



LPG/C BW ENERGY

GAS FORM C**Main particulars****2.1 PREAMBLE**

Ship's name	BW ENERGY
Owners	LPG Transport Services Ltd.
Tech. Operator	BW Fleet Management AS
Flag - Registry	Isle of Man / Douglas
Builder	Kawasaki Heavy Industries, Sakaide, Japan
Delivery	27/09/2002
Class	American Bureau of Shipping (ABS)
Class notation	+A1, Liquefied Gas Carrier, (E), +AMS, +ACCU (Unrestricted service)
IMO no.	9232515

GRT / NRT	
International	46,506 / 16,040
Suez	48,417.5 / 43,372.95
Panama	N/A

2.2 HULL

	Metres
LOA	227.00
LBP	216.62
Moulded breadth	36.00
Moulded depth	21.90
Keel to highest point	49.00

Max summer draft	11.624 m	Corresponding deadweight	53,556
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TPC, design draft	68.9 mt / cm
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Mean draft with full bunkers and full cargo		
Specific Gravity	Mean draft	Corresponding DW
Butane 0.600	11.62 m	53,556 mt
Propane 0.583	11.23 m	51,089 mt

REVISION
00DATE ISSUED
20.09.2012PREPARED BY
OJKAPPROVED BY
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PAGE NO

2.1



LPG/C BW ENERGY

Communication equipment	
International call sign	2GAF4
Radio station	
Satcom	
- Telephone	764 95 27 45 / 46
- Telefax	764 95 27 47
Satcom C Telex	431 130 310
E-mail	energy@bwfleet.com
Mobil GSM Phone	+47 95 91 53 31
MMSI	235095717

2.3 MACHINERY

Main Engine	Kawasaki – Man B&W 5S70MC Mk VI
Max Cont. (Service power)	12,510 kW (17,010 PS) at 88 RPM
Grade fuel used	IFO 380 CST

Auxiliaries	Diesel	Turbo generator
No.	3 sets	n/a
Maker	Daihatsu 8DK-20	
Kw / RPM	1035 Kw x 900 rpm	

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

*) 50 / 50 Propane / Butane and max. wind force 5 Beaufort.

Slow speed / consumption figures as guidance only	
Average loaded / ballast	Consumption*)
14 knots	
15 knots	
16 knots	

*) Auxiliary engines included.

Average consumption in port (HFO / MDO / GASOIL)	
Inert gas plant when operating	
Boiler consumption	

Permanent bunkers capacity (Excl. daily service tanks)	
HFO	2,945 m ³ (95 %)
DIESEL OIL	200 m ³ (95 %)
GASOIL	54 m ³ (95 %)



LPG/C BW ENERGY

2.4 CARGO INSTALLATION

Tank No.	100% M ³	98 % M ³	Butane 0.601 0°C MT	Propane 0.585 - 42.0°C MT	NH ₃ 0.680 -32°C MT		
1	16,677.762	16,344.207	9,704	9,444			
2	21,424.494	20,996.004	12,466	12,132			
3	23,227.128	22,762.585	13,515	13,153			
4	21,221.254	20,796.829	12,348	12,017			
Total	82,550.638	80,899.625	48,034	46,747			
Deck tank capacity			N/A				
Transportable products and respective quantities							
Other transportable products:							

Scantlings of the cargo tanks are based on a maximum density of cargo of 610 kg/m³.
Scantling draft is based on full cargo with a density of 601 kg/m³.

Tank working pressure	
Maximum allowable tank pressure at sea	0.250 bar at sea
Minimum pressure	-0.120 bar
Maximum allowable tank pressure at harbour	0.400 bar
Minimum temperature acceptable in tanks	- 48° C

Loading rate - tons/hour	Loading time without vapour return to shore when tanks are fully pre-cooled and the cargo is fully refrigerated. Butane – 2,345 mt / hr, Propane – 2,285 mt / hr
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2.5 CARGO PUMPS

Number and type	8 x 550 m ³ /h Submerged Centrifugal, Electric driven single stage pumps (Shinko Industries)
Location	Tank domes
Max permissible specific gravity	0.610
Time for discharging full cargo using all pumps against no backpressure	Abt 23 hrs (2 manifold lines) Abt 42 hrs (1 manifold line)
Cargo remaining onboard in cargo tanks after completion pumping	Abt. 260 mt Propane Abt. 275 mt Butane
Total head when working in series with booster pump	200 m.l.c (s.g. 0.610)
Booster pumps	2 x 450 m ³ /h at 100 m.l.c. / Electric driven, Single stage, Horizontal centrifugal (Shinko Industries)

2.6 CARGO COMPRESSORS

Number and type	4 x Nissin Gas Engineering (Sulzer) 3 stage 3K 140-3A
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	Propane	Butane
Refrigeration Capacity per unit	830 MJ / h	1,000 MJ / h
Suction pressure	1.0 bar	
Suction temperature	- 20° C	



LPG/C BW ENERGY

2.7 INERT GAS SYSTEM

Does the vessel use inert gas?	Yes
Utilization	Inerting and gas freeing of cargo tanks, and filling of holds when required
Does the vessel produce inert gas?	Yes
Type	SMIT – Aalborg, dew point +5C at 1 bar
Daily production	5000 m ³ /h, 0.25 bar

Composition of inert gas	
Carbon dioxide	12.5 %
Oxygen max.	0.2 %
Carbon monoxide max.	350 ppm
NOX max	150 ppm
Nitrogen	86 % (balance)
Soot	0 Bach
Sulphur oxides max.	10 ppm
Dewpoint	+ 5° C

State if any shore supply of liquid nitrogen may be required	
What quantity?	

