

BW LPG Ltd.

GAS FORM-C
based on the
OCIMF / SIGTTO
SHIP INFORMATION QUESTIONNAIRE
for
GAS CARRIERS
2nd Edition 1998

Specifications of the vessel and the gas installations are believed to be correct as per design specifications and capacities, but not guaranteed, and consequently Owners are not to be held accountable for such.

We further reserve our rights for normal wear and tear on cargo equipment in respect of loading-, discharging-, cooling-rates and time for changing cargo grades etc., including but not limited to capacity of cargo re-heaters, compressors, pumps and other equipment, as described in this form-C as these descriptions, as described above, refers to design capacities.

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SECTION A GENERAL INFORMATION

A1 PRINCIPAL SHIP PARTICULARS

1.1	Date questionnaire completed
1.2	Name of vessel
1.3	LR/IMO number

3-Jan-18
BW BRAGE
9732539

1.4	Last previous name		Aurora Brage
1.4.1	Date of name change		6/15/2017
1.5	Second last previous name		-
1.5.1	Date of name change		
1.6	Third last previous name		-
1.6.1	Date of name change		-
1.7	Fourth last previous name		-
1.7.1	Date of name change		-
1.8	Flag		Marshall Islands
1.9	Port of Registry		Majuro
1.10	Official number		6837
1.11	Call sign		V7RW6
1.12	INMARSAT FBB numbers		870-773407430
1.13	Vessel's telephone number (V-Sat)	4723962496	60389885603
1.13.1	Vessel's mobile number		
1.14	Vessel's fax number		870-783400310
1.15	Vessel's telex number (Inmarsat-C)	453842622	453842623
1.16	Vessel's E-mail address	master.bwbrage@ship-bw.wilhelmsen.com	
1.17	INMARSAT C number	453842622	453842623
1.18	Vessel's MMSI number	538006837	
1.19	Type of vessel	Gas carrier (VLGC)	

OWNERSHIP AND OPERATION

1.20	Registered Owner	BW Constellation II Ltd.	
	Full address	Clarendon House 2 Church Street Hamilton HM11, Bermuda	
	Office telephone number	+65 6705 5588	
	Office telex number		
	Office fax number	+65 6570 6056	
	Office Email address	lpg.commercialdevelop@bwipg.com	
	Contact person	Capt. Kevin Knott	
	Contact person after hours telephone number	+65 6570 6056	
1.21	Name of technical operator (If different from above)	Wilhelmsen Ship Management Sdn Bhd	
	Full Address	18th floor, 1 Sentral, Jln Travers, Kuala Lumpur Sentral, 50400 Kuala Lumpur, Malaysia.	
	Office telephone number	+60 3 20845600/5601	
	Office telex number		
	Office fax number	+60 3 20845604/ 5605	
	Office Email address	wsm.kul.vetting@wilhelmsen.com	
	Contact person	Mr. Peter Vekemans	
	Contact person after hours telephone number	+60 1 2304 2749	
	Emergency callout number	+60 1 2210 2620	
	Emergency callout pager number		
	Contact details for person responsible for oil spill response	Rajiv Nigam, H/P: +60 17 3098616	
	Number of years controlled by technical operator	1	Years
1.22	Total number of ships operated by this Operator	60	
1.23	Number of years ship owned	0.5	Years
1.23.1	Name of commercial operator (If different from above)	BW LPG Ltd	
	Full Address	Mapletree Business City 10 Pasir Panjang Rd, #17-02Singapore 117438	
	Office telephone number	+65 6705 5588	

Office telex number
 Office fax number
 Office Email address
 Contact person
 Contact person after hours telephone number
 Emergency callout number
 Emergency callout pager number
 Number of years controlled by commercial operator

+65 6570 6056	
Email: fleetops2@bwlpg.com	
Mr. Adrian Lai	
+65 9670 8546	
+65 6705 5599	
	0.5

Years

BUILDER

1.24 Builder
 1.25 Name of yard vessel built at
 1.26 Hull number
 1.27 Date keel laid
 1.28 Date launched
 1.29 Date delivered
 1.30 Date of completion of major hull changes, - if any.
 1.31 If changes were made, what changes were made and at which yard were they carried out

Hyundai Heavy Industries	
	HHI
	2780
	9-Nov-15
	29-Jan-16
	22-Apr-16
	-

NA

CLASSIFICATION

1.32 Classification society
 1.33 Class Notation
 1.34 If Classification society changed, name of previous society
 1.35 If Classification society changed, date of change
 1.36 Was ship built in accordance with the following regulations:

Det Norske Veritas
+1A1 Tanker for liquefied Gas Ship Type 2G (-50C, 610kg/m ³ ,0.275 bar), E0, BIS,TMON,COAT-PSPC(B), BWM(T), SPM, CLEAN, NAUTICUS(New building), ERS
N/A
N/A

IMO
 US COAST GUARD
 RINA
 Other: _____

	Yes
	Yes

1.37 IMO certification
 Certificate of fitness - IGC
 Certificate - A328
 Certificate - A329
 Letter of Compliance
 Issued by

	DNV.GL
	To be advised
	To be advised
	To be advised
	To be advised

1.38 Unattended Machinery Space Certificate

	DNV.GL
--	--------

1.39 Net Registered Tonnage
 1.40 Gross Registered Tonnage
 1.41 Suez Net Tonnage - Canal Tonnage
 Suez Gross Tonnage
 1.42 Panama Net Tonnage - Canal Tonnage
 Panama Gross Tonnage

	18667
	47384
	44881.32
	50381.56
	39074
	-

A2 HULL DIMENSIONS

2.1 Length overall (LOA)
 2.2 Length between perpendiculars (LBP)
 2.3 Distance bow to bridge
 2.4 Distance bridge front - mid point manifold
 2.5 Distance bow to mid-point manifold
 2.6 Extreme breadth

	225.216	Metres
	220.00	Metres
	187.26	Metres
	78.80	Metres
	111.46	Metres
	36.64	Metres

2.7	Extreme depth	22.20	Metres
2.8	Summer draught	12.022	Metres
2.9	Corresponding Summer deadweight	54457	Tonnes
2.10	Light displacement	19240	Tonnes
2.11	Loaded displacement (Summer deadweight)	73697	Tonnes
2.12	Cargo tanks cubic capacity - 100%	84113.5	Cubic metres
2.12.1	Deck tank(s) cubic capacity - 100%	N/A	Cubic metres
2.12.2	Cargo tanks cubic capacity - 99%	83272.4	Cubic metres
2.12.3	Deck tank(s) cubic capacity - 99%	N/A	Cubic metres
2.13	Distance from keel to highest point	49.360	Metres
2.14	Air draught (normal ballast condition)	41.32	Metres

A3 IMMERSION

- 3.1 TPC - in normal ballast condition
- TPC - in loaded condition (summer deadweight)

Tonnes / cm @ metres draught

63.06	6.66
70.58	12.022

A4 LOADED PARTICULARS

- 4.1 Cargo grade
- 4.2 Density
- 4.3 Cargo loadable
- 4.4 Bunkers - FO
- 4.5 Bunkers - DO
- 4.6 Fresh water
- 4.7 Stores & spares
- 4.8 Lub oil
- 4.9 Ballast
- 4.10 x
- 4.11 Draught - forward
- Draught - aft
- Draught - mean

n-Butane	iso-Butane	
0.6007	0.5965	
49989.6	49622.6	Tonnes
2180	2180	Tonnes
150	150	Tonnes
450	450	Tonnes
		Tonnes
100	100	Tonnes
0	0	Tonnes
52500	52500	Tonnes
11.00	11.00	Metres
12.50	12.50	Metres
11.75	11.75	Metres

- Cargo grade
- Density
- Cargo loadable
- Bunkers - FO
- Bunkers - DO
- Fresh water
- Stores & spares
- Lub oil
- Ballast
- Deadweight
- Draught - forward
- Draught - aft
- Draught - mean

