synergas

LAST UPDATE:
FEB 2011

FORM C GAS

SYN ALTAIR

MODEL

Form C gas

Index

SECTION

A

A1 PRINCIPAL SHIP PARTICULARS

1.1	Name of Ship	SYN ALTAIR
1.2	Previous Name(s)	VAL CADORE
1.3	Builder	CANTIERI NAVALI PESARO
1.4	Date of delivery	05 FEBRUARY 1998
1.5	Classification Society and No.	RINA/BUREAU VERITAS
1.6	Gross Registered Tonnage	5778
1.7	Net registered Tonnage	1733
1.8	Suez Tonnage Gross/Net	6257.68/4009.02
1.9	Panama tonnage Gross/Net	4912
1.10	Registered Owner	SYNERGAS S.r.l.
	Address	Via Riviera di Chiaia, 283 – NAPOLI - ITALIA
	Telephone	+ 39 081 9637170
	Telex/fax	+ 39 081 3313110
1.11	Manager or Operator	S YNERGAS S.r.l.
	Address	Via Riviera di Chiaia, 283 - NAPOLI - ITALIA
	Telephone	+ 39 081 9637170
	Telex/fax	+ 39 081 3313110
1.12	Flag	ITALIANA
1.13	Port of registry	AUGUSTA
1.14	Official No.	17 R.I.
1.15	Call Sign	ICIV
1.16	Immarsat No.	424767730
1.17	LR/IMO No.	9158240
1.18	Was the ship built in accordance with the following regulations	
	IMO	YES
	USCG	YES
	RINA	YES
	OTHER	
1.19	IMO Certification	
	Certificate of Fitness IGC	YES
	A328	
	A329	
	Letter of Compliance	NOT APPLICABLE
1.20	Date questionnaire compiled	Feb 2011

A2 HULL DIMENSIONS

2.1	Length overall	115,31 mt
2.2	Length between perpendiculars	105,12 mt
2.3	Extreme breadth	16,80 mt
2.4	Extreme depth	8,26 mt
2.5	Summer draught	8,10 mt
2.6	Corresponding deadweight	7553 tonnes
2.7	Load displacement	3545 tonnes
2.8	Load displacement (summer)	11146 tonnes
2.9	Cargo tank cubic capacity (100%)	7174.631 m3
2.10	Distance from keel to top antenna	34,20 mt
2.11	Air draught (with normal ballast)	29,15 mt

A3 BALLAST PARTICULARS

3.1	Permanent Ballast		1614 M3
3.2	Ballast quantity		1654 M3
3.3	Bunkers, stores, etc.		577 CBM
3.4	Draught	- Forward	3,97 meter
		- Aft	4,96 meter
		- Mean	4,46 meter

