

COMMUNICATION EQUIPMENT

Call letter	:	V7MJ6
Radio Station normally watched	:	CH. 16 / CH. 70
Radio MF/HFNBDP	:	1set / FURUNO
Radio MF/HFTEL/DSC	:	1set / FURUNO
VHF	:	2sets / FURUNO
Satellite Communication	Inmarsat 'C'	1set / FURUNO
	Inmarsat 'F'	FB500 1set & FB250 1set / FURUNO
		Voice :+870773256498
		Fax :+870783234309
		E-mail : ecogreen@stealth.gr

MACHINERY

Main Engine x 1	Type and make	STX - MAN B&W5S35ME-B9.2
	Service power	3,303 KWx161.2 rpm (90%SMCR)
	No of Cylinders	5
	Cyl Bore x Stroke	350 mm x 1550 mm
	Grade of fuel used	HFO having a viscosity of not more than 380cst @ 50°C
Auxiliaries 1	Type and make (Electrical)	STX NIIGATA 6L17AHX
	(Mechanical)	570 kW x AC 450V x 3 phase x 60 Hz
	Grade of fuel used	4 stroke x600kW X 900rpm
	No off	HFO (Up to 380 cSt at 50°C)
		2
Auxiliaries 2	Type and make (Electrical)	STX NIIGATA 5L17AHX
	(Mechanical)	470 kW x AC 450V x 3 phase x 60 Hz
	Grade of fuel used	4 stroke x500kW X 900rpm
	No off	HFO (Up to 380 cSt at 50°C)
		1
Emergency Gen	Type	STX 6CT8.3DMGE, 100 kW x 1800 rpm
	No off	3 phase, 60 Hz
		1
Boiler/Exhaust Economiser	Type	KANGRIM RP-130M (OILON), Composite Boiler
	Evaporation	1,000 kg/h for oil fired section
		600 kg/h for exh. gas section at NCR load of M.E.
	Max Design Pressure	9 kg/cm²
	Feed Water Temp	80°C
	No off	1
Bow Thruster	Type	KTE – NAKASHIMA, TCT-120

		340kW
Air Compressors (Main)	Type / Capacity No off	DONGHWA PNEUTEC CO.,Ltd.H-63 - Vertical, EMD driven, 2-stage, F.W cooled type / 60m³ / Hr 2
Air Compressors (Emergency)	Type No off	One of the two main air compressors is used as the emergency air compressor
Fuel Oil Purifier	Type No off Capacity	GEAOSE 5-0136–037/5 – Centrifugal 2 Appx. 1,150 L/H based on 380 cSt at 50°C
Lub Oil Purifier	Type No off Capacity	GEAOSE 5-91–037/4 – Centrifugal 2 Appx. 900 L/H based on detergent oil for crosshead engine
Evaporator	Type Capacity	ALFA LAVAL – AQUA-80-HWS– Low pressure evaporating, single stage, plate type with steam injector Max. 12T/Day with S.W. temp. 32°C and M.E. jacket water temperature of 90°C at NCR load of M.E. together with steam injector
Fresh Water Sterilizer	Type Capacity	SAMKUN CENTURY CO.,LTD - JSA-3000 – Ultra Violet type 3,000 L/H
Waste Oil Incinerator (IMO MEPC 76 (40))	Type Capacity	HYUNDAI-ATLAS INCINERATOR – MAXI NG50SL WS - Solid waste and sludge oil burning, single door, IMO approved type 4,300m³/h
Oily Water Separator	Type Capacity	Blohm + Voss Industries TMPB-2,5– 5ppm with an oil content bilge alarm device, IMO MEPC 107 (49) approved type 2.5 m³/h
Sewage Treatment plant	Type Capacity	STX IL-SEUNG (ENVIRO+Notation.) 1 x 22 persons per day
Hot Water Set (Calorifier unit)	No off	SAMKUN CENTURY CO.,LTD- SE-200SE Harison Co Ltd (CFT-400-E) 200L tank Steam heating type (Electric heating of 15kW for em'cy heating) / 1 set
Steering Gear	Type Duty Capacity Hydraulic pump unit	ROLLS ROYCE STEERING GEAR SR722 FCP Electro-Hydraulic system with 2-pump units (dual system) – (one pump to be able to supply full power) 275 kNm Electric motor driven, 14 Kw

Environmentally Acceptable Lubricants (EAL) – Will be applied in Stern Tube & Bow Thruster

SPEED

About 13.5 knots up to Beaufort scale 4 and Douglas sea state 3.

