January 2016	GAS FORM-C

1. PREAMBLE	
Ship's name	GAS AEGEAN
Owners	CLARIN NAVIGATION CORP. c/o: BENELUX OVERSEAS Inc
Flag – Registry	Liberia - Monrovia
Builder	STX Offshore & Shipbuilding (S.Korea)
Delivery	28 JUNE 2012
Class	KOREAN REGISTER OF SHIPPING
IMO No.	9545209

GT (International)	9,134
NT (International)	2,745
GRT (Suez)	10,044.92
NRT (Suez)	9,297.78
GRT (Panama)	7.712.00
LWT (MT)	4,934.60
Is vessel approved?	
USCG	Yes
IMO	Yes

2. HULL		
	Metres	**Feet**
LOA	120.4	395.01
LBP	112.4	368.76
Breadth	19.8	64.96
Depth	11.2	36.74
Air draft (fm Summer LL)	27.8	91,18
	Draft (m)	**Corresponding DWT**
Tropical	9.00	10,821,50
Summer	8.81	10,388,00
Winter	8.63	10,042.20
TPC fully loaded (MT)	20.4	

Estimated Mean draft with full bunkers and 98% cargo & full bunkers

Cargo	Mean draft (m)	DWT	displacement
Propane	7.6	7,758	12,800
Butane	7.8	7,955	12,997
Ammonia	8.4	9,495	14,538
VCM	7.4	7,425	12,468
Propylene Oxide	7.4	7,478	12,520

3. COMMUNICATION EQUIPMENT	
International call sign	D5AO9

Radio station	636015415
Inmarsat F77	
- Telephone	765101528
- Telephone	765101529
- Telefax	765101530
- Telex	
Inmarsat C	463712494
MMSI	636015415
Cell phone	-
E-Mail	master.gasaegean@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)	15,2
Draft at Guarantee average loaded/ ballast speed (m)	7,65

Consumption

	Consumption at sea	**Consumption at port**
Main engine (IFO)	17.8 MT/day	-
Aux. Engines (IFO)	2.4 MT/day	2.6 MT/day
Number of A/E in use	One(1)	Two(2)
MDO Consumption alongside in port		2.4 MT/Day
Inert Gas plant when operating	-	-
Boiler consumption (MT/day)	1.5	

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 ^{o} C (propylene)

Tank No.	Capacities		n-C4 0.605 @ -5^{o} C	C3 0.582 @ -41.5^{o} C	NH3 0.682 @ -33.4^{o} C	Butadiene 0.653 @ -5^{o}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 m^3 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^{o} 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	
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^o 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)	-	12
Discharging rate (10 bars)	-	20

8. CARGO COMPRESSORS	
Number/Type	2 x (two stage piston type-Oil free)

Maker/Model	Sulzer Burckhardt 2K-160-2H	
Total Swept volume	1200 m³ / 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 m³/hr @ 99.5 % vol
Composition of inert gas	
Garbon dioxide	N/A
Oxygen max.	Max. 2% - Min. <0,1%
Garbon 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
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
Capacity	N/A
Ventilation fan	N/A
11. CHANGING GRADE	
Can this operation be carried out at sea?	YES

State method used and time required for charging from NH_3 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 & NH3 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

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

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	56,700mm
Distance from manifold to stern	63,600 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)
Max. distance from ship’s side of lifting hook	max 6,000mm	max 15,000mm

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