

**GAS FORM C****Main Particulars****2.1 PREAMBLE**

Ship's name	BW Libra
Owners	BW CONSTELLATION III LIMITED
Flag – Registry	Isle of Man (IOM)
Builder	Hyundai Heavy Industries Co., Ltd, Ulsan, Korea
Delivery	26 th August 2015
Class	Det Norske Veritas (DNV)
Class notation	+1A1, Tanker for Liquefied Gas, Ship Type 2G(-50°C, 0.610kg/m ³ , 0.275 bar), E0, NAUTICUS(Newbuilding), PLUS, TMON, BIS, BWM-E(s), BWM-T, COAT-PSPC(B)
IMO No.	9719496

GRT / NRT	
International	47342 / 18644
Suez	50476.37 / 44505.69
Panama	NA

2.2 HULL

	Metres
LOA	225.2 mtrs
LBP	220.2mtrs
Breadth	36.6 mtrs
Depth	22.2mtrs
Keel to highest point	49.73mtrs(without tilting), 48.02 mtrs (with tilting)

Max summer draft	12.022 mtrs	Corresponding deadweight	54561mt
Freeboard summer draft	6.646 mtrs		

TPC fully loaded	70.60 mt
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Mean draft with 95% full bunkers and full cargo		
Specific Gravity	Mean draft	Corresponding DW
0.5800	11.51 m	51494.6
0.6100	11.88 m	53965.9



Communication equipment	
International call sign	2IPF6
Radio Station	Isle of Man
Satcom FBB 500 (Capt Office/Dayroom)	+870 773930405
- Telefax	+870 783200306
V-SAT (Bridge/Capt Office/Dayroom)	+65 31587695 / +47 81503242
Satcom C	423594369 / 423594370
Cell phone	
MMSI	235111639
E-mail	libra@bwfleet.com

2.3 MACHINERY

Main Engine	
HYUNDAI-MAN B&W 6G60ME-C9.2	
Max Cont.	12,400 kW (16,622 (HP) PS) x 92.2 RPM
Grade fuel used	IFO 380 cst

Auxiliaries	
Diesel	3 units
Make	HYUNDAI HIMSEN 6H21/32
kW/RPM	1200 kW / 900 rpm
Grade fuel used	700 cSt at 50°C (ISO 8217)

Speed/Consumption*	
Guaranteed average loaded/ballast speed over 12 months	
Average consumption on Main Engine guaranteed speed	mt / 24 hrs
Average consumption on auxiliaries	mt / 24 hrs

*) Above based on 50/50 propane/butane and max force 5 Beaufort

Slow speed/consumption figures as guidance only	
Average loaded/ballast	Consumption
13 Knots	
14 Knots	
15 Knots	

Average consumption in port	mt / 24 hrs
Inert gas plant when operating	mt / 24 hrs
Boiler consumption	mt / 24 hrs

Permanent bunkers capacity (95% full) (Excl. daily service and settling tanks)		
HFO	2112.0 m3	2090.9 mt
LSFO	150.0 m3	148.5 mt
GAS OIL	270.1 m3	229.6 mt
MDO	NA	NA

2.4 CARGO INSTALLATION



Transportable products and respective quantities								
Tank No.	100 % m ³	98 % m ³	Butane 0.6012 -0.0°C Mt	Propane 0.5813 -42.0°C mt	NH ₃ 0.680 -32°C MT	Butadiene 0.651 -5.0°C MT	Propylene 0.6094 -48.0°C MT	Naphtha 0.676 30°C MT
1	18038.207	17677.443	10620.50	10255.1	NA	11498.8	10748.9	NA
2	22583.527	22131.856	13297.10	12839.7	NA	14396.3	13457.7	NA
3	22592.128	22140.285	13302.2	12844.6	NA	14401.8	13462.9	NA
4	20981.664	20562.03	12354.0	11928.9	NA	13375.1	12503.2	NA
Total	84195.526	82511.614	49573.8	47868.3	NA	53672.0	50172.7	NA
Deck tank capacity					NA			
Transportable products and respective quantities								
<i>Other transportable products: Pure Propane, Commercial Propane, Commercial Butane, Mixture of Propane and Butane in any proportion, Propylene</i>								

