

JANUARY 01, 2016

GAS FORM C



1. PREAMBLE

Ship's name	GAS IONIAN
Owners	Cloe Shipping & Trading Ltd c/o: BENELUX OVERSEAS Inc
Flag – Registry	Liberia - Monrovia
Builder	STX Offshore & Shipbuilding (S.Korea)
Delivery	04 Jan. 2012
Class	Korean Register of Shipping
IMO No.	9522271

GT (International)	9134
NT (International)	2741
GRT (Suez)	10240
NRT (Suez)	7747.67
GRT (Panama)	-
LWT (MT)	4892

Is vessel approved?	
USCG	Yes
IMO	Yes

2. HULL

	Metres	Feet
LOA	120.46	395.01
LBP	112.40	368.76
Breadth	19.82	64.96
Depth	11.20	36.74
Air draft (fm Summer LL)	27.80	91,18

	Draft (m)	Corresponding DWT
Tropical	8.997	10821.5
Summer	8.814	10431.0
Winter	8.631	10042.2

TPC fully loaded (MT)	21.7
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Estimated Mean draft with full bunkers and 98% cargo & full bunkers			
Cargo	Mean draft (m)	DWT	displacement

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Propane	7.10	6897	11789
Butane	7.37	7406	12298
Ammonia	7.65	7991	12883
VCM	8.63	10035	14620
Propylene Oxide	8.17	9078	13970

3. COMMUNICATION EQUIPMENT

International call sign	D5A07
Radio station	636015414
Inmarsat F77	
- Telephone	765092129
- Telephone	765092130
- Telefax	765092131
- Telex	
Inmarsat C	4637112920
MMSI	636 015 414
Cell phone	-
E-Mail	master.gasionian@amosconnect.com

4. MACHINERY

Main Engine	
Maker/model	STX/MAN-B&W (7S35MC-C Mk7)
MCR	5,180KW / 173 RPM
Grade fuel used	I.F.O 180/280/380. & M.D.O 30/60/70.

Auxiliaries Engines	
Type/Model	Four stroke diesel engine - MAN 6L21/31
Maker	STX Engine Ltd (S.Korea)
Output(KW/RPM)	3 x 1,176KW @ 900 RPM
Generator	3 x 1,100 KW /450VAC, 3ph,60Hz
Grade fuel used	I.F.O 180/280/380 & M.D.O 30/60/70.

Speed	
Guarantee average loaded/ ballast speed (kt)	14.0
Draft at Guarantee average loaded/ ballast speed (m)	7,65

Consumption		
	Consumption at sea	Consumption at port
Main engine (IFO)	19.9 MT/day	-
Aux. Engines (IFO)	2.7 MT/day	4.2 MT/day
Number of A/E in use	One(1)	Two(2)

IFO Consumption alongside in port	ONE A/E 2.7 MT	TWO A/E 4.2 MT
Inert Gas plant when operating	-	-
Boiler consumption (MT/day)	1.4	
All cooling plans in operation	All generators	6.0 MT/Day

Permanent bunkers capacity (Excl. daily service tanks) @ 98%	
HFO (MT)	937
MDO (MT)	127

5. CARGO INSTALLATION

Re-liquefaction plant Type	Compression type
Minimum temperature can maintain	- 48.4 ° C (propylene)

Tank No.	Capacities		n-C4 0.605 @ - 5° C	C3 0.582 @ -41.5° C	NH3 0.682 @ -33.4° C	Butadien e 0.653 @ -5° C
	100% M ³	98% M ³				
1	4,551.05	4,460.03	2,698.30	2,595.70	3,041.70	2,912.40
2	4,550.99	4,459.97	2,698.30	2,595.70	3,041.70	2,912.40
Total	9,102.02	8,920.00	5,396.60	5,191.40	6,083.40	5,824.80

Carried Products
Propene (Propylene), commercial Propane*, Propane/Butane mixtures, Anhydrous Ammonia, Vinyl Chloride Monomer, i-Butane, Butene (Butylene), Butadiene, Acetaldehyde, Dimethylamine, Ethyl Chloride, Diethyl Ether**, Ethene Oxide/Propene Oxide(max. 30%W-%E.O)**, isoprene(monomer), isopropylamine**, Monoethylamine**, Propene Oxide, Vinyl Ethyl Ether**
Notes: (*) Propane/Ethane mixtures: Maximum ethane percentage for commercial Propane in liquid phase at saturated temperature is 2.5 mol-% Ethane at 1.013bar-abs

(**) Maximum allowable quantity of cargo per tank should not exceed 3,000 m³ in any one tank according to IGC Ch.17 §11

Cooling before loading

(for fully-refrigerated vessels what quantity of cargo is needed and which is the corresponding time to pre-cool the tanks and have them ready to load?)

