

2. MAIN PARTICULARS OF VESSEL/GAS FORM C

2.1 PREAMBLE

Ship's name	BW NANTES
Owners/Managing Owners	BW Cyan Ltd / BW Fleet Management AS
Flag - Registry	Bermuda
Builder	Kawasaki Shipbuilding Corporation, Japan
Delivery	31.10.2003
Class	+1A1, DNV Tanker for Liquefied Gas, (-50 degC,685 kg/m3, 0,275 bar), Ship type 2 G, E0, Nauticus, Plus - 1, TMON
IMO NO.	9253818

GRT/NRT	
International	35190 / 11023 UMS
Suez	36931,82 / 32385,27
Panama	29148

Is vessel approved?	
USCG	YES
IMO	YES

Communication equipment	
International call sign	ZCEH6
Radio station	VSAT
VSAT – telephone	+65 3158 0426 /+6531583643/+47 8150 3127/+47 8150 3113
- telex	-
- Telefax	-
Satcom C Telex	+431064111/112
MMSI no	310 641 000
E-mail	nantes@bwfleet.com

2.2 HULL

	Metres	Feet
LOA	204.915	672.29
LBP	200.45	657.64
Breadth	32.20	105.64
Depth	20.24	66.38
Keel to highest point	47.7	156.49

Max summer draft	12.023	Corresponding deadweight	44773
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TPC fully loaded	55mt @ 11.0m draft
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	Freeboard mtr	Draught mtr	Displacement MT	Deadweight MT
FW TROPICAL	7.699	12.540	62060	46152
FW	7.949	12.290	60676	44768
TROPICAL	7.966	12.273	62097	46189
SUMMER	8.216	12.023	60681	44773
WINTER	8.466	11.773	59267	43359

Mean draft with full bunkers and full cargo		
Specific Gravity	Mean draft	Corresponding DW
Propane S.G. 0,58	10,70	37200
Ammonia S.G. 0,685	12,023	44639

2.3 MACHINERY

Main Engine	
Type and make: MAN B&W 5 S 60 MC-C	Kawasaki 5 S 60 MC-C
Max Cont.	11,275 Kw
Grade fuel used	HFO - 380 Cst - RMG 35 – ISO 8217:1996 MGO - DMA - ISO 8217:1996

Auxiliaries	Diesel	Turbogenerator
Type	MAN 7L28 / 32 H	NA
Make	B & W license	
Kw/RPM	2 x 1470 kW + 1 x 1050 kW	

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

HFO consumption alongside in port	
Inert gas plant when operating	
Boiler consumption	

Permanent bunkers capacity (Excl. daily service tanks)		
HFO	Abt 3121 m3	2668 mt with sp gr 0,95 (90% filling)
DIESEL OIL	Abt 140 m3	107 mt with so gr 0,85 (90% filling)
GAS OIL	Abt 82 m3	63 mt with sp gr 0,85 (90% filling)

2.4 CARGO INSTALLATION

Transportable products and respective quantities							
Tank No.	100 % cubm	98 % cubm	Butane 0.5965 -11,8°C Mt	Propane 0.5830 -44.7°C Mt	NH ₃ 0.6818 -33,4°C Mt	Butadiene 0.6505 -4,4°C Mt	Propylene 0.6095 -47,7°C Mt
1	14444,7	14155,8	8443,9	8252,8	9651,4	9208,3	8628,0
2	14853,0	14555,9	8682,6	8486,1	9924,2	9468,6	8871,8
3	14856,9	14559,8	8684,9	8488,4	9926,9	9471,1	8874,2
4	15244,6	14939,7	8911,5	8709,8	10185,9	9718,3	9105,7
Total	59399,2	58211,3	34723,0	33937,2	39688,5	37866,5	35479,8

Tank working pressure	
Maximum pressure	0.275 Bar
Minimum pressure	- 0.250 Bar
Harbour condition	0.400 Bar
Minimum temperature acceptable in tanks	- 50° C.