Propane	Propylene	
0.583	0.6095	
48450.5	50645.5	Tonnes
2180	2180	Tonnes
150	150	Tonnes
450	450	Tonnes
		Tonnes
100	100	Tonnes
0	0	Tonnes
51000	53500	Tonnes
10.7	11	Metres
12.2	12.5	Metres
11.45	11.8	Metres

- Cargo grade
- Density
- Cargo loadable
- Bunkers - FO
- Bunkers - DO
- Fresh water
- Stores & spares
- Lub oil
- Ballast
- Deadweight
- Draught - forward
- Draught - aft
- Draught - mean

Ethylene	Ammonia	
NA	NA	
		Tonnes
		Tonnes
		Tonnes
		Tonnes
		Tonnes
		Tonnes
		Tonnes
		Tonnes
		Metres
		Metres
		Metres

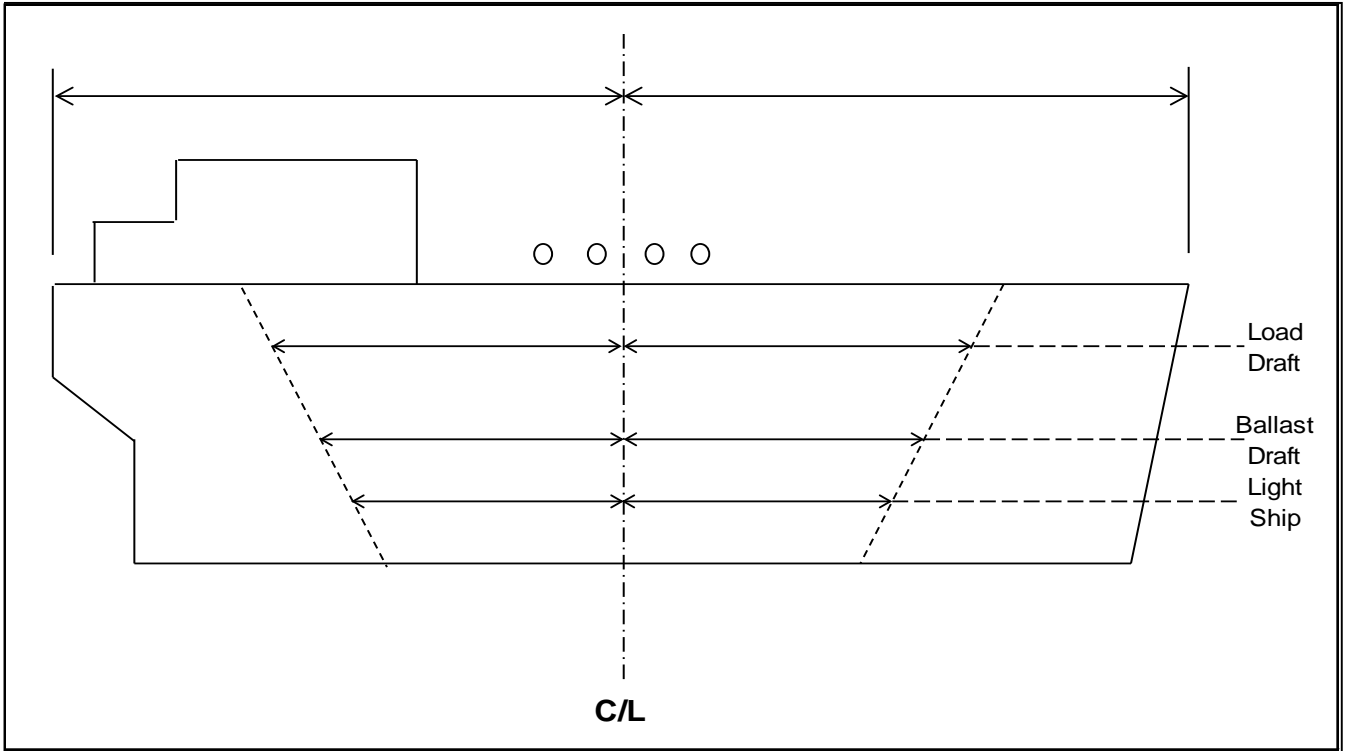
- Cargo grade

VCM	Propylene Oxide
-----	-----------------

Density
 Cargo loadable
 Bunkers - FO
 Bunkers - DO
 Fresh water
 Stores & spares
 Lub oil
 Ballast
 Deadweight
 Draught - forward
 Draught - aft
 Draught - mean

NA	NA	
		Tonnes
		Tonnes
		Tonnes
		Tonnes
		Tonnes
		Tonnes
		Tonnes
		Metres
		Metres
		Metres

A5 PARALLEL MID-BODY DIMENSIONS



5.1	Light ship	40.24	Metres
5.2	Forward to mid-point manifold - light ship	10.02	Metres
5.3	Aft to mid-point manifold - light ship	30.22	Metres
5.4	Normal ballast	87.73	Metres
5.5	Forward to mid-point manifold - normal ballast	43.38	Metres
5.6	Aft to mid-point manifold - normal ballast	44.35	Metres
5.7	Loaded SDWT	104.15	Metres
5.8	Forward to mid-point manifold - loaded SDWT	43.64	Metres
5.9	Aft to mid-point manifold - loaded SDWT	60.51	Metres

A6 BUNKER CAPACITIES

Main engine
 Auxiliary engine(s)
 Other: _____

Grade	Capacity @ 98%
380cST	2695
MGO	632

A7 FUEL CONSUMPTION DETAILS

7.1 At sea - normal service speed
 7.2 At sea - normal service speed - while conditioning cargo

Grade		
Fuel oil		Tonnes/day
Diesel oil		Tonnes/day
Gas oil		Tonnes/day
Fuel oil		Tonnes/day

(Cooling down condition)

7.3 In port - loading

7.4 In port - discharging

7.5 In port - idle

Diesel oil		Tonnes/day
Gas oil		Tonnes/day
Fuel oil		Tonnes/day
Diesel oil		Tonnes/day
Gas oil		Tonnes/day
Fuel oil		Tonnes/day
Diesel oil		Tonnes/day
Gas oil		Tonnes/day
Fuel oil		Tonnes/day
Diesel oil		Tonnes/day
Gas oil		Tonnes/day

Based on FO LCV=10200kcal/kg, MDO LCV=10200kcal/kg under ISO reference condition

A7 SPEED/CONSUMPTION

Copies of the vessel's Speed and Consumption Graph for both Laden and Ballast conditions are enclosed?

NO

A8 MAIN ENGINE PARTICULARS

8.1 Main engine make and type

HYUNDAI- MAN B&W / 6G60ME-C9.2

8.2 Number of units

6

8.3 Maximum continuous rating (MCR) per engine

KW @ RPM

12400	92.2
-------	------

8.4 Total available power

at 103 rpm		HF KW
------------	--	-------

8.5 Normal service power

at 89 rpm	11160	HF KW
-----------	-------	-------

A9 AUXILIARY PLANTS

9.1 Make and type of auxiliary generators / engines

HHI-EMD / 8H21/32

9.2 Number of units

3

9.3 Maximum generator output per unit

	RPM	Kilowatts
Unit no. 1	720	1280
Unit no. 2	720	1280
Unit no. 3	720	1280

9.4 Shaft generator

-

9.5 Total available power

3840

9.6 Emergency generator

1800	130
------	-----

9.7 Emergency fire pump - type

CENTRIFUGAL, VERTICAL, SELF-PRIMING, ELEC. MOTOR
--

Delivery pressure

10

Bar

Motive power

Electric

If electrical, - indicate power required

55

Kilowatts

9.8 Steering gear - type

2-RAM 4 Cylinder Electro Hydraulic

Indicate power required to steer the vessel with one pump unit

45

Kilowatts

A10 POWER/SPEED INFORMATION

10.1 Trial data

BHP		
MRC		SHP
Speed		Knots
Draught		Metres

10.2 Normal service speed

BHP		
MRC		SHP
Speed		Knots
Draught		Metres

A11 THRUSTERS

11.1 Make and type

N/A

11.2	Bow thruster	(output)	N/A	Kilowatts
11.3	Stern thruster	(output)	N/A	Kilowatts

A12 FRESH WATER

12.1	Capacity of distilled tanks			Tonnes
12.2	Capacity of domestic tanks		455.4	Tonnes
12.3	Daily consumption	Distilled		Tonnes
		Domestic	12	Tonnes
12.4	Daily evaporator capacity		22	Tonnes

