



## COMMUNICATION EQUIPMENT

Call letter	:	V7LL5
Radio Station normally watched	:	GMDSS
Radio MF/HF NBDP	:	FS-2575 include
Radio MF/HFTEL/DSC	:	FS-2575 include
VHF	:	FM-8900S 2sets
Satellite Communication	Inmarsat 'C'	: 453841639 EGLX X
	Inmarsat 'FBB'	: (Voice) 870 773213545
		: (Fax) 870 783231178
		: (E-mail) ecogalaxy@stealth.gr

## MACHINERY

<b>Main Engine x 1</b>	Type and make	: MAN B&W 6L35MC6.1
	Service power No of Cylinders Cyl Bore x Stroke	: 3,510 Kw (4,772ps) x 203 rpm (90%MCO) 6 350 mm x 1050 mm
	Grade of fuel used	: HFO having a viscosity of not more than 380cst @ 50°C
<b>Auxiliaries</b>	Type and make (Electrical)	Yanmar 6NY16L-EW rated 400 Kw x 450V x 3 phase x 60 Hz
	(Mechanical)	4 stroke x 441 Kw x 1,200 rpm
	Grade of fuel used	Diesel Oil - 3,6 cSt – 14 cSt
	No off	2
<b>Emergency Gen</b>	Type	STX Engine NT855DMGE – 200Kw, AC 450V, 3 phase, 60 Hz
	No off	1
<b>Boiler</b>	Type	Alfa Laval KK (Aalborg OC) Fully automatic smoke-tube composite boiler
	Evaporation	500 Kg/Hr (Exhaust gas)
	Max Design Pressure	0.69 Mpa Saturated
	Feed Water Temp	60°C
	No off	1
<b>Exhaust Economiser</b>	Type	Composite Boiler
	Evaporation	750Kg/Hr (Oil fired)
	No off	1
<b>Air Compressors (Main)</b>	Type / Capacity	Matsubara (MH-120K) - Vertical, 2-stage, F.W cooled type / 85.0m <sup>3</sup> / Hr
	No off	2
<b>Air Compressors (Emergency)</b>	Type	TBA

	No off	1
<b>Fuel Oil Purifier</b>	Type	<b>Mitsubishi SJ20G – Centrifugal</b>
	No off	<b>2</b>
	Capacity	<b>1150 Ltrs / Hr, 700mm<sup>2</sup>/s at 50°C</b>
<b>Lub Oil Purifier</b>	Type	<b>Mitsubishi SJ20G – Centrifugal</b>
	No off	<b>1</b>
	Capacity	<b>1950 Ltrs / Hr, 100/150mm<sup>2</sup>/s at 40°C</b>
<b>Evaporator</b>	Type	<b>Sasakura Engineering Co. Ltd. (KE-10) – Waste heat recovery</b>
	Capacity	<b>1 x 10 t/day</b>
<b>Fresh Water Sterilizer</b>	Type	<b>Nippon Control's Co.,Ltd. – Electric Germicidal lamp with filter</b>
	Capacity	<b>1 x1,000 litre/h</b>
<b>Waste Oil Incinerator (IMO MEPC 76 (40))</b>	Type	<b>Sunflame Co. Ltd. (OSV-360SAI) – Rotary cup system</b>
	Capacity	<b>Oil @ 38 lit/h &amp; Solids @ 30 Kg/h</b>
<b>Oily Water Separator</b>	Type	<b>Heishin Pump Works Co., Ltd.</b>
	Capacity	<b>1 x 1.0 m3/h</b>
<b>Sewage Treatment plant</b>	Type	<b>Taiko Kikai Industries Co, Ltd (SBH-25)- Activated sludge aeration (Biological) – USCG certified</b>
	Capacity	<b>1 x 25 persons per day</b>
<b>Hot Water Set (Calorifier unit)</b>	No off	<b>Toyo Dennetsu Kogyo Co., Ltd. (TTS-400) 400L with 1 x 1.1m<sup>2</sup> steam heater / 1 set</b>
<b>Steering Gear</b>	Type	<b>Kawasaki Heavy Industries, Ltd. Electro-Hydraulic system (RV21-022) with 2-pump units (dual system) – (one pump to be able to supply full power)</b>
	Duty Capacity	<b>22.4 t-m</b>
	Hydraulic pump unit	<b>Electric motor driven, 2 x 5.5 Kw</b>

## SPEED

In **Ballast** condition : **About 14.0 knots**

In **Laden** condition : **About 13.5 knots**

Speed figures always up to Beaufort scale 4 and max significant wave height of 1.25 mtrs

## CONSUMPTION / DAY

Main Engine	VLSFO	<b>Abt 11.00 Mt/day +/-5%</b>	
Auxiliary Engine	LSMGO	<b>Abt 0.96 Mt/day +/-5%</b>	<b>Per unit</b>
In Port Discharging	LSMGO	<b>Abt 2.10 Mt/day +/-5%</b>	+ boiler (if in use)
In Port Idle / Loading		<b>Abt 0.96 Mt/day +/-5%</b>	+ boiler (if in use)
Use of N2/ IGG		<b>Abt 2.10 Mt/day +/-5%</b>	
Use of Boiler		<b>Abt 1.00 Mt/day +/-5%</b>	

### Notes:

1. Speed and consumption figures at sea, are best estimated basis daily weather conditions are up to Beaufort scale 4 - max significant wave height of 1.25 mtrs, 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.