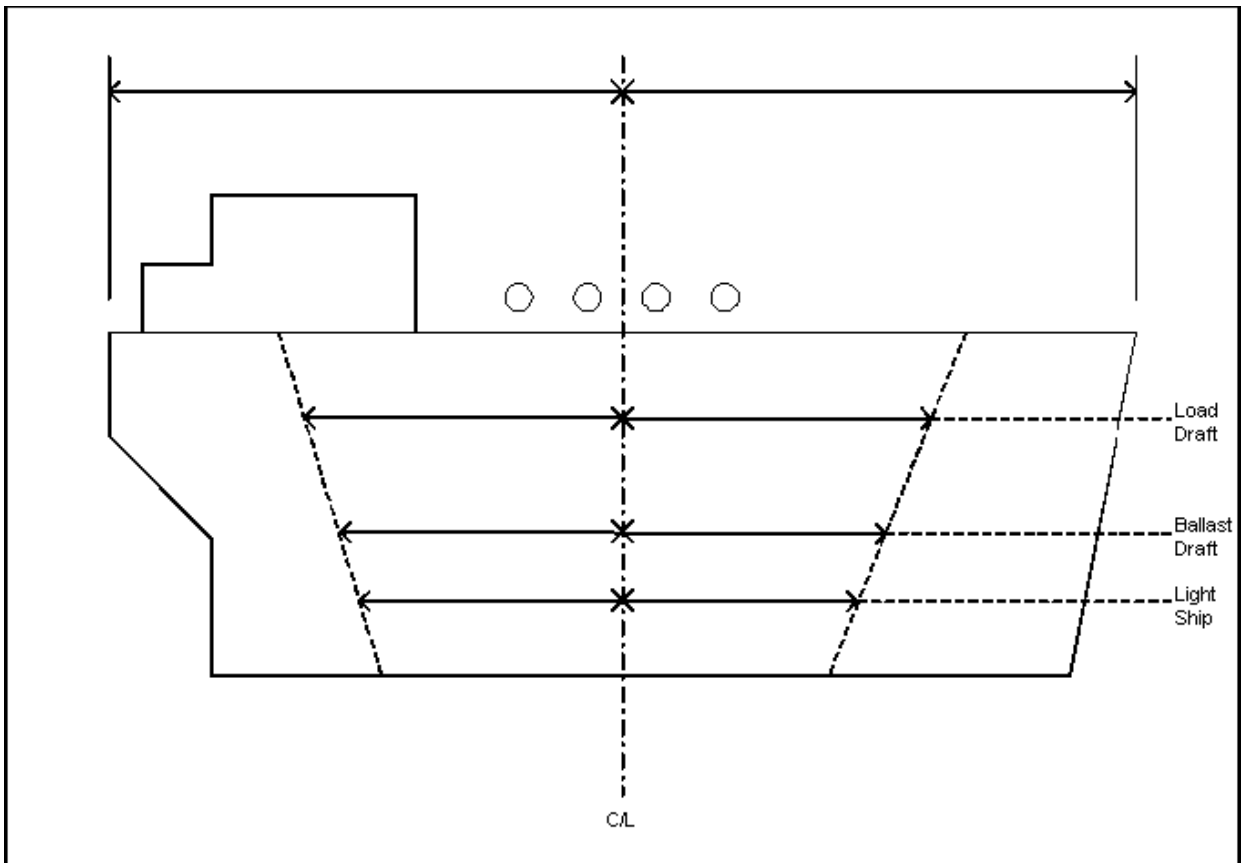
A4 IMMERSION

4.1	TPC at normal draught	14,45 tonnes at 4,85m. draught trim 1,20
4.2	TPC at loaded draught	16,75 tonnes at 8.10 m. draugth

A5 LOADED PARTICULARS

5.1	Cargo			**BUTANE**	**PROPANE**	**VCM**	**BUTADIENE**
5.2	Density			0,600	0.580	0,970	0,650
5.3	Cargo		tons	4223	4072	6719	4569
5.4	Bunkers		IFO	565	565	565	565
5.5	GASOIL			174	174	174	174
5.6	Fresh water			13	13	13	13
5.7	Stores/spares			20	20	20	20
5.8	Lub oil			36	36	36	36
5.9	Ballast						
5.10	Deadweight			5744	5596	7605	5936
5.11	Draught	- Forward		6,94	6,88	7,89	6,88
		- Aft		7,00	6,92	8,32	7,32
		- Mean		6,99	6,90	8,10	7,10

A6 PARALLEL MID-BODY DIMENSIONS



Distance bow to mid-point manifold	56 Metres
Distance stern to mid-point manifold	59.31 Metres
Light ship parallel body length	40 Metres
Light ship parallel body - bow to mid-point manifold	18 Metres
Light ship parallel body - stern to mid-point manifold	22 Metres
Normal ballast parallel body length	50 Metres
Normal ballast parallel body length - bow to mid point manifold	22 Metres
Normal ballast parallel body length - stern to mid point manifold	28 Metres
Parallel body length at Summer Deadweight (SDWT)	80 Metres
Parallel body length at SDWT - bow to manifold	34 Metres
Parallel body length at SDWT - stern to mid point manifold	46 Metres
Does ship have a bulbous bow?	Yes

A7 BUNKER CAPACITIES

7.1	M.E. Fuel Oil	Grade	IFO 180
		Capacity 98%	595,84
7.2	Diesel Oil Grade		GASOIL
		Capacity 98%	207,76

A8 FUEL CONSUMPTION DETAILS

8.1	At sea (normal service speed)	FO	ton/day	14.5 M/T
		GO -	ton/day	2,5 M/T
8.2	At sea (normal service speed) while conditioning cargo	FO	ton/day	15,5 M/T
		GO	ton/day	6,0 M/T
8.3	In port, loading	FO	ton/day	NIL
		GO	ton/day	6,0 M/T / 2,0 M/T
8.4	In port, discharging	FO	ton/day	NIL
		GO	ton/day	5,0 M/T
8.5	In port, idle	FO	ton/day	NIL
		GO	ton/day	2,0 M/T