A13 BALLAST CAPACITIES AND PUMPS

	Tank	Capacity (m3)	Number
13.1	Fore peak	1701.8	1
13.2	Wing and or side tanks	16660.8	8
13.3	Double bottom tanks		
13.4	Aft peak	1152	1
13.5	Other:		
13.6	Total	19514.6	10

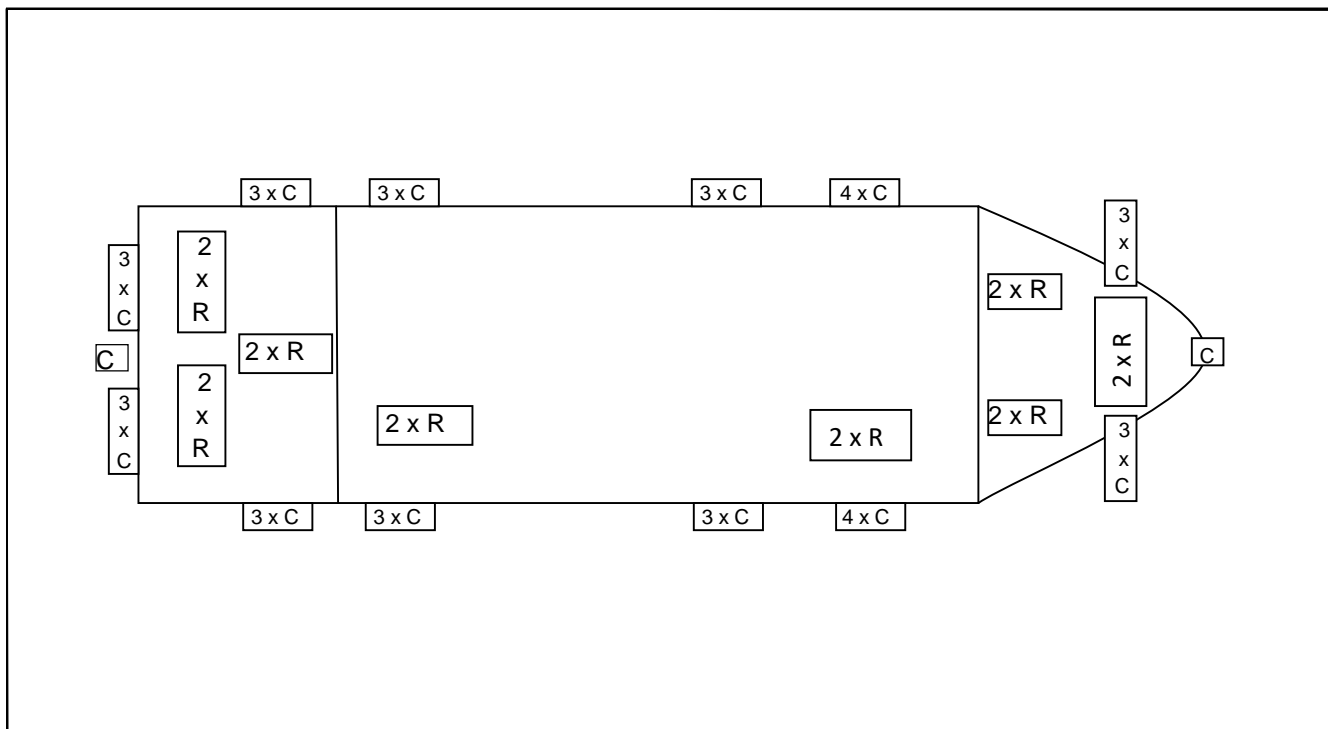
13.7	Ballast pump make and type	SHIN SHIN MACH./ MDC 350C	
13.8	Number of pumps	2	
13.9	Total capacity	1600 (2 x 800) M3/hour	
13.10	Location	E/R FLOOR FWD	
13.11	Control location	CARGO CONTROL ROOM	

A14 MOORING EQUIPMENT

- 14.1 **ROPES**
 Indicate on the diagram below the position of:
 Winch Mounted Ropes (R)
 Open Fairleads (O)
 Closed Fairleads (C)

Alternatively enclosed copy of vessel's Mooring arrangements in A4 format.

NO



MOORING ROPES (ON DRUMS)

Mooring Ropes (On Drums) Forecastle - Number

Diameter	6	
	35	mm.
Material	GALV STEEL WIRE ROPE(IWRC)	
Length	220	Metres
Breaking Strength	837	KN

Mooring Ropes (On Drums) Forward Main Deck - Number

Diameter	2	
	35	mm.
Material	GALV STEEL WIRE ROPE(IWRC)	
Length	220	Metres
Breaking Strength	837	KN

Mooring Ropes (On Drums) Aft Main Deck - Number

Diameter	2	
	35	mm.
Material	GALV STEEL WIRE ROPE(IWRC)	
Length	220	Metres
Breaking Strength	837	KN

Mooring Ropes (On Drums) Poop - Number

Diameter	6	
	35	mm.
Material	GALV STEEL WIRE ROPE(IWRC)	
Length	220	Metres
Breaking Strength	837	KN

OTHER MOORING LINES

Mooring Ropes not on Drums - Number

Diameter	4	
	62	mm.
Material	Polyolefin resin & Polyester Mixed	
Length	220	Metres
Breaking Strength	829	KN

Fire Wires - Number

Diameter	2	
	38	mm.
Material	GALV STEEL WIRE ROPE (IWRC)	
Length	130	Metres
Breaking Strength	539	KN

14.2

MOORING WINCHES

Forecastle - Number

Single Drum or Double Drums	2	
Split Drums Y/N	DOUBLE DRUM	
Motive Power	Y	
Heaving Power	HYD.	
Brake Capacity	20	Tonnes
Hauling Speed	50.4	Tonnes
	15	Metres/Min.

Forward Main Deck - Number

Single Drum or Double Drums	2	
Split Drums Y/N	DOUBLE DRUM	
Motive Power	Y	
Heaving Power	HYD.	
Brake Capacity	20	Tonnes
Hauling Speed	50.4	Tonnes
	15	Metres/Min.

Aft Main Deck - Number

Single Drum or Double Drums	1	
Split Drums Y/N	DOUBLE DRUM	
Motive Power	Y	
Heaving Power	HYD.	
Brake Capacity	20	Tonnes
Hauling Speed	50.4	Tonnes
	15	Metres/Min.

Poop - Number

Single Drum or Double Drums	3	
Split Drums Y/N	DOUBLE DRUM	
Motive Power	Y	
Heaving Power	HYD.	
	20	Tonnes

Brake Capacity	50.4	Tonnes
Hauling Speed	15	Metres/Min.

