

# **GAS CARRIERS**

## **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.

## INDEX

	<b>GENERAL INFORMATION</b>	<b>PAGE</b>
A1	Principal Ship Particulars	2-3
A2	Hull Dimensions	4
A3	Immersion	4
A4	Loaded Particulars	4-5
A5	Parallel Mid-Body Dimensions	6
A6	Bunker Specifications and Capacities	6
A7	Fuel Consumption Details	6
A7	Speed/Consumption (Appendix)	7
A8	Main Engine Particulars	7
A9	Auxiliary Plants	7
A10	Power/Speed Information	7
A11	Thrusters	7
A12	Fresh Water	7
A13	Ballast Capacities and Pumps	8
A14	Mooring Equipment	8-10
A15	Navigational Equipment	10-11
A16	Communication and Electronics	11
	<b>CARGO SYSTEMS</b>	
B1	Cargo - General Information	12
B2	Cargo Tanks	12
B3	Cargo Tank Capacities	13-15
B16	Deck Tank Capacities	15-16
B4	Loading Rates	16-17
B5	Discharging - General	17-18
B6	Discharge Performance	18
B7	Unpumpables	18
B8	Vaporising Unpumpables	18
B9	Reliquefaction Plant	18-19
B10	Section not in use.	
B11	Cargo Temperature Lowering Capability	19
B12	Inert Gas and Nitrogen	19-20
B13	Cargo Tank Inerting / De-Inerting	20
B14	Gas Freeing to Fresh Air	20
B15	Changing Cargo Grades	20-21
B17	Pre-Loading Cooldown	21-22
B18	Vaporiser	22
B19	Blower	22
B20	Cargo Re-Heater	22
B21	Hydrate Control	22
B22	Cargo Measurement	22-23
B23	Cargo Sampling	23
B24	Cargo Manifold	24-25
B25	Cargo Manifold Reducers	25-26
B26	Connections to Shore for ESD and Communication Systems	26
B27	Manifold Derrick/Crane	26
B28	Stores Derrick/Crane	
B29	Sister Vessel(s)	

**SECTION A  
GENERAL INFORMATION**

**A1 PRINCIPAL SHIP PARTICULARS**

1,1	Date questionnaire completed	08/07/2013
1,2	Name of vessel	BESIKTAS GH
1,3	LR/IMO number	9654971
1,4	Last previous name	N/A
1.4.1	Date of name change	N/A
1,5	Second last previous name	N/A
1.5.1	Date of name change	N/A
1,6	Third last previous name	N/A
1.6.1	Date of name change	N/A
1,7	Fourth last previous name	N/A
1.7.1	Date of name change	N/A
1,8	Flag	MALTA
1,9	Port of Registry	VALLETTA
1.10	Official number	9654971
1,11	Call sign	9HA3392
1,12	INMARSAT A or B number	
1,13	Vessel's telephone number	
1.13.1	Vessel's mobile number	
1,14	Vessel's fax number	
1,15	Vessel's telex number	
1,16	Vessel's E-mail address	
1,17	INMARSAT C number	422954311 & 422954312
1,18	Vessel's MMSI number	229543000
1,19	Type of vessel	IMO 2G

**OWNERSHIP AND OPERATION**

1.20	Registered Owner	GALATA GAS SHIPPING LTD
	Full address	13/16 VINCENTI BUILDINGS, STRAIT STREET, VALLETTA VLT 1432, MALTA
	Office telephone number	+35621234128
	Office telex number	
	Office fax number	+35621240021
	Office Email address	<a href="mailto:ofis@besiktasgroup.com">ofis@besiktasgroup.com</a>
	Contact person	Capt. Evren Gurel
	Contact person after hours telephone number	+905304685260
1.21	Name of technical operator (If different from above)	BERNHARD SCHULTE SHIPMANAGEMENT
	Full Address	152 BEACH ROAD #32-00, GATEWAY EAST, SINGAPORE 189721
	Office telephone number	+6562722220
	Office telex number	
	Office fax number	+6562724404
	Office Email address	<a href="mailto:Sq-sdc-marine@bs-shipmanagement.com">Sq-sdc-marine@bs-shipmanagement.com</a>
	Contact person (Designated Person Ashore)	Edwin Rodriguez
	Contact person after hours telephone number	+6591724882
	Emergency callout number	
	Emergency callout pager number	
	Contact details for person responsible for oil spill response	<a href="mailto:edwin.rodriguez@bs-shipmanagement.com">edwin.rodriguez@bs-shipmanagement.com</a>
	Number of years controlled by technical operator	After delivery fm Shipyard Years

1.22	Total number of ships operated by this Operator	
1.23	Number of years ship owned	
1.23.1	Name of commercial operator (If different from above)	BESIKTAS LIKID TAS. VE DEN. TIC. AS
	Full Address	PIYALEPASA BULVARI MEMORIAL CENTER A BLOK KAT:15, OKMEYDANI/SISLI/TURKEY
	Office telephone number	+902122109910
	Office telex number	
	Office fax number	+902122109920
	Office Email address	<a href="mailto:ofis@besiktasgroup.com">ofis@besiktasgroup.com</a>
	Contact person	Capt. Evren Gurel
	Contact person after hours telephone number	+905304685260
	Emergency callout number	
	Emergency callout pager number	
	Number of years controlled by commercial operator	after delivery fm Shipyard

**BUILDER**

1.24	Builder	BEŞİKTAŞ GEMİ İNŞA A.Ş.
1.25	Name of yard vessel built at	BEŞİKTAŞ SHIPYARD
1.26	Hull number	11
1.27	Date keel laid	26/02/2010
1.28	Date launched	22/02/2013
1.29	Date delivered	~ 30/07/2013
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	N/A

**CLASSIFICATION**

1.32	Classification society	RINA
1.33	Class Notation	C HULL – MACH – LIQUEFIED GAS CARRIER (P MAX 5.7 barg, Tmin -104°C) – UNRESTRICTED NAVIGATION – AVM DPS NS – AUT UMS – AUT PORT – AUT CCS – SYS NEQ 1 – BWM-E – GREEN STAR 3 DESIGN – INWATERSURVEY – MON SHAFT – STAR HULL NB
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:	

IMO	Y
US COAST GUARD	Y
RINA	Y
Other: _____	
OCIMF recommendations and guidelines	

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

1.38	Unattended Machinery Space Certificate	
1.39	Net Registered Tonnage	2512
1.40	Gross Registered Tonnage	7971
1.41	Suez Net Tonnage - Canal Tonnage	
	Suez Gross Tonnage	
1.42	Panama Net Tonnage - Canal Tonnage	
	Panama Gross Tonnage	

