main engine(s)
Design:MAN
Model:Hyundai-MAN B&W 6G50ME-C9.6-HPSCR
Manufacturer:HHI-EMD
Number:1 set / ship
Type of fuel:HFO/MGO/MDO
Output of each engine:10,320kW x 100rpm (Nominal Rating). 7,180kW at 86.9MCR
Is this a diesel-electric or hybrid?:N
Propeller(s)
Material:Ni-Al Bronze
Designer/Manufacturer:HMD/HHI-EMD
Number:1 EA
Fixed/Controllable pitch:Fixed
Diameter:6.8m
Speed:86.9rpm @ MCR
Diesel-driven alternators
Number:3 EA
Engine make/type:HiMSEN / 6H21/32
Type of fuel:HFO / MDO
Alternator make/type:Hyundai Electric / HFC7 508-08P
Output/speed of each set:1,412.5kW / 900rpm
Exhaust-gas scrubbing equipment
Manufacturer:Panasia
Type:Open loop type
On main engines?:Main engine
On auxiliary engines?:2 sets of G/E, Auxiliary boiler
Boilers
Number:2 EA
Type:Auxiliary boiler (Water tube), Composite boiler (Water tube / Smoke tube)

Owned by Mitsui and built at Hyundai Mipo, the eco MR product tanker *Stena Convoy* was delivered in March 2022 into a charter with Stena Bulk. A sister vessel, *Stena Conductor*, was delivered in June 2022. When announcing the charter in 2021, Stena Bulk said that the vessels would be 20% more fuel-efficient than the first generation of eco vessels and at their delivery the most efficient MR tankers in service.

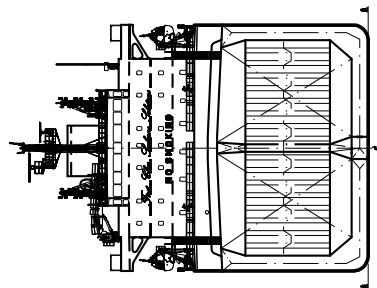
The 49,999dwt vessels have hull dimensions of 183m loa, 32.2m beam and a draught of 13.32m and have a bulbous bow and transom stern. They are built to a Hyundai Mipo design and at the time of their ordering in 2020, the builder also contracted a number of sales with other operators.

Stena Convoy and its sister can carry IMO type 2 and 3 cargoes as well as petroleum products. Total cargo capacity is 54,400m³ in six pairs of cargo tanks and two slop tanks. Discharging is by a dedicated Framo submerged stainless steel pump for each tank. Those in the cargo tanks operate at 600m³/h while those in the slop tanks have a capacity of 300m³/h.

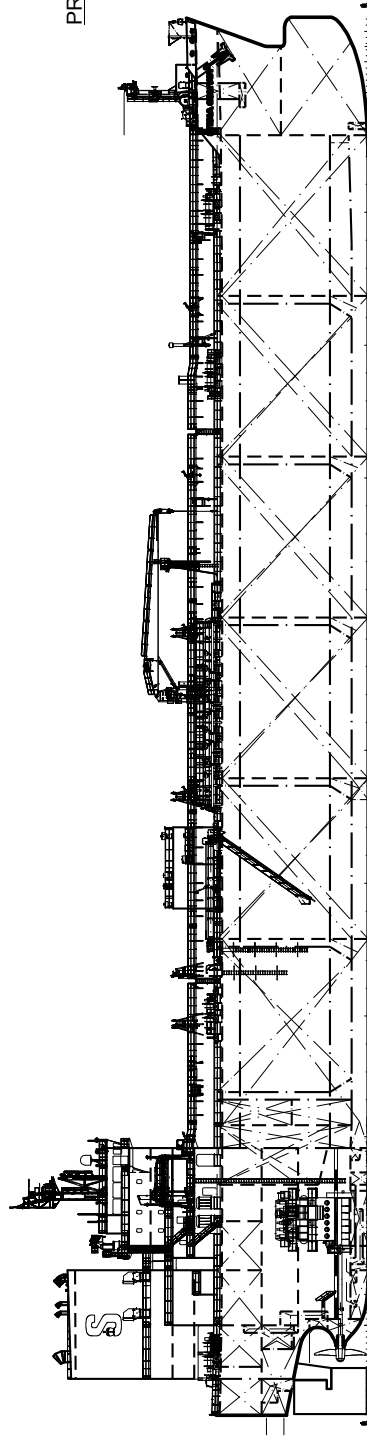
The main engine is a MAN B&W 6G50ME-C9.6-HPSCR ultra-long stroke type outputting a nominal 10,320kW at 100rpm although the engine has been downrated to operate at 86.9rpm when power will be 7,180kW. Auxiliary power comes from three HiMSEN 6H21/32 gensets each with an output of 1,412.5kW at 900rpm.

The HPSCR suffix denoting that the engine employs high-pressure selective catalytic reduction to meet IMO NOx Tier III requirements. A 6.8m diameter fixed pitch propeller gives a service speed of 14.5kt. For 2020 SOx compliance, a Panasia open loop scrubber cleans the exhausts of the main engine, two of the gensets and the auxiliary boiler.

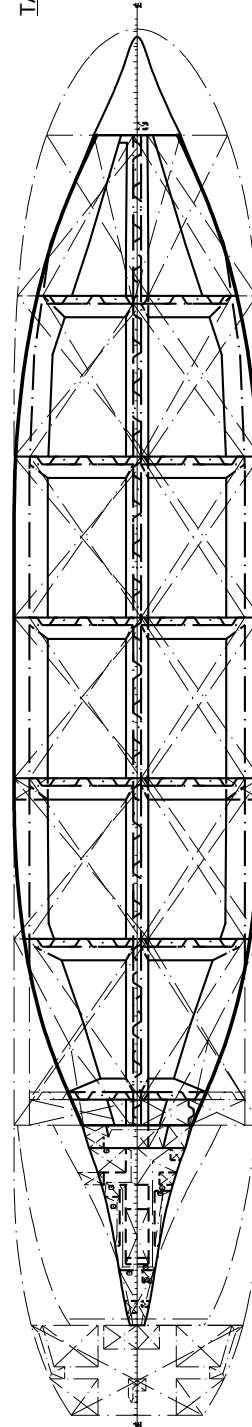
An attained EEDI of 4.05 is comfortably inside the required 4.97.