14.3 **ANCHORS AND WINDLASS**

Windlass motive power(e.g. steam, hydraulic)	HYD.	
Hauling power	34.2	Tonnes
Brake holding power	236.9	Tonnes
Anchor type	HHP TYPE	
Weight	8.775	Tonnes
Is spare anchor carried	1	
Cable diameter	84	mm.
Number of shackles port cable	12	
Number of shackles starboard cable	13	

14.4 **TOWING ARRANGEMENTS**

Is the vessel fitted with a Towing Bracket Aft?	YES	
If Yes, state SWL	200	Tonnes
Is Towing chain provided	YES	
Dimensions of Towing wire	80	mm.
Diameter	100	mm.
Length		Metres

14.5 **WINDAGE**

Windage on ballast draught	End-on	1027.3	Squaremetres
	Lateral	4098	Squaremetres

A15 NAVIGATIONAL EQUIPMENT

15.1	Magnetic compass		YES
15.2	Off Course Alarm - Magnetic compass		YES
15.3	Gyro compass	Number of Units	YES
			2
15.4	Off Course Alarm - Gyro compass		YES
15.5	Gyro (Bridge) Repeaters	Number of Units	YES
			5
15.6	Radar 3cm		YES
15.7	Radar 10cm		YES
15.8	Are radars gyro stabilised?		YES
15.9	Radar plotting equipment		NO
15.10	ARPA		YES
15.11	ECDIS		YES
15.12	Depth sounder with recorder		YES
15.13	Depth sounder without recorder		NO
15.14	Speed/distance indicator		YES
15.15	Doppler log		YES
15.16	Docking approach Doppler		YES
15.17	Rudder angle indicator		YES
15.18	Rudder angle indicator on Each Bridge Wing		YES
15.19	RPM indicator		YES
15.20	RPM indicator on Each Bridge Wing		YES
15.21	Controllable pitch propeller indicator		N/A
15.22	Thruster(s) indicator		N/A
15.23	Rate of turn indicator		YES
15.24	Radio direction finder		N/A
15.25	Navtex receiver		YES
15.26	GPS		NO
15.26.1	DGPS		YES
15.27	Transit SATNAV		N/A
15.28	Decca navigator		N/A
15.29	Omega		N/A
15.30	Loran C		N/A

15.31	Weather fax		YES
15.32	Sextant(s)		YES
15.33	Signal lamp ALDIS		YES
15.34	Anemometer		YES
15.35	Engine order recorder		YES
15.35.1	VDR (Voyage Data Recorder)		YES
15.36	Course recorder		YES
15.37	Are steering motor controls and engine controls fitted on bridge wings?		NO
15.38	Is bridge equipped with a 'Dead-Man' alarm?		NO
15.39	What chart outfit coverage is provided	World-wide	YES
		Limited	NO
	If limited, - please indicate area(s) covered	N/A	
15.40	Formal chart correction system in use		NAVTOR
15.41	Electronic Chart system in use		YES

A16 COMMUNICATIONS AND ELECTRONICS

16.2	What GMDSS areas is the vessel classed for? A1 A2 A3 A4		A1,A2 and A3
16.3	Transponder (SART)		YES
16.4	EPIRB		YES
16.5	How many VHF radios are fitted on the bridge?		2
16.6	Is vessel fitted with VHF in the cargo control room (CCR)?		YES
16.7	Is the CCR connected to the vessel's internal communication system?		YES
16.8	How many intrinsically safe walkie talkies are provided for cargo handling?		11
16.9	Is vessel fitted with an INMARSAT satellite communications system?		YES
16.10	Does vessel carry at least three survival craft two-way radio telephones?		YES
16.11	Inmarsat satellite system		YES
	Specify system type A, B or C		C
16.12	2182kHz bridge auto alarm		NO
16.13	Radio telephone distress frequency watch receiver		YES
16.14	Emergency lifeboat transceiver		NO
16.15	Can vessel transmit the helicopter homing signal on 410 kHz?		NO
16.16	Full set of Radio List publications		YES

**SECTION B
CARGO SYSTEMS**

B1 CARGO - GENERAL INFORMATION

1.1 List products which the ship is Certified to carry

Butadiene (All Isomers)
Biutane (All Isomers)
Butylenes (All Isomers)
Commercial Propane (max. 5.0 mole% ethane in the liquid phase)
Propane-Butane Mixtures
Propane-Butane mixtures
Propylene

Transport and Carriage Conditions

1.2	Minimum allowable tank temperature	-50	Deg. Celsius
1.3	Maximum Permissible tank pressure	400	mBar
1.4	List Number of grades that can be loaded/discharged simultaneously and completely segregated without risk of contamination?	2	
1.5	List the Number of grades that can be carried simultaneously and completely segregated without risk of contamination?	2	
1.6	What is the Number of Products that can be conditioned by reliquefaction simultaneously?	2	
1.7	State the number of natural segregation's (NB: Separation must be by the removal of spools or the insertion of blanks)	2	

B2 CARGO TANKS

2.1	Type and materials of cargo tanks	Low temperature Carbon Manganese steel	
2.2	Maximum allowable relief valve setting	Ref. 2.3	Bar gauge
2.2.1	IMO Setting	0.275	Bar gauge
2.2.2	USCG Setting	-	Bar gauge
2.3	Safety valve set pressure, - if variable stipulate range of pilot valves	0.4 in harbor	0.275 at seagoing
2.4	Maximum allowable vacuum	-0.05	Bar gauge
2.5	Maximum cargo density at 15 deg Celsius	0.61	Kg/cm2
2.6	Maximum rate of cool-down	10	Deg Cel / Hour
2.7	State any limitations regarding partially filled tanks		

NIL

2.8 State allowable combinations of filled and empty tanks

1. FULL-FULL-FULL-FULL
2. EMPTY-FULL-EMPTY-EMPTY
3. FULL-EMPTY-FULL-FULL
4. EMPTY-FULL-EMPTY-FULL
5. FULL-EMPTY-FULL-EMPTY

B3 CARGO TANK CAPACITIES

Tank number / location	1 P+S	
Capacity m3 (100%)	18011.5	m3
Capacity 99%	17831.3	m3
n-Butane capacity	10716.6	Tonnes
Butane temperature	0.0	Deg. C
iso-Butane capacity	10645.3	Tonnes
iso-Butane temperature	-11.0	Deg. C
Propane capacity	10395.6	Tonnes
Propane temperature	-42.5	Deg. C
Propylene capacity	10859.3	Tonnes
Propylene temperature	-47.0	Deg. C
Vinyl Chloride Monomer capacity	NA	Tonnes
Vinyl Chloride Monomer temperature	-	Deg. C
Ethylene capacity	NA	Tonnes

Ethylene temperature	-	Deg. C
Propylene Oxide capacity	NA	Tonnes
Propylene Oxide temperature	-	Deg. C
Ammonia capacity	NA	Tonnes
Ammonia temperature	-	Deg. C

Tank number / location

2 P+S		
Capacity m3 (100%)	22565.2	m3
Capacity 99%	22339.5	m3
n-Butane capacity	13426.0	Tonnes
n-Butane temperature	0.0	Deg. C
iso-Butane capacity	13336.7	Tonnes
iso-Butane temperature	-11.0	Deg. C
Propane capacity	13023.9	Tonnes
Propane temperature	-42.5	Deg. C
Propylene capacity	13604.8	Tonnes
Propylene temperature	-47.0	Deg. C
Vinyl Chloride Monomer capacity	NA	Tonnes
Vinyl Chloride Monomer temperature	-	Deg. C
Ethylene capacity	NA	Tonnes
Ethylene temperature	-	Deg. C
Propylene Oxide capacity	NA	Tonnes
Propylene Oxide temperature	-	Deg. C
Ammonia capacity	NA	Tonnes
Ammonia temperature	-	Deg. C

Tank number / location

3 P+S		
Capacity m3 (100%)	22572.7	m3
Capacity 99%	22347.1	m3
n-Butane capacity	13430.6	Tonnes
n-Butane temperature	0.0	Deg. C
iso-Butane capacity	13341.2	Tonnes
iso-Butane temperature	-11.0	Deg. C
Propane capacity	13028.4	Tonnes
Propane temperature	-42.5	Deg. C
Propylene capacity	13609.4	Tonnes
Propylene temperature	-47.0	Deg. C
Vinyl Chloride Monomer capacity	NA	Tonnes
Vinyl Chloride Monomer temperature	-	Deg. C
Ethylene capacity	NA	Tonnes
Ethylene temperature	-	Deg. C
Propylene Oxide capacity	NA	Tonnes
Propylene Oxide temperature	-	Deg. C
Ammonia capacity	NA	Tonnes
Ammonia temperature	-	Deg. C