**A2 HULL DIMENSIONS**

2.1	Length overall (LOA)	123,00	Metres
2.2	Length between perpendiculars (LBP)	115,50	Metres
2.3	Distance bow to bridge	96,35	Metres
2.4	Distance bridge front - mid point manifold	31,466	Metres
2.5	Distance bow to mid-point manifold	64,88	Metres
2.6	Extreme breadth	19,00	Metres
2.7	Extreme depth	9,50	Metres
2.8	Summer draught	7,7	Metres
2.9	Corresponding Summer deadweight	9212	Tonnes
2.10	Light displacement	4204	Tonnes
2.11	Loaded displacement (Summer deadweight)	13416	Tonnes
2.12	Cargo tanks cubic capacity - 100%	9012,1	Cubic metres
2.12.1	Deck tank(s) cubic capacity - 100%	-	Cubic metres
2.12.2	Cargo tanks cubic capacity - 98%	8831,8	Cubic metres
2.12.3	Deck tank(s) cubic capacity - 98%	-	Cubic metres
2.13	Distance from keel to highest point	35,25	Metres
2.14	Air draught (normal ballast condition)	29,17	Metres

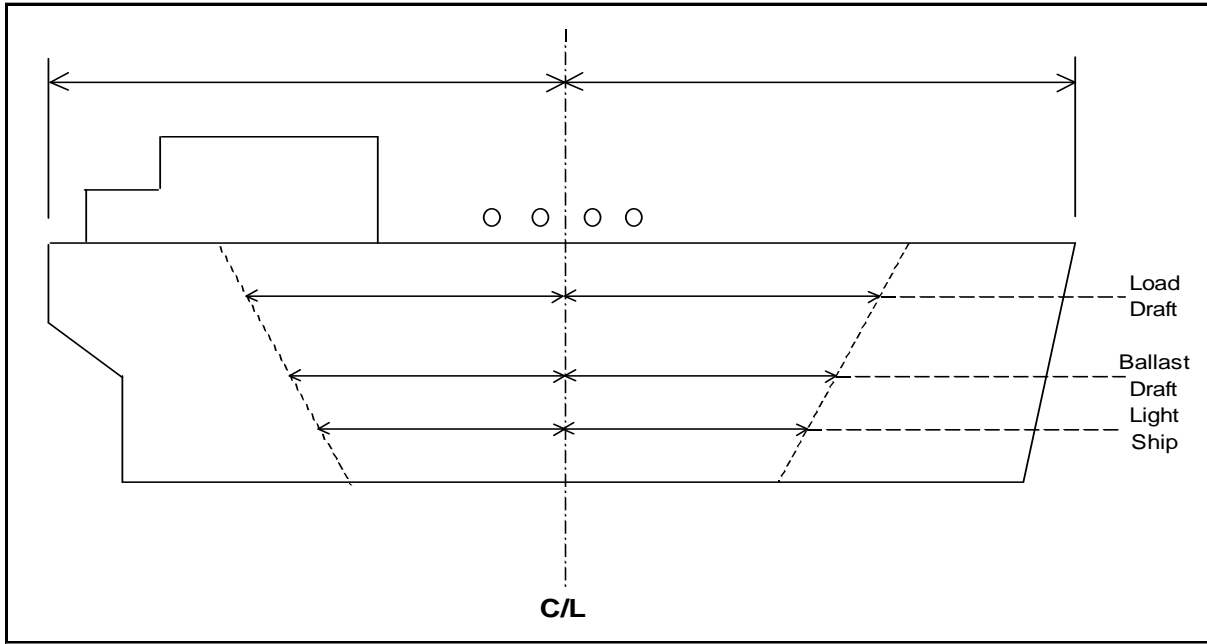
**A3 IMMERSION**

		Tonnes / cm @ metres draught	
3.1	TPC - in normal ballast condition	19,00	4,87
	TPC - in loaded condition (summer deadweight)	21,00	7,70

**A4 LOADED PARTICULARS**

		Butane	Propane	
4.1	Cargo grade	0,6	0,582	
4.2	Density	5290	5140	Tonnes
4.3	Cargo loadable (with heel)	530	530	Tonnes
4.4	Bunkers - FO	163	162,7	Tonnes
4.5	Bunkers - DO	158,14	158,14	Tonnes
4.6	Fresh water	242	242	Tonnes
4.7	Stores & spares	34,5	34,5	Tonnes
4.8	Lub oil	220	220	Tonnes
4.9	Ballast	6672	6490	Tonnes
4.10	Deadweight	6,18	6,02	Metres
4.11	Draught - forward	6,72	6,70	Metres
	Draught - aft	6,45	6,36	Metres
	Draught - mean			

**A5 PARALLEL MID-BODY DIMENSIONS**



5.1	Light ship	58,81	Metres
5.2	Forward to mid-point manifold - light ship	27,64	Metres
5.3	Aft to mid-point manifold - light ship	31,17	Metres
5.4	Normal ballast	55,58	Metres
5.5	Forward to mid-point manifold - normal ballast	26,96	Metres
5.6	Aft to mid-point manifold - normal ballast	28,64	Metres
5.7	Loaded SDWT	71,17	Metres
5.8	Forward to mid-point manifold - loaded SDWT	34,63	Metres
5.9	Aft to mid-point manifold - loaded SDWT	36,54	Metres

**A6 BUNKER CAPACITIES**

	Grade	Capacity @ 98% m3
Main engine	ISO-F-RMG380	640,59
Auxiliary engine(s)	ISO-F-RMG380	181,3
Other: IG plant		

**A7 FUEL CONSUMPTION DETAILS**

		Grade		
7.1	At sea - normal service speed	Fuel oil	17	Tonnes/day
		Diesel oil		Tonnes/day
		Gas oil		Tonnes/day
7.2	At sea - normal service speed - while conditioning cargo -	Fuel oil	23	Tonnes/day
		Diesel oil		Tonnes/day
		Gas oil		Tonnes/day
<b>Generators</b>				
7.3	In port - loading	Fuel oil	3,5	Tonnes/day
		Diesel oil	0,5	Tonnes/day
		Gas oil		Tonnes/day
7.4	In port - discharging	Fuel oil	4	Tonnes/day
		Diesel oil	0,5	Tonnes/day
		Gas oil		Tonnes/day
7.5	In port - idle	Fuel oil	1,5	Tonnes/day
		Diesel oil	0,5	Tonnes/day
		Gas oil		Tonnes/day

**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	WARTSILA 6L26	
8.2	Number of units	2	
8.3	Maximum continuous rating (MRC) per engine	2040kw @ 1000 RPM	
8.4	Total available power	5472	HP
8.5	Normal service power	4651	HP

