VESSEL PARTICULARS (FORM C)
LPG/C ECO TEXIANA
(last updated 09/25/2019)

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

(A) VESSEL'S CHARACTERISTICS

PREAMBLE

Name	:	ECO TEXIANA
Owner	:	To be named (TBN)
Flag	:	To be named (TBN)
Build	:	To be named (TBN)
Date on Service	:	FEB 2020
Class	:	To be named (TBN)

GRT International	:	Abt. 4,258	Suez	:	Abt. 4932.35
			Panama	:	Abt. 3637
NRT International	:	Abt. 1,376	Suez	:	Abt. 4054.65
			Panama	:	Abt. 3637

Is vessel build according to	USCG regulations?	:	Yes.
	RINA regulations?	:	IMO COMPLIANCE
	Japanese regulation?	:	JIS
Has vessel received	USCG approval?	:	USCG Certificate to be obtained at the 1st call of US port
	RINA approval?	:	CLASS NK APPROVAL

HULL

LOA	:	99.98	M
LBP	:	93.50	M
Breadth	:	17.50	M (Moulded)
Depth	:	7.80	M (Moulded)
Summer Draft	:	6.163	M (Moulded) (LPG98%) (VCM76%)
Air draft at full load condition	:	26.90	M (est)
Air draft at ballast load condition	:	29.14	M (est)

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	Abt. 4.35	Abt. 6.13	Abt. 5.24	Abt. 3506.52
VCM	Abt. 5.39	Abt. 6.89	Abt. 6.14	Abt. 4752.58
Isoprene	Abt. 5.50	Abt. 6.80	Abt. 6.15	Abt. 4752.58
i-Butane	Abt. 4.62	Abt. 6.33	Abt. 5.47	Abt. 3820.23

Propeller immersion :

Propane	Aft draft	At	6.13 m correspond.	: 109.30 %
VCM	Aft draft	At	6.89 m correspond.	: 130.70 %
Isoprene	Aft draft	At	6.80 m correspond.	: 128.17 %
i-butane	Aft draft	At	6.33 m correspond.	: 114.93 %

COMMUNICATION EQUIPMENT

Call letter		:	VLK92
Radio Station normally watched		:	VHF 16
Radio MF/HF NBDP		:	538006288
Radio MF/HF TEL/DSC		:	MMSI - 538006288
VHF		:	16/70
Satellite Communication	**Inmarsat 'C'**	:	453841528
	Inmarsat 'F'	:	+870 773132397
		:	

MACHINERY

Main Engine x 1	.	Type and make	:	MAKITA-MITSUI-MAN B&W, 5L35MC6.1
	.	Service power	:	2750kW x 210 min-1 (MCR)
		No of Cylinders		5 Cylinders
		Cyl Bore x Stroke		350φ x 1,050
	.	Grade of fuel used	:	I.F.O. (380 mm2/s @ 50 deg. C)
Auxiliaries		Type and make (Electrical)		TAIYO, AC450V x 3φ x 60Hz
				360kW x 1,200min-1
		(Mechanical)		YANMAR, 6NY16L-SW
		Grade of fuel used		M.D.O. (Maximum 14 mm2/s @ 50 deg. C)
		No off		2 sets
Emergency Gen		Type		MITSUI E&S POWER SYSTEMS INC., F5L912, MDG-50E
		No off		1 set
		Power		40kW x AC445V x 3phi x 60Hz
Boiler		Type		MIURA, VWH-600E
		Evaporation		538 kg/h (Actual Evaporation)
		Max Design Pressure		0.5~0.6 MPa
		Feed Water Temp		60 deg.
		No off		1 set
Exhaust Economiser		Type		MIURA, KF-101F
		Evaporation		420 kg/h (at M/E 90% load)
		No off		1 set
Air Compressors (Main)		Type / Capacity		J.P. SAUER & SOHN, WP45L
		No off		2 sets
Air Compressors (Emergency)		Type		J.P. SAUER & SOHN, WP15L
		No off		1 set
Fuel Oil Purifier		Type		ALFA LAVAL, P615
		No off		2 sets
		Capacity		900 ltr/h (at 380 cst 50 deg. C)
Lub Oil Purifier		Type		ALFA LAVAL, P615
		No off		1 set
		Capacity		1,100 ltr/h (at 150 cst 40 deg. C)

Evaporator	Type	ALFA LAVAL, AQUA blue-C80-HW-FS
	Capacity	8 ton/day
Fresh Water Sterilizer	Type	NIPPON CONTROLS, L-N201F
	Capacity	2.0 M3/h
Fresh Water Mineraliser	Type / Capacity	N/A
Waste Oil Incinerator	Type	MIURA, BGW-20N
	Capacity	301 kW (Max. Capacity)
Oily Water Separator	Type	HEISHIN, HFM-200
	Capacity	2 M3/h
Sewage Treatment plant	Type	TAIKO, SBH-25
	Capacity	For 25P (Discharge Pump 4M3 x 0.2)
Hot Water Set (Calorifier unit)	No off	1 set
Steering Gear	Type	RV21-017
	Duty Capacity	170 kN.M
	Hydraulic pump unit	LVPO17-210ROL
Bow Thruster	Type	1 set , 1800rpm 4 blades, propeller dia.: 1050mm
	Capacity	Output: 325kW, Nominal Thrust: abt. 5t