Tank number / location

4 P+S		
Capacity m3 (100%)	20964.1	m3
Capacity 99%	20754.5	m3
n-Butane capacity	12473.4	Tonnes
n-Butane temperature	0.0	Deg. C
iso-Butane capacity	12390.4	Tonnes
iso-Butane temperature	-11.0	Deg. C
Propane capacity	12099.8	Tonnes
Propane temperature	-42.5	Deg. C
Propylene capacity	12639.5	Tonnes
Propylene temperature	-47.0	Deg. C
Vinyl Chloride Monomer capacity	NA	Tonnes
Vinyl Chloride Monomer temperature	-	Deg. C
Ethylene capacity	NA	Tonnes
Ethylene temperature	-	Deg. C
Propylene Oxide capacity	NA	Tonnes

Propylene Oxide temperature	-	Deg. C
Ammonia capacity	NA	Tonnes
Ammonia temperature	-	Deg. C
Total Capacity of all cargo tanks (100%)	84113.5	m3
Total Capacity of all cargo tanks (99%)	83272.4	m3
Total Capacity of n-Butane	49989.6	Tonnes
Total Capacity of iso-Propane		Tonnes
Total Capacity of Propane	48450.5	Tonnes
Total Capacity of Propylene	50645.5	Tonnes
Total Capacity of Vinyl Chloride Monomer	NA	Tonnes
Total Capacity of Ethylene	NA	Tonnes
Total Capacity of Propylene Oxide	NA	Tonnes
Total Capacity of Ammonia		Tonnes

B16 DECK TANK CAPACITIES

Are Deck pressure tank(s) fitted?	NO	
Material of tank(s)	N/A	
Maximum allowable relief valve setting	-	Bar gauge

Deck tank number 1 - capacity (100%)

Capacity 98%	-	m3
Propane Capacity	-	m3
Butane Capacity	-	Tonnes
Propylene capacity	-	Tonnes
Ethylene capacity	-	Tonnes
Ammonia Capacity	-	Tonnes

Deck tank number 2 - capacity (100%)

Capacity 98%	-	m3
Propane Capacity	-	m3
Butane Capacity	-	Tonnes
Propylene capacity	-	Tonnes
Ethylene capacity	-	Tonnes
Ammonia Capacity	-	Tonnes

B4 LOADING RATES

4.1 From Refrigerated Storage (Fully Refrigerated at Vessel's Manifold)

Butane - with vapour return	2880	Tonnes/Hr.
Butane - without vapour return	2880	Tonnes/Hr.
Propane - with vapour return	2784	Tonnes/Hr.
Propane - without vapour return	2784	Tonnes/Hr.
Butadiene - with vapour return	3124	Tonnes/Hr.
Butadiene - without vapour return	3124	Tonnes/Hr.
Propylene - with vapour return	2923	Tonnes/Hr.
Propylene - without vapour return	2923	Tonnes/Hr.
Ethylene - with vapour return	NA	Tonnes/Hr.
Ethylene - without vapour return	NA	Tonnes/Hr.
Ammonia - with vapour return	NA	Tonnes/Hr.
Ammonia - without vapour return	NA	Tonnes/Hr.
Vinyl Chloride Monomer - with vapour return	NA	Tonnes/Hr.
Vinyl Chloride Monomer - without vapour return	NA	Tonnes/Hr.
Propylene Oxide - with vapour return	NA	Tonnes/Hr.
Propylene Oxide - without vapour return	NA	Tonnes/Hr.

4.8 From Pressure Storage

Butane 0 deg C - with vapour return	2880	Tonnes/Hr.
0 deg C - without vapour return	2880	Tonnes/Hr.
10 deg C - with vapour return	-	Tonnes/Hr.

10 deg C - without vapour return	-	Tonnes/Hr.
20 deg C - with vapour return	-	Tonnes/Hr.
20 deg C - without vapour return	-	Tonnes/Hr.
Propane minus 30 deg C - with vapour return	-	Tonnes/Hr.
Minus 30 deg C - without vapour return	-	Tonnes/Hr.
Minus 20 deg C - with vapour return	-	Tonnes/Hr.
Minus 20 deg C - without vapour return	-	Tonnes/Hr.
Minus 10 deg C - with vapour return	-	Tonnes/Hr.
Minus 10 deg C - without vapour return	-	Tonnes/Hr.
0 deg C - with vapour return	-	Tonnes/Hr.
0 deg C - without vapour return	-	Tonnes/Hr.
10 deg C - with vapour return	-	Tonnes/Hr.
10 deg C - without vapour return	-	Tonnes/Hr.
20 deg C - with vapour return	-	Tonnes/Hr.
20 deg C - without vapour return	-	Tonnes/Hr.
Butadiene 0 deg C - with vapour return	-	Tonnes/Hr.
0 deg C - without vapour return	-	Tonnes/Hr.
10 deg C - with vapour return	-	Tonnes/Hr.
10 deg C - without vapour return	-	Tonnes/Hr.
20 deg C - with vapour return	-	Tonnes/Hr.
20 deg C - without vapour return	-	Tonnes/Hr.
Propylene minus 30 deg C - with vapour return	-	Tonnes/Hr.
Minus 30 deg C - without vapour return	-	Tonnes/Hr.
Minus 20 deg C - with vapour return	-	Tonnes/Hr.
Minus 20 deg C - without vapour return	-	Tonnes/Hr.
Minus 10 deg C - with vapour return	-	Tonnes/Hr.
Minus 10 deg C - without vapour return	-	Tonnes/Hr.
0 deg C - with vapour return	-	Tonnes/Hr.
0 deg C - without vapour return	-	Tonnes/Hr.
10 deg C - with vapour return	-	Tonnes/Hr.
10 deg C - without vapour return	-	Tonnes/Hr.
20 deg C - with vapour return	-	Tonnes/Hr.
20 deg C - without vapour return	-	Tonnes/Hr.
Ethylene minus 100 deg C - with vapour return	NA	Tonnes/Hr.
Minus 100 deg C - without vapour return		Tonnes/Hr.
Minus 95 deg C - with vapour return		Tonnes/Hr.
Minus 95 deg C - without vapour return		Tonnes/Hr.
Minus 90 deg C - with vapour return		Tonnes/Hr.
Minus 90 deg C - without vapour return		Tonnes/Hr.
Minus 85 deg C - with vapour return		Tonnes/Hr.
Minus 85 deg C - without vapour return		Tonnes/Hr.
Ammonia minus 20 deg C - with vapour return	-	Tonnes/Hr.
Minus 20 deg C - without vapour return	-	Tonnes/Hr.
Minus 10 deg C - with vapour return	-	Tonnes/Hr.
Minus 10 deg C - without vapour return	-	Tonnes/Hr.
0 deg C - with vapour return	-	Tonnes/Hr.
0 deg C - without vapour return	-	Tonnes/Hr.
VCM minus 10 deg C - with vapour return	NA	Tonnes/Hr.
Minus 10 deg C - without vapour return		Tonnes/Hr.
0 deg C - with vapour return		Tonnes/Hr.
0 deg C - without vapour return		Tonnes/Hr.
10 deg C - with vapour return		Tonnes/Hr.
10 deg C - without vapour return		Tonnes/Hr.
20 deg C - with vapour return		Tonnes/Hr.
20 deg C - without vapour return		Tonnes/Hr.

Special remarks:

Note 1: The figures given apply for four cargo tanks and three reliquefaction units in operation, where applicable, and for +20 degC ambient temperature.
Note 2: Loading a fully refrigerated vessel from pressurized storage will give unacceptable loading times and therefore not deemed applicable for this type of vessel.

