Form C gas

Index

	CTION A Neral information			CTION B RGO SYSTEMS	
A1	Principal ship particulars	1	В1	Cargo - General information	9
A2	Hull dimensions	1	B2	Cargo tanks	9
А3	Ballast particulars	2	В3	Cargo tank capacities	10
A4	Immersion	2	B 4	Loading rates	10
A5	Loaded particulars	2	B 5	Discharging - general	10
A6	Parallel mid-body dimensions	3	B 6	Discharge performances	11
A7	Bunker capacities	4	B7	Umpumpables	11
A8	Fuel consumption details	4	B 8	Vaporising umpumpables	11
A9	Main engine particulars	4	В9	Reliquefaction plant	11
A10	Auxiliary plant	4	B 10	Cooling capacity	12
A11	Power/Speed information	4	B11	Cargo temperature lowering	
A12	Thrusters	5		capability (at sea)	12
A13	Fresh water	5	B12	Inert gas	12
A14	Ballast capacities and pumps	5	B 13	Cargo tank inerting/de-inerting	12
A15	Mooring equipment	6	B14	Cargo freeing to fresh air	12
A16	Navigational equipment	7	B15	Changing cargo grades	13
A17	Communications equipment	8	B 16	Deck tank capacities	13
			B17	Pre-loading cooldown	13
			B18	Vaporiser	13
			B 19	Blower	13
			B20	Cargo Re-Heater	14
			B21	Hydrate control	14
			B22	Cargo measurement	14
			B23	Cargo sampling	15
			B24	Cargo manifold arrangements	16
			B25	Cargo manifold reducers	17
			B26	Manifold Derrick/Crane	17



A1 PRINCIPAL SHIP PARTICULARS

1.1	Name of Ship	EXCALIBUR
1.2	Previous Name(s)	n/a
1.3	Builder	Vinashin - Bachdang
1.4	Date of delivery	06.04.2012
1.5	Classification Society and No. RINA /	R.I.Na RI 86051
1.6	Gross Registered Tonnage	4.761
1.7	Net registered Tonnage	1.428
1.8	Suez Tonnage Gross/Net	5506,53 / 4086,11
1.9	Panama tonnage Gross/Net	-
1.10	Registered Owner	Mediterranea di Navigazione S.p.A.
	Address	P.zza Caduti sul Lavoro, 3 – 48122 Ravenna - Italy
	Telephone	+39 0544 598911
	Telex/fax	+39 0544 423799
1.11	Manager or Operator	Mediterranea di Navigazione S.p.A.
	Address	P.zza Caduti sul Lavoro, 3 – 48122 Ravenna - Italy
	Telephone	+39 0544 598911
	Telex/fax	+39 0544 423799
1.12	Flag	Italian – 2 nd Register
1.13	Port of registry	Ravenna
1.14	Official No.	53
1.15	Call Sign	IBAP
1.16	Immarsat No.	Phone 00870 773140391 – fax 00870 783140269
1.17	LR/IMO No.	9480409
1.18	Was the ship built in accordance with the	e following regulations
	IMO	Yes
	USCG	Yes
	RINA	Yes
	OTHER	Yes
1.19	IMO Certification	
	Certificate of Fitness IGC	
	A328	
	A329	
	Letter of Compliance	
1.20	Date questionnaire compiled	06.10.2017

A2 HULL DIMENSIONS

2.1	Length overall	104 m.
2.2	Length between perpendiculars	97.20 m
2.3	Extreme breadth	16.40 m.
2.4	Extreme depth	8,40 m
2.5	Summer draught	7 ,2 0 m
2.6	Corresponding deadweight	5.312 tonn
2.7	Light displacement	3.043 tonn
2.8	Load displacement (summer)	8.355 tonn
2.9	Cargo tank cubic capacity (100%)	4.655,83 cbm
2.10	Distance from keel to top antenna	32.5 m abt.
2.11	Air draught (with normal ballast)	27.5