**A9 AUXILIARY PLANTS**

9.1	Make and type of auxiliary generators / engines	DAIHATSU MOD 6DE 18	
9.2	Number of units	3	
9.3	Maximum generator output per unit	RPM	Kilowatts
	Unit no. 1	900	750
	Unit no. 2	900	750
	Unit no. 3	900	750
9.4	Shaft generator	2 X 560	
9.5	Total available power	3370	
9.6	Emergency generator	1800	100
9.7	Emergency fire pump - type	ALLWEILER - NISM40 - 200/01U31D	
	Delivery pressure	8,2	
	Motive power	50 m3/h	
	If electrical, - indicate power required	18	
9.8	Steering gear - type	HATLAPA / TRITON 130 / ROTARY VANE TYPE	
	Indicate power required to steer the vessel with one pump unit	Kilowatts	

**A10 POWER/SPEED INFORMATION**

10.1	Trial data	BHP	5472	
		MRC	90	SHP
		Speed	15	Knots
		Draught	6.5	Metres
10.2	Normal service speed	BHP	4650	
		MRC	85	SHP
		Speed	14.6	Knots
		Draught	6,5	Metres

**A11 THRUSTERS**

11.1	Make and type	BERG // BTT 313	
11.2	Bow thruster	(output)	460 kW, 1782 RPM
11.3	Stern thruster	(output)	N/A

**A12 FRESH WATER**

12.1	Capacity of distilled tanks	14,14	Tonnes
12.2	Capacity of domestic tanks	191,84	Tonnes
12.3	Daily consumption		Tonnes
	Distilled	4	Tonnes
	Domestic	8 m3/h	Tonnes
12.4	Daily evaporator capacity		Tonnes

**A13 BALLAST CAPACITIES AND PUMPS**

Tank	Capacity (m3)	Number
13.1 Fore peak	249	1
13.2 Wing and or side tanks	3580,76	19
13.3 Double bottom tanks and topside tanks		
13.4 Aft peak	24,52	2
13.5 Other:		
13.6 Total	3854,28	22

13.7 Ballast pump make and type	ALLWEILER, MI 150-315/01/289 U3.19D-S-W-133	
13.8 Number of pumps	3	
13.9 Total capacity	600	m3/hour
13.10 Location	ER double bottom	
13.11 Control location	LOCAL, ECR, WHEELHOUSE	

**A14 MOORING EQUIPMENT**

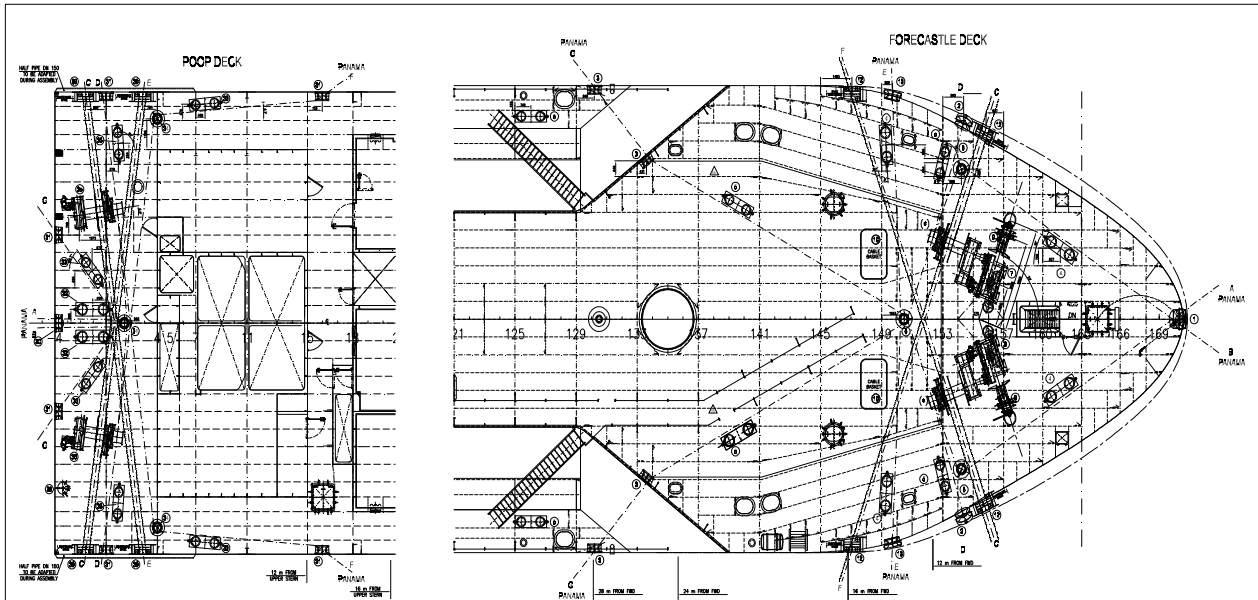
**14.1 ROPES**

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.

YES



**MOORING ROPES (ON DRUMS)**

**Mooring Ropes (On Drums) Forecastle - Number**

Diameter

Material

Length

Breaking Strength

**Mooring Ropes (On Drums) Poop - Number**

Diameter

Material

Length

Breaking Strength

	2	
	55	mm.
Mix PP		
	220	Metres
	370	KN
	2	
	55	mm.
Mix PP		
	220	Metres
	370	KN

**OTHER MOORING LINES**

**Mooring Ropes not on Drums - Number**

Diameter

Material

	14	
	55	mm.
Mix PP		



Length	220	Metres
Breaking Strength	36	t
<b>Fire Wires - Number</b>	2	
Diameter	2	mm.
Material	Galvanized steel	
Length	45	Metres
Breaking Strength	34	t

14.2 **MOORING WINCHES**

<b>Poop - Number</b>	2	
Single Drum or Double Drums	SINGLE	
Split Drums Y/N	N	
Motive Power	63	kW
Heaving Power	425	kN
Brake Capacity	270	kN
Hauling Speed	100kN @ 15	Metres/Min.

14.3 **ANCHORS AND WINDLASS**

Windlass motive power(e.g. steam, hydraulic)	Hydraulic	
Hauling power	178	kN
Brake holding power	882	kN
Anchor type	High holding power type AC-14	
Weight	3.038	Tonnes

Is spare anchor carried  
 Cable diameter  
 Number of shackles port cable  
 Number of shackles starboard cable

No
50 Q2
10
9

mm.