B5 DISCHARGING - GENERAL

Cargo Pumps

5.1	Type of Pumps	Hamworthy Svanehoj DW 250/200-3-	
		k+1	
5.2	Number of pumps per tank	2	
5.3	Rate per Pump	600	m3/hr
5.4	At Delivery Head m/c	120	m/c
5.5	Maximum density	610	Kg/m3

Booster Pump

5.6	Type of Booster Pumps	Hamworthy Svanehoj NMB 150e	
5.7	Number of pumps	2	
5.8	Rate per Pump	600	m3/hr
5.9	At Delivery Head m/c	115	m/c
5.10	Maximum density	690	Kg/m3

Copies of pumping curves for cargo and booster pumps are enclosed?

NO

B6 DISCHARGE PERFORMANCE

Full Cargo Discharge Times (using all cargo pumps)

Fully Refrigerated

Manifold Back Press 1 kP/cm2, with vapour return	15	Hours
Manifold Back Press 1 kP/cm2, without vapour return	17	Hours
Manifold Back Press 5 kP/cm2, with vapour return	18	Hours
Manifold Back Press 5 kP/cm2, without vapour return	20	Hours
Manifold Back Press 10 kP/cm2, with vapour return	22	Hours
Manifold Back Press 10 kP/cm2, without vapour return	22	Hours

Pressurised

Manifold Back Press 1 kP/cm2, with vapour return	NA	Hours
Manifold Back Press 1 kP/cm2, without vapour return	NA	Hours
Manifold Back Press 5 kP/cm2, with vapour return	NA	Hours
Manifold Back Press 5 kP/cm2, without vapour return	NA	Hours
Manifold Back Press 10 kP/cm2, with vapour return	NA	Hours
Manifold Back Press 10 kP/cm2, without vapour return	NA	Hours

B7 UNPUMPABLES

7.1	Tank number / location	Tank 1, P&S: 14 m3	mt
	Tank number / location	Tank 2, P&S: 18 m3	mt
	Tank number / location	Tank 3, P&S: 18 m3	mt
	Tank number / location	Tank 4, P&S: 16 m3	mt
	Total	66 m3	mt

B8 VAPORISING UNPUMPABLES

8.1	Process used	Hot gas by cargo compressors
-----	--------------	------------------------------

Time to vaporise liquid unpumpables remaining after full cargo discharge of:

8.2	Butane	18	Hours
8.3	Propane	8	Hours
8.4	Butadiene	N/A	Hours

8.5	Propylene	8	Hours
8.6	Ethylene	NA	Hours
8.7	Ammonia	NA	Hours
8.8	Vinyl Chloride Monomer	NA	Hours
8.9	Propylene Oxide	NA	Hours

B9 RELIQUEFACTION PLANT

9.1	Plant Design Conditions - air temperature	45	Deg. C
9.3	Plant Design Conditions - sea temperature	36	Deg. C

Plant Type

9.4	Is the plant single stage/direct?	-
9.5	Is the plant two stage/direct?	Two/three stage
9.6	Is the plant simple cascade?	-
9.7	Coolant type	NA

Compressors

9.8	Compressor type	Piston
9.8.1	Compressor makers name	Buckhardt Compression
9.9	Number of compressors	3
9.10	Capacity per unit	Depending on type of cargo
9.11	Are they Oil Free?	Yes

B11 CARGO TEMPERATURE LOWERING CAPABILITY (AT SEA WITH SEA TEMPERATURE +15C)

Time taken to lower the temperature of:

11.1	Propane from -5 deg C to -42 deg C	NA	Hours
11.2	Propane from -20 deg C to -42 deg C	NA	Hours
11.3	Propane from -38 deg C to -42deg C	108	Hours
11.4	Propane from +20 deg C to 0 deg C	NA	Hours
11.5	Propane from 0 deg C to -20 deg C	NA	Hours
11.6	Butane from +20 deg C to 0 deg C	NA	Hours
11.7	Butane from +10 deg C to 0 deg C	NA	Hours
11.8	Butane from +10 deg C to -5 deg C	NA	Hours
11.9	Butadiene From +20 deg C to -5 deg C	NA	Hours
11.10	Propylene From -20 deg C to -47 deg C	NA	Hours
11.11	Ethylene From -100 deg C to -104 deg C	NA	Hours
11.12	Ammonia From -15 deg C to -33 deg C	NA	Hours
11.13	Vinyl Chloride Monomer From -5 deg C to -14 deg C	NA	Hours

B12 INERT GAS AND NITROGEN

Main IG Plant

12.1	Type of system	Inert Gas Generator	
12.2	Capacity	5300	Nm3/hr
12.3	Type of fuel used	Marine diesel oil DMA	
12.4	Composition of IG - oxygen	1-2	%
	Composition of IG - CO2	Approx. 14	%
	Composition of IG - Nox	Max 100 ppm	
	Composition of IG - N2	Balance	%

12.5	Lowest dewpoint achievable	-40	Deg. C
12.6	Used for	Inerting of cargo tanks and holds	

Auxiliary IG or Nitrogen plant

12.7	Type of System	NA	
12.8	Capacity	-	m3/hr
12.9	Composition of IG - oxygen	-	%
	Composition of IG - CO2	-	%
	Composition of IG - Nox	-	
	Composition of IG - N2	-	%
12.10	Lowest dewpoint achievable	-	Deg. C
12.11	Used for	-	

Nitrogen

12.12	Liquid storage capacity	NA	m3
12.13	Daily boil-off loss	NA	m3
12.14	Maximum supply pressure	-	Kp/Cu. Cm
12.15	Supply capacity	-	m3/hr
12.16	Used for		

B13 CARGO TANK INERTING/DE-INERTING

13.1	Time taken to inert from fresh air to under 5% O2 at minus 25 degree C?	20	Hours
13.2	Time taken to inert from cargo vapour to fully inert at minus 25 degrees dewpoint when IG density is less than product?	19	Hours
	Time taken to inert from cargo vapour to fully inert at minus 25 degrees dewpoint when IG density is greater than product?	NA	Hours

B14 GAS FREEING TO FRESH AIR

14.1	Plant used	Vent fans	
14.2	Time taken from fully inert condition to fully breathable fresh air?	24	Hours

B15 CHANGING CARGO GRADES

Indicate number of hours needed to change grades from the removal of pumpables to tanks fit to load and the estimated quantity of Inert Gas and or Nitrogen consumed during the operation:

	Hours	Inert Gas	Nitrogen
From Propane to Butane	60	-	-
From Propane to Butadiene	-	-	-
From Propane to Ethylene	NA	NA	NA
From Propane to Ammonia	105	NA	-
From Propane to Vinyl Chloride Monomer	NA	NA	NA
From Propane to Propylene Oxide	NA	NA	NA
From Butane to Propane	62	-	-
From Butane to Butadiene	-	-	-
From Butane to Ethylene	NA	NA	NA
From Butane to Ammonia	NA	NA	NA
From Butane to Vinyl Chloride Monomer	NA	NA	NA
From Butane to Propylene Oxide	NA	NA	NA
From Butadiene to Propane	NA	NA	NA
From Butadiene to Butane	NA	NA	NA
From Butadiene to Ethylene	NA	NA	NA
From Butadiene to Ammonia	NA	NA	NA
From Butadiene to Vinyl Chloride Monomer	NA	NA	NA
From Butadiene to Propylene Oxide	NA	NA	NA
From Ethylene to Propane	NA	NA	NA
From Ethylene to Butane	NA	NA	NA
From Ethylene to Butadiene	NA	NA	NA

Ethylene - Time required to cooldown cargo tanks from ambient temperature without vapour return line

-

Hrs.

