VESSEL PARTICULARS (FORM C)
GAS HARALAMBOS
(Last updated 21/1/2020)

Specifications of the vessel and the gas installation which are representations by the Owners.

(A) VESSEL'S CHARACTERISTICS

PREAMBLE

Name	:	**Gas Haralambos**
Owner	:	**Cannes View Incorporated, Marshall Islands**
Flag	:	**Bahamas**
Build	:	**Kanrei Shipbuilding Company, Ltd., Japan**
Date on Service	:	**30 October 2007**
Class	:	**Bureau Veritas**

GRT International	:	**5, 806**	Suez	:	**6,372.91**
			Panama	:	**5,806**
NRT International	:	**1,945**	Suez	:	**5,165.82**
			Panama	:	**4,936.58**
Is vessel build according to			USCG regulations?	:	**Yes**
			RINA regulations?	:	**No**
			Japanese regulation?	:	**Yes**
Has vessel received			USCG approval?	:	**No**
			RINA approval?	:	**No**

HULL

LOA	:	**119.5**	**M**	
LBP	:	**112**	**M**	
Breadth	:	**19.0267**	**M**	
Depth	:	**9.018**	**M**	
Summer Draft	:	**6.815**	**M**	**corresponding to Summer DWT = 7,330.64**
Multiple Draft		**NA**	**M**	**corresponding to Multiple DWT = NA**

Estimated draft with full cargo and full bunkers are as follows.

Product	Draft Fore' (m)	Draft Aft' (m)	Draft Mean (m)	Corresponding Deadweight (t)
Propane (98%)	**4.255**	**5.723**	**4.989**	**4,053.2**
Butadiene (98%)	**4.969**	**6.007**	**5.488**	**4,938.2**
VCM (98%)	**6.581**	**6.570**	**6.576**	**6,886.1**

Propeller immersion :

Draft At 5.723 m correspond. : 143%
Draft At 6.007 m correspond. : 150%
Draft At 6.570 m correspond. : 164%

COMMUNICATION EQUIPMENT

Call letter		:	**C6WP3**
Radio Station normally watched		:	**VHF CH 16 / DSC – MMSI: 308652000**
Radio MF/HF NBDP		:	**Furuno FS-5070**
Radio MF/HFTEL/DSC		:	**Furuno FS-5070**
VHF		:	**Furuno FM-8800-D**
Satellite Communication	**Inmarsat 'C'**	:	**Furuno Felcom 15 – TLX: 430665210**
	Inmarsat 'F'	:	**Furuno Felcom 70** **Inm Tel: 764815580-1** **Inm Fax: 764815582** **GasHaralambos@stealth.gr**

MACHINERY

Main Engine x 1	. Type and make	:	**Makita-Mitsui B&W 6L35MC**
	. Service power	:	**MCR 3,900 Kw SCR 3,510 Kw**
	No of Cylinders		**6**
	Cyl Bore x Stroke		**350 mm x 1,050 mm**
	. Grade of fuel used	:	**IFO 380 CST**
Auxiliaries	Type and make (Electrical)		**NTAKL-Nishiba**
	(Mechanical)		**6N165L-SN-Yanmar**
	Grade of fuel used		**MGO**
	No of Set		**2**
Emergency Gen	Type		**Diesel Engine, Horizontal, Air-Cooled**
	No of Set		**1**
Bow Thruster	Type :		**CPP Type**
	Power:		**450 Kw**
Boiler	Type		**VWH-800E**
	Evaporation		**717 Kg/Hr**
	Max Design Pressure		**0.70 MPa**
	Feed Water Temp		**60 deg celcius**
	No of Set		**1**
Exhaust Economiser	Type		**KF-87-1F**
	Evaporation		
	No of Set		**1**
Air Compressors (Main)	Type / Capacity		**MH111, 15 Kw x 1,170 min-1**
	No of Set		**1**
Air Compressors (Emergency)	Type		**Horizontal, Manual D, 2 cylinder, 2-Stage GS2AR Type**
	No of Set		**1**
Fuel Oil Purifier	Type		**Mitsubishi – SJ20G**
	No of Set		**2**