A9 MAIN ENGINE PARTICULARS

9.1	Main engine make and type	WARTISILA STORK W 6 L38
9.2	No. of units	one
9.3	Maximum continuous rating (MCR) per engine	600 RPM
9.4	Total available power	5400 HP
9.5	Normal service power (ECR)	4079 HP

A10 AUXILIARY PLANT

10.1	Make and type of auxiliary generators Alt. Type	(3) CUMMINS KT 38 (1) SHAFT GENERATOR	(3) ARGES
10.2	No. of units	THREE	
10.3	Maximum generator output per unit	Kilowatts 720	
10.4	Shaft generator	Kilowatts 1100	
10.5	Emergency generator	Kilowatts 154 KVA	
10.6	Total available power	kilowatts	

A11 POWER/SPEED INFORMATION

11.1	Trial data	BHP	HP
		MCR	SHP
		Speed	Knots
		Draught	M
11.2	Normal service speed BHP		HP
		MCR	SHP
		Speed	Knots
		Draught	m

A12 THRUSTERS

12.1	Make and type		BRUNWOLL – FU 45 LTC 1225
12.2	No. Installed		1
12.3	Location and rated bollard	pull	FORWARD 486 HP 370 KW

A13 FRESH WATER

13.1	Capacity of distilled tanks	Cbm	9,756
13.2	Capacity of domestic tanks	Cbm	83,080
13.3	Daily consumption distilled	tons	
	domestic	Tons	5
13.4	Daily evaporator production	Tons	5

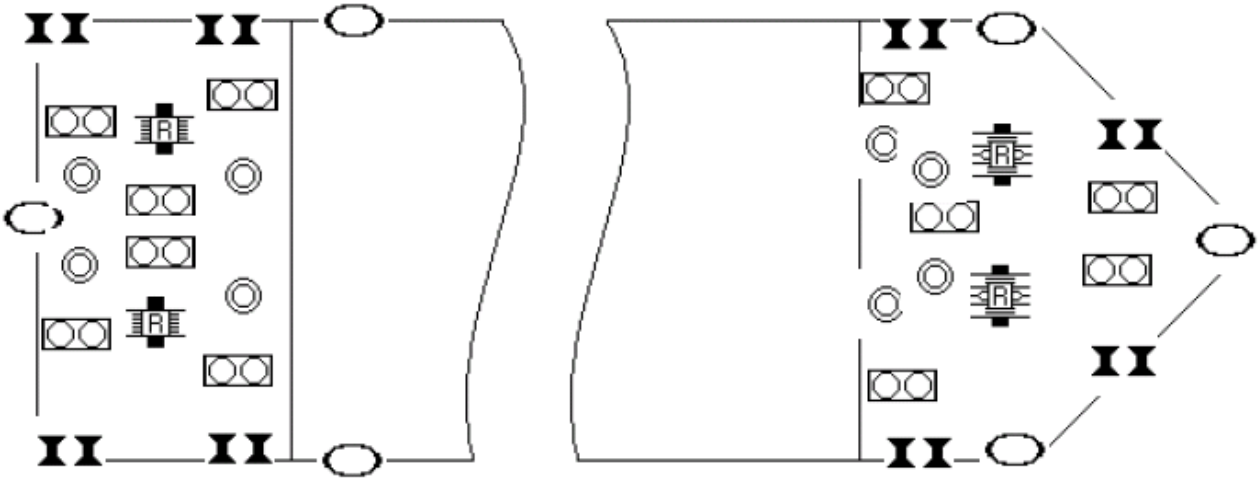
A14 BALLAST CAPACITIES AND PUMPS

Fill the following table

		Tank	Capacity	CBM	CBM
14.1		Fore peak	158,117	CBM	
14.2		Wing or side tanks	873,256	CBM	
14.3		Double bottoms	208,532	CBM	
14.4		Aft peak	113,084	CBM	
14.5		Other (.DEEP TANK.)	267,282	CBM	
14.6			Total 1.620,311	CBM	
14.7	Ballast pump make and type	GARBARINO	CENTRIFUGHE		
14.8	No. of Pumps	3			
14.9	Total capacity	cbm/hr 1200			
14.10	Location	ENGINE ROOM			
14.11	Control Location	ENGINE ROOM / CARGO CONTROL ROOM			

A15 MOORING EQUIPMENT

15.1 Ropes and Wires.
On the diagram below indicate the position of winch mounted wires(W) and ropes (R) together with open (O) and closed (C) fairleads.