Scantlings of the cargo tanks are based on a maximum density of cargo of 610kg/m³. Cargo with density up to 1,000 kg/m³ may be carried in the cargo tanks on the following conditions:

For density of 1,000 kg/m ³	N/A
For densities between 610 and 1,000 kg/m ³	Inversely linear proportional to cargo density 98% filling at S.G=0.61 to 67 % filling at S.G=1.0

Tank working pressure	
Maximum pressure	0.400 barg (harbour) / 0.275 barg (sea)
Minimum pressure	-0.05 bar
Minimum temperature acceptable in tanks	-50°C

Loading rate - tons/hour	2700 mt on two manifolds with vapour return
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2.5 CARGO PUMPS

Number and type	8 x 600 m3/hr / Wartsila Svanehoj
Location	2 x pumps in each cargo tank
Max permissible specific gravity	120 mLC, 0.610 kg/m3
Time for discharging full cargo using all pumps against no backpressure	19 hrs (excluding stripping)
Cargo remaining onboard in cargo tanks after completion pumping	Total appr 115 m3 un pumpable liquid (all cargo tanks)
Total head when working in series with booster pump	350 mLC (1 DWP + 2 BP)
Booster pumps	2 x 600 m3/hr at 115 mLC / Wartsila Svanehoj, 0.610 kg/m3



2.6 CARGO COMPRESSORS

Number and type	2 x Burckhardt Compression / 4K165-3P_1	
	Propane	Ammonia
Refrigeration Capacity	2 x 660 KW (710 rpm, F-LSC, 5% Ethane)	N/A
Suction pressure	1.4 bar (A)	N/A
Condensate Temp.	28°C	

2.7 INERT GAS SYSTEM

Does the vessel use inert gas?	Yes
Utilization	Inerting of Void spaces and Cargo tanks as required

Does the vessel produce inert gas?	Yes
Type	Wartsila Moss AS
Daily production	NA

Composition of inert gas	
Carbon dioxide	14 %
Oxygen max.	1.0 %
Carbon monoxide max.	100 ppm by volume
Hydrogen max.	-
Nitrogen	Balance
Soot	0 on Bacharach scale
Sulphur oxides max.	1 ppm by volume
Dew point	-40.0 °C at 760 mmHG

State if any shore supply of liquid nitrogen may be required	No
What quantity?	NA

2.8 GAS FREEING

Can this operation be carried out at sea?	Yes
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State method incl. all details		
For LPG	Boil Off	36 hrs C3/C4
	Inerting	35 hrs
	Ventilating for Entry	11 hrs (Deck fan)
For NH ₃		N/A

Advise time required and consumption of inert gas if any	
From LPG approximately	35 hrs / 175000 m3
From NH ₃ approximately	N/A

Is the vessel equipped with inert gas blower?	Yes
Capacity	5300Nm ³ /hr at 0.4 barg

Ventilation fan	2 x 10000 m ³ /hr at 1475 mmWC
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**2.9 CHANGING GRADE**

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

From NH ₃ to LPG	NA
Time required	NA

From LPG to NH ₃	NA
Time required	NA

Can vessel reduce in tank atmosphere and gas installation concentration of previous cargo below 50 ppm?	NA
Method used, time required and extra shore supply if any	NA
How can it be checked that no liquid gas remain onboard	Temperature indication & Pressure Rise

2.10 CARGO HEATER

State discharging rate for propane with 2.5 mol % ethane to be brought from -42 °C to 0 °C at sea temperature of 15 °C	325 mt/hr
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2.11 CARGO VAPORIZER

