

VESSEL PARTICULARS (FORM C)
LPG/C GAS GALAXY
(last updated 2/10/2017)

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

(A) VESSEL'S CHARACTERISTICS

PREAMBLE

Name : **GAS GALAXY**
Owner : **LUCKYBOY INC.**
Flag : **BAHAMAS**
Build : **23 APRIL 1997**
Date on Service : **15 OCT. 1997**
Class : **NKK**

GRT International : **3607 T** Suez : **4096.24 T**
Panama : **3607.00 T**

NRT International : **1083 T** Suez : **3102.45 T**
Panama : **3089.00 T**

Is vessel build according to USCG regulations? : **YES**
RINA regulations? : **YES**
Japanese regulation? : **YES**

Has vessel received USCG approval? : **NO**
RINA approval? : **NO**

HULL

LOA : **99.00 M**
LBP : **92.07 M**
Breadth : **16.20 M**
Depth : **7.50 M**
Summer Draft : **5.50 M corresponding to Summer DWT =3942.00 T**
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%)	3.97	4.42	4.20	2269.87
Butadiene (98%)	3.90	4.74	4.33	3426.77
VCM (98%)	5.35	5.41	5.38	3786.62

Propeller immersion :

At draft At 4.20 m correspond. : **73 %**
At draft At 4.33 m correspond. : **81 %**
At draft At 5.38 m correspond. : **100 %**

COMMUNICATION EQUIPMENT

Call letter : **C6TD9**
 Radio Station normally watched : **16 / 70 / 2187.5 KHZ**
 Radio MF/HF NBDP : **Model: NDZ 800**
 Radio MF/HFTEL/DSC : **Model: JRC NCH - 700**
 VHF : **2 X Model : JRC JHS-32A**
 Satellite Communication **Inmarsat 'C'** : **Model: NDZ-127C**
Inmarsat 'F' : **NIL**
 :
 :

MACHINERY

Main Engine x 1 . Type and make : **Makita B&W 6526 MC**
 . Total power/KW : **3270 PS / 2405**
 Service Power : **2945 PS**
 No of Cylinders : **6**
 Cyl Bore x Stroke : **260 x980**
 . Grade of fuel used : **380 HFO (RMG 35)**

Auxiliaries Type and make (Electrical) : **S165L-DN / YANMAR DIESEL**
 (Mechanical) : **TWY 35BM-6S / TAIYO ELECTRIC**
 Grade of fuel used : **YANMAR DIESEL**
 No off : **GAS OIL (DMB)**
 KW / KVA : **2**
280 / 350

Emergency Gen Type /Maker : **TFD1 150K / Yanmar Diesel**
 No off : **1**
 KW : **8**

Bow Thruster Type : Power: : **TCA 45mm / 240 kw (326 HP)**
 Maker: : **Kamome Propeller**

Boiler Type : **THERMAL OIL HBT -30H**
 Evaporation : **300,000 kcal/h**
 Max Design Pressure : **5.0 KG**
 Feed Water Temp : **230 c thermal oil**
 No off : **1**
 Maker: : **Miura Z Boiler**

Exhaust Economiser Type : **KTH-S93(21)**
 Evaporation : **184,000 kcal/h**
 No off : **1**
 Max.Working press : **5.0KG**
 Maker: : **Miura Z Boiler**

Air Compressors (Main) Type / Capacity : **SC-10N / 56 m3/h**
 No off : **2**
 Maker: : **Yanmar Diesel eng, Co., ltd**

Air Compressors (Emergency)	Type/Maker	HATLAPA L9/ Yanmar Diesel eng, Co., ltd
	No off	1
	Model: Dish. Press.	SC-10N 20KG
Fuel Oil Purifier	Type / Maker	SJ15F / Mitsubishi kakoki kaisha ltd.
	No off	2
	Capacity	650 ltrs/h
Lub Oil Purifier	Type / Maker	SJ15F / Mitsubishi kakoki kaisha ltd.
	No off	1
	Capacity	650 ltrs/h
Evaporator	Type / Maker	JWP – 2608D / Alfa laval kk
	Capacity	10m3/day
Fresh Water Sterilizer	Type	USS – 2K
	Capacity	Sterilizing rate 2k ltrs/h
Fresh Water Mineraliser	Type / Capacity	NA
Waste Oil Incinerator (IMO MEPC 76 (40))	Type /Maker	BGW-20 /MIURA CO. LTD
	Capacity	20 ltrs / h
Oily Water Separator	Type / Maker	USC – 10 / Kaiko kikai ind. Co., ltd.
	Capacity	1 m3/h
Sewage Treatment plant	Type/ Maker	SBT – 25 / Kaiko kikai ind. Co., ltd.
	Capacity	25 men/day
Hot Water Set (Calorifier unit)	No off	2
	Model	CFT -700-E
	KW / Maker	15 heater x 2 / Horizon Co., ltd.
Steering Gear	Type	R21 – 140V
	Duty Capacity	200 kg/m3
	Hydraulic pump unit	2
	Maker	Kawasaki heavy ind. Ltd.
Speed In Moderate weather:		About: 13 Knots

CONSUMPTION/ DAY

Main Engine	HFO	9.0 m/t about
Auxiliary Engine	DO	1.5 m/t about

Permanent bunker
capacity (100%)

