

COMMUNICATION EQUIPMENT

Call letter : V7RZ5
Radio Station normally watched : GMDSS
Radio MF/HF NBDP : MMSI 538003606
Radio MF/HFTEL/DSC : MMSI 538003606
VHF : MMSI 538003606
Satellite Communication **Inmarsat 'C'** : 453834049 ANSBCK : GAEX
Inmarsat 'F' : VOICE : 764911783, 764911784
: FAX : 764911785
: E-MAIL : gasexelero@stealth.gr

MACHINERY

Main Engine x 1 . Type and make : LH41LA / THE HANSHIN DIESEL WORKS LTD.
. Service power : 2,250 Kw (3,060PS) x 227 RPM (85% MCR)
No of Cylinders : 6
Cyl Bore x Stroke : 410 mm x 800 mm
. Grade of fuel used : HFO not more than 380 CST viscosity at 50 deg C

Auxiliaries Type and make (Electrical) : 6NY16L-HN / YANMAR / A.C Drip-Proof, self-ventilated 240kW x 450V x 3-phase x 60Hz
(Mechanical) : 4-stroke x 265kW x 1,200 RPM
Grade of fuel used : Diesel Oil / 6 CST at 40 deg C
No off : 2

Emergency Gen Type : NFD-150HF Yanmar Diesel Engine / 8kW, AC 105V, 1 phase, 60 Hz
No off : 1

Bow Thruster Type : Power: : NA

Boiler Type : VWH-600E Miura Z Boiler, Fully Automatic Water-tube boiler of forced recirculating type
Evaporation : 538 Kg/hr
Max Design Pressure : 0.7 MPa Saturated
Feed Water Temp : 60 deg C
No off : 1

Exhaust Economiser Type : Miura (KF-65F)
Evaporation : 350 Kg/hr actual at continuous service output of Main Engine
No off : 1

Air Compressors (Main) Type / Capacity : Matsubara (MS-92A), Vertical, EMD driven, 2-stage, FW cooled type / 32.5 m3/hr
No off : 2

Air Compressors (Emergency) Type : Robin GS2AR Air Cooled L-Type 2-stage Air Compressor
No off : 1

Fuel Oil Purifier Type : Mitsubishi SJ20G – Centrifugal
No off : 2
Capacity : 1,300 ltrs/hr at 98 deg C

Lub Oil Purifier	Type No off Capacity	Mitsubishi SJ20G – Centrifugal 1 2,100 ltrs/hr at 95 deg C
Evaporator	Type Capacity	Miura Co. Ltd (WM-10DK) – Waste Heat recovery 1 x 10 Tons/day
Fresh Water Sterilizer	Type Capacity	Uzushio Electric Co. Ltd (USS-2K)-Electric Ultra-violet lamp with Filter 1 x 2,000 liter/hr
Fresh Water Mineraliser	Type / Capacity	Nippon Controls Co. Ltd (RF-1000S) Vertical Welded steel / 1 x 1000 liters/hr
Waste Oil Incinerator (IMO MEPC 76 (40))	Type Capacity	Miura Co. Ltd. (BGW-20N) – Horizontal air atomizing type with auxiliary burner Oil : 24.3 ltr/hr ; Solids : 20 Kg/hr
Oily Water Separator	Type Capacity	Taiko Kikai Industries Co. Ltd. (USM-10) – Automatic oil discharge type 1 x 1.0 m3/hr
Sewage Treatment plant	Type Capacity	Taiko Kikai Industries Co. Ltd. (SBT-25) – Activated sludge aeration (Biological) – USCG certified 1 x 25 persons/day
Hot Water Set (Calorifier unit)	No off	Harison Co. Ltd. (CFT-400-E) 400L tank with 2 x 10kW heaters (1 stby) / 1 set
Steering Gear	Type Duty Capacity Hydraulic pump unit	RU21-013 Electro-hydraulic system with 2 pump units (1 pump able to supply full power) 13.0 t-m Electric motor-driven, 2 x 3.7 kW

Speed

In Moderate weather: **up to Beaufort scale 4 and Douglas sea state 3.**
Ballast about 13.50 kts ; Laden about 13.0 kts.