14.4 **TOWING ARRANGEMENTS**

Is the vessel fitted with a Towing Bracket Aft?  
 If Yes, state SWL

No
No

Tonnes

Is Towing chain provided  
 Dimensions of Towing wire

Diameter  
 Length

mm.  
 Metres

14.5 **WINDAGE**

Windage on ballast draught  
 End-on  
 Lateral

921,86

Squaremetres  
 Squaremetres

**A15 NAVIGATIONAL EQUIPMENT**

15.1 Magnetic compass  
 15.2 Off Course Alarm - Magnetic compass  
 15.3 Gyro compass  
 Number of Units  
 15.4 Off Course Alarm - Gyro compass  
 15.5 Gyro (Bridge) Repeaters  
 Number of Units  
 15.6 Radar 3cm  
 15.7 Radar 10cm  
 15.8 Are radars gyro stabilised?  
 15.9 Radar plotting equipment  
 15.10 ARPA  
 15.11 ECDIS  
 15.12 Depth sounder with recorder  
 15.13 Depth sounder without recorder  
 15.14 Speed/distance indicator  
 15.15 Doppler log  
 15.16 Docking approach Doppler  
 15.17 Rudder angle indicator  
 15.18 Rudder angle indicator on Each Bridge Wing  
 15.19 RPM indicator  
 15.20 RPM indicator on Each Bridge Wing  
 15.21 Controllable pitch propeller indicator  
 15.22 Thruster(s) indicator  
 15.23 Rate of turn indicator  
 15.24 Radio direction finder  
 15.25 Navtex receiver  
 15.26 GPS  
 15.26.1 DGPS  
 15.27 Transit SATNAV  
 15.28 Decca navigator  
 15.29 Omega  
 15.30 Loran C  
 15.31 Weather fax  
 15.32 Sextant(s)  
 15.33 Signal lamp ALDIS  
 15.34 Anemometer  
 15.35 Engine order recorder  
 15.35.1 VDR (Voyage Data Recorder)  
 15.36 Course recorder  
 15.37 Are steering motor controls and engine controls fitted on bridge wings?

YES
YES
YES
x2
YES
YES
x3
x1
x1
YES
x2
x2
x2
-
YES
YES
YES
-
YES
-
x2
NA
NA
NA
NA
YES
YES
YES
YES
-
YES
YES
YES

15.38	Is bridge equipped with a 'Dead-Man' alarm?		YES
15.39	What chart outfit coverage is provided	World-wide	YES
		Limited	
	If limited, - please indicate area(s) covered		
15.40	Formal chart correction system in use		YES
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		A3
16.3	Transponder (SART)		x2
16.4	EPIRB		x1
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)?		1
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?		3 x VHF , 3 x UHF
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		x3
	Specify system type A, B or C		C
16.12	2182kHz bridge auto alarm		YES
16.13	Radio telephone distress frequency watch receiver		YES
16.14	Emergency lifeboat transceiver		YES
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

The plant will be capable of containing and handling the following cargoes:
Anhydrous Ammonia (carriage temperature not to exceed - 20 °C )
Butadiene
Butane
Butane/Propane Mixtures
Butylenes
Butadiene and ( C4 ) hydrocarbon mixtures
Ethylene
Propane
Propylene
Vinyl Chloride Monomer
Commercial propane ( 2,5 mol. % ethane )

**Transport and Carriage Conditions**

1.2	Minimum allowable tank temperature	-104	Deg. Celsius
1.3	Maximum Permissible tank pressure	5,7	bar g
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?	1	
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	IMO C, Low Alloy 5% Ni Steel	
2.2	Maximum allowable relief valve setting		Bar gauge
2.2.1	IMO Setting	5,7	Bar gauge
2.2.2	USCG Setting	4,1	Bar gauge
2.3	Safety valve set pressure, - if variable stipulate range of pilot valves		Bar gauge
2.4	Maximum allowable vacuum	0,25	Bar gauge
2.5	Maximum cargo density at 15 deg Celsius	922	Kg/m3
2.6	Maximum rate of cool-down	10	Deg Cel / Hour
2.7	State any limitations regarding partially filled tanks		

For VCM (SG 0.97): can be filled approx. 85% of the tank geometrical volume
No other limitations if trim, stability, longitudinal strength are satisfactory

2.8 State allowable combinations of filled and empty tanks

All combinations

**B3 CARGO TANK CAPACITIES**

**Tank number / location**

Capacity m3 (100%)  
 Capacity 98%  
 Butane capacity (INCLUDING HEEL)  
 Butane temperature  
 Propane capacity (INCLUDING HEEL)  
 Propane temperature  
 Butadiene capacity  
 Butadiene temperature  
 Propylene capacity  
 Propylene temperature  
 Vinyl Chloride Monomer capacity  
 Vinyl Chloride Monomer temperature  
 Ethylene capacity  
 Ethylene temperature  
 Propylene Oxide capacity  
 Propylene Oxide temperature  
 Ammonia capacity  
 Ammonia temperature

1	Cargo Area	
	4400	m3
	4312	m3
	2591	Tonnes
	-1	Deg. C
	2510	Tonnes
	-42	Deg. C
	2811	Tonnes
	-5	Deg. C
	2464	Tonnes
	-47.7	Deg. C
	3641	Tonnes
	-15	Deg. C
	2453	Tonnes
	-104	Deg. C
	N.A	Tonnes
	N.A.	Deg. C
	2941	Tonnes
	-33	Deg. C

**Tank number / location**

Capacity m3 (100%)  
 Capacity 98%  
 Butane capacity (INCLUDING HEEL)  
 Butane temperature  
 Propane capacity (INCLUDING HEEL)  
 Propane temperature  
 Butadiene capacity  
 Butadiene temperature  
 Propylene capacity  
 Propylene temperature  
 Vinyl Chloride Monomer capacity  
 Vinyl Chloride Monomer temperature  
 Ethylene capacity  
 Ethylene temperature  
 Propylene Oxide capacity  
 Propylene Oxide temperature  
 Ammonia capacity  
 Ammonia temperature

2	Cargo Area	
	4600	m3
	4508	m3
	2709	Tonnes
	-1	Deg. C
	2625	Tonnes
	-42	Deg. C
	2999	Tonnes
	-5	Deg. C
	2766	Tonnes
	-47.7	Deg. C
	3806	Tonnes
	-15	Deg. C
	2565	Tonnes
	-104	Deg. C
	N.A.	Tonnes
	N.A.	Deg. C
	3074	Tonnes
	-33	Deg. C

Total Capacity of all cargo tanks (100%)  
 Total Capacity of all cargo tanks (98%)  
 Total Capacity of Butane  
 Total Capacity of Propane  
 Total Capacity of Butadiene  
 Total Capacity of Propylene  
 Total Capacity of Vinyl Chloride Monomer  
 Total Capacity of Ethylene  
 Total Capacity of Propylene Oxide  
 Total Capacity of Ammonia  
 \* see ITEM 2.7

	9012	m3
	8831	m3
	5290	Tonnes
	5140	Tonnes
	5868	Tonnes
	5412	Tonnes
	7447	Tonnes
	5018	Tonnes
	N.A.	Tonnes
	6138	Tonnes

**B4 LOADING RATES**

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

Butane - with vapour return  
 Butane - without vapour return  
 Propane - with vapour return  
 Propane - without vapour return  
 Butadiene - with vapour return  
 Butadiene - without vapour return  
 Propylene - with vapour return

	539	Tonnes/Hr.
	539	Tonnes/Hr.
	525	Tonnes/Hr.
	525	Tonnes/Hr.
	585	Tonnes/Hr.
	585	Tonnes/Hr.
	547	Tonnes/Hr.

Propylene - without vapour return	547	Tonnes/Hr.
Ethylene - with vapour return	511	Tonnes/Hr.
Ethylene - without vapour return	511	Tonnes/Hr.
Ammonia - with vapour return	613	Tonnes/Hr.
Ammonia - without vapour return	613	Tonnes/Hr.
Vinyl Chloride Monomer - with vapour return	865	Tonnes/Hr.
Vinyl Chloride Monomer - without vapour return	865	Tonnes/Hr.
Propylene Oxide - with vapour return	N/A	Tonnes/Hr.
Propylene Oxide - without vapour return	N/A	Tonnes/Hr.