- 17.6 **Ammonia** - Quantity of Coolant Required
Ammonia - Time required to cooldown cargo tanks from ambient temperature with vapour return line
Ammonia - Time required to cooldown cargo tanks from ambient temperature without vapour return line

m3

Hours

Hours

- 17.7 **VCM** - Quantity of Coolant Required
VCM - Time required to cooldown cargo tanks from ambient temperature without vapour return line
VCM - Time required to cooldown cargo tanks from ambient temperature with vapour return line

NA
-
-

m3

Hours

Hours

B18 VAPORISER

- 18.1 Type of Vaporiser
18.2 Number of Vaporisers fitted
18.3 Capacity per unit - **Propane**
18.4 Liquid Supply Rate
18.5 Delivery Temperature
18.6 Capacity per unit - **Ammonia**
18.7 Liquid Supply Rate
18.8 Delivery Temperature
18.9 Capacity per unit - **Nitrogen**
18.10 Liquid Supply Rate
18.11 Delivery Temperature

Shell and Tube type / Seawater heater	
	1
	4800
	19.2
	0
	NA
	NA
	NA
	NA
	-
	-

m3/hr Vap

m3/hr Liq

Deg. C

m3/hr Vap

m3/hr Liq

Deg. C

m3/hr Vap

m3/hr Liq

Deg. C

B19 BLOWER

- 19.1 Type of Blower
19.2 Rated Capacity
19.3 Delivery Pressure

2 off Centrifugal fans	
	10,000
	0.12

m3/hr

Kp/cm2

B20 CARGO RE-HEATER

- 20.1 Type of Re-Heater
20.2 Number Fitted
20.3 Heating Medium
20.4 Discharge rates with sea water at 15 degrees C to raise product temperature of **Propane** from -42 degrees C to 0 degrees C
20.5 Discharge rates with sea water at 15 degrees C to raise product temperature of **Ammonia** from -33 degrees C to 0 degrees C

Shell and Tube type	
	1
	Seawater
	600
	N/A

m3/hr

m3/hr

B21 HYDRATE CONTROL

- 21.1 Type of Depressant?
21.1.1 Freezing point temperature?
21.2 Quantity of Depressant Carried?
21.3 Means of injection?
Name any other system used

Ethanol	
	-114
	1200
Portable container with hand pump	
-	

Deg. C

Ltr.

B22 CARGO MEASUREMENT

Level Gauges

- 22.1 Are level gauges local or remote?
22.2 Name of manufacture
22.3 Type
22.4 Rated Accuracy

	Remote
Kongsberg Maritime	
Radar beam type GL-100/5	
	+/- 2

mm.

22.5 Certifying Authority

DNV

Temperature Gauges

22.6 Name of manufacture

Kongsberg Maritime

 22.7 Type

PT 100

 22.8 Rated Accuracy

+/- 0.03

 Deg. C
 22.9 Certifying Authority

DNV

Pressure Gauges

22.10 Name of manufacture

MRC Hypateck

 22.11 Type

Pressure indicator

 22.12 Rated Accuracy

1

 %
 22.13 Certifying Authority

--

Oxygen Analyser

22.14 Name of manufacture

Riken Keiki

 22.15 Type

RX-8000

 22.15.1 What is the lowest level measurable?

0%

Fixed Gas Analyser

22.16 Name of manufacture

Riken Keiki

 22.17 Type

RKK-2002K

 22.18 Are Cargo tank calibration tables available?

Yes

 22.19 Name of Measuring Company

SGS

 22.20 Name of Certifying Authority

DNV

 22.21 Calibration calculated to cm?

Yes

 22.21.1 Calibration calculated to 1/2 cm?

No

 22.22 Tables established to cm?

Yes

 22.22.1 Tables established to mm?

No

 22.22.2 Tables established to "other" (state what other)

N/A

 22.23 Are trim and list corrections available?

Yes

 22.24 Are temperature corrections available?

Yes

 22.25 Are float gauge tape corrections available?

NA

B23 CARGO SAMPLING

23.1 May cargo samples be obtained from the levels; top, middle and bottom in all cargo tanks?

Yes

If no, - the arrangement for sampling is limited to:

Vapour sample can be taken from top, middle and bottom levels. Liquid sample can only be taken via Cargo pump on the discharge line

23.2 Can samples be drawn from tank vapour outlet?

Yes

 Can samples be drawn from manifold liquid line?

No

 Can samples be drawn from manifold vapour line?

No

 Can samples be drawn from pump discharge line?

Yes

 23.3 State sample connection type

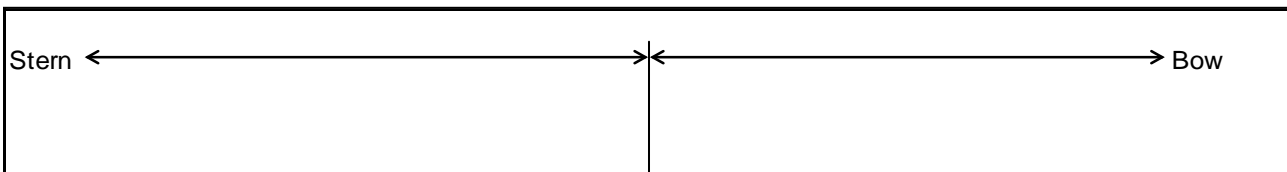
Ball valve full bore

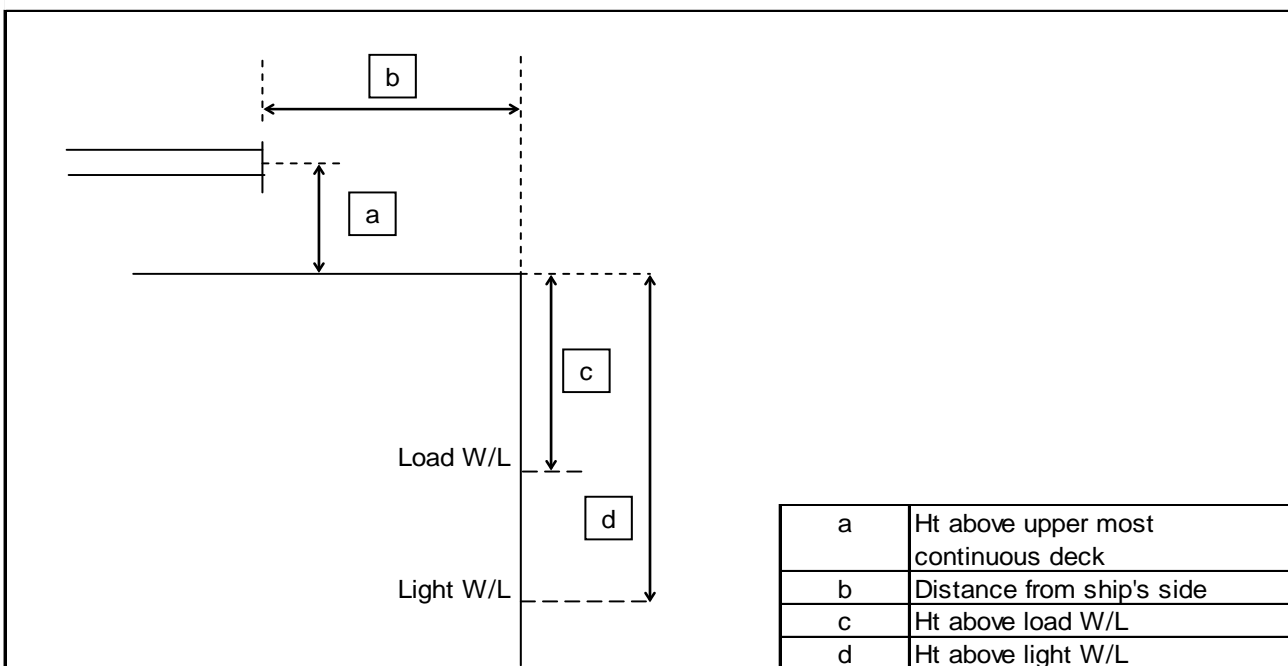
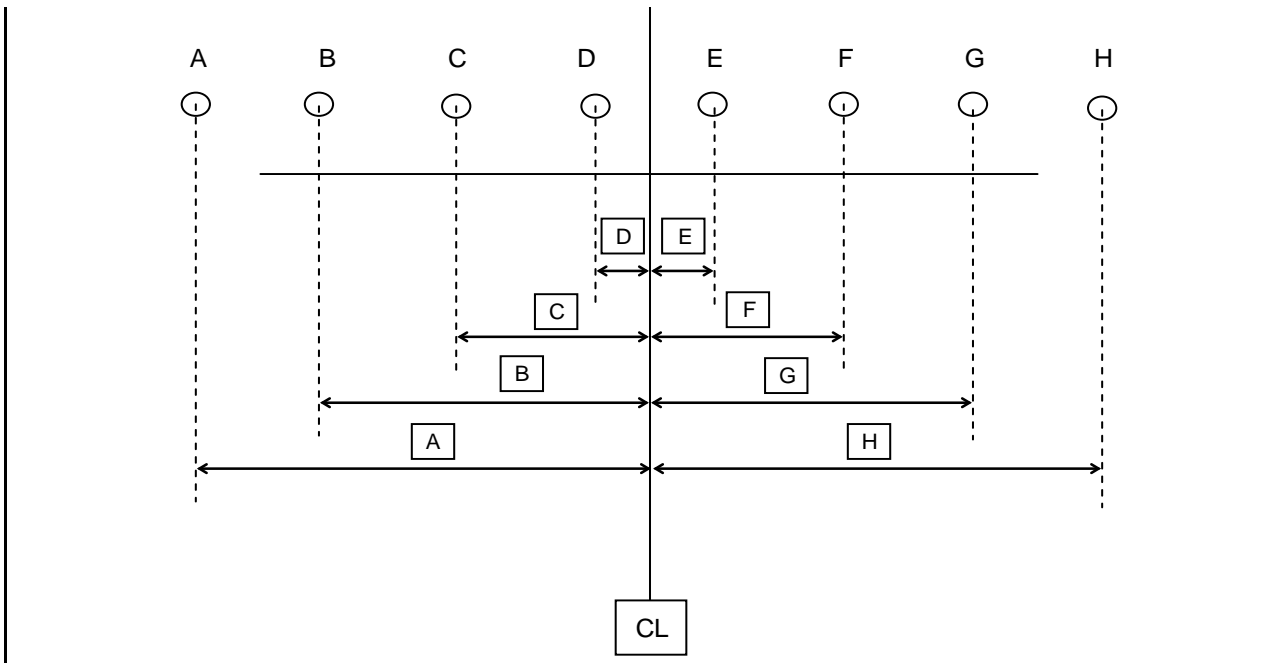
 Size of sample connection