	MT	Hrs
BUTANE	37	35
PROPANE	41	65
BUTADIENE	35	35
AMMONIA	25	45
VCM	42	30

6. CARGO TANKS

Type	Independent Cylindrical type-C with hemi-ends	
Material	13MnNi63	
MARVS	IMO 5.8 bar-g	
	USCG 3.55 bar-g	
Maximum Vacuum	about - 0.25 bar	
Minimum pressure	about 0.75 bar	
Minimum temperature acceptable in tanks	-48° C	
Maximum Specific Gravity	972 kg/m ³	
Maximum Loading rate – m³/hour	900	
Number of deck tanks	N/A	

7. CARGO PUMPS

Number/Type	2 x Electric driven vertical Deep-well pumps (450 m ³ /h @ 120m mlc)	
Maker	Hamworthy-Svanehoj	
Location	Each tank's dome	
Max permissible specific gravity	972 kg/m ³	
Cargo remaining onboard in cargo tanks after total completion pumping	0,075m ³ /per Tank in sump	
Cargo remaining onboard in cargo tanks (heel) after completion pumping	Liquid	6 m ³
	Vapour	Subject to tank condition
Total head when working in series with booster pump	240 mlc	

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Booster pumps (number/type)	2 x Electric driven horizontal centrifugal pumps (225 m ³ /h @ 120m mlc)
Maker	Hamworthy-Svanehoj

Stripping	
Stripping system	Pressurizing
Time required for all traces of liquid cargo	Subject to tank condition

Loading Rates	
Loading rate (storage tank at atmospheric pressure + vapor return) -BUTANE	545 MT /h
Loading rate (storage tank at atmospheric pressure) – PROPANE*	525 MT /h
Loading rate (storage tank at atmospheric pressure) – AMMONIA *	615 MT /h
Loading rate (storage tank at atmospheric pressure) – BUTADIENE*	580 MT /h
Loading rate (pressurized storage tank with vapour return line) – PROPANE	Subject to cargo temperature and ambient conditions
Loading rate (pressurized storage tank with vapour return line) – AMMONIA	Subject to cargo temperature and ambient conditions

()Note: for pressure or semi-refrigerated vessels using the cargo heater with sea temperature +15° C*

Time for discharging full cargo using all pumps against no backpressure		
	With vapour return line (hours)	Without vapour return line (hours)
Discharging rate (atm)	10	10
Discharging rate (1 bar)	12	12
Discharging rate (5 bars)	18	18
Discharging rate (10 bars)	24	24

8. CARGO COMPRESSORS

Number/Type	2 x (two stage piston type-Oil free)
Maker/Model	Sulzer Burckhardt 2K-160-2H
Total Swept volume	1200 m ³ / hr
Can re-liquefy VCM	YES

	Propane	Ammonia
Refrigeration Capacity	Abt 910kW	Abt 1269 kW
Suction pressure	5 bar abs	5 bar abs

9. INERT GAS SYSTEM

Does the vessel use inert gas?	YES
Method	PSA System- pressure swing adsorption
Maker	CARBONTECH GmbH
Fuel used	N/A

Does the vessel produce inert gas?	YES
Type	Nitrogen
Daily production	750 m ³ /hr @ 99.5 % vol

Composition of inert gas	
Carbon dioxide	N/A
Oxygen max.	Max. 2% - Min. <0,1%
Carbon monoxide max.	N/A
Hydrogen max.	N/A
Nitrogen	98% to 99,9%
Soot	N/A
Suphur oxides max.	N/A
Dewpoint	-50° C

State if any shore supply of liquid nitrogen may be required	
May be required for pumping tanks prior to loading butadiene and ammonia	
What quantity?	N/A

10. GAS FREEING

Can this operation be carried out at sea?	YES
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State method incl. all details	
For LPG	Nitrogen by vessel's own plant, aeration by air compressor
For NH ₃	Nitrogen by vessel's own plant, ventilation by air compressor

Advise time required and consumption of inert gas if any	
From LPG about	Apx 24 hr
From NH ₃	Apx. 24 hr
Is the vessel equipped with inert gas blower?	N/A

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Capacity	N/A
Ventilation fan	N/A

11. CHANGING GRADE

Can this operation be carried out at sea?	YES
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State method used and time required for charging from NH₃ to LPG and vice versa, to reach 50 ppm to previous cargo in tanks atmosphere, the tanks being dry and free of moisture (dewpoint plus 10° C)