4.8

**From Pressure Storage**

<b>Butane</b> 0 deg C - with vapour return	539	Tonnes/Hr.
0 deg C - without vapour return	539	Tonnes/Hr.
10 deg C - with vapour return	531	Tonnes/Hr.
10 deg C - without vapour return	531	Tonnes/Hr.
20 deg C - with vapour return	521	Tonnes/Hr.
20 deg C - without vapour return	521	Tonnes/Hr.

<b>Propane</b> minus 30 deg C - with vapour return	511	Tonnes/Hr.
Minus 30 deg C - without vapour return	511	Tonnes/Hr.
Minus 20 deg C - with vapour return	500	Tonnes/Hr.
Minus 20 deg C - without vapour return	500	Tonnes/Hr.
Minus 10 deg C - with vapour return	488	Tonnes/Hr.
Minus 10 deg C - without vapour return	488	Tonnes/Hr.
0 deg C - with vapour return	476	Tonnes/Hr.
0 deg C - without vapour return	476	Tonnes/Hr.
10 deg C - with vapour return	310	Tonnes/Hr.
10 deg C - without vapour return	255	Tonnes/Hr.
20 deg C - with vapour return	161	Tonnes/Hr.
20 deg C - without vapour return	141	Tonnes/Hr.

<b>Butadiene</b> 0 deg C - with vapour return	582	Tonnes/Hr.
0 deg C - without vapour return	582	Tonnes/Hr.
10 deg C - with vapour return	571	Tonnes/Hr.
10 deg C - without vapour return	571	Tonnes/Hr.
20 deg C - with vapour return	560	Tonnes/Hr.
20 deg C - without vapour return	560	Tonnes/Hr.

<b>Propylene</b> minus 30 deg C - with vapour return	528	Tonnes/Hr.
Minus 30 deg C - without vapour return	528	Tonnes/Hr.
Minus 20 deg C - with vapour return	516	Tonnes/Hr.
Minus 20 deg C - without vapour return	516	Tonnes/Hr.
Minus 10 deg C - with vapour return	503	Tonnes/Hr.
Minus 10 deg C - without vapour return	503	Tonnes/Hr.
0 deg C - with vapour return	309	Tonnes/Hr.
0 deg C - without vapour return	235	Tonnes/Hr.
10 deg C - with vapour return	160	Tonnes/Hr.
10 deg C - without vapour return	129	Tonnes/Hr.
20 deg C - with vapour return	102	Tonnes/Hr.
20 deg C - without vapour return	88	Tonnes/Hr.

<b>Ethylene</b> minus 100 deg C - with vapour return	507	Tonnes/Hr.
Minus 100 deg C - without vapour return	507	Tonnes/Hr.
Minus 95 deg C - with vapour return	500	Tonnes/Hr.
Minus 95 deg C - without vapour return	500	Tonnes/Hr.
Minus 90 deg C - with vapour return	494	Tonnes/Hr.
Minus 90 deg C - without vapour return	494	Tonnes/Hr.
Minus 85 deg C - with vapour return	487	Tonnes/Hr.
Minus 85 deg C - without vapour return	487	Tonnes/Hr.

<b>Ammonia</b> minus 20 deg C - with vapour return	598	Tonnes/Hr.
Minus 20 deg C - without vapour return	581	Tonnes/Hr.
Minus 10 deg C - with vapour return	104	Tonnes/Hr.
Minus 10 deg C - without vapour return	83	Tonnes/Hr.
0 deg C - with vapour return	53	Tonnes/Hr.
0 deg C - without vapour return	45	Tonnes/Hr.

<b>VCM</b> minus 10 deg C - with vapour return	865	Tonnes/Hr.
Minus 10 deg C - without vapour return	865	Tonnes/Hr.
0 deg C - with vapour return	850	Tonnes/Hr.
0 deg C - without vapour return	850	Tonnes/Hr.
10 deg C - with vapour return	836	Tonnes/Hr.
10 deg C - without vapour return	836	Tonnes/Hr.
20 deg C - with vapour return	821	Tonnes/Hr.
20 deg C - without vapour return	821	Tonnes/Hr.

4.14

**Special remarks:**

Nil

**B5 DISCHARGING - GENERAL**

**Cargo Pumps**

5.1	Type of Pumps	DEEPWELL	
5.2	Number of pumps per tank	2	
5.3	Rate per Pump	250	m3/hr
5.4	At Delivery Head mlc	120	mlc
5.5	Maximum density	972	Kg/m3

- 5.6 **Booster Pump**
- 5.7 Type of Booster Pumps
- 5.8 Number of pumps
- 5.8 Rate per Pump
- 5.9 At Delivery Head m/c
- 5.10 Maximum density

<b>CENTRIFUGAL</b>	
	1
	250
	120
	690

m3/hr  
m/c  
Kg/m3

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

<b>YES</b>
------------

**B6 DISCHARGE PERFORMANCE**

Full Cargo Discharge Times (using all cargo pumps)

**Fully Refrigerated**

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

VCM	PROPYLENE	
6	6,2	Hours
6	6,2	Hours
7,3	9,3	Hours
7,3	9,3	Hours
11,9	25	Hours
11,9	25	Hours

**Pressurised**

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

PROPYLENE		
6,5		Hours
6,5		Hours
6,3		Hours
6,3		Hours
13,4		Hours
13,4		Hours

**B7 UNPUMPABLES**

- 7.1 Tank number / location
- Tank number / location
- Tank number / location
- Tank number / location
- Total

1 - 3,0	m3
2 - 3,0	m3
	m3
	m3
6	m3

**B8 VAPORISING UNPUMPABLES**

- 8.1 Process used
- Time to vaporise liquid unpumpables remaining after full cargo discharge of:
- 8.2 Butane
- 8.3 Propane
- 8.4 Butadiene
- 8.5 Propylene
- 8.6 Ethylene
- 8.7 Ammonia
- 8.8 Vinyl Chloride Monomer
- 8.9 Propylene Oxide

**VAPOUR BLOWING (25°C)**

12	Hours
8	Hours
	Hours
8	Hours
6	Hours
8	Hours
	Hours
N/A	Hours

**B9 RELIQUEFACTION PLANT**

- 9.1 Plant Design Conditions - air temperature
- 9.3 Plant Design Conditions - sea temperature