	Capacity	**5.5 Kw x 800 rpm**
Lub Oil Purifier	Type	**Mitsubishi-SJ10G**
	No of Set	**1**
	Capacity	**3.7 Kw x 180 rpm**
Evaporator	Type	**WM-10DK**
	Capacity	**10 Tons per Day**
Fresh Water Sterilizer	Type	**USS-2K**
	Capacity	**2 Kl/Hr**
Fresh Water Mineraliser	Type / Capacity	**RF-1000S1** **1,000 L/Hr Flow Rate**
Waste Oil Incinerator (IMO MEPC 76 (40))	Type	**BGW-20N**
	Capacity	**Max Capacity 258,000 Kcal/Hr** **Capacity of Waste 0-200000 Kcal/Hr**
Oily Water Separator	Type	**Taiko-R3H-10**
	Capacity	**1 Cu.m/Hr**
Sewage Treatment plant	Type	**Taiko-SBT 25 Activated Sludge Aertion**
	Capacity	**Aeration Blow 22.2 Cu.m x h x 2 Kg/Cal**
Hot Water Set (Calorifier unit)	Type	**Electrical Heating Type, Harison-CFT-400E**
Steering Gear	Type	**SB6 10/315**
	Duty Capacity	**Max Pressure 22.0 MPa, Max Torque 270 Kn.M**
	Hydraulic pump unit	**Elctric-Hydraulic Type, RV21-027**

SPEED / CONS DAY:

About 13.0 knots,Basis up to weather Beaufort scale 4 and max significant wave height of 1.25m
Figures given are "about" defined as 0.5knot less and +/- 5% on consumption respectively

		AT SEA	AT PORT
Main Engine	HFO	**About 11.50 mt / day**	**N/A**
Auxiliary Engine	MGO	**About 1.20 mt / day** **Plus 1.0 mt when inerting**	**About 1.20 mt/day (Idle/Loading)** **About 2.00 mt/day (Discharging)**
Use of Boiler	: MGO	**About 0.20 mt / day**	

PERMANENT BUNKER CAPACITY (100%)

HFO	:	**607.10 M3**
Diesel	:	**107.64 M3**
Fresh Water	:	**157.50 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	3,509.729	3,439.534
NO.2 CARGO TANK	3,510.492	3.440.282
T O T A L	7,020.221	6,879.816

	SPSV (bar g)	Ref. Temp. (deg. C.)	Density at (Ref. Temp.)	Corresponding Quantity (MT)
Propane	17.65	45.0	0.459	3,148
Propylene	17.65	45.0	0.470	3,224
B/P Mixture	17.65	45.0	0.487	3,340
I-Butane	17.65	45.0	0.526	3,608
N-Butane	17.65	45.0	0.548	3,759
Butylene	17.65	45.0	0.565	3,875
Butadiene	17.65	45.0	0.588	4,033
V.C.M.	17.65	45.0	0.872	5,981
Isoprene	17.65	45.0	0.656	4,500
Pentane	17.65	45.0	0.600	4,116
Pentene	17.65	45.0	0.611	4,191

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	17.65	45.0	0.6	4,116
Raffinate 2	17.65	45.0	0.6	4,116
C4	17.65	45.0	0.6	4,116

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	:	**-10 °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 :
Return 2 tanks : **LPG 300 MT /H**

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 **250 m^3** 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	:	**Electric Motor Driven Deep Well Pump, Vertical Centrifugal Multi-Stage**
	Make	:	**Niigata Wothington Co., Ltd., Japan**
	How many	:	**2**
	Maximum specific gravity	:	**0.65 / 0.965**
5.2	Capacity (CMB/Hour)	:	**400 Cu.M/Hr (Butane) / 220 Cu.M/Hr (VCM)**
	Two speed or variable speed	:	
	Rated kW (each)		**150 Kw**
	Working pressure maximum	:	**18 Bars**
5.3	Location	:	**At Each Cargo Tank**
	Removable	:	**No**
5.4	Booster pumps	:	**NA**
	Type	:	
	Maker	:	
5.5	Capacity (CMB/Hour)	:	**NA**
	Working pressure	:	
5.6	Location	:	**NA**

5.7 Time to discharge a full liquid cargo using all pumps against back pressure at pump

1 bar	:	**about 17 hours for LPG**
5 bars	:	**about 20 hours for LPG**
10 bars	:	**-------**

5.8	Nominal back pressure when working	:	**about 1 bar**
	In series corresponding head	:	**NA**
	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	:	**NIL**
- vapour	:	**about 10 Mt 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 : **NA**

7. CARGO COMPRESSORS

7.1 Type : **Vertical Water-Cooled, 1-Stage, Double Acting**
Make : **Tanabe Pneumatic Machinery Co., Ltd., Japan**
How many : **2**
Piston displacement : **About 460 Cu.M./Hr**
Rated Kw : **75 Kw**
Stroke : **177.8 mm**
Max discharge pressure : **20 Bars**
Pressure differential : **Max 7 Bars**