From NH ₃ to LPG	Nitrogen production PSA System
Time required	Abt. 48h

From NH ₃ to LPG	Nitrogen production PSA System
Time required	Abt. 48h

Can vessel reduce in tank atmosphere and gas installation concentration of previous cargo below 50 ppm?	YES
Method used, time required and extra shore supply if any	Nitrogen Production, time depending on cargo conditions, shore supply possible
How can it be checked that no liquid gas remain onboard	Check level indicators, open drains at low points

12. CARGO HEATER

Cargo Heater	YES	
Maker	TGE Marine Engineering GmbH	
Type	Shell/tube	
Discharging rate for C3 & NH ₃ to be brought fm atmospheric pressure to -5° C @ S.W 15° C	PROPANE	230 MT/hr
	AMMONIA	150 MT/hr
State discharging rate for propane with 2.5 mol % ethane to be brought from -44oC to -5oC at sea temperature of 15oC	350 MT/hr	

13. CARGO VAPORIZER

In case of need of vapor gas during discharge, can vessel produce its own if no shore gas available?	Yes by cargo heater/vaporizer
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14. REFRIGERATING APPARATUS

It is independent of cargo?	YES Two(2) grade re-liquefaction systems
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15. MEASURING APPARATUS

What gauges onboard	Level/pressure/temperature
Location and type	Float type level gauges/P& T sensors
Number of temperature sensors/gauges per tank	10 pcs
Number of pressure sensors/gauges on tank	3 pcs

16. SAMPLES

Where samples can be taken?	Five(5) vapours samples inside tank, one closed sampling liquid sample by circulation
Are sample bottles available onboard?	YES

17. CARGO LINES

Is vessel fitted with midship manifolds	YES
Number of lines on each side	2 x Liquid (6" & 8") 300A 2 x Vapour (4" & 6") 300A
Lines Configuration	L-V-V-L
Distance from cargo manifold to bow	56,490mm
Distance from manifold to stern	63,970 mm
Height upper cargo manifold above main deck	3,000 mm
Height above Summer Draft mark	5,400 mm
Height upper cargo manifold waterline when LWT	10,720 mm
Height upper cargo manifold above waterline when in ballast	9,130 mm
Distance manifold from ship's rail	2,100 mm
Distance between liquid lines	4,200 mm
Distance between vapour lines	1,400 mm
Distance between loading and vapour return connections	1,400 mm

Is vessel fitted with stern discharge	N/A
Is vessel fitted with fore discharge	N/A

Note: Above distances from center line of liquid and vapour crossovers

Dimension of lines		
	Diameter	Flange size
Liquid (P/S)	6", 8"	ANSI #300
Vapour	4", 6"	ANSI #300
Booster	N/A	N/A

What reducers onboard			
Number	Diameter	Length	Pressure rating
1	8" x 8"	500mm	(300# x 300#)
2	6" x 8"	500mm	(300# x 300#)
3	6" x 6"	500mm	(300# x 300#)
4	4" x 6"	500mm	(300# x 300#)
5	8" x 10	500mm	(300# x 300#)
6	8" x 6"	500mm	(300# x 300#)
7	6" x 6"	500mm	(300# x 300#)
8	6" x 8"	500mm	(300# x 300#)
9	6" x 4"	500mm	(300# x 300#)
10	6" x 3"	500mm	(300# x 300#)
11	4" x 4"	500mm	(300# x 300#)
12	4" x 3"	500mm	(300# x 300#)
13	8" x 10	500mm	(300# x 150#)
14	8" x 8"	500mm	(300# x 150#)
15	8" x 6"	500mm	(300# x 150#)
16	6" x 8"	500mm	(300# x 150#)
17	6" x 6"	500mm	(300# x 150#)
18	6" x 4"	500mm	(300# x 150#)
19	6" x 3"	500mm	(300# x 150#)
20	4" x 6"	500mm	(300# x 150#)
21	4" x 4"	500mm	(300# x 150#)
22	4" x 3"	500mm	(300# x 150#)
23	6" x 12"	500mm	(300# x 300#)

18. LIFTING APPLIANCES

Where situated	Aft	Amidship
Number and lifting capacity	Provision and engine part handling crane(1.5t SWL)	hose handling crane (4t SWL)

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Max. distance from ship's side of lifting hook	max 6,000mm	max 15,000mm
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19. HOSES

For what products are hoses suitable				
Number	Length	Diameter	Working pressure	Flange
Purging hose	6,000mm	4"	12	ANSI #150
Drain hose	6,000mm	1"	35	ANSI #300

20. SPECIAL FACILITIES

How many grades can vessel segregate?	
Indicate systems	Two(2) grades - if compatible
Is vessel able to load/discharge two or more grades simultaneously?	YES
Can vessel sail with slack tanks?	YES
Is vessel fitted with purge tank?	NO