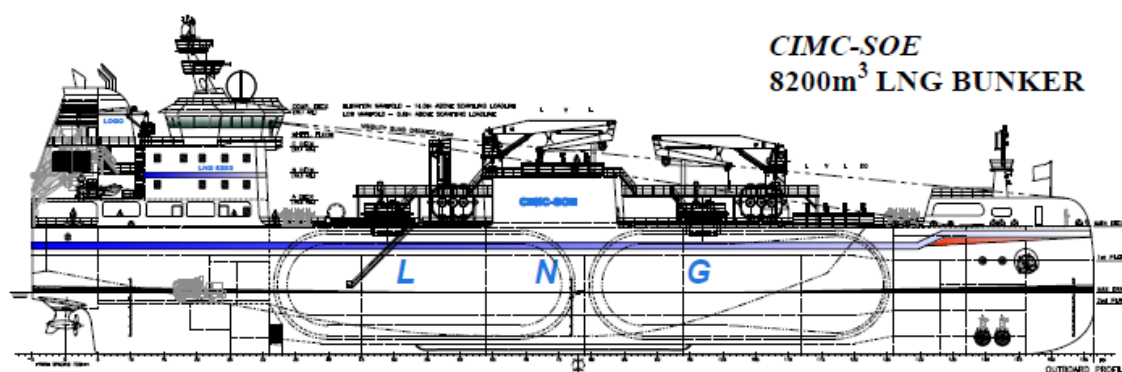


Paolina Cosulich LNG – Form B



SHELLNGTIME 2

PART II - LNG FORM B - PARTICULARS OF VESSEL

Ship's Name	Paolina Cosulich
Builder and Yard	Nantong CIMC Sinopacific Offshore Engineering Co Ltd
Hull No.	S1059
Year Built	2022
Port of Registry and Flag	TBD
IMO Number	9956836
Call Sign	TBD
Classification Society	TBD
Protection and Indemnity Club	SKULD (TBC)

1 Principal Particulars

Length overall	113.00m
Length Between Perpendiculars	109.50m
Breadth moulded	20.00m
Depth moulded	13.50m
Draught at summer freeboard (Extreme)	6.60m
Height overall – keel to highest fixed point	35.9m
Maximum air draught (with full ballast and half bunkers) - (corresponding draughts)	24.1m / 5m
Gross Tonnage (International)	8838 GT
Net Tonnage (International)	2651MT
Gross Tonnage (Suez)	To be informed upon delivery - MT
Net Tonnage (Suez)	To be informed upon delivery - MT
Net Tonnage (Panama)	To be informed upon delivery - MT
Light Ship Displacement	MT 4900 Approx
Displacement (maximum)	10351.7 MT
Windage in normal ballast conditions: Lateral	412.5m2
Longitudinal	1670m2
Classification designation	LNGBV
	Product: LNG
	Maximum pressure: 3.6 barG Minimum pressure: -0.25 barG
Conditions of Carriage (as defined on Certificate of Fitness):	Minimum temperature: -163 oC Maximum density: 500 kg/m3 for structural analysis, scantling of cargo tank and cargo pump
	Cargo tank to be 98.5 % of the total capacity at the reference temperature.
	113.00m

2 Operating Draught and Deadweight

Draught filling to 98.5% (@ cargo density 0.47 kg/m3)	6,493 mtrs
Deadweight filling to 98.5% (@ cargo density 0.47 kg/m3)	MT 5294

3 Ballast System

Total capacity of ballast water tanks	m3 2361.9
Number, capacity and head of pumps for handling ballast	n.2 self-priming 150 m3/h each, 0.30 Mpa or 30 MLC
Is Vessel able to ballast / de-ballast within the cargo loading/discharging period?	YES
Can the Vessel undertake ballast exchange at sea within 24 hours	Yes BWMS INSTALLED

4 Details of Principal Certification

(List conventions complied with / Certificates obtained, including protocols, amendments and date of issue)

Load Line	It will be available at delivery
SOLAS	It will be available at delivery
IGC Code	It will be available at delivery
Tonnage	It will be available at delivery
Marine Pollution (MARPOL)	It will be available at delivery
I. M. O. Certificate of Fitness	It will be available at delivery
USCG Certificate of Compliance	N/A
Independent Sworn Measurer Certificate	N/A
SIRE Inspection	New building
Port state control	New building

Is certification held indicating compliance with the following?