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 / heating	24 hrs / 36 hrs - for Propane / Butane
Inerting	36 hrs
Ventilating for entry	36 hrs
For NH ₃	NA

Advise time required and consumption of inert gas if any	
From LPG	36 hours and 180,000 m ³ inert
From NH ₃	NA

Is the vessel equipped with inert gas blower?	Yes
Capacity	5,000 m ³ /h

Ventilation fan	Nil
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2.9 CHANGING GRADE

Can this operation be carried out at sea?	Yes – changing from Propane to Butane and vice versa
State method used and time required for changing from NH ₃ to LPG and vice versa, to reach 50 ppm of previous cargo in tanks atmosphere, the tanks being dry and free of moisture (dew point plus 10 °C).	
From NH ₃ to LPG	NA
Time required	
From LPG to NH ₃	NA
Time required	



LPG/C BW ENERGY

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	Boil off / Heating / Inerting / Venting
How can it be checked that no liquid gas remains onboard?	Level gauge / Temperature sensors

2.10 CARGO HEATER

State discharging rate for propane with 5.0 mol % ethane to be brought from - 42°C to - 5°C at sea temperature of 15°C	450 m ³
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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?	NA
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2.13 MEASURING APPARATUS

What gauges on board	Float / Magnetic
Location and type	2 in each tank / radar type
Model	Mussasino Level Gauging System
Number of temperature sensors / gauges pr tank	9 in total (4 each side + 1 in tank dome)
Number of pressure sensors / gauges pr tank	1 in each tank

2.14 SAMPLES

Where can samples be taken?	By sample valve at cargo pump discharge and at manifold + Vapour sample at tank dome
Are samples bottles available onboard?	No

2.15 CARGO LINES (See. also last page of this gas form C)

Distance from cargo manifold to bow	116.80 m
Distance from manifold to stern	113.20 m
Height cargo manifold above deck	1.48 m
Height manifold above working platform	1.20 m
Height cargo manifold above waterline when ballast	16.60 m
Height cargo manifold above waterline when loaded	11.98 m
Distance manifold from ship's rail	3.35 m
Distance between loading and vapour return connections	2.50 m
Windage area in normal ballast condition	4,279
Is vessel fitted with SPM chain stopper suitable for 76 mm chain.	Yes
Is vessel fitted with cruciform bollards/fairleads/eye-pads in manifold area	3 cruciform bollards, 2 fairleads and pad eyes



LPG/C BW ENERGY

Dimension of lines		
	Diameter	Flange size
Liquid	400 mm	300 ANSI / 150 ANSI
Gas Line	400 mm	150 ANSI
Booster Line	400 (same as liquid line)	300 ANSI (same as liquid line)
Fuel / Diesel Oil Line	200 mm	150 ANSI
Gas Oil Line	100 mm	150 ANSI

What reducers onboard			
Number	Diameter	Length	Pressure rating
2	400 to 350	610 mm	ANSI 300 to ANSI 150
2	400 to 350	610 mm	ANSI 150 to ANSI 150
1	400 to 350	610 mm	ANSI 300 to ANSI 300
1	400 to 300	610 mm	ANSI 300 to ANSI 300
2	400 to 300	610 mm	ANSI 300 to ANSI 150
2	400 to 300	610 mm	ANSI 150 to ANSI 150
3	400 to 250	610 mm	ANSI 300 to ANSI 150
3	400 to 250	610 mm	ANSI 150 to ANSI 150
1	400 to 250	610 mm	ANSI 300 to ANSI 300
1	400 to 200	610 mm	ANSI 300 to ANSI 150
1	400 to 200	610 mm	ANSI 150 to ANSI 150
1	400 to 200	610 mm	ANSI 300 to ANSI 300

2.16 LIFTING DEVICE

Where situated	Aft	Amidship
	2 provision cranes	1 hose crane
Number and lifting capacity	1 x 1.5 tons / 1 x 5.0 tons	1 x 10 tons
Max. distance from ship's side of lifting hook	10 m / 12.5 m	5.70 m