In case of need of vapour gas during discharge, can vessel produce its own if no shore gas available?	Yes
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2.12 REFRIGERATING APPARATUS

Is it independent of cargo?	No
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2.13 MEASURING APPARATUS

What gauges onboard	Radar
Location and type	2 for each cargo tank Kongsberg / GLA-100/5
Number of temperature sensors/gauges pr tank	7 – (3 each side of tank and 1 in vapour dome)
Number of pressure sensors/gauges pr tank	1 in each tank



2.14 SAMPLES

Where can samples be taken?	1) Cargo tank dome using cargo pump (liquid) 2) Manifold (liquid) 3) Cargo tank dome (vapour)
Are sample bottles available onboard?	Yes

2.15 CARGO LINES

(See also last page of this gas form C)

Is vessel fitted with midship manifolds	Yes
Distance from cargo manifold to bow	111.41 mtrs
Distance from manifold to stern	113.75 mtrs
Height cargo manifold above main deck	2.110 mtrs
Height cargo manifold above waterline when in ballast	17.41 mtrs
Height cargo manifold above waterline when loaded	12.29* mtrs
Distance from shipside to manifold flange	4.250 mtrs
Distance between loading and vapour return connections	2.250 mtrs
Windage area in normal ballast condition	4166.0m2
Is vessel fitted with SPM chainstopper suitable for 76 mm chain.	Yes
Is vessel fitted with cruziform bollards/fairleads/eye-pads in manifold area	Yes

*Summer Draught.

Dimension of lines		
	Diameter	Flange size
Liquid	350 mm / 14 inch (Manifold)	14"
Gas Line	250 mm / 10 inch (Manifold)	10"
Booster Line	350 mm / 14 inch* (Manifold)	14"(*No separate booster manifold, liquid manifolds used to unload cargo using booster)

What reducers onboard			
Number	Diameter	Length	Pressure rating
2	14" x 16"	62.5 cm	(ANSI) 300 x 150
2	14" x 14"	50.0 cm	(ANSI) 300 x 150
2	14" x 12"	58.7 cm	(ANSI) 300 x 150
2	14" x 10"	57.5 cm	(ANSI) 300 x 150
2	14" x 8"	57.5 cm	(ANSI) 300 x 150
2	14" x 16"	64.4 cm	(ANSI) 300 x 300
2	14" x 12"	60.3 cm	(ANSI) 300 x 300
2	14" x 10"	59.0 cm	(ANSI) 300 x 300
2	14" x 8"	58.4 cm	(ANSI) 300 x 300
2	10" x 12"	55.0 cm	(ANSI) 150 x 150
2	10" x 8"	50.0 cm	(ANSI) 150 x 150
2	10" x 6"	50.0 cm	(ANSI) 150 x 150

2.16 LIFTING DEVICE

Where situated	Aft	Amidship
Number and type	2, Electro Hydraulic	1, Electro Hydraulic
Lifting capacity	4 tons	10 tons
Max. distance from ship's side of lifting hook	Port 9.2 mtrs Stb. 11.2 mtrs	6.7 mtrs