HFO	:	413.14 m3
Diesel	:	104.26 m3
Fresh Water	:	160.70 tons

(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	1655.963	1622.844		
NO.2 CARGO TANK	1656.029	1622.908		
TOTAL	3311.992	3245.752		
	SPSV (bar g)	Ref. Temp. (deg. C.)	Density at (Ref. Temp.)	Corresponding Quantity (MT)
Propane	17.65	45.0	0.459	1489.80
Propylene	17.65	45.0	0.470	1525.50
B/P Mixture	17.65	45.0	0.487	1580.68
I-Butane	17.65	45.0	0.526	1707.26
N-Butane	17.65	45.0	0.548	1778.67
Butylene	17.65	45.0	0.565	1833.85
Butadiene	17.65	45.0	0.588	1908.50
V.C.M.	17.65	45.0	0.872	2830.29
Isoprene	17.65	45.0	0.656	2129.21
Pentane	17.65	45.0	0.600	NA
Pentene	17.65	45.0	0.611	NA

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

: 1 tank : **150 mt/h**
: 2 tanks : **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 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 DEEPWELL

5.1 Type : **DW 150/159-4-K+I**
Make : **SVANEHOJ INT`L A/S**
How many : **2**
Maximum specific gravity : **948 kg/m3**

5.2 Capacity (CMB/Hour) : **300 / 250 m3/h**
Two speed or variable speed : **1780 rpm**
Rated kW (each) : **130kw each**
Working pressure maximum : **18 bars**

5.3 Location : **Tank 1 & Tank 2**
Removable : **NO**

5.4 Booster pumps : **N/A**
Type :
Maker :

5.5 Capacity (CMB/Hour) : **N/A**
Working pressure :

5.6 Location : **N/A**

5.7 Time to discharge a full liquid cargo using all pumps against back pressure at pump
1 bar : **about 6 hours for LPG**
5 bars : **about 10 hours for LPG**
10 bars : **about 12 hours for LPG**

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 1m3 per one tank**
- vapour : **about ton 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 8 hours (vaporizing)**

7. CARGO COMPRESSORS

- 7.1 Type / Model : **Vertical 1-stage water cooled / LPGOS-97A**
Make : **Tanabe Pneumatic Machinery Co. Ltd.**
How many : **2 sets**
Piston displacement / Capacity : **460 m3/h**
Rated Kw / PS : **73 / 100**
Stroke : **Cyl. Bore x Stroke 228.5 x 177.8 mm**
Max discharge pressure : **20.0 kg/cm2g**
Pressure differential : **7 kg/cm2**
- 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 :

8. INERT GAS SYSTEM

- 8.1 Does the vessel use inert gas? : **n/a**
If so, state utilization and quantities :
- 8.2 Can the vessel produce inert gas? : **n/a**
If so, state type and composition of gas produce:
- Discharge Capacity : **n/a**
- 8.3 Maximum production obtainable : **N/A**

- 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**

8.6 NITROGEN GENERATOR PLANT

- Maker : **Tamrotor marine compressor A/S**
Type : **Water cooled screw compressor**
KW /RPM : **185 / 3578**
Capacity : **150Nm3 / h**
Purity N2 / Dew point : **99 % / -65 deg. Cent.**

9. GAS FREEING

- 9.1 State method used giving all details : **Nitrogen Plant / Fans**
- 9.2 State time required including stripping : **Cargo Vapour to fully inert 36 hrs**
Fully inert to fully breathable fresh air 12 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 100 ppm of Propane in Vapour phase.

Time required: TBA

- 10.2 Can this operation be carried out at sea? : **TBA**
- 10.3 Can the ship measure the number of ppm in vapour phase? : **Yes (manual)**
- 10.4 Has vessel deck tank for changing grade/cooling operations? : **Nil**
- 10.5 Deck tanks : **NIL**
Capacity :
Purpose :

11. COOLING BEFORE LOADING : NA

12. CARGO HEATER

- 12.1 Type : **Horizontal Shell and Tube**
- 12.2 Inside Diameter **650 mm**
- 12.3 Overall length **5.7 mtrs**
- 12.4 Cargo flow rate **150 m3/h**
- 12.5 Min Inlet Temp **-45 deg C**
- 12.6 Min Outlet Temp **0 deg C**
- 12.7 Required Sea water Capacity **420 m3/h**
- 12.8 Design Pressure **20 kgf /cm3G (Shell side) 5.0 kgf/cm3G (tube side)**
- 12.9 Hydrostatic Test Pressure **7.5 kg**
- 12.10 Tightness Test Pressure **5.5 kg**

12.0 State discharging rate for propane to be brought from atmospheric pressure
Loading rate for Propane – ° C to 0° C: about 150 m3/h

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?

: **TOP LEVEL ON CARGO TANK DOME OF EACH TANK**

Standard of fitting? : **SCREW TYPE**

16.2 Same question for cargo : **MIDDLE , BOTTOM LEVEL ON CARGO TANK DOME OF EACH TANK**

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)	:	53.8	M
- distance form stem (FP) (S / P)	:	45.2	M
- height above deck	:	0.83	m for Liquid manifold
- distance from ship's rail	:	2.50	M
- underside keel to manifold	:	8.33	M

17.3 Liquid line

- flange-size	:	8 in.
- type	:	300asa

Gas line

- flange-size	:	5 in.
- type	:	300 asa

17.4 What reducers on board? :

For Liquid line (low temperature)

For Vapor line (normal temp.)

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 :

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 : **Electro hydraulic type with 2 wire drums**
- Where situated : **Port / Starboard Manifold area**
- Lifting capacity : **4.0 T at boom angle 25 deg**
- Working radius : **3.0 mtrs from the ship`s side**

20. SPECIAL FACILITIES

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