45	Deg. C
32	Deg. C



9.4	<b>Plant Type</b> Is the plant single stage/direct?	N
9.5	Is the plant two stage/direct?	Y
9.6	Is the plant simple cascade?	Y
9.7	Coolant type	R1270 PROPYLENE

<b>Compressors</b>			
9.8	Compressor type	2K160-2Q_1	reciprocating
9.8.1	Compressor makers name	Burckhardt	
9.9	Number of compressors	2	
9.10	Capacity per unit	1332 m3/h	propylene 5bar,40°C
9.11	Are they Oil Free?	Y	

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

<b>Time taken to lower the temperature of:</b>			
11.1	<b>Propane</b> from -5 deg C to -42 deg C	175	Hours
11.2	<b>Propane</b> from -20 deg C to -42 deg C	130	Hours
11.3	<b>Propane</b> from -38 deg C to -42deg C	35	Hours
11.4	<b>Propane</b> from +20 deg C to 0 deg C		Hours
11.5	<b>Propane</b> from 0 deg C to -20 deg C	44	Hours
11.6	<b>Butane</b> from +20 deg C to 0 deg C	72	Hours
11.7	<b>Butane</b> from +10 deg C to 0 deg C	45	Hours
11.8	<b>Butane</b> from +10 deg C to -5 deg C	72	Hours
11.9	<b>Butadiene</b> From +20 deg C to -5 deg C	94	Hours
11.10	<b>Propylene</b> From -20 deg C to -47 deg C	115	Hours
11.11	<b>Ethylene</b> From -100 deg C to -104 deg C	42	Hours
11.12	<b>Ammonia</b> From -15 deg C to -33 deg C	160	Hours
11.13	<b>Vinyl Chloride Monomer</b> From -5 deg C to -14 deg C	35	Hours

**B12 INERT GAS AND NITROGEN**

<b>Main Nitrogen Plant</b>			
12.1	Type of system	membrane generator	
12.2	Capacity	900	Nm3/hr
12.3	Type of fuel used		
12.4	Composition of IG - oxygen	0,5	%
	Composition of IG - CO2		%
	Composition of IG - Nox		
	Composition of IG - N2	99,5	%
12.5	Lowest dewpoint achievable	-55	Deg. C
12.6	Used for	inerting and purging of the cargo tanks,cargo pipes and hold spaces	

**B13 CARGO TANK INERTING/DE-INERTING**

13.1	Time taken to inert from fresh air to under 5% O2 at minus 25 degree C?	36	Hours
13.2	Time taken to inert from cargo vapour to fully inert at minus 25 degrees dewpoint when IG density is <b>less</b> than product?	72	Hours
	Time taken to inert from cargo vapour to fully inert at minus 25 degrees dewpoint when IG density is <b>greater</b> than product?	50	Hours

**B14 GAS FREEING TO FRESH AIR**

- 14.1 Plant used  
 14.2 Time taken from LPG vapours to breathable ?  
 Time taken from butadiene vapours to breathable ?  
 Time taken from vcm vapours to breathable ?

Nitrogen	
	72
	72
	96

Hours  
 Hours  
 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 (cbm)
From Propane to Butane	12	N.A.	N.A.
From Propane to Butadiene	80	N.A.	43000
From Propane to Ethylene	90	N.A.	63000
From Propane to Ammonia	120	N.A.	63000
From Propane to Vinyl Chloride Monomer	84	N.A.	63000
From Propane to Propylene Oxide	N.A.		
From Butane to Propane	24	N.A.	N.A.
From Butane to Butadiene	60	N.A.	43000
From Butane to Ethylene	142	N.A.	108000
From Butane to Ammonia	90	N.A.	42000
From Butane to Vinyl Chloride Monomer	168	N.A.	63000
From Butane to Propylene Oxide	N.A.	N.A.	
From Butadiene to Propane	96	N.A.	63000
From Butadiene to Butane	96	N.A.	63000
From Butadiene to Ethylene	168	N.A.	86000
From Butadiene to Ammonia	144	N.A.	63000
From Butadiene to Vinyl Chloride Monomer	168	N.A.	86000
From Butadiene to Propylene Oxide	N.A.	N.A.	
From Ethylene to Propane	180	N.A.	86000
From Ethylene to Butane	180	N.A.	86000
From Ethylene to Butadiene	180	N.A.	86000
From Ethylene to Ammonia	136	N.A.	43000
From Ethylene to Vinyl Chloride Monomer	180	N.A.	86000
From Ethylene to Propylene Oxide	N.A.	N.A.	
From Ammonia to Propane	212	N.A.	43000
From Ammonia to Butane	212	N.A.	43000
From Ammonia to Butadiene	212	N.A.	43000
From Ammonia to Ethylene	212	N.A.	43000
From Ammonia to Vinyl Chloride Monomer	212	N.A.	43000
From Ammonia to Propylene Oxide	N.A.	N.A.	

From Vinyl Chloride Monomer to Propane  
 From Vinyl Chloride Monomer to Butane  
 From Vinyl Chloride Monomer to Butadiene  
 From Vinyl Chloride Monomer to Ammonia  
 From Vinyl Chloride Monomer to Ethylene  
 From Vinyl Chloride Monomer to Propylene Oxide  
 From Propylene Oxide to Propane  
 From Propylene Oxide to Butane  
 From Propylene Oxide to Butadiene  
 From Propylene Oxide to Ethylene  
 From Propylene Oxide to Vinyl Chloride Monomer  
 From Propylene Oxide to Ammonia

180	N.A.	86000
180	N.A.	86000
180	N.A.	86000
132	N.A.	43000
180	N.A.	86000
n/a	N.A.	
n/a	N.A.	
n/a	N.A.	
n/a	N.A.	
n/a	N.A.	
n/a	N.A.	
n/a	N.A.	
n/a	N.A.	

Cargo Grade Change Operations that cannot be carried out at sea:

N/A

### B17 PRE-LOADING COOLDOWN

The following questions ask the Time and Quantity of coolant required to cooldown cargo tanks from ambient temperature to fully gassed up state sufficient to allow loading to commence.