A3 BALLAST PARTICULARS

3.1 Permanent Ballast No

3.2 Ballast quantity 2000 t abt

3.3 Bunkers, stores, etc. Fuel 428 t; Diesel 101 t;Oils 29 t;Misc. 0 t;Fresh Water 0 t;Water 122 t

3.4 Draught - Forward 4,50 m - Aft 5,50 m

- Mean 5,0 m

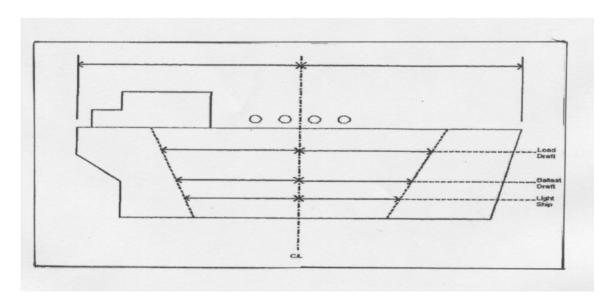
A4 IMMERSION

4.1 TPC at normal ballast draught
4.2 TPC at loaded draught
12,8 t/cm
14,5 t/cm

A5 LOADED PARTICULARS

5.1	Cargo	ETHYLENE	BUTANE	PROPANE	V.C.M.
5.2	Density	0.569 t/m3	0.600 t/m3	0.583 t/m3	0.972 t/m3
5.3	Cargo tons	2611	2748	2670 t	4364 t
5.4	Bunkers IFO	428 t	428 t	428 t	424 t
5.5	GASOIL	101 t	101 t	101 t	101 t
5.6	Fresh water	0 t	0 t	0 t	0 t
5.7	Stores/spares	40 t	40 t	40 t	40 t
5.8	Lub oil (at 95% + bilge/sludge)	29 t	29 t	29 t	29 t
5.9	Ballast	569	506 t	504 t	359 t
5.10	Deadweight	3900 t	3975 t	3895 t	5440 t
5.11	Draught - Forward	5.328 m	5.402 m	5.352 m	6.877 m
	- Aft	6.870 m	6.951 m	6.901 m	7.522 m
	- Mean	6.099 m	6.154 m	6.122 m	7.200 m

A6 PARALLEL MID-BODY DIMENSIONS



Distance bow to mid-point manifold: 58,3 m.

Distance stern to mid-point manifold: 45,6 m.

Light ship parallel body length: 47,5 m

Light ship parallel body – bow to mid-point manifold: 24,2 m

Light ship parallel body – stern to mid-point manifold: 23,3 m

Normal ballast parallel body length: 54,3 m abt.

Normal ballast parallel body length – bow to mid – point manifold: 27 m

Normal ballast parallel body length – stern to mid – point manifold: 27,3 m

Parallel body length at Summer Deadweight (SDWT): 56,3 m abt.

Parallel body length at SDWT – bow to manifold: 28 m

Parallel body length at SDWT – stern to mid – point manifold: 28,3 m

Does the ship have bulbous bow: Yes

A7 BUNKER CAPACITIES

7.1 M.E. Fuel Oil Grade

Capacity 98% 432 cbm

7.2 Diesel Oil Grade

Capacity 98% 121 cbm

A8 FUEL CONSUMPTION DETAILS

8.1 At sea (normal service speed) IFO 380 - 15,5 tonn / day

8.2 At sea (normal service speed) while **IFO 380 – 15,5 tonn / day**

conditioning cargo

8.3 In port, loading 3,5 tonn / day

8.4 In port, discharging 4,6 tonn / day

8.5 In port, idle **2,1 tonn / day**

A9 MAIN ENGINE PARTICULARS

9.1 Main engine make and type WARTSILA TYPE 8L32

9.2 No. of units

9.3 Maximum continuous rating (MCR) 4000 kW – 750 RPM

per engine

9.4 Total available power CSR

9.5 Normal service power (ECR) CSR – 3400 kW

A10 AUXILIARY PLANT

10.1 Make and type of auxiliary VOLVO PENTA TYPE D16

generators

10.2 No. of units 4

10.3 Maximum generator output per 470 kWe

unit

Shaft generator
 Shaft generator
 Emergency generator
 MAKE STX Eng. Co KOREA – 90 kW