MIDSHIP



PROFILE



TANK TOP



STENA PRO PATRIA – CHEMICAL/PRODUCTS TANKER



Type:GP 410-10t-25m
 Performance:.....Electro-hydraulic cylinder luffing jib crane
 Other crane: Provision Crane
 Number: 1
 Make: TTS Bohai
 Type: MRE0354 3.5T-4M monorail provision crane
 Tasks:For provision and equipment handling
 Performance:.....Electrical monorail provision crane
 Other crane: Engine room crane
 Number: 1
 Make: Danish Crane Building A/S
 Type: 3.5t DCB single girder E/R crane
 Tasks: dismantled and inspected for main engine
 Performance: 35tonnes SWL
 Mooring equipment
 Number: 6
 Make: MacGregor
 Type: Electro-hydraulic
 Special lifesaving equipment:
 Aft: ... 6.8m totally enclosed fire protected life boat (include equipment/spare part of engine 1 set
 Type: JY-FF-6.8
 Make: Jiangsu Jiaoyan Marine Equipment Co., Ltd
 Starboard: 4.5m rescue boat,
 Type: GJ4.5B,
 Make: Jiangsu Jiaoyan Marine Equipment Co., Ltd
 Cargo tanks included Slop tanks: 18
 Grades of cargo carried: ... Chemical/Crude oil
 Cargo pumps
 Number: 18
 Make: Framo
 Type: SD150
 Stainless steel: Y
 Capacity (each): 375m³/h
 Cargo control System
 Make: Emerson
 Type: Electro-hydraulic
 Ballast control System
 Make: Emerson
 Type: Electro-hydraulic
 Ballast water treatment system
 Make: Headway
 Capacity: 800m³/h x2 + 300m³/h x1
 Complement
 Captain class: 2
 Senior class: 2
 Junior class: 12
 Crew class: 14
 Suez/Repair Crew: 6
 Radars
 Number: 2
 Make: Furuno
 Model(s): FAR-3320/FAR-2338S
 Fire detection system
 Make/Type: Consilium / Salwico cargo
 Fire extinguishing system
 Engine room: High pressure CO₂ fire extinguishing system
 Make/Type: Survitec Fire Solutions China Co., Ltd / CO₂ gas
 Cabins: Seawater fighting system
 Make/Type: fix-water fighting system
 Public spaces: Seawater fighting system
 Make/Type: fix-water fighting system
 Waste disposal plant
 Make: Alfa Laval
 Type: Fresh Water Generator
 Model: Aqua Blue-C80-HWS-FS-1/ship
 Incinerator
 Make: CSSC Nanjing Luzhou Machine Co., Ltd
 Type: GS 500CICS, capacity nominal: 930kW / Sludge oil burning capacity nominal (IMO spec.): 105Kg/h
 Solid waste capacity nominal: 62Kg/h
 Sewage plant
 Make/Model: Wärtsilä Water Systems Ltd / STC02-13
 Contract date: 19 November 2019
 Launch/float-out date: 30 October 2021
 Delivery date: 17 June 2022

Shipbuilder: **Guangzhou Shipyard International Company Limited**
 Vessel's name: **Stena Pro Patria**
 Owner/Operator: **Proman Stena**
 Country: **Sweden**
 Model test establishment used: **SSPA Sweden AB**
 Flag: **Cyprus**
 IMO number: **9899727**
 Total number of sister ships already completed (excluding ship presented): **4**
 Total number of sister ships still on order: **2**

Delivered in June 2022 by Guangzhou Shipyard International to the Proman Stena joint venture, the 49,990dwt Chemical product tanker *Stena Pro Patria* is the first of six methanol-fuelled vessels designated as the IMOIIMeMAX class. The design is an evolution of Stena's original acclaimed and highly efficient 13-ship IMOIIMax class with the additional Me signifying the type of fuel used.

As an IMO 2 type tanker the vessel can carry most chemical cargoes and oil products. It has 16 cargo tanks and two slop tanks all of 3,000m³ capacity each. The two slop tanks are used for carrying the methanol fuel for the ships dual-fuel engine. Each tank has a Framo SD150 pump for discharging at a rate of 375m³/h. The large number of tanks and segregation permits a flexible cargo intake of different products. A nitrogen generator is installed to aid in tank cleaning.

Just as the ship is an evolution of an earlier design, so too is the main propulsion engine. The W suffix of the ship's MAN B&W 6G50ME-C9.6-LGIM-W indicates that the methanol fuelled engine incorporates a blending system that adds water to the methanol fuel. This allows the ship to meet NOx Code Tier III requirements without using SCR or EGR thus saving capital costs and reducing weight. The engine can also run on conventional oil fuels. Running on Methanol means the ship needs no SOx reduction systems.

The power output of the main engine is a SMCR of 7,600kW, a downrating of the potential 10,000plus kW of the engine type.

TECHNICAL PARTICULARS

Length oa: 186.0m
 Length bp: 182.6m
 Breadth moulded: 32.2
 Depth moulded
 to main deck: 18.35m
 to upper deck: 18.35m
 Width of double skin
 side: 2.0m
 bottom: 2.15m

Draught
 scantling: 13.0m
 design: 11.5m
 Displacement: 61,408.4t
 Lightweight: 11,418.4t
 Deadweight
 scantling: 49,990t
 design: 42,500t
 Speed, service (CSR output): 14.5kts with 15% sea margin

Cargo capacity (m³)
 Liquid volume: 54,000
 Bunkers (m³)
 Methanol: 6,000
 LS heavy fuel: 1,200
 Diesel oil: 200
 Water ballast (m³): 21,140
 Tankers - percentage segregated ballast: ... 100%
 Daily fuel consumption: SFOC 165.7g/kWh

Classification society and notations: DNV GL +1A Tanker for Oil Products ESP and Tanker for Chemicals ESP, CSR, EO, LFL fuelled,ETC, LCS, RECYCLABLE, Clean,TMON (oil lubricated), BWM(T),VCS (2), BIS,COAT-PSPC(B), SPM
 Register information: Ship type 2, a2, b3, c3, v3, f2, str0.075, k, ssp

The vessel to be designed as per the Class notation NAUT(OC), not including in certificate Propulsion

Main engine(s)
 Design: MAN
 Model: MAN 6G50ME-C9.6-LGIM-W
 Manufacturer: HHI
 Number: 1
 Type of fuel: MGO, methanol, methanol in water, fuel in water
 Output of each engine: SMCR 7,600kW at 84.4rpm, CSR 5,700kW at 76.7rpm

Propeller(s)
 Material: Bronze
 Designer/ Manufacturer: 702/dpcc
 Number: 1
 Fixed/Controllable pitch: Fixed
 Diameter: 7.2m
 Speed: 84.4rpm