ISPS Code	YES
Rules and Regulations of Suez Canal Authorities	YES
ISM	YES

5 Propulsion

Type and make of propulsion plant	SCHOTTLE EcoPeller SRE 360 Z FP																																							
Maximum rated power and RPM	1500KW@1800rpm																																							
Proposed service power and RPM																																								
Grade of Fuel	DMA as per ISO8217-2010) with 0.1% Sulphur (Viscosity 2~6 cSt/40oC)																																							
Dual Fuel Burning	<p>YES</p> <p>Fuel gas quality</p> <p>The gas has to fulfil requirements as in the table below.</p> <table><tr><th>Property</th><th>Unit</th><th>Limit</th></tr><tr><td>Lower Heating Value (LHV_u), min. ¹⁾</td><td>MJ/m³N ²⁾</td><td>26</td></tr><tr><td>Methane Number (MN), min. ⁵⁾</td><td></td><td>70</td></tr><tr><td>Methane (CH₄) content, min.</td><td>% v/v</td><td>70</td></tr><tr><td>Hydrogen sulphide (H₂S) content, max.</td><td>% v/v</td><td>0.05</td></tr><tr><td>Hydrogen (H₂) content, max. ³⁾</td><td>% v/v</td><td>3.0</td></tr><tr><td>Liquid phase water and hydrocarbon condensate bef. engine, max. ⁴⁾</td><td>% v/v</td><td>Not allowed</td></tr><tr><td>Oil content, max.</td><td>mg/m³N</td><td>2.0</td></tr><tr><td>Ammonia content, max.</td><td>mg/m³N</td><td>25</td></tr><tr><td>Chlorine + Fluorine content, max.</td><td>mg/m³N</td><td>50</td></tr><tr><td>Partides or solids content in engine inlet, max.</td><td>mg/m³N</td><td>50</td></tr><tr><td>Partides or solids size in engine inlet, max.</td><td>µm</td><td>5</td></tr><tr><td>Gas inlet temperature</td><td>°C</td><td>0...60</td></tr></table>	Property	Unit	Limit	Lower Heating Value (LHV _u), min. ¹⁾	MJ/m³N ²⁾	26	Methane Number (MN), min. ⁵⁾		70	Methane (CH ₄) content, min.	% v/v	70	Hydrogen sulphide (H ₂ S) content, max.	% v/v	0.05	Hydrogen (H ₂) content, max. ³⁾	% v/v	3.0	Liquid phase water and hydrocarbon condensate bef. engine, max. ⁴⁾	% v/v	Not allowed	Oil content, max.	mg/m³N	2.0	Ammonia content, max.	mg/m³N	25	Chlorine + Fluorine content, max.	mg/m³N	50	Partides or solids content in engine inlet, max.	mg/m³N	50	Partides or solids size in engine inlet, max.	µm	5	Gas inlet temperature	°C	0...60
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6 Speed / Consumption

[illegible]

7 Boilers and Steam Capacity

Number and type of boilers	N/A
Maximum steam output available	N/A
Normal service output corresponding to 5(b)	N/A

8 Cargo Tanks

Number of tanks	2
Capacity of LNG tanks at 98.5% filling level	m ³
No 1 Tank	4,038.5
No 2 Tank	4,305.6
Total	8344.1
Gross Capacity of LNG tanks at 100%	m ³
No 1 Tank	4,100.0
No 2 Tank	4,371.2
Total	8471.2
Partial loading / filling restrictions	No partial loading and no filling restrictions;
The Vessel's cargo tanks can be cooled down from ambient in:	Approx.21 Hours (considering start condition 30 degC and end condition -140 degC, at cooldown rate is 8.2 degC/h which is the maximum acceptable cooldown rate by the cargo pump.)
Maximum filling rate	1500 m3 per hour
Relief valve settings (MARVS)	3600mb (gauge) (3.6barg)
Loaded Boil-Off rate	Tank No.1: 0.232% of 98% filling ratio per day Tank No.2: 0.228% of 98% filling ratio per day
Ballast Boil-Off rate	Not yet available. Only contractual BOG rate available.