CONSUMPTION/ DAY

Main Engine	: abt 11.0 MT/day +/- 5%
Auxiliary Engine	: abt 1.8 MT/day +/- 5%
In Port Discharging	: abt 2.5 MT/day +/- 5%
In Port Idle / Loading	: abt 1.8 MT/day +/- 5%
Use IGG	: abt 2.5 MT/day +/- 5%
Use of Boiler	: abt 1.4 MT/day +/- 5%
Use of Chillers	: abt 1.2 MT/day per unit

Notes:

1. Speed and consumption figures at sea, are best estimated basis daily weather conditions are up to Beaufort scale 4 - sea state Douglas 3, without effect of sea currents or swell, and vessel en route under a steady course, with a net sea passage duration of at least 24 hrs.
2. Consumption figures at port, are subject to port movements, port and/or harbour, terminal requirements, for the safe manoeuvring, approach, inland navigation, and port stay of the vessel throughout her call.

TOTAL Bunker tanks capacity (100%)

HFO	: Appx. 420 m ³
Diesel	: Appx. 85m ³
Fresh Water	: Appx. 200 m ³

EFFECTIVE Bunker tanks capacity (90%)

HFO	: Appx. 370 MT
Diesel	: Appx. 68 MT
Fresh Water	: Appx. 180 MT

3.7 Hydrostatic Test Pressure : **26.4bar g**

4. NOMINAL LOADING RATE (M3/hr) – For Full Cargo Parcels

Nominal cargo loading rate ex-atmospheric storage with use of VRL

: 1 tank	: About 450 m³ per hour for LPG About 350 m³ per hour for VCM
2 tanks	: About 900 m³ per hour for LPG About 700 m³ per hour for VCM

Remarks:

1. Loading by shore pumps under use of proper size gas return line and subject to both ship and shore tanks being under similar and favourable conditions. Actual agreed rate is subject always to safe operation.

2. If cargo temperature is less than 0 °C, shore heater to be used for loading. If ship's heater is used, loading rate is subject to seawater and environmental temperatures and conditions.

3. Nominal loading rate is calculated basis cargo temp above -10deg. C with cargo densities 0.65 for LPG - 0.966 for VCM and based on maximum velocity of 6.5 metres/sec except VCM, and 4.0 meters/sec for VCM in the liquid piping

5. CARGO PUMPS

- | | | |
|-----|---|--|
| 5.1 | Type | : Deepwell type of vertical centrifugal multistage design DW 200/200-3-K+I |
| | Make | : HAMWORTHY SVANEHOJ A/S |
| | Number of | : 2 (two) |
| | Maximum allowable density | : 0.650(LPG) / 0.966 (VCM) |
| 5.2 | Nominal Rated Capacity (CMB/Hour) | : 450 m³/hr @ 110 mlc (for LPG density 0.650)
350 m³/hr @ 130 mlc (for VCM density 0.966) |
| | Two speed or variable speed | : Single Speed |
| | Rated kW (each) | : 190 kW |
| | Max. Allowable working pressure | : 20 bar g |
| 5.3 | Location | : 1 (one) pump per cargo tank |
| | Removable | : Yes |
| 5.4 | Booster pumps | : 1 (one) horizontal centrifugal single stage |
| | Type | : NMB 150c |
| | Maker | : Svanehoj - Wartsila |
| 5.5 | Nominal Rated Capacity (CMB/Hour) | : 350 m³/hr @ 120 mlc |
| | Max. Allowable working pressure | : 23 bar g |
| 5.6 | Location | : On top of No.2 Cargo tank |
| 5.7 | Time to discharge a full Propane liquid cargo using all pumps against back pressure at pump | |
| | 1 bar | : 13 hrs |
| | 5 bars | : 33 hrs |
| | 10 bars | : N/A |
| 5.8 | Nominal pressure when working | : About 7.5 barg @130 mlc (Propane) |
| | In series corresponding head | : N/A |
| | Maximum back pressure | : 8.0 barg |
| | Nominal pressure at rail | : 5.5 barg (Propane) |
| 5.9 | What amount of cargo remains in tanks after completion pumping before stripping: | |