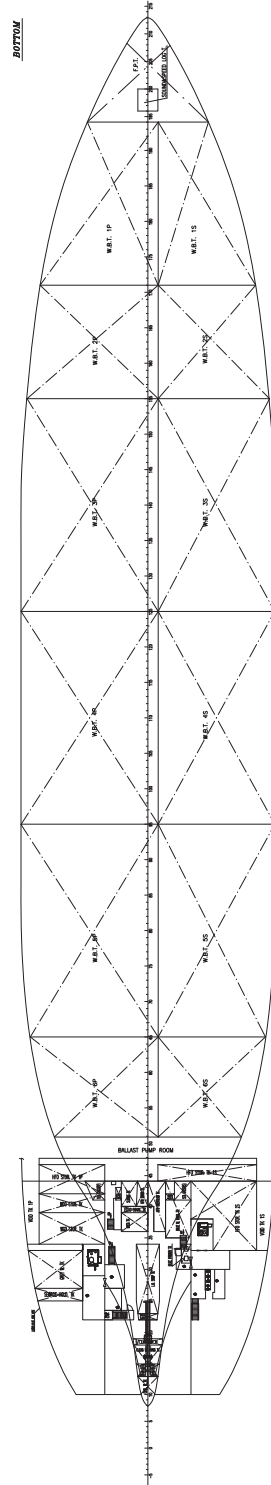
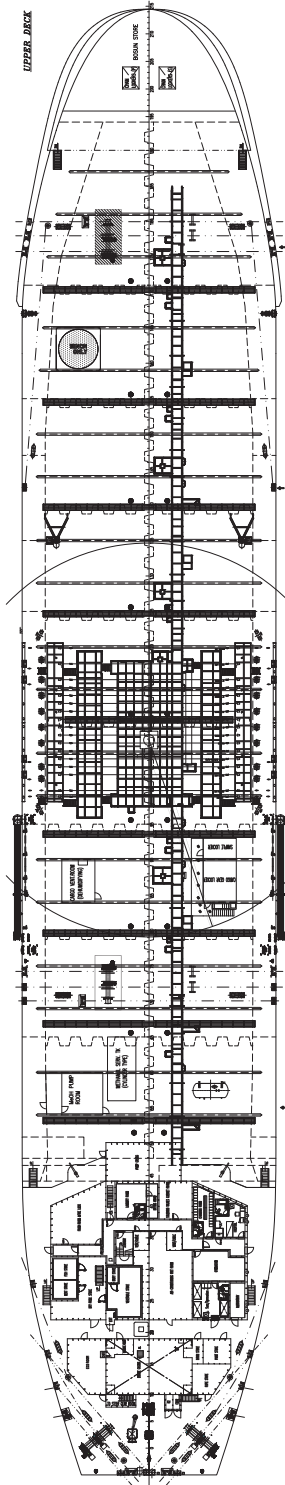
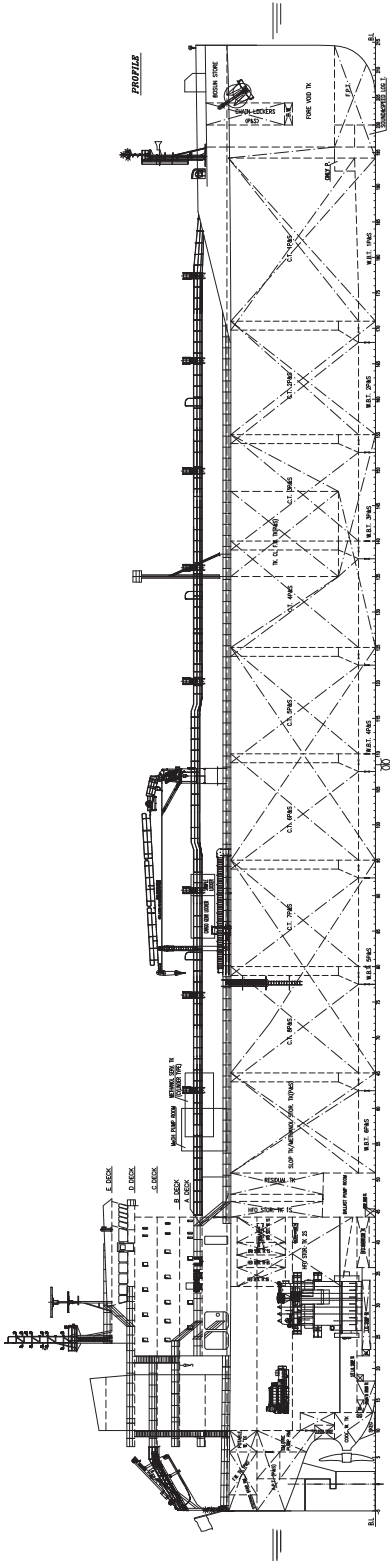
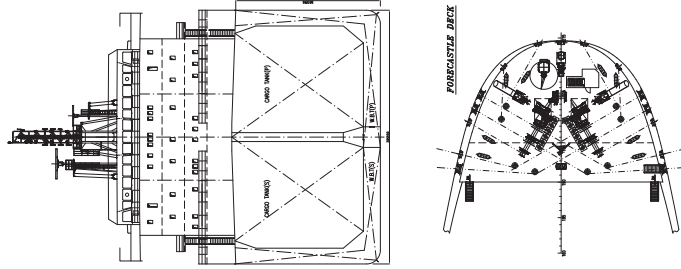
Main-engine driven alternators
 Number: 3
 Make/type: Zhenjiang / MAN Energy Solutions 3 x 6L23/30H x 900rpm
 Output/speed of each set: MCR 1,050kW at 900rpm

Boilers
 Number: 3
 Type: Oil fired boiler and composite boiler
 Make: Alfa Laval
 Output, each boiler: Boiler plant: Oil fired boiler: 2 x oil fired 12,500kg/h x 7bar / composite boiler: 1 x Aalborg OC-TCl 1,200kg/h x 7bar

Deck machinery
 Cargo cranes/cargo gear
 Number: 1
 Make: TTS Bohai



STENA PRO PATRIA



STL YANGTZE – ETHANE/LPG CARRIER



Shipbuilder: **Hyundai Heavy Industries Co., Ltd**
 Vessel's name: **STL Yangtze**
 Owner/Operator: .. **Eastern Pacific Shipping Pte. Ltd**
 Country: **Singapore**
 Designer: **Hyundai Heavy Industries Co., Ltd**
 Country: **Republic of Korea**
 Flag: **Liberia**
 IMO number: **9918171**
 Total number of sister ships already completed (excluding ship presented): **4**
 Total number of sister ships still on order: **1**

Delivered by Hyundai Heavy Industries in April 2022, the 98,050m³ Very Large Ethane Carrier (VLEC) *STL Yangtze* is the first in a series of six vessels for Singapore-based Eastern Pacific Shipping intended for carriage of ethane and LPG. Four of the sisters were delivered later in 2022 and the final ship was undergoing sea trials in late February 2023. The ships are a further step on the owner's route to expanding the number of dual-fuel vessels across all sectors it is active in. These vessels also have reimagined accommodations, as part of the EPS Life at Sea Programme aimed at improving seafarers' welfare and mental health.