No of Revolutions **540 rpm**

7.2 Are compressors oil free : **Yes**

7.3 Can they reliquefy VCM without risk : **No, only for compression of vapour**

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

8. INERT GAS SYSTEM

8.1 Does the vessel use inert gas? : **N2 GENERATOR**
If so, state utilization and quantities :

8.2 Can the vessel produce inert gas? : **YES**
If so, state type and composition of gas produce: **NITROGEN (N2)**
Discharge Capacity 245 Nm /h - 97% of N2 /215 Nm /h - 98% of N2
200 Nm /h - 99% of N2 /180 Nm /h – 99.5% of N2
130 Nm/h–99.9% of N2 /120 Nm /h–99.95% of N2

8.3 Maximum production obtainable 245 Nm /h - 97% of N2

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

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

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

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 & Tube**
12.2	Inside Diameter	:	**1,000 mm**
12.3	Overall length	:	**8,300 mm**
12.4	Cargo flow rate	:	**550 Cu.M/Hr**
12.5	Min Inlet Temp	:	**-48 deg Celcius**
12.6	Min Outlet Temp	:	**-10 deg Celcius**
12.7	Required Sea water Capacity	:	**600 Cu.M/Hr @ 18 deg Celcius**
12.8	Design Pressure	:	**20 Bars**
12.9	Hydrostatic Test Pressure	:	**30 Bars**
12.10	Tightness Test Pressure	:	**20 Bars**

12.0 State discharging rate for propane to be brought from atmospheric pressure
Loading rate for Propane – ° C / 0° C: **about** 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^{o}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?
: **Sampling Point at Cargo Tank Dome**

Standard of fitting? : **Coupler Socket Pt ¼**

16.2 Same question for cargo : **TBA**

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)	:	**64.7**	**M**
- distance form stem (FP) (S / P)	:	**54.8**	**M**
- height above deck	:	**1.43**	**m for Liquid manifold**
- distance from ship's rail	:	**2.5**	**M**
- underside keel to manifold	:	**10.463**	**M**

17.3 Liquid line

- flange-size	:	**10 in.**
- type	:	**ANSI 300 lbs**

Gas line

- flange-size	:	**6 in.**
- type	:	**ANSI 300 lbs**

17.4 What reducers on board? :

For Liquid line (low temperature) :
10 in x 12 in ANSI 300 lbs
10 in x 8 in ANSI 300 lbs
10 in x 6 in ANSI 300 lbs
10 in x 5 in ANSI 300 lbs
10 in x 4 in ANSI 300 lbs
10 in x 3 in ANSI 300 lbs
10 in x 10 in ANSI 150 lbs
10 in x 8 in ANSI 150 lbs
10 in x 6 in ANSI 150 lbs
10 in x 5 in ANSI 150 lbs

For Vapor line (normal temp.) :
6 in x 8 in ANS 300 lbs
6 in x 5 in ANSI 300 lbs
6 in x 4 in ANSI 300 lbs
6 in x 3 in ANSI 300 lbs
6 in x 2 in ANSI 300 lbs
6 in x 8 in ANSI 150 lbs
6 in x 6 in ANSI 150 lbs
6 in x 5 in ANSI 150 lbs
6 in x 4 in ANSI 150 lbs
6 in x 3 in ANSI 150 lbs
6 in x 5 in ANSI 150 lb with Stud
6 in x 4 in ANSI 150 lbs with Stude

17.5	Is ship fitted with stern discharge?		**No**
	- Liquid line - diameter	:	**NA**
	- flange – size	:	**NA**
	- type	:	**NA**

18. HOSES

Are serviceable hoses available on board? : **None**

18.1		:
	Length	:
	Diameter	:
	Flange-size	:
	Type	:
	Bending radius	:
18.2	Minimum temperature acceptable	:
	Maximum pressure acceptable	:
18.3	For what products are hoses suitable?	:

19. DERRICKS

- Hose cranes	:	**1**
- Where situated	:	**Main Deck**
- Lifting capacity	:	**4 Tons – 15 M**
- Working radius	:	

20. SPECIAL FACILITIES

20.1	How many grades can be segregated?	:	**1**
20.2	How many cooled?	:	**NA**
20.3	Can vessel sail with slack cargo tanks?	:	**Yes**