

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

<b>Ship's name</b>	BW Mindoro
<b>Owners</b>	BW SEOUL LTD.
<b>Flag – Registry</b>	Isle of Man (IOM)
<b>Builder</b>	Daewoo Shipbuilding & Marine Engineering Co. Ltd.
<b>Delivery</b>	6 <sup>th</sup> January 2017
<b>Class</b>	Lloyds Register (LR)
<b>Class notation</b>	+100A1, Liquefied Gas Carrier, Ship type 2G, (Propane, Butane and mixture of propane and butane), in Independent tanks Type A, Maximum S.G 0.61, Maximum Vapour Pressure 0.275 bar, Minimum Cargo Temperature minus 52C, ShipRight (SDA, ACS(B), FDA, CM), *IWS, LI, ECO(BWT, IHM), +LMC, UMS, +Lloyd's RMC(LG) with descriptive note ShipRight (BWMP(T), SCM)
<b>IMO No.</b>	9735050

<b>GRT / NRT</b>	
<b>International</b>	48532 / 17336
<b>Suez</b>	51537.19 / 45596.44
<b>Panama</b>	40021

**2.2 HULL**

	<b>Metres</b>
<b>LOA</b>	226.10 mtrs
<b>LBP</b>	219.00mtrs
<b>Breadth</b>	36.6 mtrs
<b>Depth</b>	22.2mtrs
<b>Keel to highest point</b>	48.8 mtrs(without tilting), 47.6 mtrs (with tilting)

<b>Max summer draft</b>	11.824 mtrs	<b>Corresponding deadweight</b>	54647.1 mt
<b>Freeboard summer draft</b>	7.211 mtrs		

<b>TPC fully loaded</b>	71.25 mt
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<b>Mean draft with 95% full bunkers and full cargo</b>		
<b>Specific Gravity</b>	<b>Mean draft</b>	<b>Corresponding DW</b>
0.5800		
0.6100		



Communication equipment	
International call sign	MAKR9
Radio Station	Isle of Man
Satcom FBB 500	+870 773 802 117
- Telefax	+870 783 403 678
V-SAT	+4785230347 / +6531584071 = Bridge & CCR +6531586131 / +4785230328 = Capt. Office & Cabin
Satcom C	423 594 730 / 423 594 731
Cell phone	
MMSI	232005596
E-mail	<a href="mailto:mindoro@bwfleet.com">mindoro@bwfleet.com</a>

2.3 MACHINERY

Main Engine	
HYUNDAI-MAN B&W 6G60ME-C9.2	
Max Cont.	12,400 kW x 92.3 RPM
Grade fuel used	IFO 380 cst

Auxiliaries	
Diesel	3 units
Make	HIMSEN 2 x 8H21/32 + 1 x 6H21/32
kW/RPM	2 x 1600 kW / 900 rpm + 1 x 1200kW /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	mt / 24 hrs
14 Knots	mt / 24 hrs
15 Knots	mt / 24 hrs

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	1437.6 m3	1408,9 mt
LSFO	763.7 m3	748.4 mt
GAS OIL	500.9 m3	425.8 mt
MDO	102.8 m <sup>3</sup>	87.4 mt

2.4 CARGO INSTALLATION

REVISION	DATE	PREPARED BY	APPROVED BY	CHAPTER	PAGE NO
00	14/12/2016	-	OEB	02	2.2



Transportable products and respective quantities								
Tank No.	100 % m <sup>3</sup>	98 % m <sup>3</sup>	Butane 0.6012 -0.0°C Mt	Iso-Butane 0.5930 -11.0°C Mt	NH <sub>3</sub> 0.680 -32°C MT	Propane 0.5813 -42.0°C Mt	Propylene 0.6094 -48.0°C MT	Naphtha 0.676 30°C MT
1	18149.5	17786.50	10686.0	10536.2	NA	10317.4	10813.9	NA
2	22353.4	21906.30	13161.1	12976.7	NA	12707.1	13318.7	NA
3	22356.5	21909.40	13162.9	12978.5	NA	12708.9	13320.5	NA
4	21320.1	20893.70	12552.7	12376.8	NA	12119.8	12703.0	NA
<b>Total</b>	84179.5	82495.90	49562.7	48868.2	NA	47853.2	50156.1	NA
<b>Deck tank capacity</b>					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/m<sup>3</sup>. Cargo with density up to 1,000 kg/m<sup>3</sup> may be carried in the cargo tanks on the following conditions:

For density of 1,000 kg/m <sup>3</sup>	N/A
For densities between 610 and 1,000 kg/m <sup>3</sup>	

Tank working pressure	
Maximum pressure	0.450 barg (harbour) / 0.275 barg (sea)
Minimum pressure	-0.05 bar
Minimum temperature acceptable in tanks	-52°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	3 x Burckhardt Compression / 3K-160-3K	
Refrigeration Capacity	<b>Propane</b> 3 x 350000 kcal/hr (Comm. Propane FLSC+VGC, 5% Ethane) at 36°C SW temp.	Ammonia N/A
Suction pressure	1.3 bar (A)	N/A
Condensate Temp.	43°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	Maritime Protection AS
Daily production	NA

Composition of inert gas	
Carbon dioxide	14 %
Oxygen max.	0.5 %
Carbon monoxide max.	100 ppm by volume
Hydrogen max.	-
Nitrogen	Balance
Soot	0 on Bacharach scale
Sulphur oxides max.	10 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	18 /24 hrs C3/C4
	Inerting	35 hrs
	Ventilating for Entry	82 hrs (IG Blower)
For NH <sub>3</sub>		N/A

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

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

Ventilation fan	NA
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**2.9 CHANGING GRADE**

Can this operation be carried out at sea?	N/A
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State method used and time required for changing from NH<sub>3</sub> 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 <sub>3</sub> to LPG	NA
Time required	NA

From LPG to NH <sub>3</sub>	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	112.92 mtrs
Distance from manifold to stern	113.18 mtrs
Height cargo manifold above main deck	1.923 mtrs
Height cargo manifold above waterline when in ballast	17.147 mtrs
Height cargo manifold above waterline when loaded	12.323* mtrs
Distance from shipside to manifold flange	4.018 mtrs
Distance between loading and vapour return connections	2.500 mtrs
Windage area in normal ballast condition	4047.6 m2
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"	500 mm	(ANSI) 300 x 150
2	14" x 14"	500 mm	(ANSI) 300 x 150
2	14" x 12"	500 mm	(ANSI) 300 x 150
2	14" x 10"	500 mm	(ANSI) 300 x 150
2	14" x 8"	500 mm	(ANSI) 300 x 150
2	14" x 16"	500 mm	(ANSI) 300 x 300
2	14" x 14"	500 mm	(ANSI) 300 x 300
2	14" x 12"	500 mm	(ANSI) 300 x 300
2	14" x 10"	500 mm	(ANSI) 300 x 300
2	14" x 8"	500 mm	(ANSI) 300 x 300
2	10" x 12"	500 mm	(ANSI) 150 x 150
2	10" x 12"	500 mm	(ANSI) 150 x 150
2	10" x 8"	500 mm	(ANSI) 150 x 150
2	10" x 6"	500 mm	(ANSI) 150 x 150

**2.16 LIFTING DEVICE**

<b>Where situated</b>	<b>Aft</b>	<b>Amidship</b>
<b>Number and type</b>	2, Electro Hydraulic	1, Electro Hydraulic
<b>Lifting capacity</b>	4 tons	5 tons
<b>Max. distance from ship's side of lifting hook</b>	Port 7,735 mtrs Stb. 7,735 mtrs	7.7 mtrs