The STL element of the ships' names indicate all six vessels have been fixed on 15-year charters to China-based Zhejiang Satellite Petrochemical (STL) and will carry ethane between the US Gulf Coast to STL's plant in Lianyungang, China.

Hull dimensions are 229.97m loa, 36.6m beam and 12.55m draught, typical for VLGCs as these are the maximum size permitted by the majority of IPG loading ports. *STL Yangtze* is a fully refrigerated vessels designed for carrying liquefied gas cargoes at -104°C at near atmospheric pressure. Cargo is carried in four GTT Mark III membrane tanks and discharged using eight Svanehøj deepwell tanks with a capacity of 650m³/h each.

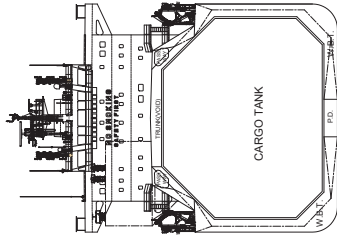
The vessel is powered by a Hyundai MAN B&W 6G60ME-C9.5-GIE-HPSCR dual-fuel main engine rated at 12,429kW. This is the least common of MAN's dual-fuel two-stroke engines with only 37 ordered as of November 2022. The engine is an ultra-long stroke model with high pressure selective catalytic reduction for meeting NOX Tier III requirements. Use of ethane boil off means CO₂ emissions are around 15-20% lower and SOx emissions virtually nil.

STL Yangtze features three Hyundai proprietary energy saving devices; a pre-swirl duct, Hi-Rudder with bulb and Hi-Fin hull appendages. It is also equipped with Hyundai-ISS (Integrated Smart ship Solution) to help voyage monitoring, route optimisation, fuel/energy flow monitoring, performance analysis and reporting.

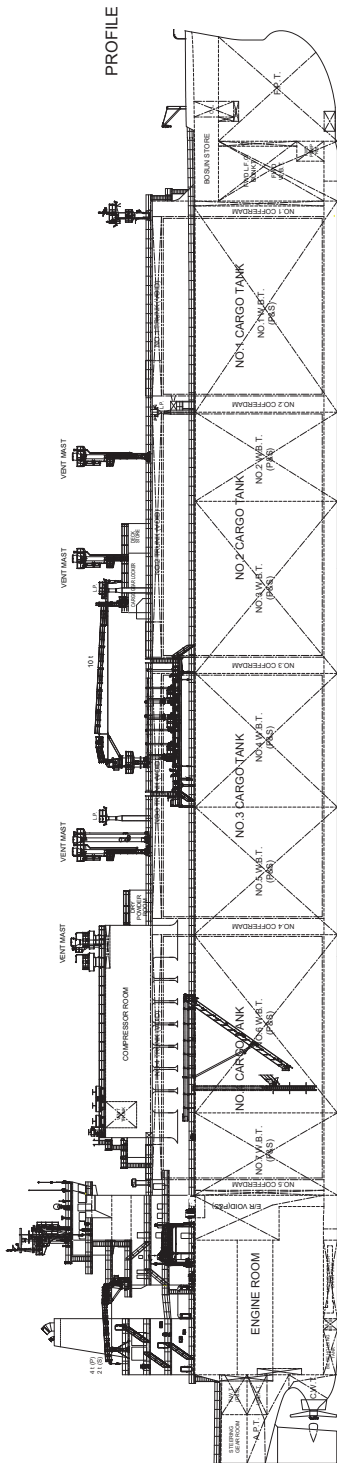
TECHNICAL PARTICULARS

Length oa: 229.97m
 Length bp: 224.60m
 Breadth moulded: 36.60m
 Depth moulded
 to main deck: 22.80m
 to upper deck: 22.80m
 to other decks: 29.70m (Trunk deck), 18.48m (Sunk. Deck)
 Width of double skin
 side: 2.04m
 bottom: 2.15m
 Draught
 scantling: 12.55m
 design: 11.70m
 Gross: 60,776
 Deadweight
 scantling: 64,012t
 design: 57,745t
 Speed, service: 17kts
 Cargo capacity (m³)
 Liquid volume: 98,050
 Bunkers (m³)
 Heavy oil: 2,330
 Diesel oil: 370
 Water ballast (m³): 36,500
 Daily fuel consumption (tonnes/day)
 Main engine only: 50.5t
 Classification society and notations: ABS +A1, Liquefied Gas Carrier, (E), +AMS, +ACCU, CPS, SH, SHCM, BWT, DFD-Ethane, IHM, LEIQ, RRDA, RW, TCM, UWILD, CRC(SC,SP), NOx-Tier III, LNG Cargo Ready(with the descriptive letters CC, DF, PP)
 Propulsion
 Main engine(s)
 Design: MAN B&W
 Model: 6G60ME-C9.5-GIE-HPSCR
 Manufacturer: Hyundai Heavy Industries (Engine & Machinery Division)
 Number: 1
 Type of fuel: LFO / MGO / Ethane
 Output of each engine: 12,429kW
 Is this a diesel-electric or hybrid?: N
 Propeller(s)
 Material: Ni-Al-Bronze
 Designer/Manufacturer: Hyundai Heavy Industries (Engine & Machinery Division)
 Number: 1
 Fixed/Controllable pitch: Fixed pitch
 Diameter: 7.5m
 Speed: 89.5rpm
 Diesel-driven alternators
 Number: 3
 Engine make/type: Hyundai HiMSEN 8H21/32 (Four Stroke, Trunk Piston in-line type)
 Type of fuel: LFO / MGO
 Alternator make/type: Hyundai Electric & Energy System / HFC7 636-08P
 Output/speed of each set: 1,670kVA x 900rpm
 Boilers
 Number: 1
 Type: Automatic, Forced Draft, LFO Burning Marine Boiler (PA0501P32)
 Make: Kangrim