CONSUMPTION/ DAY

Main Engine	HFO	At sea Laden 11.0 MT/day At sea Ballast 10.5 MT/day	
Auxiliary Engine	DO	At sea with 1 D/G 1.0 MT/day At sea with 2 D/G 1.8 MT/day	At port loading or idle 1.5 MT/day At port discharging 2.0 MT/day
Permanent bunker capacity (100%)			
HFO	:	380.22 m3	
Diesel	:	101.14 m3	
Fresh Water	:	221.46 m3	

(B) CARGO INSTALLATIONS

1. Transportable products and respective quantities, calculated in accordance with IMO – maximum filling formula. (Tonnes)

	100% (CBM)	98% (CBM)		
NO.1 CARGO TANK	1,756.497	1,721.137		
NO.2 CARGO TANK	1,756.990	1,721.850		
TOTAL				
	SPSV (bar g)	Ref. Temp. (deg. C.)	Density at (Ref. Temp.)	Corresponding Quantity (MT)
Propane	17.65	45.0	0.459	1,574
Propylene	17.65	45.0	0.470	1,612
B/P Mixture	17.65	45.0	0.487	1,670
I-Butane	17.65	45.0	0.526	1,804
N-Butane	17.65	45.0	0.548	1,878
Butylene	17.65	45.0	0.565	1,936
Butadiene	17.65	45.0	0.588	2,016
V.C.M.	17.65	45.0	0.872	2,990
Isoprene	17.65	45.0	0.656	2,250
Pentane	17.65	45.0	0.600	2,058
Pentene	17.65	45.0	0.611	2,094
Note: Corresponding quantity was taken from Operation Manual				

Note(1): In case of USCG, propylene, propane and B/P mixtures are not to be carried except the vapour pressure of B/P mixtures is not more than 12.75 bar g, 13.0 kg/cm² @ 45 °C

Note(2): On and after, the pressure value in parentheses is shown as a conversion value
Mixing ratio of above mentioned B/P mixtures is as follows:

Butane 35 wt% and propane 65 wt%

2. Other transportable products N/A

	SPSV	Ref. Temp. (°C.)	Density at Ref. Temp.	Corresponding Quantity (MT)
Raffinate 1				
Raffinate 2				
C4				

3. TANKS

- 3.1 Design pressure (Vapour) – BV-IGC : **17.65 bar g (1.765 MPag)**
- USCG : **12.75 bar g (1.275 MPag)**
- 3.2 Valve setting : **17.65 bar g (1.765 MPag) / 12.75 bar g (1.275 MPag)**
- 3.3 Maximum vacuum obtainable : **Atmospheric**
- 3.5 Maximum temperature acceptable : **45 °C**
- 3.6 Minimum temperature acceptable : **0 °C**
- 3.7 Hydrostatic Test Pressure : **26.48 bar g (2.648 MPag)**

4. LOADING RATE (TONS/HOUR) – For Full Cargo Parcels

- Ex-atmospheric storage with gas : 1 tank : **320 m3/hr**
Return : 2 tanks : **570 m3/hr**

Remarks:

* Based on maximum velocity of 6.5 metres/sec except VCM, and 4.0 meters/sec for VCM in the liquid piping.

* If cargo temperature is less than 0 °C, shore heater to be used. If ship heater used, max rate is **150 m³** per hour.