SPEED

Abt 13.1 knots @ CSO with 15% sea margin, full load condition

CONSUMPTION/ DAY: To be confirmed after sea trials ton/day

Main Engine	HFO	: abt 10.8 MT/ day
Auxiliary Engine to be confirmed after shop trials		
In Port Discharging	MGO	: abt 2 MT/ day
In Port Idle / Loading	MGO	: abt 1 MT/ day
Loading via heater	MGO	: abt 1.6 MT/ day
Use IGG	MGO	: abt 2 MT/ day
Boiler	IFO	: abt 0.5 MT/day

Notes:

1. Speed and consumption figures at sea, are best estimated basis daily weather conditions are up to Beaufort scale 4 - sea state Douglas 3, 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.

Permanent bunker capacity (100%)

HFO	: 436.58	m^3 (est)
Diesel	: 146.14	m^3 (est)
Fresh Water	: 148.32	m^3 (est)

(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	Abt. 2,500	Abt. 2450
NO.2 CARGO TANK	Abt. 2,500	Abt. 2450
T O T A L	Abt. 5,000	Abt. 4,900

	SPSV (bar g)	Ref. Temp. (deg. C.)	Density at (Ref. Temp.)	Corresponding Quantity (MT) at 98%
Propylene	17.65	45.0	0.470	Abt. 2303.00
Propane	17.65	45.0	0.459	Abt. 2249.10
B/P Mixture	17.65	45.0	0.914	Abt. 4478.60
n-Butane	17.65	45.0	0.548	Abt. 2685.20
i-Butane	17.65	45.0	0.526	Abt. 2577.40
Butadiene	17.65	45.0	0.580	Abt. 2842.00
Butylene	17.65	45.0	0.565	Abt. 2768.50
V.C.M.	17.65	45.0	0.872	Abt. 4272.80
Isoprene	17.65	45.0	0.656	Abt. 3214.40
Pentanes	17.65	45.0	0.600	Abt. 2940.00
Pentene	17.65	45.0	0.611	Abt. 2993.90
B/P Mixtures	12.75	45.0	0.914	Abt. 4478.60
n-Butane	12.75	45.0	0.548	Abt. 2685.20
i-Butane	12.75	45.0	0.526	Abt. 2577.40
Butadiene	12.75	45.0	0.580	Abt. 2842.00
Butylene	12.75	45.0	0.565	Abt. 2768.50
V.C.M.	12.75	45.0	0.872	Abt. 4272.80
Isoprene	12.75	45.0	0.656	Abt. 3214.40
Pentanes	12.75	45.0	0.600	Abt. 2940.00
Pentene	12.75	45.0	0.611	Abt. 2993.90

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%
Note(3): VCM loadable quantity is subject to applicable loadline, present bunkers onboard and allowable trim & stability calculations

3. TANKS

3.1	Design pressure (Vapour) - IGC	:	17.7 bar (G) for IGC-Code
	- USCG	:	12.7 bar (G) for U.S.C.G.
3.2	Valve setting	:	High: 17.7 bar (G)IMO, Low: 12.7 bar (G)USCG
3.3	Maximum vacuum obtainable	:	0.0 bar (G)
3.5	Maximum temperature acceptable	:	+45 deg. C
3.6	Minimum temperature acceptable	:	- 10 deg. C
3.7	Hydrostatic Test Pressure	:	36 bar (G)

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

Ex-atmospheric storage with gas	:	1 tank	:	about 450 m^3 per hour
Return		2 tanks	:	about 790 m^3 per hour

Remarks:

5. CARGO PUMPS

5.1	Type	:	Wartsila Svanehoj A/S
	Make	:	Deep Well Pump, Vertical Centrifugal Multistage
	How many	:	2 sets
	Maximum specific gravity	:	0.965
5.2	Capacity (CMB/Hour)	:	300 m^3/h at 110m TH / 250m^3/h at 120m TH
	Two speed or variable speed	:	Two speed
	Rated kW (each)		130 kW at 1800 min^{-1}
	Working pressure maximum	:	17.65 bar G
5.3	Location	:	On top of each Cargo Tank
	Removable	:	Permanent Type
5.4	Booster pumps	:	Yes (1 set)
	Type	:	Horizontal
	Maker	:	Wartsila Svanehoj A/S
5.5	Capacity (CMB/Hour)	:	300 m^3/h
	Working pressure	:	17.65 bar G
5.6	Location	:	
5.7	Time to discharge a full liquid cargo using all pumps against back pressure at pump		
	1 bar	:	
	5 bars	:	
	10 bars	:	
5.8	Nominal back pressure when working	:	
	In series corresponding head	:	
	Maximum back pressure	:	
	Nominal pressure at rail (propane)	:	
5.9	What amount of cargo remains in tanks after completion pumping before stripping:		
	- liquid	:	
	- vapour	:	

NOTE: To reduce pressure by 1 bar/tank:- 3.8 hrs.