1/2" NPT (F)

B24 CARGO MANIFOLD

Manifold arrangement diagram





Center of manifold to bow
Center of manifold to stern

Dimension A
Dimension B
Dimension C
Dimension D
Dimension E
Dimension F
Dimension G
Dimension H

Pipe Flange A - duty
Pipe Flange A - rating
Pipe Flange A - size
Pipe Flange A raised or flat face
Pipe Flange B - duty
Pipe Flange B - rating
Pipe Flange B - size
Pipe Flange B raised or flat face
Pipe Flange C - duty
Pipe Flange C - rating

111.46	M.
113.76	M.
-	mm.
-	mm.
3375	mm.
1125	mm.
1125	mm.
3375	mm.
5625	mm.
7875	mm.
-	
-	bar
-	mm.
-	
-	bar
-	mm.
-	
LIQUID 2	
300#	bar

Pipe Flange C - size	355.6	mm.
Pipe Flange C raised or flat face	Raised	
Pipe Flange D - duty	VAPOUR 2	
Pipe Flange D - rating	150#	bar
Pipe Flange D - size	254	mm.
Pipe Flange D raised or flat face	Raised	
Pipe Flange E - duty	VAPOUR 1	
Pipe Flange E - rating	150#	bar
Pipe Flange E - size	254	mm.
Pipe Flange E raised or flat face	Raised	
Pipe Flange F - duty	LIQUID 1	
Pipe Flange F - rating	300#	bar
Pipe Flange F - size	355.6	mm.
Pipe Flange F raised or flat face	Raised	
Pipe Flange G - duty	LIQUID 2A	
Pipe Flange G - rating	300#	bar
Pipe Flange G - size	355.6	mm.
Pipe Flange G raised or flat face	Raised	
Pipe Flange H - duty	VAPOUR 2A	
Pipe Flange H - rating	150#	bar
Pipe Flange H - size	254	mm.
Pipe Flange H raised or flat face	Raised	
Height above uppermost continuous deck	2110	mm.
Distance from ship side	4250	mm.
Height above load waterline	12310	mm.
Height above light waterline (Ballast cond.(dep))	17210	mm.

Manifold Arrangement Located on Top of Compressor

Distance from rail of compressor room/platform to presentation flanges	NA	mm.
Distance from deck of compressor room/platform/try to centre of manifold	NA	mm.

B25 CARGO MANIFOLD REDUCERS

25.1	Number of ANSI Class 300 reducers carried onboard	8	
	Flange rating of ANSI Class 300 reducer	300#	bar
	Size of ANSI Class 300 reducer	14x16, 14x12, 14x10, 14x8	inch
	Length of ANSI Class 300 reducer	645	mm.
25.2	Number of ANSI Class 300 to Class 150 reducers carried onboard	10	
	Flange rating of ANSI Class 300 to Class 150 reducer	300#,150#	bar
	Size of ANSI Class 300 to Class 150 reducer	14x16,14x14,14x12,14x10,14x8	inch
	Length of ANSI Class 300 to Class 150 reducer	645	mm.
25.3	Number of ANSI Class 150 reducers carried onboard	6	
	Flange rating of Class 150 reducer	150#	bar
	Size of ANSI Class 150 reducer	10x12,10x8,10x6	mm.
	Length of ANSI Class 150 reducer	500	mm.

B26 CONNECTIONS TO SHORE FOR ESD AND COMMUNICATIONS SYSTEMS

26.1	Is ESD connection to shore available?	Yes	
	If yes, is the system pneumatic?	Yes	
	If yes, is the system electrical?	Yes	
	If yes, is the system fiber optic?	-	
26.2	What is the type of connection used?	SIGGTO	
26.3	Are ESD hoses or cables available on board?	Yes	
	If yes, length of pneumatic		mm.
	If yes, length of electrical	30 meters	mm.
	If yes, length of fiber optic	-	mm.

26.4	Is there a connection available for a telephone line?	No	
26.5	Are ESD connections available on both sides of vessel?	Yes	
	Are ESD Fusible plugs fitted at tank domes?	Yes	
	Are ESD Fusible plugs fitted at manifolds?	Yes	
	Is the link compatible with the SIGTTO guidelines?	Yes	
	Type of manifold valve	Butterfly	
	Closing time in seconds	26	secs
	Is closing time adjustable?	Yes	
	Is Independent high level shut down system fitted(overflow control)?	Yes	
	If yes, does the independent high level shutdown system also switch off running cargo pumps?	Yes	
	Shut down level %	99.5	%

B27 MANIFOLD DERRICK/CRANE

27.1	Is manifold derrick provided	NA	
27.2	Is manifold crane provided	YES	
27.3	Is lifting equipment same for port and starboard?	YES	
	If no, then stipulate details	THE LOCATION IS SHIP'S CENTER	
27.4	State SWL at maximum outreach	10	Tonnes
27.4.1	Maximum outreach of lifting equipment	6.7	Metres

B28 STORES DERRICK/CRANE

28.1	State location	PORT AND STBD AFT OF ACCOM. EL. MOTOR HANDLING	
	SWL	5 / 5	Tonnes

B29 SISTER VESSEL(S)

29.1	Name of vessel	BW BALDER
		BW VAR
		BW NJORD
		BW FREYA
		BW FRIGG