**2.17 HOSES**

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

<b>How many grades can vessel segregate?</b>	2
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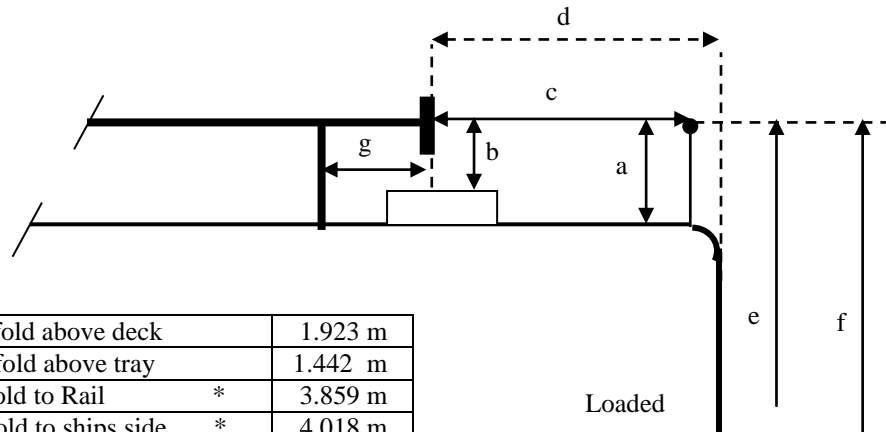
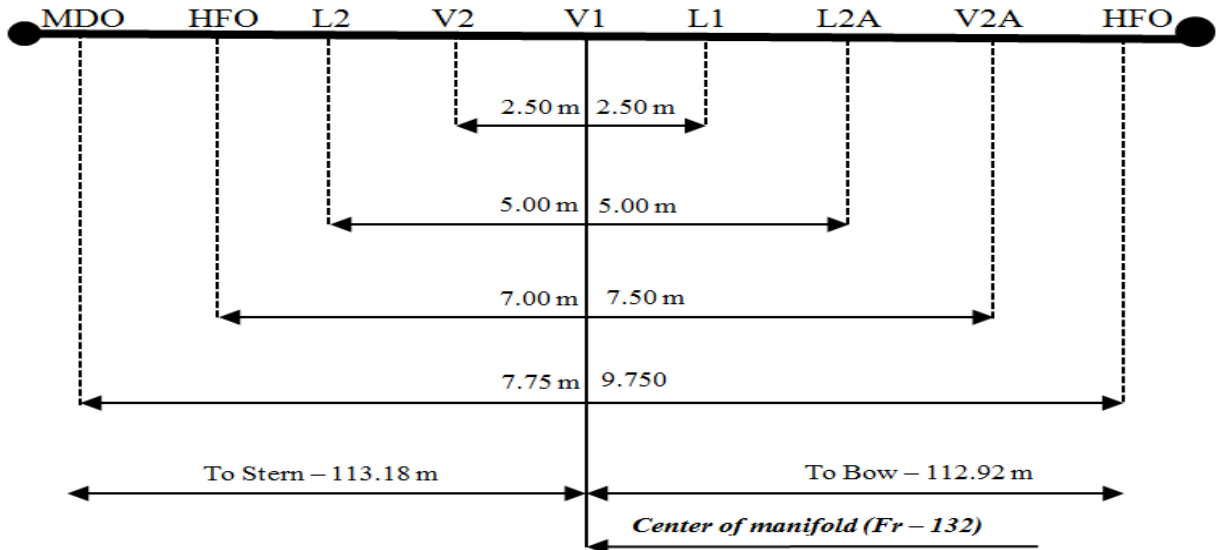
<b>Indicate systems</b>	(Tks 1+3) and (Tks 2+4) or (Tks 1+3+4) and (Tk 2)
<b>Is vessel able to load/discharge two or more grades simultaneously?</b>	Yes
<b>Can vessel sail with slack tanks?</b>	Yes
<b>Is vessel fitted with purge tank?</b>	No



## ARRANGEMENT OF CARGO MANIFOLD



LOA Midpoint – FR 132 + 580 mm



a) Height of manifold above deck	1.923 m
b) Height of manifold above tray	1.442 m
c) Distance manifold to Rail	* 3.859 m
d) Distance manifold to ships side	* 4.018 m
e) Dist. waterline loaded to manifold	12.323 m
f) Dist. waterline ballast to manifold	17.147 m
g) Dist. 1 <sup>st</sup> stander to manifold	0.365 m

\* without reducer

### PARALLEL BODY LENGTH

LOADED CONDITION

Mid Point manifold