6. STRIPPING

6.1	Stripping system, if any	:	
6.2	Time required to remove all traces of liquid cargo as stated in 5.9 for:		
	- LPG	:	

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		About 460 m^3/h
	Rated Kw		75kw
	Stroke		177.8 mm
	Max discharge pressure		20 bar g
	Pressure differential		4 bar Maximum 7 bar at single action
	No of Revolutions		540 min^{-1}
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
	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: 97.0 % to 99.9%		97.0% : Abt. 250 NM3/h 98.0% : Abt. 240 NM3/h 99.0% : Abt. 210 NM3/h 99.5% : Abt. 185 NM3/h 99.9% : Abt. 130 NM3/h
	Discharge Capacity		Abt. 185 NM3/h at N2 Purify 99.5%
8.3	Maximum production obtainable		
	NOTE:- Above quantities obtained at engine room temperature 45° C		
8.4	State if there are storage facilities for inert gas onboard:		
	- Size	:	1.5M3
	- Pressure	:	10 bar
8.5	State if any shore supply of nitrogen may be required:	:	
	- for what purpose	:	Shore supply of nitrogen is required in order to reduce oxygen contents in cargo tanks less than 0.5% by volume or to save time for inerting.
	- what quantities	:	It depends on the requirement of oxygen contents of cargo tanks and time required.

9. GAS FREEING

9.1	State method used giving all details	:	IGG – N2 Plant / Fans
9.2	State time required including stripping	:	Abt. 3 days (remain 0.2 vol%)

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:

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? : N/A

10.5 Deck tanks :
Capacity :
Purpose :

11. COOLING BEFORE LOADING : N/A

12. CARGO HEATER

12.1	Type	:	Shell and Tube
12.2	Inside Diameter		700 mm
12.3	Overall length		5800 mm
12.4	Cargo flow rate		300 m^3/h
12.5	Min Inlet Temp		-48 ° C
12.6	Min Outlet Temp		-10 ° C
12.7	Required Sea water Capacity		500 m^3/h (min.18 ° C)
12.8	Design Pressure		20 bar G (2.0 MPa g)
12.9	Hydrostatic Test Pressure		30 bar G (3.0 MPa g)
12.10	Tightness Test Pressure		20 bar G (2.0 MPa g)

12.0 State discharging rate for propane to be brought from atmospheric pressure

13. CARGO VAPORIZER

In case vapour gas is needed to feed compressors, can vessel produce its own if no shore available: N/A

14. REFRIGERATING APPARATUS

14.1 Is it independent of cargo? : N/A
Is so, state cooling agents :

14.2 What minimum temperature can be maintained : N/A

14.3 What time required at sea to lower by 1°C the full cargo of : N/A

15. MEASURING APPARATUS

What gauges on board? Float type level gauges (Local & Remote reading)
Type : MUSASINO, LMC-VA
Location : 1 set for each tank

16. SAMPLES

16.1 State how tank atmosphere samples can be taken and where from?
BOTTOM, MIDDLE, TOP

Standard of fitting? :

16.2 Same question for cargo : Same as above

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)	:	53.18	M
- distance form stem (FP)	:	46.80	M
- height above deck	:	1.20	m for Liquid manifold
- distance from ship's rail	:	2.75	M
- underside keel to manifold	:	9.00	M

17.3 Liquid line

- flange-size : 8 inches
- type : ANSI 300 LB

Gas line

- flange-size : 5 inches
- type : ANSI 300 LB

17.4 What reducers on board? :

For Liquid line (low temperature)

ANSI#300-200A * ANSI#300-250A – 1 set
ANSI#300-200A * ANSI#300-150A – 1 set
ANSI#300-200A * ANSI#300-125A – 1 set
ANSI#300-200A * ANSI#300-100A – 1 set
ANSI#300-200A * ANSI#300-80A – 1 set

For Vapor line (normal temp.)

ANSI#300-125A * ANSI#300-150A – 1 set
ANSI#300-125A * ANSI#300-100A – 1 set
ANSI#300-125A * ANSI#300-80A – 1 set
ANSI#300-125A * ANSI#300-50A – 1 set
ANSI#300-125A * ANSI#150-150A – 1 set
ANSI#300-125A * ANSI#150-125A – 1 set
ANSI#300-125A * ANSI#150-100A – 1 set
ANSI#300-125A * ANSI#150-80A – 1 set
ANSI#300-125A * ANSI#150-50A – 1 set

Blind Flange for Manifold :

ANSI#300-200A – 2 sets
ANSI#300-125A – 4 sets

17.5 Is ship fitted with stern discharge? N/A

- Liquid line - diameter :
- flange – size :
- type :

18. HOSES

Are serviceable hoses available on board? : No Cargo Hoses are Onboard

18.1 Two pieces, each :
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 : Yes.
- Where situated : Midship
- Lifting capacity : 5.0 t
- Working radius : 13.0 m/R

20. SPECIAL FACILITIES

20.1 How many grades can be segregated? : Singe cargo segregation

20.2 How many cooled? : N/A

20.3 Can vessel sail with slack cargo tanks? : As per stability calculation