Product	LOADING RATE (mt/Hr)		DISCHARGING RATE (mt/Hr)	
	1 MANIFOLD	2 MANIFOLD	1 MANIFOLD	2 MANIFOLDS
Propane	1400	2800	1400	2320
Butane	1450	2900	1450	2400
Ammonia	1630	3200	1630	2700

Loading rate-tons/hour	Loading time to be abt. 20 hrs. without vapor return to shore when tanks are fully pre-cooled and the cargo is fully refrigerated.
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How many grades can vessel segregate?	Two
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Indicate systems	1 & 2 (1+2+3+4), (1+3+4, 2), (1+3, 2+4)
Is vessel able to load/discharge two or more grades simultaneously?	Any two
Can vessel sail with slack tanks?	Yes
Is vessel fitted with purge tank?	No

2.5 CARGO PUMPS

Number and type	8 x 500 m3/hr centrifugal deepwell pumps at - 130 m.l.c.
Location	Two in each cargo tank
Max permissible specific gravity	0.685
Time for discharging full cargo using all pumps against no backpressure	18 hours
Cargo remaining onboard in cargo tanks after completion pumping	LPG Liquid abt 25 MT Vapour abt 149 MT NH ₃ Liquid abt 35 MT Vapour abt 153 MT

REVISION	DATE ISSUED	ISSUED BY	APPROVED BY	PAGE NO
01	08.10.2003	FMA		2.3

Total head when working in series with booster pump	260 m.l.c
Booster pumps	2 x 500 cu.m/hr centrifugal at 130 mlc and at S.G. 0.685

2.6 CARGO COMPRESSORS

Number and type	4 x Sulzer 3K - 140 - 3A
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	Propane	Butane.	Ammonia
Refrigeration Capacity	5% Ethane 4 x 190.000	4 x 573.000 kcal/h	4 x 320.000 kcal/h
Suction pressure	1,02 bar ata	1,02 bar ata	1,02 bar ata
Suction temperature	-20 c	+5 c	- 20 °C.

Cool down of one tank from ambient temp. to about -40°C in sump, Reliqefaction with 2 compressor.	Approx 19hrs
Cool down of all tanks from ambient temp. to about -40°C in sump, Reliqefaction with 4 compressors.	Approx 50hrs

2.7 INERT GAS SYSTEM

Does the vessel use inert gas?	Yes
Utilization	For Cargo system and hold spaces

Does the vessel produce inert gas?	Yes
Type	Hamworthy KSE
Daily production	132000 m3

Composition of inert gas	
Carbon dioxide	About 15%
Oxygen max.	0,5%
Carbon monoxide max.	100 ppm
Hydrogen max.	100 ppm
Nitrogen	Balance
Soot	Bacharach 0
Sulphur oxides max.	Depends on Fuel
Dewpoint	- 40 ° C.

State if any shore supply of liquid nitrogen may be required	
Yes if tanks require to be inerted to lower Oxygen content	
What quantity?	About 84,000 m ³

2.8 GAS FREEING

Can this operation be carried out at sea?	Yes
State method incl. All details – See page 10	
After LPG	Boil-off - Warm-up - Inert – Ventilate
After Ammonia	Boil-off - Warm-up – Ventilate

Advise time required and consumption of inert gas if any	
From LPG about	Abt 30 hrs. - approx. 80,000 m ³ inert gas
From NH ₃ about	Abt 16 hrs. - No inert gas

Is the vessel equipped with inert gas blower?	Yes
Capacity	5500 Nm ³

Ventilation fan	2 x 20000 m ³ /h
Air heater	1 x 410 kW (20°C to 80°C)

2.9 CHANGING GRADE/INERTING/GAS FREEING

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 (dew point plus 10 degrees C).