15.2 Mooring Winches

	No	Motive power (steam,hydraul)	Heaving power	Brake Capacity	Hauling speed
Forecastle	2	HYD	10	29	15
Poop	2	HYD	10	29	15

15.3 Anchors and Windlasses

Windlass motive Power (steam, hydraulic)	HYDRAULIC
Hauling power	Tonnes 5 kN
Brake holding capacity	Tonnes
Date of last test	28.01.07
Anchor type	HALL
Weight	Tonnes 3,083
Is spare carried	YES
Cable diameter	Mm 44
No of schackles port	9
No of schackles starboard	9

15.4 Windage

Windage on ballast draught	M2
Windage full loaded	M2

A16 NAVIGATIONAL EQUIPMENT

Is the following equipment fitted :		YES	NO
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		NO
16.9	Rudder angle, RPM, controllable pitch and Thrusters indicators	YES	
16.10	Rate of turn indicator	YES	
16.11	Radio D.F.		NO
16.12	Navtex receivers	YES	
16.13	Satellite navigator	YES	
16.14	Decca navigator		NO
16.15	Loran C		NO
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 covered	CAIM	
16.21	Formal chart correction system in use	YES	

A17 COMMUNICATION EQUIPMENT

Is the following equipment fitted :

		YES	NO
17.1	Is ship with GMDSS	YES	
17.2	Radio telegraph main transmitter including facility to transmit on radio telephone distress frequency		
17.3	Radio telegraph main receiver including facility to receive on radio telephone distress frequency		
17.4	Radio telephone distress frequency watch receiver		
17.5	Main radio antenna		
17.6	Radio telegraph reserve transmitter		
17.7	Radio telegraph reserve receiver		
17.8	Reserve radio antenna		
17.9	Are the main and reserve installation electrically separate and electrically independent of each other		
17.10	Radio telegraph auto alarm		
17.11	2182 KHZ bridge watch receiver		
17.12	Alarm signal generating device		
17.13	VHF radio	YES	
17.14	Inmarsat satellite communications system if yes, state identification number	YES	
17.15	Telex if yes, state identification number		
17.16	Telex if yes, state identification number		
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	NO	
17.21	Full set of publications	YES	
17.22	Satellite Epirb	YES	
17.23	VHF Epirb	YES	
17.24	Radio transponder for survival craft	YES	

SECTION B

B1 CARGO - GENERAL INFORMATION

1.1	List products which the ship is certified to carry	Acetaldehyde – Ammonia – Butadiene – Butane – Butylenes – Ethyle chloride – Vinyl chloride – Dimethylamine – Ethane – Diethyl ether - Vinyl ethyl ether – Ethylene – Isoprene – Isopropylamine- Butano-propane Mixtures – Ethylene oxide-pripylene oxide mixtures with ethylene oxide Content of not more than 30%by weight – Manoetylamine – Propylene oxide - Propane – Propylene -
1.2	Minimum allowable tank temp.	°C -104
1.3	Maximum permissible tank pressure	Bar 6
1.4	List grades which can be transported simultaneously	2
1.5	List grades which can be loaded or discharged simultaneously	2
1.6	State natural tank segregation. (N.B. separation obtained by the removal of spools or by insertion of blind flange)	YES
1.7	Number of products, (gas) that can be conditioned by reliquefaction simultaneously.	2

B2 CARGO TANKS

2.1	No. and type of cargo tanks	
2.2	Maximum allowable relief valve setting	Bar 6,0
2.3	Safety valve set pressure - if variable give range for pilot valve	6 Bars / 0,50 – 4,0 – 6,0 BARS
2.4	Maximum vacuum	0,75 BARS
2.5	Maximum cargo density	kg/cm2 0,9720
2.6	Maximum rate of cool-down	°C/hr 10
2.7	State any limitations regarding partially filled tanks	YES
2.8	State allowable combinations of filled and empty tanks	NO