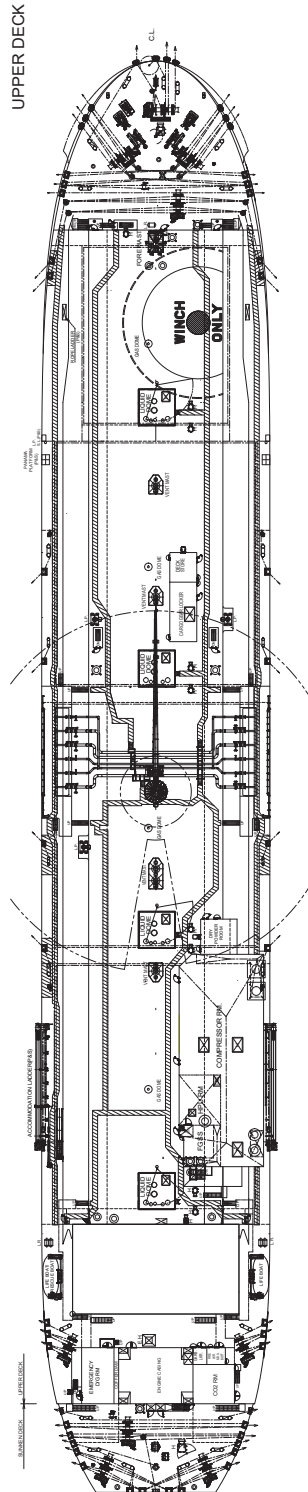
Output, each boiler: 3,000kg/h
 Deck machinery
 Cargo cranes/cargo gear
 Number: 1
 Make: Sangsangin Industry Co., Ltd
 Type: Elec. Hyd Type
 Performance: SWL 10t, Radius Max 29m ~ Min 5.8m
 Other cranes
 Number: 2
 Make: Sangsangin Industry Co., Ltd
 Type: Elec. Hyd Type
 Tasks: Provision Crane
 Performance: SWL 4t, Radius Max 15m ~ Min. 4.2m / SWL 2t, Radius Max 17m ~ Min. 4.4m
 Mooring equipment
 Number: 9
 Make: Flutek
 Type: hydraulic
 Special lifesaving equipment
 Number of each and capacity: 28 persons
 Make: HLB
 Type: Total enclosed (HLB65F)
 Cargo tanks
 Number: 4, GTT Mark III
 Grades of cargo carried: Ethane
 Product range: Commercial Ethane, Commercial Butane, Pure Propane, Commercial Propane, Mixture of Propane and Butane, Propylene, Ethylene
 Cargo pumps
 Number: 8
 Type: DW 250-4-K+I
 Make: Svanehøj Denmark A/S
 Capacity (each): 650m³/h x 180mlc
 Cargo control system
 Make: Kongsberg
 Type: K-Chief 600
 Ballast control system
 Make: Kongsberg
 Type: K-Chief 600
 Ballast water treatment system
 Make: Techcross
 Capacity: 2,000m³/h
 Complement
 Officers: 12
 Crew: 16
 Navigation and other equipment
 Bridge control system
 Make: Kongsberg
 Type: K-Chief 600
 Is bridge fitted for one-man operation?: N
 Integrated bridge system: N
 Radars
 Number: 2
 Make: JRC
 Model(s): JMR-9282-S, JMR-9225-6X
 Fire detection system
 Make: Autronica
 Type: Fire Alarm System AutoSafe
 Fire extinguishing systems
 Engine room: CO₂ Fire Extinguishing system
 Make/Type: Fain Co., Ltd
 Waste disposal plant
 Incinerator
 Make: Hyundai Marine Machinery Co.,Ltd
 Model: Sludge Oil & Solid Waste Burning (IMO Approved Type)
 Sewage plant
 Make: Jonghap Machinery
 Model: Biological Type (IMO Approved Type)
 Efficiency
 Attained EEDI value: 4.62
 Required EEDI value: 5.76 (w/ phase 2 reduction ratio)
 Installed Fuel Meters: Mass flow meter
 Other installed monitoring tools: Shaft Power Meter, Trim, Draughts
 Energy Saving Technologies*: Hi-PSD, Hi-Rudder w/ bulb, Hi-Fin
 Hull coatings: antifouling paint
 Performance Monitoring Regime: Hyundai-ISS (Integrated Smart ship Solution) / Hi-PSD, Hi-Rudder w/ bulb, Hi-Fin, LED Lighting, Trim Optimisation(Hyundai-ISS)
 Launch/float-out date: 26 November 2021
 Delivery date: 29 April 2022



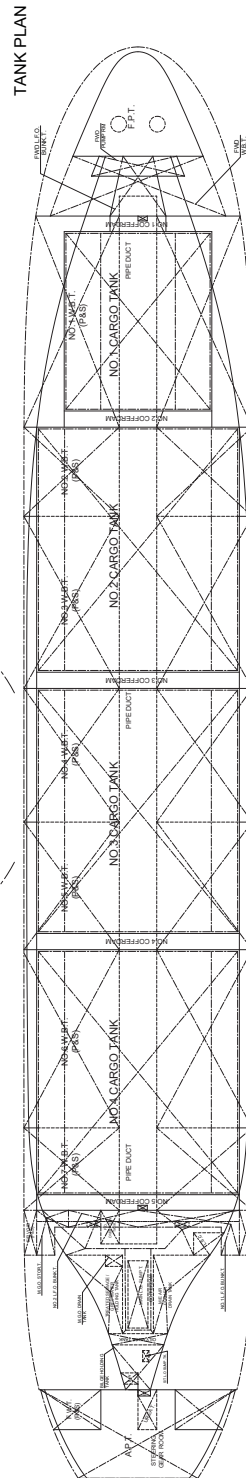
MIDSHIP SECTION



PROFILE



UPPER DECK



TANK PLAN



THERESA GLORY – BULK CARRIER



Shipbuilder: **Austal**
 Vessel's name: **Bajamar Express**
 Owner/Operator: **Fred Olsen Express**
 Country: **Spain**
 Designer: **Austal**
 Country: **Australia**
 Flag: **Spanish Maritime Authority**
 IMO number: **9874296**
 Total number of sister ships already completed (excluding ship presented): **Nil**
 Total number of sister ships still on order: **1**

Theresa Glory is one of the first four of the new generation of 64,000dwt Ultramax size bulk carriers designed and built by Shin Kurushima Sanoyas at the Mizushima yard in Japan. The ship was delivered in December 2022. Three sister ships have been delivered to other Japanese operators in 2022 and deliveries are ongoing in 2023.

At 199.99m in length and with a beam of 32.24m and a draught of 13.495, the ship is at the larger end of the Ultramax class as regards deadweight. Theresa Glory has the vertical bow form that has become a common feature of larger ships.

