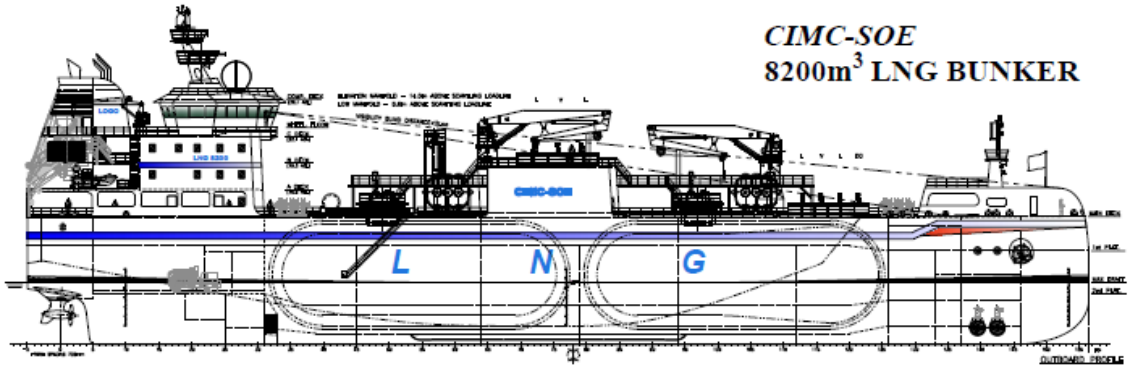
Alice Cosulich
LNG – Form B



SHELLLNGTIME 2

PART II - LNG FORM B - PARTICULARS OF VESSEL

Ship's Name	**Alice Cosulich**
Builder and Yard	**Nantong CIMC Sinopacific Offshore Engineering Co Ltd**
Hull No.	**S1058**
Year Built	**2022**
Port of Registry and Flag	**Genova – Italy Flag**
IMO Number	**9938767**
Call Sign	**IBBB**
Classification Society	**RINA**
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)	**8847 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**
Conditions of Carriage (as defined on Certificate of Fitness):	**Product: LNG** **Maximum pressure: 3.6 barG** **Minimum pressure: -0.25 barG** **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	**SCHOTTEL 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	**YES** **Fuel gas quality** The gas has to fulfil requirements as in the table below.

Property	Unit	Limit
Lower Heating Value (LHV_V), min. [1]	MJ/m³N [2]	26
Methane Number (MN), min. [5]		70
Methane (CH_4) content, min.	% v/v	70
Hydrogen sulphide (H_2S) 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
Particles or solids content in engine inlet, max.	mg/m³N	50
Particles or solids size in engine inlet, max.	µm	5
Gas inlet temperature	°C	0...60

6 Speed / Consumption

Maximum fuel consumption (Tonnes of Fuel Oil Equivalent / day)

Speed (Knots)	Laden	Ballast
10.5	**6.3**	**6.3**
11.0	**7.1**	**7.1**
11.5	**8.1**	**7.9**
12.0	**9.1**	**8.9**
12.5	**10.6**	**10.2**
13.0	**12.0**	**11.2**
13.5	**13.6**	**12.3**
14.0	**15.7**	**13.5**

Trial Speed at Maximum Power	**To be informed after delivery**
Service Speed, Laden and Ballast	**13.0 Knots and 13.0 Knots**
In Port (cargo operations)	**Abt. 3.8 MT per day**
In Port (idle)	**Abt. 2.6 MT per day**
For Inert Gas Generation	**Abt. 3.6 MT per day of Gas Oil**
For Reliquification of the cargo	**Abt. 4.9 MT per day of Gas Oil**
For Ballast exchange	**Abt. 2.7 For 100% exchange of ballast water (TBC)**

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 No 2 Tank	**4,038.5** **4,305.6**
Total	**8344.1**
Gross Capacity of LNG tanks at 100%	**m^3**
No 1 Tank No 2 Tank	**4,100.0** **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 ℃**
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℃ Discharge pressure: 9 bara Discharge temperature: 76℃ 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 Sm3/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 Level measuring system accuracy and range	**Maker: KONGSBERG Type of level measuring system: Radar Tank Gauge GLA-310/5 Accuracy: +/- 5 mm Range: 0~20 m**

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

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	**1. Elevated manifold:** **L-V-L** **2*L: 12 " ANSI 300** **1*V: 12" ANSI 150** **2. Fore manifold:** **L-V-L** **2*L: 8" ANSI 300** **1*V: 6" ANSI 150**
Distance of the centre of manifolds from amidships	**1. Elevated manifold: 0 mm** **2. Fore manifold: 28300 mm**
Distance of presentation flange from ship's side	**1. Elevated manifold:** **Liquid: 3115mm** **Vapour: 3230mm** **2. Fore manifold:** **Liquid: 3239mm** **Vapour: 3350 mm**

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? Close manifold valves? Trip cargo pumps? Trip ship/shore link system?	**Trip ESD system? √** **Close manifold valves? √** **Trip cargo pumps? √** **Trip ship/shore link system? √**
What ship/shore link systems are installed: Optical Fibre Link Electric Links — Pyle-National / Miyake connector Pneumatic ESD Link	**Optical Fibre Link √** **Electric Links:** **PYLE 37 way** **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 ℃ @ 1 bara), purity 97vol.%** **2. Membrane type N2 Generator** **Type: Atlas NGM3+** **Capacity: 70Nm3/h (20 ℃ @ 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: Φ28mm 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 equips**
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**