10.6 Total available power 3480 kWe

A11 POWER/SPEED INFORMATION

11.1 Trial data BHP

MCR

Speed

Draught

11.2 Normal service speed BHP

MCR

Speed

Draught

A12 THRUSTERS

12.1 Make and type THRUST MASTER&SAM ELETRONICS - 400 kW

12.2 No. Installed

12.3 Location and rated bollard pull Abt fr. 131

A13 FRESH WATER

13.1 Capacity of distilled tanks
13.2 Capacity of domestic tanks
13.3 Daily consumption distilled
9.10 cbm
115.11 cbm
8.05 cbm

domestic

13.4 Daily evaporator production 10 t/day

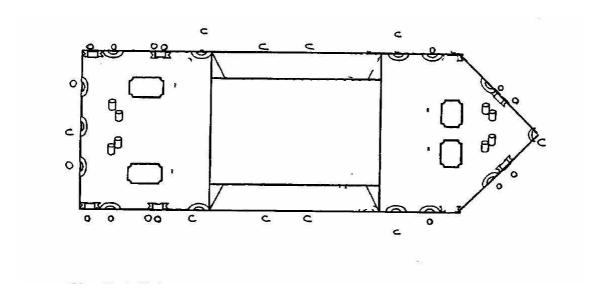
A14 BALLAST CAPACITIES AND PUMPS

Fill the following table Capacity CBM Tank **CBM** 14.1 Fore peak 136 14.2 Wing or side tanks 1899 14.3 Double bottoms n/a 14.4 Aft peak 18 14.5 Other (.....) n/a 14.6 Total 2054 14.7 GARBARINO – TYPE MU150-315LE Ballast pump make and type 14.8 2 (N° 1 Service; N° Spare) No. of Pumps 14.9 Total capacity $2 \times 460 \text{ cbm/H} \times 30 \text{ m.w.l}$ 14.10 Location Engine Room 14.11 Control Location C.C.R./Locally

A15 MOORING EQUIPMENT

15.1 Ropes and Wires.

On the diagram below indicate the position of winch mounted ropes (R) together with open (O) and (Panama) closed (C) fairleads.



15.2	Mooring	W	/inche	S
------	---------	---	--------	---

		No	Motive power (steam,hydraul)	Heaving power	Brake Capacity	Hauling speed
Forecas	stle	2	hydraulic	tbd	27 t	12 m/min
Poop		2	hydraulic	tbd	27 t	12 m/min
15.3	Anchors and Windlasses	2				
	Windlass motive Power (steam, hydraulic)	hydraulic				

Hauling power tbd
Brake holding capacity 24.6 t

Anchor type HHP ANCHOR BALANCED

Weight 2295 kg
Is spare carried No
Cable diameter 44 mm

No of schackles port

No of schackles starboard

15.4 Windage

Windage on ballast draught

Windage full loaded

A16 NAVIGATIONAL EQUIPMENT

Is the fo	llowing equipment fitted:	
16.1	Magnetic compass	YES
16.2	Gyro compass and repeaters	YES
16.3	Radars	YES
16.4	Radar plotting equipment	YES
16.5	Arpa	YES
16.6	Echo sounder	YES
16.7	Speed/Distance indicator	YES
16.8	Doppler log	YES
16.9	Rudder angle, RPM, controllable pitch and	YES
	Thrusters indicators	
16.10	Rate of turn indicator	tbd
		YES
16.13	Satellite navigator	YES
16.14	Decca navigator	NC
16.15	Loran C	NC
16.16	Sextants	YES
16.17	Signal lamp (aldis)	YES
16.18	Course recorder	YES
16.19	Engine order printer	YES
16.20	What chart outfit coverage is provided if limited, indicate	
areas cov	vered	

16.21 Formal chart correction system in use

A17 COMMUNICATION EQUIPMENT

Is the following equipment fitted:

17.1	Is ship with GMDSS YES	YES
17.2	Radio telegraph main transmitter including facility to transmit on radio telephone distress frequency YES	YES
17.3	Radio telegraph main receiver including facility to receive on radio telephone distress frequency YES	YES
17.4	Radio telephone distress frequency watch receiver YES	YES
17.5	Main radio antenna YES	YES
17.6	Radio telegraph reserve transmitter	n/a
17.7	Radio telegraph reserve receiver	n/a
17.8	Reserve radio antenna	YES
17.9	Are the main and reserve installation electrically separate and electrically independent of each other	YES
17.10	Radio telegraph auto alarm	NO
17.11	2182 KHZ bridge watch receiver	NO
17.12	Alarm signal generating device	YES
17.13	VHF radio	YES
17.14	Inmarsat satellite communications system	YES
	if yes, state identification number	00870 773140391
17.15	Telex	YES
	if yes, state identification number	0580 424703755/56
17.16	Telefax	YES
	if yes, state identification number	00870 783140629
17.17	Weatherfax	YES
17.18	Epirbs	YES
17.19	At least three survival craft two-way radio telephone apparatus	YES
17.20	Emergency lifeboat transmitter	YES
17.21	Full set of publications	YES
17.22	Satellite Epirb	YES
17.23	VHF Epirb	NO
17.24	Radio transponder for survival craft	YES



B1 CARGO - GENERAL INFORMATION

1.1 List products which the ship is certified to carry

Acetaldehyde

Anhydrous Ammonia

Butadiene

Butanes (iso and normal)

Butylenes

Butane / Propane Mixtures

Propane

Commercial Propane (max. Ethane in liquid phase 2.5 mol. %)

Propylene

Vinyl Chloride Monomer

Isoprene Ethane

Butadiene and C4 Hydrocarbon Mixtures

Ethylene -104 °C

- 1.2 Minimum allowable tank temp.
- 1.3 Maximum permissible tank pressure
- 1.4 List grades which can be transported simultaneously

8.0 Barg IMO (6 Barg USCG)

Acetaldehyde

Anhydrous Ammonia

Butadiene

Butanes (iso and normal)

Butylenes

Butane / Propane Mixtures

Propane

Commercial Propane (max. Ethane in liquid phase 2.5 mol. %)

Propylene

Vinyl Chloride Monomer

Isoprene Ethane

Butadiene and C4 Hydrocarbon Mixtures

Ethylene

1.5 List grades which can be loaded or discharged simultaneously

Acetaldehyde

Anhydrous Ammonia

Butadiene

Butanes (iso and normal)

Butylenes

Butane / Propane Mixtures

Propane

Commercial Propane (max. Ethane in liquid phase 2.5 mol. %)

Propylene

Vinyl Chloride Monomer

Isoprene Ethane

Butadiene and C4 Hydrocarbon Mixtures

Ethylene

1.6 State natural tank segregation. (N.B. separation obtained by the removal of spools or by insertion of blind flange)

2 (by spool pieces removal)

CARGO SYSTEMS

1.7 Number of products, (gas) that can be conditioned by reliquefaction **2 (two)** simultaneously.

B2 CARGO TANKS

2.1 No. and type of cargo tanks
2.2 Maximum allowable relief valve setting
2 (two independent Type C)
8.0 Barg

2.3 Safety valve set pressure - if variable give range for pilot valve

2.4 Maximum vacuum

2.5 Maximum cargo density

2.6 Maximum rate of cool-down

2.7 State any limitations regarding partially filled tanks

2.8 State allowable combinations of filled and empty tanks

8.0 Barg (IMO Setting)

6.0 Barg (USCG Setting)

0.75 Bar abs 970 kg/m³

B3 CARGO TANK CAPACITIES

Complete the following table

TANK	Capacity CBM	Capacity CBM	PROPANE	AMMONIA	BUTANE	VCM
	100%	98%	Tonnes -42.8°C	Tonnes -33°C	Tonnes -0,5°C	Tonnes -13,4°C
1	2157	2114	1231	1441	1273	2043
2	2374	2326	1355	1586	1401	2249
3						
4						
5						
6						
OTALS						