17.1	<b>Propane</b> - Quantity of Coolant Required	30	mt
	<b>Propane</b> - Time required to cooldown cargo tanks from ambient temperature with vapour return line	8	Hours
	<b>Propane</b> - Time required to cooldown cargo tanks from ambient temperature without vapour return line	12	Hours
17.2	<b>Butane</b> - Quantity of Coolant Required	25	T
	<b>Butane</b> - Time required to cooldown cargo tanks from ambient temperature with vapour return line	6	Hours
	<b>Butane</b> - Time required to cooldown cargo tanks from ambient temperature without vapour return line	10	Hours
17.3	<b>Butadiene</b> - Quantity of Coolant Required	25	m3
	<b>Butadiene</b> - Time required to cooldown cargo tanks from ambient temperature with vapour return line	6	Hours
	<b>Butadiene</b> - Time required to cooldown cargo tanks from ambient temperature without vapour return line	10	Hours
17.4	<b>Propylene</b> - Quantity of Coolant Required	30	T
	<b>Propylene</b> - Time required to cooldown cargo tanks from ambient temperature without vapour return line	10	Hours
	<b>Propylene</b> - Time required to cooldown cargo tanks from ambient temperature with vapour return line	14	Hours
17.5	<b>Ethylene</b> - Quantity of Coolant Required	24	T
	<b>Ethylene</b> - Time required to cooldown cargo tanks from ambient temperature with vapour return line	18	Hours
	<b>Ethylene</b> - Time required to cooldown cargo tanks from ambient temperature without vapour return line	24	Hours
17.6	<b>Ammonia</b> - Quantity of Coolant Required	20	T
	<b>Ammonia</b> - Time required to cooldown cargo tanks from ambient temperature with vapour return line	8	Hours
	<b>Ammonia</b> - Time required to cooldown cargo tanks from ambient temperature without vapour return line	12	Hours

17.7	<b>VCM - Quantity of Coolant Required</b>	30	T
	<b>VCM - Time required to cooldown cargo tanks from ambient temperature without vapour return line</b>	6	Hours
	<b>VCM - Time required to cooldown cargo tanks from ambient temperature with vapour return line</b>	10	Hours

**B18 VAPORISER**

18.1	Type of Vaporiser	N.A.
------	-------------------	------

**B19 BLOWER**

19.1	Type of Blower	N.A.
------	----------------	------

**B20 CARGO HEATER**

20.1	Type of Heater	shell and tube heat exchanger	
20.2	Number Fitted	1	
20.3	Heating Medium	sea water	
20.4	Discharge rates with sea water at 15 degrees C to raise product temperature of <b>Propane</b> from -42 degrees C to -5 degrees C	270	m3/hr
20.5	Discharge rates with sea water at 15 degrees C to raise product temperature of <b>Ammonia</b> from -33 degrees C to 0 degrees C	180	m3/hr

**B21 HYDRATE CONTROL**

21.1	Type of Depressant?	N.A.
------	---------------------	------

**B22 CARGO MEASUREMENT**

**Level Gauges**

22.1	Are level gauges local or remote?	Both
22.2	Name of manufacture	Henry system
22.3	Type	FT LG 807
22.4	Rated Accuracy	5 mm.
22.5	Certifying Authority	RINA

**Temperature Gauges**

22.6	Name of manufacture	Emerson / Nuova Fima
22.7	Type	3144 / TG8
22.8	Rated Accuracy	0,1 / 1
22.9	Certifying Authority	RINA

<b>Pressure Gauges</b>	
22.10	Name of manufacture
22.11	Type
22.12	Rated Accuracy
22.13	Certifying Authority

Emerson / Nuova Fima	
3051 / MN 9	
	0,1 / 1
RINA	

<b>Oxygen Analyser</b>	
22.14	Name of manufacture
22.15	Type
22.15.1	What is the lowest level measurable?

MSA	
tankscope II	
0%	accuracy. 0,1%

<b>Fixed Gas Analyser</b>	
22.16	Name of manufacture
22.17	Type
22.18	Are Cargo tank calibration tables available?
22.19	Name of Measuring Company
22.20	Name of Certifying Authority
22.21	Calibration calculated to cm?
22.21.1	Calibration calculated to 1/2 cm?
22.22	Tables established to cm?
22.22.1	Tables established to mm?
22.22.2	Tables established to "other" (state what other)
22.23	Are trim and list corrections available?
22.24	Are temperature corrections available?
22.25	Are float gauge tape corrections available?

Consilium	
Salwico 2020	
	Y
NKKK	
RINA	
	Y
	N
	Y
	Y
	Y

**B23 CARGO SAMPLING**

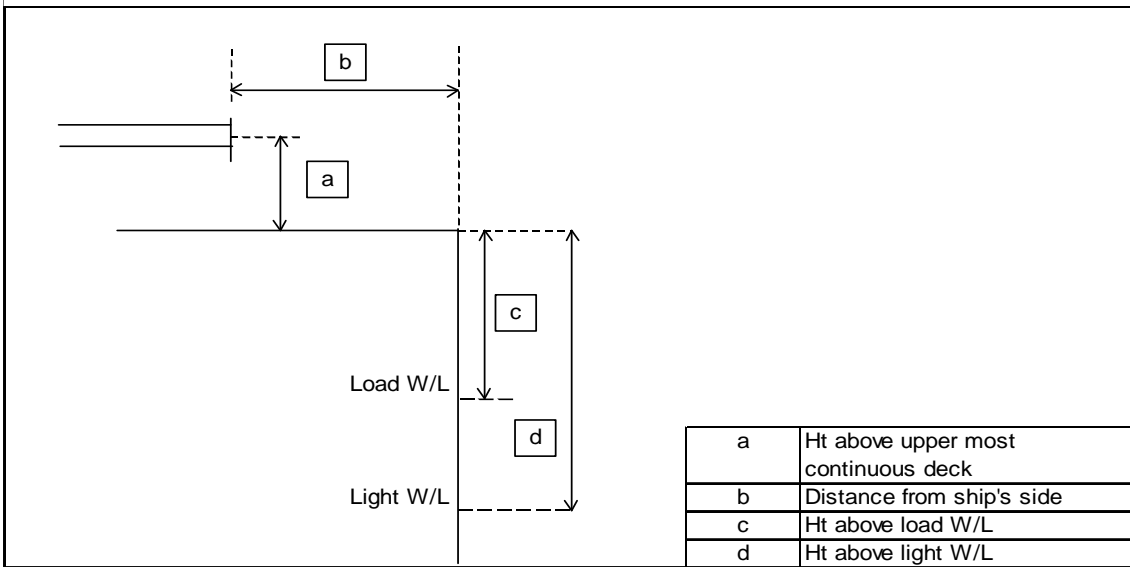
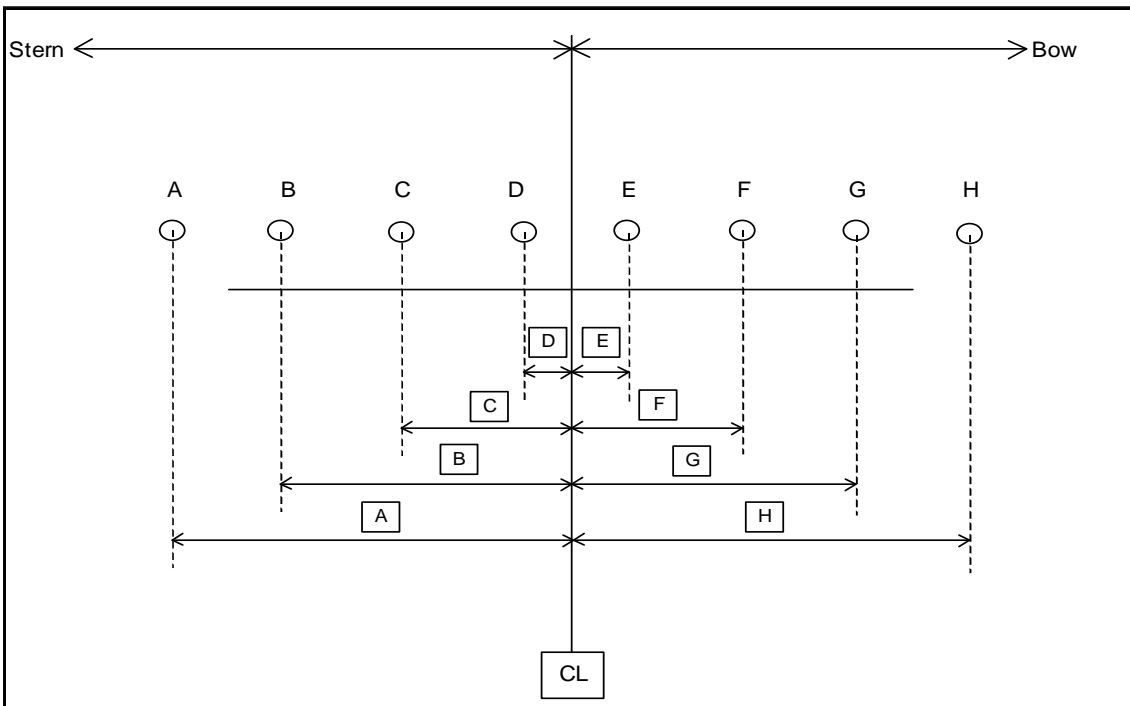
23.1	May cargo samples be obtained from the levels; top, middle and bottom in all cargo tanks?	Y
------	---	---