**2.17 HOSES**

For what products are hoses suitable	No Cargo Hoses Carried on-board
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Number	Length	Diameter	Working pressure	Flange
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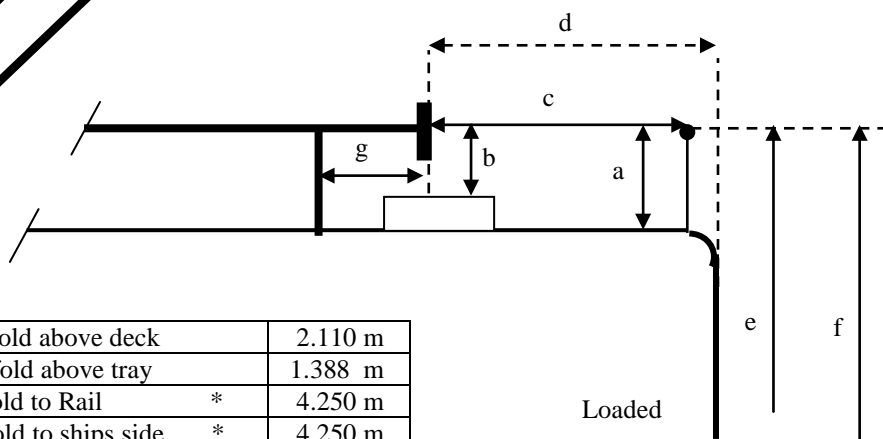
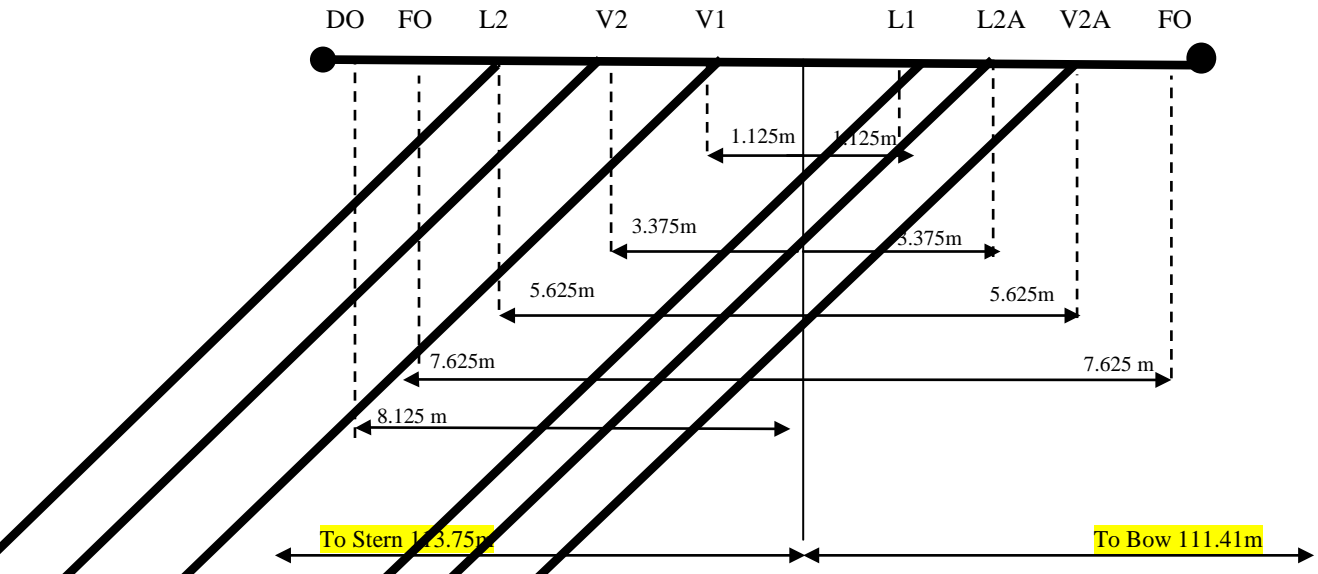
2.18 SPECIAL FACILITIES

How many grades can vessel segregate?	2
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Indicate systems	(Tks 1+3) and (Tks 2+4) or (Tks 1+3+4) and (Tk 2)
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



ARRANGEMENT OF CARGO MANIFOLD



a) Height of manifold above deck	2.110 m
b) Height of manifold above tray	1.388 m
c) Distance manifold to Rail *	4.250 m
d) Distance manifold to ships side *	4.250 m
e) Dist. waterline loaded to manifold	12.29m
f) Dist. waterline ballast to manifold	17.41m
g) Dist. 1 st stander to manifold	0.39 m

* without reducer

PARALLEL BODY LENGTH

LOADED CONDITION