The five holds with end folding hatchcovers are a typical feature of the type as are the four cranes located along the centreline of the vessel. In this ship the cranes have a capacity of 31tonnes. The ship has a grain capacity of 81,490 and is suitable for most bulks and semi-bulk cargoes. The holds are strengthened for heavy cargoes and when used for this purpose holds 2 and 4 may be left empty.

The designer has built on previous classes of ship size and optimised the vessel for improved efficiency. The propulsion arrangements, improved cargo intake and energy saving features permit the vessel to easily meet the EEDI Phase III requirements despite these not applying until 2025.

The main engine is a derated super-long stroke, Mitsui-built two-stroke engine of MAN B&W type 6S50ME-C9.7. The output of the engine has been limited to 6,650kW at 88.8rpm according to ClassNK records. The directly connected large diameter propeller is aided by the yards proprietary ESDs

including a Sanoyas Tandem fin and Sanoyas Ace Duct which in combination are claimed to reduce fuel consumption by 8%. With the engine running at 85% MCR, Theresa Glory has a service speed of 14.1kts.

TECHNICAL PARTICULARS

Length oa: 199.99m
 Breadth moulded: 32.24m
 Depth moulded
 to main deck: 19.22m
 to upper deck: 19.22m
 Draught
 scantling: 13.495m
 Gross: 36,298
 Deadweight
 scantling: 63,921mt
 Speed, service (85%MCR output): 14.1kts
 with 15% sea margin
 Cargo capacity (m³)
 Grain: 81,490m³
 Bunkers (m³)
 Heavy oil: abt 1,980m³
 Diesel oil: abt 240m³
 Water ballast (m³): abt 32,500m³
 Classification society and notations: Nippon Kaiji Kyokai
 NS*(CSR,BC-A,BC-XII,GRAB20,PSPC-WBT,NC)
 (ESP)(HCM-GBS)(PSCM)(IHM)(EEDI-p3)(NOx-III(SCR,EGR)),MNS*
 Propulsion
 Main engine(s)
 Design: Mitsui E&S machinery Co., Ltd
 Model: MAN B&W 6S50ME -C9.7
 Manufacturer: .. Mitsui E&S machinery Co., Ltd
 Number: 1 set
 Type of fuel: HFO/MDO
 Output of each engine: 6,650 @88.8rpm
 (ClassNK)
 Propeller(s)
 Material: Ni-Al-Bronze
 Designer/Manufacturer: Nakashima Propeller Co., Ltd

Number: 1 set
 Fixed/Controllable pitch: Fixed
 Diesel-driven alternators
 Number: 3 sets
 Engine make/type: Daihatsu Diesel MFG.
 Co., Ltd / 4 cycle diesel engine
 Type of fuel: HFO/MDO
 Alternator make/type: Taiyo Electric Co., Ltd

Boilers
 Number: 1 set
 Type: Composite, vertical smoke
 tube type
 Make: Osaka Boiler MFG Co., Ltd

Deck machinery
 Cargo cranes/cargo gear
 Number: 4
 Make: IKnow Machinery Co., Ltd
 Type: Electro hydraulic Single deck crane

Other cranes
 Number: 3 sets
 Make: Kyoritsu Kikai Co., Ltd
 Type: Electric motor driven fixed davit
 Tasks: Engine parts, provisions, hose
 handling

Mooring equipment
 Number: Windlass 2 sets / Mooring
 winches 2 sets
 Make: Kawasaki Heavy Industries, Ltd
 Type: Electro-hydraulic

Special lifesaving equipment
 Number of each and capacity: 1set x
 24 persons
 Make: Jiangsu Jiaoyan Marine Equipment
 Co., Ltd
 Type: Freefall enclosure type

Cargo/capacity
 Hatch covers
 Design: IKnow Machinery Co., Ltd
 Manufacturer: IKnow Machinery Co., Ltd
 Type: Weathertight folding type

Ballast control system
 Make: Nakakita Seisakusho Co., Ltd

Ballast water treatment system
 Make: Techcross Inc

Complement
 Officers: 10
 Crew: 14

Radars
 Number: 2 sets
 Make: Japan Radio Co., Ltd

Fire detection system
 Make: Nohmi Bosai Ltd

Fire extinguishing systems
 Cargo holds
 Make/Type: Air Water Safety Service Inc. /
 Fixed CO₂ fire extinguishing system

Engine room
 Make/Type: Air Water Safety Service Inc. /
 Fixed CO₂ fire extinguishing system

Cabins
 Make/Type: Seawater
 Public spaces
 Make/Type: Seawater

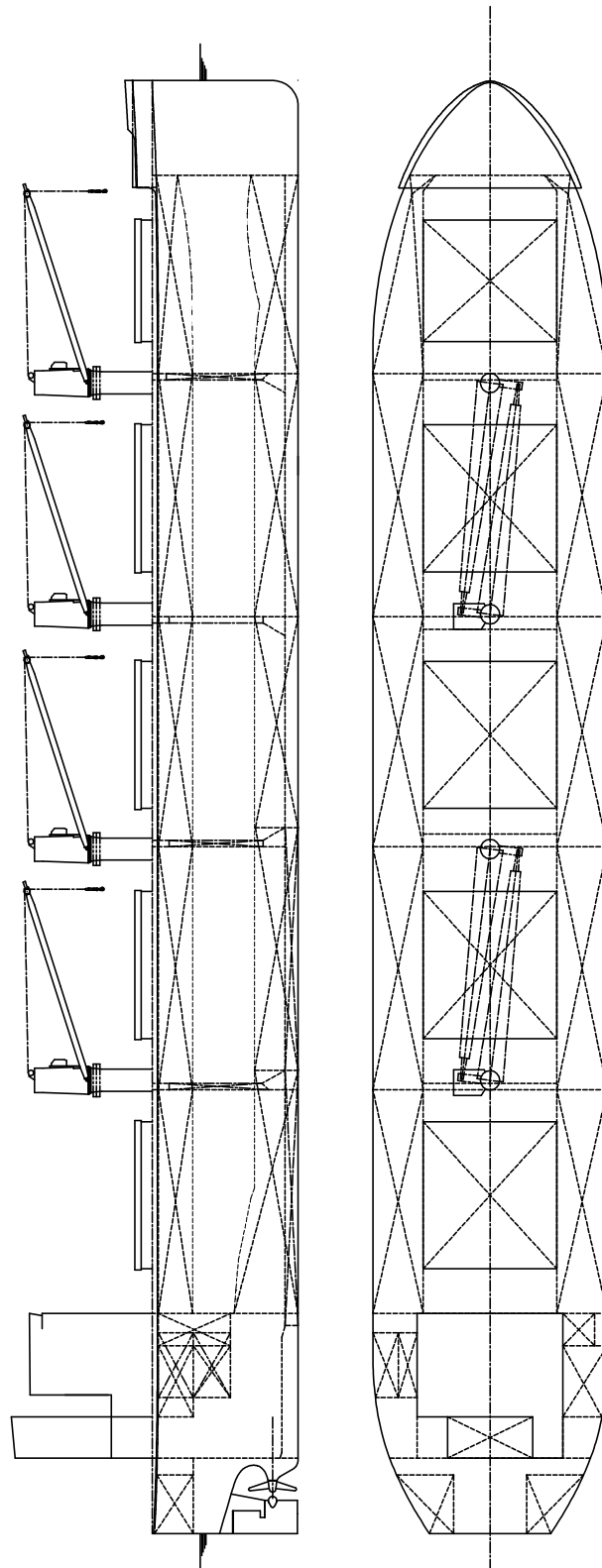
Waste disposal plant
 Incinerator
 Make: Miura Co., Ltd
 Sewage plant
 Make: Taiko Kikai Industries Co., Ltd