From NH ₃ to LPG	
Boil-off - Warm-up tanks - Ventilate - Inert - Gas-up (pre-cooled)	
Time required	120 hrs

From LPG to NH ₃	
Boil-off - Warm-up tanks - Inert - Ventilate - Gas-up (pre-cooled)	
Time required	108 hours

Can vessel reduce in tank atmosphere and gas installation concentration of previous cargo below 50 ppm?	Yes
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How can it be checked that no liquid gas remain onboard	Tank sump/bottom temperature sensors
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Inerting of tank 4 from (air) 21%O ₂ to 5%O ₂	Abt 5 hours
Inerting of tank 4 from 21%O ₂ to 1%O ₂	Abt 11 hours
Parallel inerting all tanks from 21%O ₂ to 1%O ₂	Abt 40 hours
Series inerting all tanks from 21%O ₂ to 1%O ₂	Abt 24 hours
Inerting tank 4 from 100%LPG atmosphere to 5%LPG	Abt 5 hours
Inerting tank 4 from 100%LPG atmosphere to 1%LPG	Abt 8 hours
Parallel inerting all tanks from 100%LPG atmosphere to 1%LPG	Abt 30 hours
Series inerting all tanks from 100%LPG atmosphere to 1%LPG:	Abt 15 hours
Venting all tanks from inert gas atmosph.to 20% O ₂ . (two fans running)	Abt 4 hours
Parallel venting all tanks from 100% ammonia atmosphere to safe entrance (= 20 ppm ammonia) with two fans running	Abt 13 hours
Parallel venting all tanks from inert gas atmosph. to 21% O ₂ with one fan running.	Abt 11hrs
Parallel venting all tanks from inert gas atmosph.to 20% O ₂ with two fans running	Abt 4 hours
Evaporating cargo residue one tank after max stripping by cargo pumps (using 2 compressors) - LPG	Abt 4-5 hours

2.10 CARGO HEATER

State discharging rate for propane with 2.0 mol % ethane to be brought from -42°C to -5°C at sea temperature of 15°C	500 m3/h
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2.11 CARGO VAPOURIZER

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

General refrigeration principle Direct condensation against sea water Is it independent of cargo?	Direct
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2.13 MEASURING APPARATUS

What gauges onboard	Radar System
Location and type	Remote

2.14 SAMPLES

Where can samples be taken?	At Tank Domes 1 to 4 (Closed Type)
Are sample bottles available onboard?	Yes

2.15 LIFTING DEVICE

Where situated	Aft	Amidship
	Provision Cranes, one each side Aft	Hose handling crane.
Number and lifting capacity	2 x 4 tonnes SWL	1 x 7.5 tonnes SWL
Max. distance from ship's side of lifting hook	3.0m from ships parallel body. 6.3m from ship's side.	6.3 m from ships side