- liquid : **about 30 m³ per one tank**
 - vapour : **about 55 m³ per one tank**
- 6. STRIPPING**
- 6.1 Stripping system, if any : **Hot gas – puddle heating / Vapor pushing via cargo compressors**
- 6.2 Time required to remove all traces of liquid cargo as stated in 5.9 for:
 - LPG : **About 6.0 hours for liquid puddle heating**
- 7. CARGO COMPRESSORS**
- 7.1 Type : **Vertical water cooled 1 stage double acting LPGOS-97S**
- Make : **Tanabe pneumatic machinery Co Ltd**
- How many : **3 sets**
- Piston displacement : **510m³/h**
- Rated Kw : **100 kW**
- Stroke : **177.8 mm**
- Max discharge pressure : **20 bar g**
- Pressure differential : **7 bar**
- Max 7 bar at single action**
- No of Revolutions : **592 rpm**
- 7.2 Are compressors oil free : **Yes**
- 7.3 Can they re-liquefy VCM without risk : **N/A**
- 7.4 State time to bring full cargo of butane to atmospheric pressure : **N/A. Chiller units on each cargo compressor are used only to maintain the cargo temperature in the cargo tanks.**
- 8. INERT GAS SYSTEM**
- 8.1 Does the vessel use inert gas? : **Yes (N2)**
 If so, state utilization and quantities : **Deck service and Source for Air bubbling, 18 EA**
- 8.2 Can the vessel produce inert gas? : **Yes (N2)**
 If so, state type and composition of gas produce:
 Nitrogen: 97 % to 99.9% : **Capacity @ N2 purity 99.90%: 250 Nm³/h**
- N2 purity obtainable at cargo tanks : **99.80%**
- 8.3 Maximum production obtainable : **250 Nm³/h**
 NOTE:- Above quantities obtained at engine room temperature 45° C
- 8.4 State if there are storage facilities for inert gas onboard: **Yes**
 - Size : **2 m³**
 - Pressure : **7 Bar g**
- 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 : **Nitrogen Plant / Fans**

9.2 State time required including stripping : **About 164 hrs**

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 0.2% by volume of Propane in Vapour phase.

N2 production required: about 20,000 cbm - Time required: about 86 hrs

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? : **N/A**

10.5 Deck tanks : **N/A**

Capacity : -

Purpose : -

11. COOLING BEFORE LOADING :

12. CARGO HEATER

12.1 Type : **Shell and Tube**

12.2 Inside Diameter : **800 mm**

12.3 Overall length : **7500 mm**

12.4 Cargo inlet max flow rate : **450 m3/h (Propane)**

12.5 Min Inlet Temp : **-48 °C**

12.6 Min Outlet Temp : **0 °C**

12.7 Required Sea water Capacity : **700 m3/h (Min seawater temp 15°C)**

12.8 Design Pressure : **25 bar g**

12.9 Hydrostatic Test Pressure : **37.5 bar g**

12.10 Tightness Test Pressure : **25 bar g**

12.11 State nominal loading rate for propane to be brought from -minus 42° C to /0° C:

About 450 m3/hr (propane) with seawater temp above 15 C and seawater flow of 700 m3/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 : **3 (three) Chiller units on each cargo compressor. Chillers are used only to maintain constant cargo temperature in the tanks.**