9 Cargo Discharge

Number of cargo pumps per tank	2, 1 for each lobe
Make and type of cargo pumps	Maker: Svanehøj Type: DW 150/150-6-K+I
Design rated capacity of each cargo pump and corresponding discharge head	Capacity:300 m3/h Head :210 m.l.c
Number of spray (stripping) pumps per tank	1
Make and type of spray (stripping) pumps	Maker: Svanehøj Type: EFP 24-4 15/440/60.C70M.L.PN10
Design rated capacity of each spray pump and corresponding discharge head	Capacity:15 m3/h Head :130 m.l.c
Number, Make and Capacity of Auxiliary Pumps	Glycol pump Number: 2 sets per ship Maker: PG Flow Solution AS Type:PG - 50/315 A1 Capacity:54 m3/h
Bulk discharge time (not including start up and stripping periods) – assume head at ship's rail = 80 mlc and no restrictions on vapour return from shore.	7 hours
LNG STS TANSFER SYSTEM	

Cargo hose	Dolphinflex White SS composite hose for LNG STS. EN13766 – IMO IGC CODE – EN1474-II
	Details: nr. 1 8" 300 Ansi 25 mtrs nr. 1 6" 150 Ansi 25 mtrs
Hose supporter and Fall Arrest	KLAW K080SSF005 Quantities: 1 x 8" + 1 x 6"
ERCS	KLAW KR080 Liquid line 8" KLAW KR060 Liquid line 6"
QCDC	KLAW DCH080SYRRA2ABZ (8") KLAW DCH060SYRRA2ABZ (6") Tank unit and connections as per ISO 21593
VSD	KLAW VSD003
HPU	KLAW EPHPU-4-1-P

10 Cryogenic Systems

Type of LNG containment system	Type C
Design temperature	Min. Temperature: -163 °C
Make and type of vapour return compressors	Maker: Burckhardt compression Type: 2KL90-2D_1
Number and rated capacity of vapour return compressors and corresponding discharge head	Number: 2 sets per ship Start pressure: 1 bara Start temperature -140°C Discharge pressure 9 bara Discharge temperature: 76°C Capacity: 360.21 kg/h
Is a steam dump system provided? If so, is the capacity sufficient to deal with all excess steam generated by the boilers at max designed Boil-Off rate with engines stopped according to Class & USCG Rules?	GCU maker: Saacke GCU type 1002/2007 GCU capacity 500 Sm ³ /h (100% contractual BOG) Subcooler ready with a maximum guaranteed capacity by the vendor of 0.49 MT/hour with LNG. (128% of contractual BOG)
Total capacity of liquid nitrogen storage tanks (if nitrogen generator not fitted)	Liquid Nitrogen storage tank not fitted

11 LNG Measurement and Tank Calibration

Are all tanks calibrated and certified by a qualified agency? (Specify agency)	Yes, all cargo tanks calibrated and certified by SGS
Make and type of primary system for measuring cargo level, temperature and pressure	Maker: KONGSBERG
Level measuring system accuracy and range	Type of level measuring system: Radar Tank Gauge GLA-310/5 Accuracy: +/- 5 mm Range: 0~20 m

Temperature measuring system accuracy and range	<p>Type of temperature measuring system: Temp. sensor LNG/LPG-MN-3927</p> <p>Accuracy:</p> <p>-165°C to -145°C: +/-0,2°C</p> <p>-145°C to -120°C: +/-0,3°C</p> <p>-120°C to +40°C: +/- 1,5°C</p> <p>Range: -196~400°C</p>
Pressure measuring system accuracy and range	<p>Type of Pressure measuring system: E+H PMC71</p> <p>Accuracy: ±0.5%</p> <p>Range: 0~6 bara</p>
Gas Chromatograph	<p>EMERSON 370X1 – IEC-604-3-HE-W-R.</p> <p>Component/range mole%:</p> <p>Methane 65 to 100</p> <p>Ethane 0 to 20</p> <p>Propane 0 to 10</p> <p>N-Butane 0 to 5</p> <p>Iso-Butane 0 to 5</p> <p>N-Pentane 0 to 1</p> <p>Iso-Pentane 0 to 1</p> <p>Neo-Pentane 0 to 1</p> <p>Nitrogen 0 to 20</p> <p>Carbon Dioxide 0 to 20</p> <p>C6+ 0 to 1</p>
Is secondary system for measuring LNG liquid level fitted and, if so, state type and measuring accuracy	<p>Secondary system for measuring LNG liquid level is fitted.</p> <p>Type of level measuring system: Radar Tank Gauge GLA-310/5</p> <p>Accuracy: +/- 5 mm</p> <p>Range: 0~20m</p>