### Bunker Capacity

IFO (Bunker tanks)	:	<b>492.64 m<sup>3</sup> (Fuel oil bunker tanks are DH)</b>
Diesel (Bunker tanks)	:	<b>69.28 m<sup>3</sup> (Diesel oil bunker tanks are DH)</b>
Fresh Water	:	<b>193.06 m<sup>3</sup></b>

## (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	3606.39	3534.26		
NO.2 CARGO TANK	3606.31	3534.18		
T O T A L	7212.70	7068.44		
	SPSV (bar g)	Ref. Temp. (deg. C.)	Density at (Ref. Temp.)	Corresponding Quantity (MT)
Propane	17.65	45.0	0.459	3244.21
Propylene	17.65	45.0	0.470	3321.96
B/P Mixture	17.65	45.0	0.487	3442.12
I-Butane	17.65	45.0	0.526	3717.77
N-Butane	17.65	45.0	0.548	3873.26
Butylene	17.65	45.0	0.565	3993.42
Butadiene	17.65	45.0	0.588	4155.98
V.C.M.	17.65	45.0	0.965	4552.00* (4)
Isoprene	17.65	45.0	0.656	4636.61
Pentane	17.65	45.0	0.600	4240.80
Pentene	17.65	45.0	0.611	4318.55
B/P Mixtures	12.75	45.0	0.487	3442.11

Note(1): In case of there is no request by USCG, setting pressure of safety valve may use 17.65 bar g. Propylene, Propane and Butane/Propane Mixtures are to be carried. In case of there is request by USCG, propylene, propane and Butane/Propane mixtures are not to be carried except the vapour pressure of Butane/Propane mixtures is not more than 12.75 bar g, 13.0 kg/cm<sup>2</sup> @ 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%

Note (3): Figures are preliminary Subject to change according to displacement

\*Note (4): VCM Quantity at 65% CT Filling and subject to Stability Booklet and Loading Manual.

### 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	:	<b>17.65 bar g (1.765 MPag) / 12.75 bar g (1.275 MPag)</b>
3.3	Maximum vacuum obtainable	:	<b>Atmospheric</b>
3.5	Maximum temperature acceptable	:	<b>45 °C</b>
3.6	Minimum temperature acceptable	:	<b>-10 °C</b>
3.7	Hydrostatic Test Pressure	:	<b>TBA</b>

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

Ex-atmospheric storage with vapor	:	1 tank	:	<b>about 730 m<sup>3</sup> per hour for LPG</b>
Return	:		:	<b>about 560 m<sup>3</sup> per hour for VCM</b>
	:	2 tanks	:	<b>about 1130 m<sup>3</sup> per hour for LPG</b>
	:		:	<b>about 870 m<sup>3</sup> per hour for VCM</b>

Remarks:

\* If cargo temperature is less than -10 °C, shore heater to be used. If ship heater used, max rate is **550 m<sup>3</sup>** per hour.

\* Based on maximum velocity of 6.5 metres/sec except VCM, and 5.0 meters/sec for VCM in the liquid piping.

\* 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	:	<b>Deepwell type of vertical centrifugal multistage design</b>
	Make	:	<b>WARTSILA SVANEH <math>\phi</math> J A/S</b>
	How many	:	<b>1 set per tank (2 sets)</b>
	Maximum specific gravity	:	<b>0.601(LPG) / 0.965 (VCM)</b>
5.2	Capacity (CMB/Hour)	:	<b>400 m<sup>3</sup>/hr at 110 m (SG 0.601)</b> <b>200 m<sup>3</sup>/hr at 140 m (SG 0.965)</b>
	Two speed or variable speed	:	<b>Single Speed</b>
	Rated kW (each)	:	<b>150 kW</b>
	Working pressure maximum	:	<b>20 bar g</b>
5.3	Location	:	<b>At each cargo tank</b>
	Removable	:	<b>Not removable</b>
5.4	Booster pumps	:	<b>1 set</b>
	Type	:	<b>Horizontal</b>
	Maker	:	<b>WARTSILA SVANEH <math>\phi</math> J A/S</b>
5.5	Capacity (CMB/Hour)	:	<b>400m<sup>3</sup>/h</b>
	Working pressure	:	<b>22 bar g</b>
5.6	Location	:	<b>Platform near the manifold</b>
5.7	Time to discharge a full liquid cargo using all pumps against back pressure at pump	:	
	1 bar	:	<b>about 21 hours for LPG</b>
	5 bars	:	<b>about 60 hours for LPG</b>
	10 bars	:	<b>-----</b>
5.8	Nominal back pressure when working	:	<b>about 1 bar</b>
	In series corresponding head	:	<b>220 ml.c.</b>
	Maximum back pressure	:	<b>about 10 bar</b>