B4 LOADING RATES

		PRODUCT	RATE (Cbm	n/hr)
4.1	From refrigerated storage		With vapour return	Without return
4.2		BUTANE	400	400
4.3		PROPANE	400	400
4.4		AMMONIA	400	400
4.5		ETHYLENE	400	400
4.6				
4.7				
		PRODUCT	RATE (Tons	nes/hr)
4.8	From pressure storage		With vapour return	Without return
4.9		BUTANE 0-30°C	350	300 / 250
4.10		PROPANE 0°C	350	200
4.11		10° C	350	150
4.12		20° C	350	120
4.13		30° C	350	100

B5 DISCHARGING - GENERAL

Cargo	pumps	
5.1	Type of pumps	Centrifugal Deepwell Pump
5.2	Number per tank	1 (one)
5.3	Rate (per pump)	400 m³/hr
5.4	Delivery head	120 m.l.c.
5.5	Maximum density	0.972 kg/l
	Booster pumps	
5.6	Type of pump	Centrifugal Pump (Horizontal)
5.7	Number	1 (one)
5.8	Rate (per pump)	400 m³/hr
5.9	Delivery head	120 m.l.c.
5.10	Maximum density	0.69 kg/l

B6 DISCHARGE PERFORMANCES

Full cargo discharge times (using all main pumps)

		MANIFOLD	Hours		
6.1	From refrigerated	BACK PRESSURE	With vapour return	Without return	
6.2		4	4	6	
6.3		7	5.5	5.6	
6.4		14	11	11	
		MANIFOLD	Hou	rs	
6.5	Pressurized	BACK PRESSURE	With vapour return	Without return	
6.6		4	3.7	3.7	
6.7		7	4	6	
6.8		14	11	11	

B7 UMPUMPABLES

9.1

Plant design conditions

	TANK NO.	1	2	3	4	5	6	TOTAL TONNES
7.1	Vapour							
7.2	Liquid							
7.3						Total o	quantity	

B8 VAPORISING UNPUMPABLES

8.1	Process used	WARMING
	Time to vaporise liquid unpumpables re	maining after full cargo discharge:
8.2	- Propane	2 Hrs
8.3	- Butane	8 Hrs
8.4	- Ammonia	6 Hrs
8.5	- Propylyne	2 Hrs
8.6	-	- hrs
8.7	-	- hrs

B9 RELIQUEFACTION PLANT

Plant type: $\mathbf{X} \square$ 9.2 Single stage/direct \mathbf{X} 9.3 Two stage/direct 9.4 Simple cascade \mathbf{X} 9.5 Coolant type Sea Water / Refrigerant (Propylene) Compressors 9.6 Type BCA - 2K 140-2H 9.7 Number 2 (two) 9.8 Capacity (per unit) 40 - 520 kWR 9.9 Are they oil-free **YES**

B10 COOLING CAPACITY

State cooling capacity (in Kcal/hr) for:

e @ -42°C	90283 Kcal/hr
@-20°C	171970 Kcal/hr
@- 5°C	266550 Kcal/hr
@- 5°C	171970 Kcal/hr
@ 0°C	180570 Kcal/hr
@ 0°C	180570 Kcal/hr
	@ -20°C @ - 5°C @ - 5°C @ 0°C

B11 CARGO TEMPERATURE LOWERING CAPABILITY (AT SEA)

Time taken to lower the temperature of:

		1	
11.1	Propane from	+10°C to -42°C	148 Hours
11.2		-5°C to -42°C	131 Hours
11.3		-38°C to -42°C	28 Hours
11.4		+20°C to -0.5°C	21 Hours
11.5		+10°C to -0.5°C	12 Hours
11.6	Butane from	+20°C to -0.5°C	45 Hours
11.7		+ 10°C to -0.5°C	26 Hours
11.8		+10°C to -5 °C	43 Hours
11.9	Ethylene from -	-95°C to -103°C	54 Hours
11.10	Ethylene from -	-98°C to -103°C	37 Hours