* Loading by shore pump only, proper size gas return line to be connected

* Subject to both ship and shore tanks being under favourable conditions

5. CARGO PUMPS

5.1	Type	:	Deepwell pump of vertical centrifugal, multi-stage design, with inducer
	Make	:	HAMWORTHY KSE SVANEHOJ A/S
	How many	:	2 units
	Maximum specific gravity	:	0.601 (LPG) / 0.948 (VCM)
5.2	Capacity (CMB/Hour)	:	300 m3/hr at 110m head (SG 0.601) 250 m3/hr at 132m head (SG 0.948)
	Two speed or variable speed	:	Single speed
	Rated kW (each)	:	130 kW
	Working pressure maximum	:	20 bar g
5.3	Location	:	Cargo tanks (1 unit each)
	Removable	:	Yes
5.4	Booster pumps	:	NA
	Type	:	NA
	Maker	:	NA
5.5	Capacity (CMB/Hour)	:	NA
	Working pressure	:	NA
5.6	Location	:	NA
5.7	Time to discharge a full liquid cargo using all pumps against back pressure at pump	:	
	1 bar	:	about 12 hours for LPG
	5 bars	:	about 24 hours for LPG
	10 bars	:	-----
5.8	Nominal back pressure when working	:	about 1 bar
	In series corresponding head	:	N/A
	Maximum back pressure	:	about 5 bar
	Nominal pressure at rail (propane)	:	about 13 bar at 20 degree C of cargo temperature
5.9	What amount of cargo remains in tanks after completion pumping before stripping:	:	
	- liquid	:	about 1.0 m3 per one tank
	- vapour	:	about 25 tons per one tank for LPG

6. STRIPPING

6.1	Stripping system, if any	:	Nil
6.2	Time required to remove all traces of liquid cargo as stated in 5.9 for:	:	
	- LPG	:	about 2 hours

7. CARGO COMPRESSORS

7.1	Type	:	Vertical single stage water-cooled double action
	Make	:	Tanabe Pneumatic Machinery Co. Ltd.
	How many	:	2 sets

Piston displacement	460 m3/hr
Rated Kw	75 kW
Stroke	177.8 mm
Max discharge pressure	20 Bar G
Pressure differential	4 Bar g (Maker's setting) 7 Bar g (Maximum setting)
No of Revolutions	540 rpm

7.2 Are compressors oil free : **Yes**

7.3 Can they reliquefy VCM without risk : **NA**

7.4 State time to bring full cargo of butane to atmospheric pressure from : **NA**

8. INERT GAS SYSTEM

8.1 Does the vessel use inert gas? : **Yes (N2 Generator)**
If so, state utilization and quantities :

8.2 Can the vessel produce inert gas? : **Yes (N2 Generator)**
If so, state type and composition of gas produce: **Nitrogen 97% to 99.9%**
Discharge Capacity **97.0% purity – 245 Nm3/hr**
99.0% purity – 200 Nm3/hr
99.9% purity – 130 Nm3/hr

8.3 Maximum production obtainable **99.9% NITROGEN**

NOTE:- Above quantities obtained at engine room temperature 45° C

8.4 State if there are storage facilities for inert gas onboard: **N/A**
- Size : **N/A**
- Pressure : **N/A**

8.5 State if any shore supply of nitrogen may be required: : **N/A**
- for what purpose : **N/A**
- what quantities : **N/A**

9. GAS FREEING

9.1 State method used giving all details : **N2 Generator using Displacement Method / Water-Driven Fan for Aeration**

9.2 State time required including stripping : **About 72 hours**

10. CHANGING GRADE

10.1 From completion discharge of cargo Propane, time required in hours and inert gas in CBM required to reach a tank and gas installation atmosphere of less than 100 ppm of Propane in Vapour phase.
Time required: About 100 hours to reach 99.9% Nitrogen on both tanks. N2 required about 13,000 m3.

10.2 Can this operation be carried out at sea? : **Yes**

10.3 Can the ship measure the number of ppm in vapour phase? : **Yes**

10.4 Has vessel deck tank for changing grade/cooling operations? : **NA**

10.5 Deck tanks : **NIL**
Capacity :
Purpose :

11. **COOLING BEFORE LOADING** : **Not to exceed 10 deg C per hour**

12. CARGO HEATER

12.1 Type : **Horizontal Shell and Tube**
12.2 Inside Diameter : **700 mm**
12.3 Overall length : **7597 mm**
12.4 Cargo flow rate : **250 m3/hr (Propane)**
12.5 Min Inlet Temp : **-48 °C**
12.6 Min Outlet Temp : **0 °C**
12.7 Required Sea water Capacity : **Not less than 450 m3/hr (min 16 °C)**
12.8 Design Pressure : **20 Bar G**
12.9 Hydrostatic Test Pressure : **30 Bar G**
12.10 Tightness Test Pressure : **20 Bar G**