Efficiency
 Attained EEDI value: abt -35%
 Energy Saving Technologies*: STF (Sanoyas
 tandem fin, ACE DUCT (Sanoyas Advanced
 flow Controlling and Energy saving DUCT),
 Rudder bulb

Delivery date: 15 December 2022



THERESA GLORY



VLADIMIR ARSENYEV – AFRAMAX SHUTTLE TANKER



Engine make/type:..... HHI (HiMSEN), 4-stroke
9H25/33
Type of fuel:.....HFO, VLSFO, MDO, MGO
Alternator make/type:..... Hyundai electric
Output/speed of each set:2,690kW /
900rpm

Boilers
Number: 2
Type:Oil fired
Make:Alfa Laval
Output, each boiler:35ton/h
Bow thruster(s)
Make: KHI
Number: 1
Output (each):..... 2.4MW
Deck machinery
Cargo cranes/cargo gear
Number: 2
Make:OPCO
Type: High pressure, self-contained
ele.-hyd. single jib type
Performance:..... 15tons SWL, each

Other cranes
Number:..... 2 sets, Provision crane
Make:OPCO
Type: High pressure, self-contained
ele.-hyd. single jib type
Tasks:..... Provision and equipment handling
Performance:..... 5tons SWL, each
Mooring equipment
Number:..... 2 x mooring winches combined
with windlass (1 C/L + 2 M/D + 1 W/H, each),
2 x mooring winches (1 M/D, each) / 6 x
mooring winches (2 M/D + 1 W/H, each)
Make:Kongsberg
Type:Ele.-hyd. driven (high pressure
type), non-auto tension
Special lifesaving equipment
Number of each and capacity:..... 2 x, 30P
Make: Viking / OPCO
Type:Totally enclosed hinged gravity type

Cargo tanks
Number:6 pairs
Grades of cargo carried:.....Crude Oil
Coated tanks:..... Epoxy of 2 coats
320microns (ceiling and bottom)
Cargo pumps
Number:3
Type:Vertical, Single stage, Centrifugal,
Double suction
Make: Hyundai Turbomachinery
Capacity (each).....2,500m³/h, 135m @
S.G. 1.025

Cargo control system
Make:Scana
Type:Hydraulic system
Ballast control system
Make:Scana
Type:Hydraulic system
Ballast water treatment system
Make:Techcross
Capacity:2,600m³/h
Complement
Officers:17
Crew:13
Suez/Repair Crew:..... 6
Single/double/other rooms: ...Total 29 cabins
(Single 28 + Double 1) + 1 cabin (for Suez)

Fire extinguishing systems
Engine room: High pressure CO₂ system
Make/Type:.....NK
Waste disposal plant
Incinerator
Make/Model:..... Teamtec / OG400CS
Sewage plant
Make/Model:..... Il Seung / ISB-06
Efficiency
Attained EEDI value:.....3.55g-CO₂/ton NM
Required EEDI value:.....3.90g-CO₂/ton NM
(based on the Phase 1)
Installed Fuel Meters:.....FO flowmeter for M/E,
G/Es, Aux. boilers (Coriolis)
Energy Saving Technologies*:..... VFD for E/R
supply Fan, SAVER Fin (Hydrodynamic device)
Hull coatings:.....Tin-free SPC AF type (5-year
life time)
Contract date: 29 November 2019
Launch/float-out date:..... December 2021
Delivery date: March 2022

Shipbuilder: **Samsung Heavy Industries Co., Ltd**
Vessel's name: **Vladimir Arsenyev**
Owner/Operator: **Sovcomflot**
Country: **Russia**
Designer: **Samsung Heavy Industries**
Country: **Republic of Korea**
Flag: **Panama**
IMO number: **9901025**
Total number of sister ships already completed (excluding ship presented): **1**
Total number of sister ships still on order: **Nil**

Width of double skin
side:..... 2.3m
bottom:..... 2.4m
Draught
scantling:..... 14.5m
design: 14.5m
Gross:..... 65,500
Displacement:..... 127,600MT
Lightweight: 23,000MT
Deadweight
scantling:..... 104,569MT
design: 104,600MT
Speed, service (–%MCR output): 15.0kts
incl. 15% power margin (90% of DMCR)

Cargo capacity (m³)
Liquid volume: 125,555.9
Bunkers (m³)
Heavy oil: 2,400
Diesel oil: 500
Water ballast (m³): 41,900
Tankers – percentage segregated ballast: ...100%
Daily fuel consumption (tonnes/day)
Main engine only:.... 47.7 metric tons per day at
NCR of the main engine at Tier II mode
without SCR operation.
47.8 metric tons per day at NCR of the main
engine at Tier III mode with SCR operation

Classification society and notations:DNV
*1A, Tanker for Oil, ESP, EO, VCS-2, ICE (1C),
DAT (-30°), Winterized (Cold, -30°), Bow
Loading, SPM, Clean,
TMON (Oil lubricated), NAUT (OC), LCS, CSR,
CSA1, Clean (Design, Tier III), BWM (E(s), T),
BIS, BMON, Recyclable,
ECA (SOx-A), COMF-C (2), ER (Tier III), ECO
Indian Register of Shipping (from Sept 2022):
Hull - "ICE DRAUGHT (m) - Maximum moulded
draught "Upper Ice Water Line" (m) Fore: 15.15
Amidships : 15.15 Aft: 15.50 Minimum
moulded draught "Lower Ice Water Line " (m)
Fore: 5.10 Amidships: 6.65 Aft: 7.25", SUL,
SPM, OIL TANKER, ESP, LOAD COMP(3),
INWATER SURVEY, Ha(B), ERS, CSR. Machinery
- CLEAN-AIR, VCS 1, TCM, SYJ, NV, IY, EP,
CLEAN-SEA