- Nominal pressure at rail (propane) : **about 18 bar at 20 degree C of cargo temperature**
- 5.9 What amount of cargo remains in tanks after completion pumping before stripping:
- liquid : **about 1.5 m<sup>3</sup> per one tank**
  - vapour : **about 40 ton per one tank**

## 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 water cooled 1 stage double acting**
  - Make : **Tanabe pneumatic machinery Co Ltd**
  - How many : **2 sets**
  - Piston displacement : **460m<sup>3</sup>/h**
  - Rated Kw : **75 kW**
  - Stroke : **177.8 mm**
  - Max discharge pressure : **20 bar g**
  - Pressure differential : **4 bar**
  - Max 7 bar at single action**
  - No of Revolutions : **540 rpm**
- 7.2 Are compressors oil free : **Yes**
- 7.3 Can they reliquefy VCM without risk : **N/A**
- 7.4 State time to bring full cargo of butane to atmospheric pressure from : **N/A**

## 8. INERT GAS SYSTEM

- 8.1 Does the vessel use inert gas? : **Yes (N2)**
- If so, state utilization and quantities : **TBA**
- 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 (discharge) @ 97.00% N2 is 360 Nm<sup>3</sup>/h**
    - Capacity (discharge) @ 99.00% N2 is 280 Nm<sup>3</sup>/h**
    - Capacity (discharge) @ 99.90% N2 is 185 Nm<sup>3</sup>/h**
  - Oxygen: 1.0 % to 0.05%**
  - Discharge Capacity : **TBA**
- 8.3 Maximum production obtainable : **TBA**

- 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 : **Nitrogen Plant / Fans**  
 9.2 State time required including stripping : **TBA**

## 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: TBA**
- 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? : **No**
- 10.5 Deck tanks : **NIL**  
 Capacity :  
 Purpose :

## 11. COOLING BEFORE LOADING :

## 12. CARGO HEATER

- 12.1 Type : **Shell and Tube**  
 12.2 Inside Diameter **850 mm**  
 12.3 Overall length **7000 mm**  
 12.4 Cargo flow rate **550 m3/h (Propane)**  
 12.5 Min Inlet Temp **-48 °C**  
 12.6 Min Outlet Temp **-10 °C**  
 12.7 Required Sea water Capacity **600 m3/h (Min 18°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 **NA**  
 Loading rate for Propane – **minus 42 ° C / minus10 ° C: about 300 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

- 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 : **1set each tank beside tank dome**  
**1set each tank at tank dome**

## 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 PT1/4 thread**

16.2 Same question for cargo : **Sampling connection at outlet of each cargo Pump (JIS PT1/4 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) : **59.3 M**  
- distance from stem (FP) (S / P) : **50.7 M**  
- height above deck : **1.295 m for Liquid manifold**  
- distance from ship's rail : **2.40 M**  
- underside keel to manifold : **10.509 M**

17.3 Liquid line

- flange-size : **10 in.**  
- type : **10" ANSI 300LB**

Gas line

- flange-size : **6 in.**  
- type : **6" ANSI 300LB**

17.4 What reducers on board? : **Carbon steel pieces supplied**

**For Liquid line (low temperature)**

**10" ANSI 300LB to**

**12" ANSI 300LB, 8" ANSI 300LB, 6" ANSI 300LB  
5" ANSI 300LB, 4" ANSI 300LB, 3" ANSI 300LB  
10" ANSI 150LB, 8" ANSI 150LB, 6" ANSI 150LB  
5" ANSI 150LB**

**For Vapor line (normal temp.)**

**6" ANSI 300LB to**

**8" ANSI 300LB, 5" ANSI 300LB, 4" ANSI 300LB,  
3" ANSI 300LB, 2" ANSI 300LB  
8" ANSI 150LB, 6" ANSI 150LB, 5" ANSI 150LB,  
4" ANSI 150LB, 3" ANSI 150LB**

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 : **TBA – Owners**  
Length : **TBA – Owners**  
Diameter : **TBA – Owners**  
Flange-size : **TBA – Owners**  
Type : **TBA – Owners**  
Bending radius : **TBA – Owners**
- 18.2 Minimum temperature acceptable : **TBA – Owners**  
Maximum pressure acceptable : **TBA – Owners**
- 18.3 For what products are hoses suitable? : **TBA - Owners**

## 19. DERRICKS

- Hose cranes : **1 set**  
- Where situated : **Mid-ship(center)**  
- Lifting capacity : **5.0 tons @ 10m/min**  
- Working radius : **14.1m**

## 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**