12.0 State discharging rate for propane to be brought from atmospheric pressure
Loading rate for Propane – ° C / 0° C: **about 125 Mt/hr**

13. CARGO VAPORIZER

In case vapour gas is needed to feed compressors, can vessel produce its own if no shore available:

No

14. REFRIGERATING APPARATUS : **NA**

14.1 Is it independent of cargo? : **NA**
Is so, state cooling agents : **NA**

14.2 What minimum temperature can be maintained : **NA**

14.3 What time required at sea to lower by 1°C the full cargo of : **NA**

15. MEASURING APPARATUS

What gauges on board?

Type : **Float type level gauge**
Location : **At each cargo tank dome**

16. SAMPLES

16.1 State how tank atmosphere samples can be taken and where from?
Standard of fitting? : **JIS PT ½ thread**

16.2 Same question for cargo : **JIS PT ½ thread**

16.3 Are sample bottles available on board? : **No**

17. CARGO LINES

17.1 Is ship fitted with a port and starboard cargo manifold? : **Yes**

17.2 Position of cargo manifold
- distance from stern (AP) (S / P) : **51.3/50.6 M**
- distance form stem (FP) (S / P) : **44.7/45.4 M**
- height above deck : **1.17 m for Liquid manifold**
1.13 m for Vapour manifold
- distance from ship's rail : **2.30 M**
- underside keel to manifold : **8.17 M**

17.3 Liquid line

- flange-size : **8 in.**
 - type : **ANSI 300LB RF**
- Gas line
- flange-size : **5 in.**
 - type : **ANSI 300LB RF**
- 17.4 What reducers on board? :
- For Liquid line (low temperature)** **8"x10" ANSI 300lb, 8"x6" ANSI 300lb, 8"x5" ANSI 300lb, 8"x4" ANSI 300lb, 8"x3" ANSI 300lb, 8"ANSI 300lb x 8" ANSI 150lb, 8"ANSI 300lb x 6" ANSI150lb 8"ANSI 300lb x 4" ANSI150lb, 8"ANSI300lb x 8" JIS 20K, 8"ANSI 300lb x 6" JIS20K, 8"ANSI300lb x 4" JIS 20K**
- For Vapor line (normal temp.)** **5"x4" ANSI300lb, 5"x3" ANSI300lb, 5"x2" ANSI300lb, 5"ANSI300lb x 6" ANSI150lb, 5"ANSI300lb x 5" ANSI150lb, 5"ANSI300lb x 3" ANSI150lb, 5"ANSI300lb x 2" ANSI150lb, 5"ANSI300lb x 5" JIS20K, 5"ANSI300lb x 4" JIS20K**
- 17.5 Is ship fitted with stern discharge? **No**
- Liquid line - diameter : **N/A**
 - flange – size : **N/A**
 - type : **N/A**

18. HOSES

- Are serviceable hoses available on board? : **None**
- 18.1 : **NA**
- Length : **NA**
 - Diameter : **NA**
 - Flange-size : **NA**
 - Type : **NA**
 - Bending radius : **NA**
- 18.2 Minimum temperature acceptable : **NA**
- Maximum pressure acceptable : **NA**
- 18.3 For what products are hoses suitable? : **NA**

19. DERRICKS

- Hose cranes : **1 SET**
- Where situated : **Cargo manifold area in between cargo tanks**
- Lifting capacity : **4.0 Tons**
- Working radius : **15 meters**

20. SPECIAL FACILITIES

- 20.1 How many grades can be segregated? : **Single grade**
- 20.2 How many cooled? : **N/A**
- 20.3 Can vessel sail with slack cargo tanks? : **Yes**