14.1 Is it independent of cargo? : **N/A**

Is so, state cooling agents : -

14.2 What minimum temperature can be maintained : **- 8.0 deg. C**

14.3 What time required at sea to lower by 1°C the full cargo : **Propane**
(basis air temp +45 deg.C and sea temp +30 deg. C and two chiller units in operation) **20 °C to 19 °C : abt 2 hrs**
0 °C to -1 °C : abt 7 hrs
-7 °C to -8 °C : abt 16 hrs
N-Butane
20 °C to 19 °C : abt. 6.5hrs
1 °C to 0 °C : abt. 45hrs

15. MEASURING APPARATUS

What gauges on board?
 Type : **Float type level gauge / HSH type (manual)**
 Location : **1 (one) fitted each cargo tank – dome area**

16. SAMPLES

16.1 State how tank atmosphere samples can be taken and where from?
Sample points at tank bottom, mid and top

Standard of fitting? : **JIS PT1/2 thread**

16.2 Same question for cargo : **Yes**

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 : **50.06 m**
 - distance from stem : **49.89 m**
 - height above deck : **1.42 m (Liquid manifold)**
 - distance from ship's rail : **2.55 m**
 - underside keel to manifold : **9.42 m**

17.3 Liquid line (2)
 - flange-size : **8" inches (x2)**
 - type : **ANSI 300 LB RF**

Gas line (4)
 - flange-size : **6" inches (x2) & 4" inches (x2)**
 - type : **ANSI 300 LB RF**

17.4 What reducers on board? : **26 carbon steel pieces supplied**
For Liquid line (low temp.)
8" ANSI 300 TBA to See table
For Vapor line (normal temp.)
6" ANSI 300 TBA to
4" ANSI 300 TBA to See table

No off	Shore conn.	Inboard flange of spool piece			Presentation flange of spool piece		
		Size	Rating	Type	Size	Rating	Type
2	Liquid	8"	ANSI 300	RF	10"	ANSI 300	RF
2	Liquid	8"	ANSI 300	RF	8"	ANSI 300	RF
2	Liquid	8"	ANSI 300	RF	6"	ANSI 300	RF
2	Liquid	8"	ANSI 300	RF	10"	ANSI 150	RF
2	Liquid	8"	ANSI 300	RF	8"	ANSI 150	RF
2	Liquid	8"	ANSI 300	RF	6"	ANSI 150	RF
1	Vapour	6"	ANSI 300	RF	8"	ANSI 300	RF
1	Vapour	6"	ANSI 300	RF	6"	ANSI 300	RF
1	Vapour	6"	ANSI 300	RF	4"	ANSI 300	RF
1	Vapour	6"	ANSI 300	RF	3"	ANSI 300	RF
1	Vapour	6"	ANSI 300	RF	8"	ANSI 150	RF
1	Vapour	6"	ANSI 300	RF	6"	ANSI 150	RF
1	Vapour	6"	ANSI 300	RF	4"	ANSI 150	RF
1	Vapour	6"	ANSI 300	RF	3"	ANSI 150	RF
1	Vapour	4"	ANSI 300	RF	6"	ANSI 300	RF
1	Vapour	4"	ANSI 300	RF	4"	ANSI 300	RF
1	Vapour	4"	ANSI 300	RF	3"	ANSI 300	RF
1	Vapour	4"	ANSI 300	RF	6"	ANSI 150	RF
1	Vapour	4"	ANSI 300	RF	4"	ANSI 150	RF
1	Vapour	4"	ANSI 300	RF	3"	ANSI 150	RF

- 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 Two pieces, each : **N/A**
Length : **N/A**
Diameter : **N/A**
Flange-size : **N/A**
Type : **N/A**
Bending radius : **N/A**
- 18.2 Minimum temperature acceptable : **N/A**
Maximum pressure acceptable : **N/A**
- 18.3 For what products are hoses suitable? **N/A** :

19. DERRICKS

- Hose cranes : **1 set**
- Where situated : **Mid-ship**
- Lifting capacity : **5.0 tons @ 10m/min**
- Working radius : **15m**

20. SPECIAL FACILITIES

- 20.1 How many grades can be segregated? : **Double Grade**
- 20.2 How many cooled? : **Two**
- 20.3 Can vessel sail with slack cargo tanks? : **Yes**