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


23.2	Can samples be drawn from tank vapour outlet?	N
	Can samples be drawn from manifold liquid line?	Y
	Can samples be drawn from manifold vapour line?	Y
	Can samples be drawn from pump discharge line?	Y
23.3	State sample connection type	1/4 " NPT M
	Size of sample connection	

**B24 CARGO MANIFOLD**

**Manifold arrangement diagram**



- a vapour manifold
- a liquid manifold
- Center of manifold to bow
- Center of manifold to stern
- Dimension A
- Dimension B
- Dimension C
- Dimension D
- Dimension E
- Dimension F

1355	mm
1480	mm
65,5	M.
58	M.
4170	mm.
3370	mm.
1886,5	mm.
625	mm.
625	mm.
1886,5	mm.

Dimension G		mm.
Dimension H		mm.
Pipe Flange A - duty	Fuel Oil	
Pipe Flange A - rating	10,5	bar
Pipe Flange A - size	150	mm.
Pipe Flange A raised or flat face	raised	
Pipe Flange B - duty	Diesel Oil	
Pipe Flange B - rating	10,5	bar
Pipe Flange B - size	100	mm.
Pipe Flange B raised or flat face	raised	
Pipe Flange C - duty	L2	
Pipe Flange C - rating	ANSI 300	bar
Pipe Flange C - size	8"	inch
Pipe Flange C raised or flat face	r	
Pipe Flange D - duty	V2	
Pipe Flange D - rating	ANSI 150	bar
Pipe Flange D - size	4"	inch
Pipe Flange D raised or flat face	r	
Pipe Flange E - duty	V1	
Pipe Flange E - rating	ANSI 150	bar
Pipe Flange E - size	4	inch
Pipe Flange E raised or flat face	r	
Pipe Flange F - duty	L1	
Pipe Flange F - rating	ANSI 300	bar
Pipe Flange F - size	8"	inch
Pipe Flange F raised or flat face	r	
Pipe Flange G - duty		
Pipe Flange G - rating		bar
Pipe Flange G - size		inch
Pipe Flange G raised or flat face		
Pipe Flange H - duty		
Pipe Flange H - rating		bar
Pipe Flange H - size		mm.
Pipe Flange H raised or flat face		
Height above uppermost continuous deck	1400	mm.
Distance from ship side	4000	mm.
Height above load waterline	8070	mm.
Height above light waterline	10900	mm.

**B25 CARGO MANIFOLD REDUCERS**

25.1	Number of ANSI Class 300 reducers carried onboard	1	
	Flange rating of ANSI Class 300 reducer	30	bar
	Size of ANSI Class 300 reducer	8"x10"	inch
	Length of ANSI Class 300 reducer	500	mm.
25.2	Number of ANSI Class 300 to Class 150 reducers carried onboard	2	
	Flange rating of ANSI Class 300 to Class 150 reducer	30	bar
	Size of ANSI Class 300 to Class 150 reducer	4 x 4 & 3 x 8	inch
	Length of ANSI Class 300 to Class 150 reducer	500	mm.
25.3	Number of ANSI Class 150 reducers carried onboard	3	
	Flange rating of Class 150 reducer	15	bar
	Size of ANSI Class 150 reducer	3" x 4" & 3"x 8" & 6"x 4"	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?		Y	
	If yes, is the system pneumatic?		N	
	If yes, is the system electrical?		Y	
	If yes, is the system fiber optic?		N	
26.2	What is the type of connection used?		Handheld	
26.3	Are ESD hoses or cables available on board?		y	
	If yes, length of pneumatic			m
	If yes, length of electrical		25	m
	If yes, length of fiber optic			m
26.4	Is there a connection available for a telephone line?			
26.5	Are ESD connections available on both sides of vessel?		Y	
	Are ESD Fusible plugs fitted at tank domes?		Y	
	Are ESD Fusible plugs fitted at manifolds?		Y	
	Is the link compatible with the SIGTTO guidelines?		Y	
	Type of manifold valve			
	Closing time in seconds		20 - 30	secs
	Is closing time adjustable?		Y	
	Is Independent high level shut down system fitted(overflow control)?		Y	
	If yes, does the independent high level shutdown system also switch off running cargo pumps?		Y	
	Shut down level %		98	%

**B27 MANIFOLD DERRICK/CRANE**

27.1	Is manifold derrick provided		NO	
27.2	Is manifold crane provided		YES	
27.3	Is lifting equipment same for port and starboard?		YES	
	If no, then stipulate details			
27.4	State SWL at maximum outreach		5	Tonnes
27.4.1	Maximum outreach of lifting equipment		14	Metres

**B28 STORES DERRICK/CRANE**

28.1	State location		POOP DECK	
	SWL		2	Tonnes

**B29 SISTER VESSEL(S)**

29.1	Name of vessel		SYN ANTARES (one screw)