B12 INERT GAS

Main inert gas and nitrogen plant

12.1	Type of system	Membrane
12.2	Capacity	450 Nm³/hr
12.3	Composition of inert gas	N2 > 99.0%
		O2 < 1.0 % Vol.
		CO2 < 1.0 ppm
12.4	Dewpoint	-55 °C atmospheric
12.5	Used for	Piping flushing and blanketing
		Cargo Tanks inertization
	Nitrogen	

- 12.6 No of bottles
- 12.7 Capacity (each one)
- 12.8 Used for

B13 CARGO TANK INERTING/DE-INERTING

13.1	Time taken from fresh air to under 5% 02 at -25°C dewpoint		11 hours
	Time take	en from cargo vapour to fully inert at -25°C dewpoint	35 hours
13.2	When:	Inert gas density less than product	35 hours
		Inert gas density greater than product	35 hours

B14 GAS FREEING TO FRESH AIR

14.1 Plant used Cargo compressors

14.2 Time taken from fully inerted condition to fully breathable fresh air 11 hours

B15 CHANGING CARGO GRADES

In this table write down time to change products (in hrs). Write also consumption of nitrogen.

From	PROPANE	BUTANE	PROPYLENE	AMMONIA	VCM
To	TIME/CONS.	TIME/CONS.	TIME/CONS.	TIME/CONS.	TIME/CONS.
PROPANE		21 / 12	21 / 12	40 / 23	40 / 23
BUTANE				40 /23	40 /23
PROPYLENE	21 / 12	40 / 23		85 / 36	40 /23
AMMONIA					
VCM	40 / 23	60 / 27	40 / 23	85 / 36	

B16 DECK TANK CAPACITY

16.1	Propane capacity	20 Cbm
16.2	Butane capacity	20 Cbm
16.3	Ammonia capacity	20 Cbm
16.4	Nitrogen capacity	N.A. Ncm

B17 PRE-LOADING COOLDOWN

In the table below, show time and quantity of coolant required to cooldown cargo tanks from ambient temperature and fully gassed up state sufficient to allow loading to commence.

			TIM	E
	PRODUCT	QUANTITY REQUIRED	With return line	Without return
17.1	ETHYLENE	90	12	16
17.2	PROPANE	44	6	8
17.3	BUTANE	15	2	3
17.4	AMMONIA	11	5	6
17.5	VINYL	27	4	5

B18 VAPORISER

18.1	Type of vaporiser	Shell and Tube Heat Exchanger
18.2	Number fitted	1 (one)
18.3	Capacity (per unit)	250000 kcal/hr
18.4	Liquid supply rate	2000 kg/hr
18.5	Delivery temperature	<u> </u>

B19 BLOWER

19.1	Type of blower	n.a.
19.2	Rated capacity	
19.3	Delivery pressure	

B20 CARGO RE-HEATER

Type of re-neater	Snell and tube neat exchanger
Number fitted	1
Heating medium	Seawater
Discharge rates with sea water at 15°C	to raise product temperature:
for propane from -42°C to -5°C	232 tonnes / hr
for ammonia from -33°C to 0°C	210 tonnes / hr
	Number fitted Heating medium Discharge rates with sea water at 15°C for propane from -42°C to -5°C