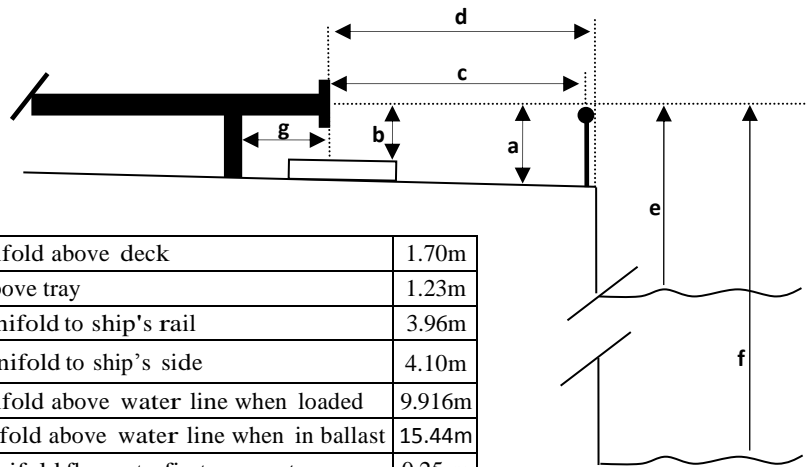
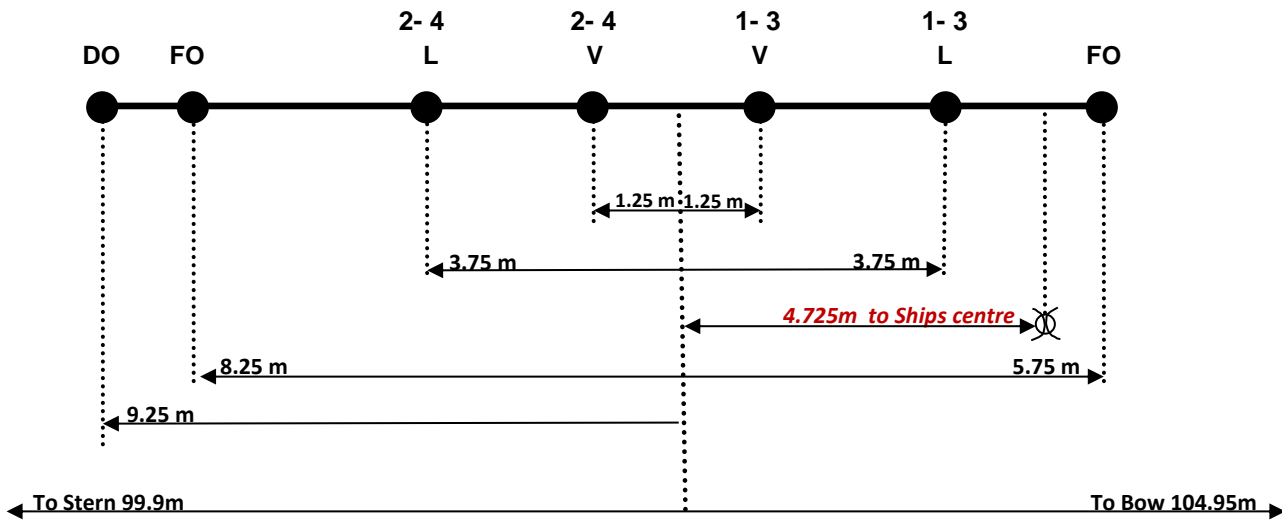
2.16 HOSES

For what products are hoses suitable	No cargo hoses on board
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2.17 CARGO LINES

Flange dimensions-shore connections (crossovers)			
Crossover	Size	Rating	Type
Liquid Crossover I,II	DN 350	ANSI 300	RF
Vapour Crossover I,II	DN 250	ANSI 150	RF

Reducers for cargo manifold						
No. off	Size 1	Rating 1	Type 1	Size 2	Rating 2	Type 2
2	DN 350	ANSI 300	RF	DN 400	ANSI 300	RF
2	DN 350	ANSI 300	RF	DN 300	ANSI 300	RF
2	DN 350	ANSI 300	RF	DN 250	ANSI 300	RF
2	DN 350	ANSI 300	RF	DN 200	ANSI 300	RF
2	DN 350	ANSI 300	RF	DN 150	ANSI 300	RF
2	DN 350	ANSI 300	RF	DN 400	ANSI 150	RF
2	DN 350	ANSI 300	RF	DN 350	ANSI 150	RF
2	DN 350	ANSI 300	RF	DN 300	ANSI 150	RF
2	DN 350	ANSI 300	RF	DN 250	ANSI 150	RF
2	DN 350	ANSI 300	RF	DN 200	ANSI 150	RF
2	DN 250	ANSI 150	RF	DN 300	ANSI 150	RF
2	DN 250	ANSI 150	RF	DN 200	ANSI 150	RF
2	DN 250	ANSI 150	RF	DN 150	ANSI 150	RF



a) Height cargo manifold above deck	1.70m
b) Height manifold above tray	1.23m
c) Distance from manifold to ship's rail	3.96m
d) Distance from manifold to ship's side	4.10m
e) Height cargo manifold above water line when loaded	9.916m
f) Height cargo manifold above water line when in ballast	15.44m
g) Distance from manifold flange to first support	0.25 m

PARALLEL BODY LENGTH