B3 CARGO TANK CAPACITIES

Complete the following table

TANK	Capacity CBM 100%	Capacity CBM 98%	PROPANE Tonnes -42.8°C	AMMONIA Tonnes -33°C	BUTANE Tonnes -0,5°C	VCM Tonnes -13,4°C
1	2160,977	2117	1230,42	1446,43	1270	2053
2	2510,276	2460	1429,3	1680,23	1476	2386
3	2503,378	2453	1425,37	1675,61	1477	2379
4						
5						
6						
TOTALS	**7174,631**		**4085,09**	**48085,09**	**4223**	**6818**

B4 LOADING RATES

		PRODUCT	RATE (Tonnes/hr) With vapour return	Without return
4.1	From refrigerated storage			
4.2		BUTANE	400	350
4.3		PROPANE	400	350
4.4		AMMONIA	500	400
4.5		ETHYLENE	500	450
4.6				
4.7				

		PRODUCT	RATE (Tonnes/hr) With vapour return	Without return
4.8	From pressure storage			
4.9		BUTANE 0-30°C	250	250
4.10		PROPANE 0°C	150	100
4.11		10° C	100	75
4.12		20° C	75	50
4.13		30° C	30	15

B5 DISCHARGING - GENERAL

Cargo pumps

5.1	Type of pumps	DW 125/100-3-K-I SVANEOJ
5.2	Number per tank	ONE
5.3	Rate (per pump)	125
5.4	Delivery head	120
5.5	Maximum density	0,9720
	Booster pumps	
5.6	Type of pump	SVANEOJ CENTRIFGALL NIPB 100 B-XL
5.7	Number	2
5.8	Rate (per pump)	250 CM/H
5.9	Delivery head	120 MLC
5.10	Maximum density	0,680 KG/M3

B6 DISCHARGE PERFORMANCES

Full cargo discharge times (using all main pumps)

		MANIFOLD BACK PRESSURE	Hours With vapour return	Without return
6.1	From refrigerated			
6.2		1 bar	8	8
6.3		5 bar	8	8
6.4		10 bar	8	8

		MANIFOLD BACK PRESSURE	Hours With vapour return	Without return
6.5	Pressurized			
6.6		**1 bar**	**8**	**8**
6.7		**5 bar**	**8**	**8**
6.8		**10 bar**	**8**	**8**

B7 UMPUMPABLES

ETHYLENE: PRESSURE TANKS 0,03 BAR

	TANK NO.	1	2	3	4	5	6	TOTAL TONNES
7.1	Vapour	4,393	5,051	5,041				
7.2	Liquid	NIL	NIL	NIL				
7.3						**Total quantity**		**14,484**

B8 VAPORISING UNPUMPABLES

8.1	Process used	
	Time to vaporise liquid unpumpables remaining after full cargo discharge :	
8.2	- Propane	Hrs 4
8.3	- Butane	Hrs 10
8.4	- Ammonia	Hrs 6
8.5	- Propylene	- Hrs 4
8.6	-	- hrs
8.7	-	- hrs

B9 RELIQUEFACTION PLANT

9.1	Plant design conditions	Air temperature °C 45 Sea temperature ° C 32	
	Plant type :		
9.2	Single stage/direct	☐ yes	X no
9.3	Two stage/direct	X yes	☐ no
9.4	Simple cascade	X yes	☐ no
9.5	Coolant type	SEA WATER / R22	
	Compressors		
9.6	Type	SULZER 2K140 2F	HOWDEN MK6/WRV204
9.7	Number	3 + 3	
9.8	Capacity (per unit)	570 CBM/HR	
9.9	Are they oil-free	YES	

B10 COOLING CAPACITY

State cooling capacity (in Kcal/hr) for :

10.1	Propane	@ -42°C	Kcal/hr
10.2		@ -20°C	Kcal/hr
10.3		@ - 5°C	Kcal/hr
10.4	Butane	@ - 5°C	Kcal/hr
10.5		@ 0°C	Kcal/hr
10.6		@ 0°C	Kcal/hr