12 Cargo Manifolds

Do manifolds follow requirements of Vol Category “B” of OCIMF “Recommendations for Manifolds for Refrigerated Liquefied Natural Gas Carriers (LNG)” 2nd Edition – 1994? (If “No”, state variations)	No, the vessel follows version Second Edition 2018 of OCIMF “Recommendations for Manifolds for Refrigerated Liquefied Natural Gas Carriers (LNG)”
State layout of liquid and vapour connections	<p>1. Elevated manifold: L-V-L 2*L: 12 ” ANSI 300 1*V: 12” ANSI 150</p> <p>2. Fore manifold: L-V-L 2*L: 8” ANSI 300 1*V: 6” ANSI 150</p>
Distance of the centre of manifolds from amidships	<p>1. Elevated manifold: 0 mm</p> <p>2. Fore manifold: 28300 mm</p>
Distance of presentation flange from ship’s side	<p>1. Elevated manifold: Liquid: 3115mm Vapour: 3230mm</p> <p>2. Fore manifold: Liquid: 3239mm Vapour: 3350 mm</p>

Distance of presentation flange from ship's rail	1. Elevated manifold: Liquid: 3047mm Vapour: 3364mm 2. Fore manifold: Liquid: 3179mm Vapour: 3290 mm
Height of manifold centre above keel	N/A
Size and location of liquid nitrogen loading connection	N/A
Elevation above baseline	1a. Elevated manifold Stbd: Liquid: 20700 mm Vapour: 20700 mm 1b. Elevated manifold Port: Liquid: 21800 mm Vapour: 21800 mm 2. Fore manifold: Liquid: 15300 mm Vapour: 15300 mm
Elevation above design waterline	1a. Elevated manifold Stbd: Liquid: 14350 mm Vapour: 14350 mm 1b. Elevated manifold Port: Liquid: 15450 mm Vapour: 15450 mm 2. Fore manifold: Liquid: 8950 mm Vapour: 8950 mm

13 Emergency Shutdown System and Ship/Shore Compatibility

At what cargo level (%) is overflow protection activated?	99%
Does overflow protection activate the following:	
Trip ESD system?	Trip ESD system? ✓
Close manifold valves?	Close manifold valves? ✓
Trip cargo pumps?	Trip cargo pumps? ✓
Trip ship/shore link system?	Trip ship/shore link system? ✓
What ship/shore link systems are installed:	Optical Fibre Link ✓
Optical Fibre Link	Electric Links:
Electric Links — Pyle-National / Miyake connector	PYLE 37 way
Pneumatic ESD Link	and
	5-pin SIGGTO connectors
	No Miyake connector
	Pneumatic ESD Link ✓
	Vessel SSL system in compliance with ISO20519 and ISO28460. It combines electric (PYLE 37 way and 5-pin SIGGTO connectors), Fiber optic and pneumatic links. The system shall enable the terminal to release the ESD on the vessel by a remote fixed wired connection.