B21 HYDRATE CONTROL

21.1	Freezing point temperature of
	Depressant
21.2	Quantity of Depressant carried
21.3	Means of injection

B22 CARGO MEASUREMENT

	LEVEL GAUGES
21.1	Are level gauges local or remote
21.2	Manufacturer
21.3	Туре
21.4	Rated accuracy
21.5	Certifying authority
	TEMPERATURE GAUGES
22.6	Manufacturer
22.7	Туре
22.8	Rated accuracy
22.9	Certifying authority
	PRESSURE GAUGES
22.10	Manufacturer
22.11	Туре
22.12	Rated accuracy
22.13	Certifying authority
	OXYGEN ANALYSER
22.14	Manufacturer
22.15	Туре
	FIXED GAS DETECTOR
22.16	Manufacturer
22.17	Туре
22.18	No of points detected
	PORTABLE GAS DETECTOR
22.19	Number
22.20	Manufacturer
22.21	Туре
	TOXIC GAS INDICATOR
22.22	
22.23	71
	TOXIC GAS INDICATOR TUBES
22.24	
22.25	Products
22.26	Exp.dates
	TANKSCOPE
22.27	Туре

B23 CARGO SAMPLING

23.1 Fill the following table

	SAMPLE		POINTS
CARGO TANKS	TOP	MIDDLE	BOTTOM
1	Yes	Yes	Yes
2	Yes	Ye	Yes
3			
4			
5			
6			

23.2 Can sample be drawn from:

- Tank vapour outlet

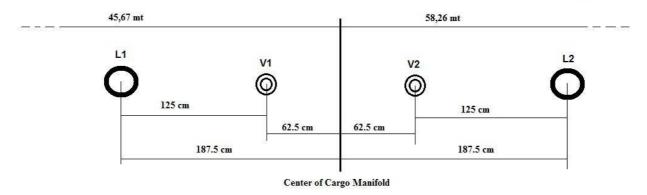
Manifold liquid line
 Manifold vapour line
 Pump discharge line

Yes
Yes

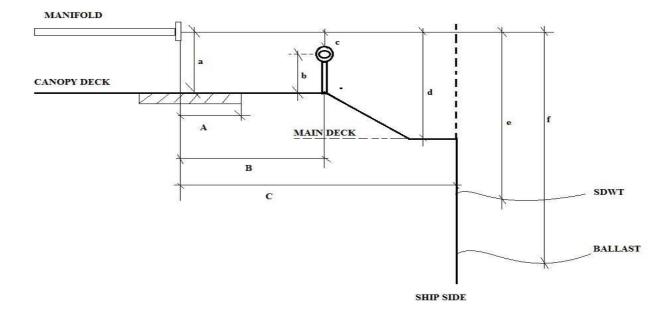
23.3 State connection type and size

B24 CARGO MANIFOLD ARRANGEMENTS

AFT



PIPE FLANGE	DUTY	RATING	SIZE	RAISED ® or Flat (F) face
L1	LIQUID SYSTEM I	ANSI 300	8"	R
V1	VAPOUR SYSTEM I	ANSI 150	4"	R
V2	VAPOUR SYSTEM II	ANSI 150	4"	R
L2	LIQUID SYSTEM II	ANSI 300	8"	R



a)	Spill tank grating to center manifold	1480 mm
b)	Continuous deck to Ship's rail	900 mm
c)	Ship's rail to center manifold (height)	580 mm
d)	Main deck to center manifold	5280 mm
e)	Height of manifold above water line at SDWT	7,68 mt
f)	Height of manifold above water line at normal ballast condition	8,58 mt
A) B) C)	Distance from manifold to spill tank end Distance from manifold to ship's rail (canopy deck) Distance from manifold to ship's side	1,50 mt 2,55 mt 3,70 mt

B25 CARGO MANIFOLD REDUCERS

State number of reducers carried on board and their flange rating and size

25.1	8/300 to 10/300
25.2	8/300 to 8/300
25.3	8/300 to 6/300
25.4	8/300 to 10/150
25.5	8/300 to 8/150
25.6	8/300 to 6/150
25.7	6/150 to 4/150
25.8	4/150 to 4/150
	4/150 to 3/150
	4/300 to 4/150
	6/300 to 4/150

B26 MANIFOLD DERRICK/CRANE

26.1 Is Manifold Derrick	orovided	NO
--------------------------	----------	----

26.2	Is Manifold Crane provided	YES
26.3	Is lifting equipment same	NO
	port and starboard	1 MIDSHIF

If not give details

26.4 State SWL at maximum 5 tons

outreach