% high-tensile steel used in construction: .abt 75%
Propulsion
Main engine(s)
Design: 2 stroke engine
Model:6X62
Manufacturer: WinGD
Number: 1
Type of fuel:.....HFO, VLSFO, MDO, MGO
Output of each engine: NMCR: 15,960kW
/ DMCR: 13,540kW / NCR: 12,180kW
Is this a diesel-electric or hybrid?:.....N
Propeller(s)
Material:.....Stainless steel
Designer/Manufacturer:Kongsberg
Number: 1
Fixed/Controllable pitch: Controllable
Diameter: 8.0m
Speed: 87rpm
Diesel-driven alternators
Number: 3

Ordered in December 2019 and delivered in April 2022, *Vladimir Arsenyev* is the first of a pair of ice classed, Aframax shuttle tankers built by Samsung Heavy Industries for Russian operator Sovcomflot. The sister vessel, *Nikolay Zadornov*, was delivered later in the year.

Sanctions imposed on Russia in 2022, have resulted in the original flag (Cyprus) and classification society (DNV) being changed to Panama and Indian Register of Shipping respectively. The original DNV class details indicate that the ship is built to Ice C standards and is winterized for operations in temperatures to minus 30°C. They also highlight a number of environmental aspects of the ship.

The vessel is 259m in length, has a beam of 42m and a draught of 14.5m. Its deadweight is 104,600tonnes. It has a bulbous bow and typical for a shuttle tanker, the ship has a bow loading system and single point mooring capability.

Cargo arrangements are six pairs of tanks for a total 125,559m³ capacity. Cargo is discharged by three vertical, single stage, centrifugal double suction pumps supplied by Hyundai Turbomachinery. Each pump has a 2,500m³/h rating.

Power comes from a 6x62 WinGD engine derated to 13,540kW at 87rpm directly connected to a controllable pitch propeller with a diameter of 8m. IMO 2020 SOx requirements will be met by running on low-sulphur fuels or distillates as the vessel is not scrubber fitted. NOx Tier III requirements are met by exhaust gas recirculation. Auxiliary power is provided by a trio of HiMSEN four stroke 9H25/33 driven gensets with an output of 2.690kW each at 900rpm.

A Samsung SAVER fin on the hull and the use of variable frequency drive add to the efficiency to achieve an EEDI rating of 3.55 against a required 3.90.

TECHNICAL PARTICULARS

Length oa: 259m
Length bp: 244.0m
Breadth moulded: 42.0m
Depth moulded
to main deck: 21.7m
to upper deck: 21.7m (Same as above)

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SIGNIFICANT SHIPS of 2023

The 34th edition of our annual Significant Ships series, *Significant Ships of 2023*, will be published in March 2024. As in previous editions we shall be including up to 50 of the most innovative and interesting commercial ship designs (of mostly 100m length and above) which will be delivered during the forthcoming year.

The Editor invites shipbuilders, designers and owners to submit details of vessels for possible inclusion in *Significant Ships of 2023*. Presentation will follow on the established two-page format, with a colour photograph, descriptive text and tabular details (including major equipment suppliers) on the first page, followed by a full page of technical general arrangement plans. Initial potential entries should comprise a short technical description (100 words) of the proposed vessel highlighting the special features and the delivery date.



All entries should be addressed to:

Editor, Significant Ships of 2023,
Email: editorial@rina.org.uk
Tel: +44 (0) 20 7235 4622 Fax: +44 (0) 20 7245 6959



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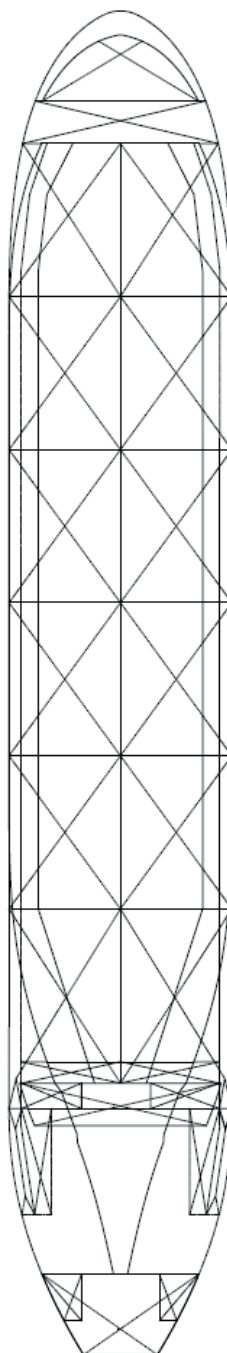
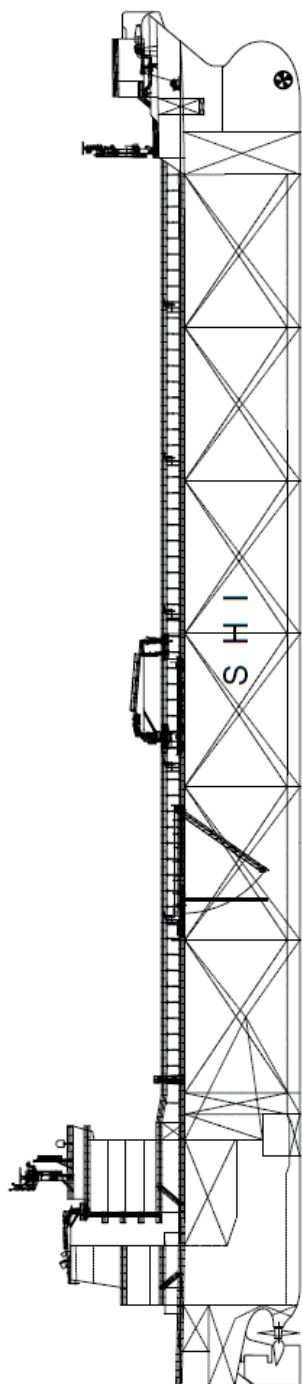
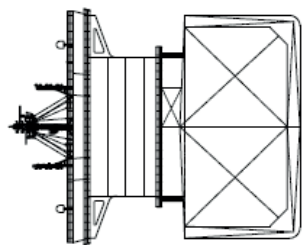
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VLADIMIR ARSENYEV





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Author Acceptance Notification	Friday 19 May 2023
Refereed Paper Submission	Monday 14 August 2023



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