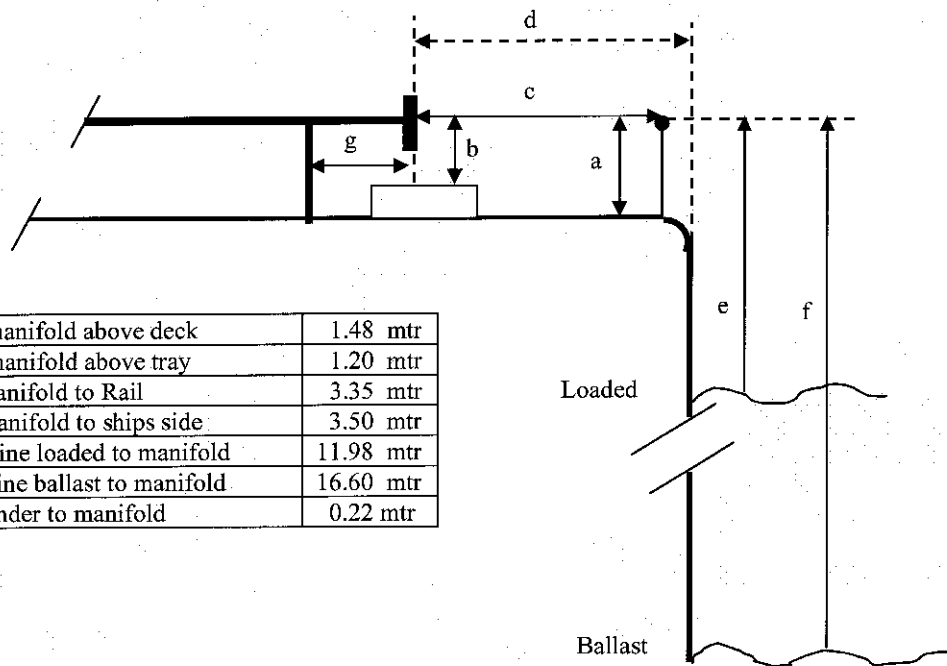
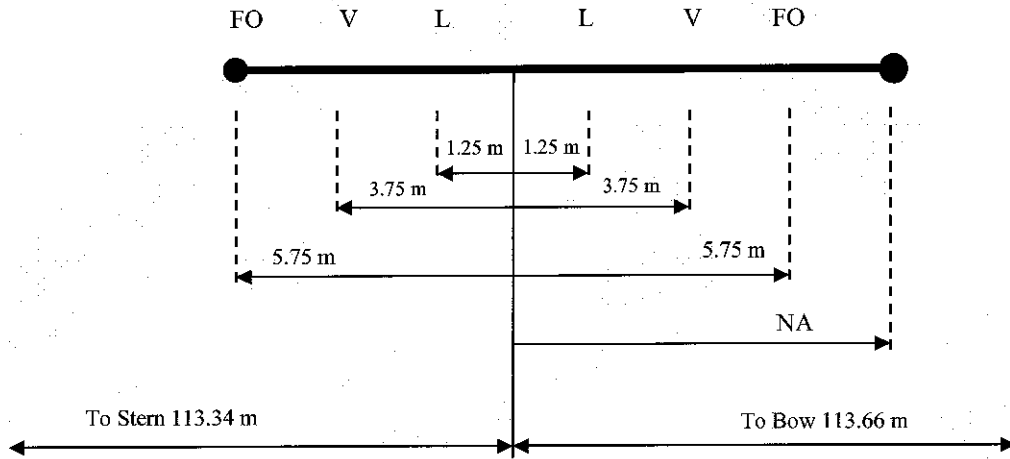
2.17 SPECIAL FACILITIES

How many grades can vessel segregate?	Two
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Indicate systems	Any combination depending on safe stress, stability, draft & trim. Double valve segregation on liquid systems, single valve on vapour systems.
Is vessel able to load/discharge two or more grades simultaneously?	Yes, two grades
Can vessel sail with slack tanks?	Yes if within stress and stability limits.
Is vessel fitted with purge tank?	No



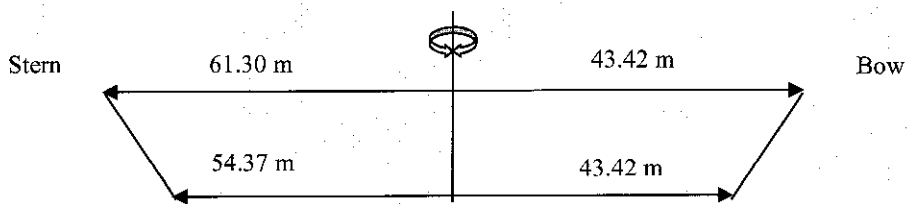
ARRANGEMENT OF CARGO MANIFOLD



a) Height of manifold above deck	1.48 mtr
b) Height of manifold above tray	1.20 mtr
c) Distance manifold to Rail	3.35 mtr
d) Distance manifold to ships side	3.50 mtr
e) Dist. waterline loaded to manifold	11.98 mtr
f) Dist. waterline ballast to manifold	16.60 mtr
g) Dist. 1 st stander to manifold	0.22 mtr

PARALLEL BODY LENGTH

LOADED CONDITION



BALLASTED CONDITION