14 Bunkers

Capacity of fuel oil bunker tanks @ 98% (SG 0.99)	N/A
Capacity of gas oil bunker tanks @ 98% (SG 0.86)	225.7 MT
Maximum bunker loading rate	70 MT/hr
Segregated low sulphur fuel oil storage capacity	N/A

15 Fresh Water Capacity

Capacity of fresh water generators	5 MT per day Reverse Osmosis type
Distilled capacity	N/A
Domestic capacity	MT 96
Distilled consumption	N/A
Domestic consumption	N/A

16 Inert Gas Generation

Type and make of equipment	N/A
Capacity	N/A
Quality of gas O2 Max	N/A
Quality of gas CO Max	N/A
Quality of gas SO2 Max	N/A
Quality of gas NOx Max	N/A
Dew point	N/A
Dew point measurement systems available on-board:	Portable: SHAW MODEL SADP-R Fixed / local: Installed in the nitrogen generator systems.

17 Nitrogen

Type and capacity of nitrogen generation system	1.PSA type N2 Generator Type: Atlas MN 1500 Capacity: 700Nm3/h (20 °C @ 1 bara), purity 97vol.% 2. Membrane type N2 Generator Type: Atlas NGM3+ Capacity: 70Nm3/h (20 °C @ 1 bara), purity: 97vol.%
Consumption	N/A
Liquid nitrogen storage	N/A

Nitrogen generator capacity	For PSA, 16800 Nm3 per day For Membrane, 1680 Nm3 per day
Pressure tank	One N2 buffer tank used for N2 purging, 5m3, design pressure: 10barg

18 Gas Compressors

Low duty (fuel gas compressor): No. and capacity	Refer to item10, (c), (d)
Low duty (fuel gas compressor): make	Refer to item10, (c), (d)

19 Electrical Generating

Number of electric generators: Diesel Electric Propulsion	Main: 4 Emergency: 1
Type of electric generators	Main: ABB AMG 0500M Emergency: LSA M46.3 M7
Output of electric generators	Main: 1120kW Emergency: 200kW
Fuel type and quantity at full load of electric generators	Dual Fuel
Power required for discharge / de-ballasting at full rate	Unloading without Vapour Return From Shore + Fuel Supply from BOG Compressor and Fuel Pump: 4 cargo pump: 580kW 1 BOG compressor: 83kW 1 fule pump: 20kW 1 HPU, SVC: 8kW 1 glycol pum: 17kW UPS power: 15kW 2 ballast pump: 40kW Cooling water pump:90kW Fuel pump:4.6kW TOTAL: 857.6 kW

20 Deck Machinery

Winches	No:6 Pull Type: Electro-hydraulic Brake Holding Force: 356kN
Wires UHMWPE ropes + Snap Back arrestor	Size: Ø28mm x 220m B.S: 445KN
No. Wires Soft Forward	6
No. Wires Soft Aft	6
Soft Fitted with Synthetic Tails	Length and Size: Nylon 11mtrs/560 KN B.S: according MEG4
Derricks, Cranes – Type and SWL	Two (2) cargo cranes Ex-proof electro-hydraulic driven knuckle boom, 5.0 Mtons / 4 – 22 mtrs One (1) provision crane, 3.0 Mtons / 4 mtrs

21 Navigation and Communications

Type and number of radar sets fitted	MODEL: JMR-9225-6X No.1 RADAR X-BAND MODEL: JMR-9230-S No.2 RADAR S-BAND
Is an approved GMDSS installed? (Type?)	GMDSS combined in the WHC include of 2sets Inm-C (JUE-87-JR(SH1))/JUE-87-JR(SH1) and MF/HF (JSS-2250SC(SH3) etc Radio equipments
Is an additional SatCom system installed? (Type?)	FBB-(JUE-251) installed only VSAT
Is Suez Canal Projector fitted?	Yes

22 Crew

The Officers may be of the following Nationalities	According flag rules
Number of Officers (Minimum)	5 - MSM still to be defined
Number of Crew (Minimum)	5 - MSM still to be defined

23 List of Compatible LNG Terminals/Receiving Vessels

Load Ports	Discharge Ports
FSRU TOSCANA	FRSU TOSCANA
ROTTERDAM (Gate Terminal)	
ZEENBRUGE (Fluxys Terminal)	
BARCELONA (Enagas Terminal)	
RAVENNA (PIR Terminal)	
FOS Terminal	

24 List of Visited LNG Terminals at the Date of Vessel Delivery

Load Ports	Discharge Ports
N/A	N/A
N/A	N/A
N/A	N/A