B11 CARGO TEMPERATURE LOWERING CAPABILITY (AT SEA) Full cargo with two compressors

Time taken to lower the temperature of:

11.1	Propane from	°C to -42°C	Hrs	195
11.2		-5°C to -42°C	Hrs	170
11.3		-38°C to -42°C	Hrs	42
11.4		+20°C to -0.5°C	Hrs	32
11.5		+10°C to -0.5°C	Hrs	18
11.6	Butane from	+20°C to -0.5°C	Hrs	90
11.7		+ 10°C to -0.5°C	Hrs	52
11.8		+10°C to -5°C	Hrs	52
11.9	from	to	Hrs	
11.10	from	to	Hrs	

B12 INERT GAS

Main inert gas and nitrogen plant

12.1	Type of system	SMIT SINIUS PSA 300-0,1-8/680 2-6 CDP
12.2	Capacity	Cbm/hr 02 % 0,1 300 NM3/HR - 02 % 2,0 680 NM3/HR
12.3	Composition of inert gas	CO2 ABOUT 50 ppm
12.4	Dewpoint	- 50°C
12.5	Used for	INERTING VOID SPACES-PURGING-INERTING CARGO TANKS
	Nitrogen	
12.6	No of bottles	NO
12.7	Capacity (each one)	ltrs
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		Hrs 24	16000 M3
	Time taken from cargo vapour to fully inert at -25°C dewpoint		HRS 36	24000 M3
13.2	When :	Inert gas density less than product	hrs	
		Inert gas density greater than product	hrs	

B14 GAS FREEING TO FRESH AIR

14.1	Plant used	
14.2	Time taken from fully inerted condition to fully breathable fresh air	hrs

B15 CHANGING CARGO GRADES

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

From / To	PROPANE TIME/CONS.	BUTANE TIME/CONS.	PROPYLENE TIME/CONS.	AMMONIA TIME/CONS.	VCM TIME/CONS.
PROPANE	40				
BUTANE		40			
PROPYLENE			40		
AMMONIA				40	
VCM					40

B16 DECK TANK CAPACITY

16.1	Propane capacity	Cbm
16.2	Butane capacity	Cbm
16.3	Ammonia capacity	Cbm
16.4	Nitrogen capacity	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.

	PRODUCT	QUANTITY REQUIRED	TIME	
			With return line	Without return
17.1	ETHYLENE	60		
17.2	PROPANE	50		
17.3	BUTANE	45		
17.4	AMMONIA	40		
17.5	VINYL	35		

B18 VAPORISER

18.1	Type of vaporiser	
18.2	Number fitted	
18.3	Capacity (per unit)	cbm/hr vapour
18.4	Liquid supply rate	cbm/hr liquid
18.5	Delivery temperature	°C

B19 BLOWER

19.1	Type of blower		
19.2	Rated capacity	cbm/hr	N.A.
19.3	Delivery pressure	kg/cm2	N.A.

B20 CARGO RE-HEATER

20.1	Type of re-heater	Horizontal Shell & Tube	
20.2	Number fitted	1	
20.3	Heating medium	Sea water	
	Discharge rates with sea water at 15°C to raise product temperature:		
20.4	for propane from -42°C to -0°C	cbm/hr	400 m3/h
20.5	for ammonia from -33°C to 0°C	cbm/hr	250 m3/h

B21 HYDRATE CONTROL

21.1	Freezing point temperature of Depressant	°C	-97
21.2	Quantity of Depressant carried	litres	100
21.3	Means of injection	Manual pump	

B22 CARGO MEASUREMENT

	LEVEL GAUGES	
21.1	Are level gauges local or remote	Local and remote
21.2	Manufacturer	ENRAF HENRI 806
21.3	Type	ENRAF HENRI 806
21.4	Rated accuracy	- DL = +/- (2,5 + 0,18 L) mm
21.5	Certifying authority	SGS
	TEMPERATURE GAUGES	
22.6	Manufacturer	Term. Local and Elect.
22.7	Type	
22.8	Rated accuracy	Less of +/- 0,5° C
22.9	Certifying authority	SMAI S.r.l.
	PRESSURE GAUGES	
22.10	Manufacturer	Manometer local and trasmitter
22.11	Type	
22.12	Rated accuracy	Less of +/- 0,01 B
22.13	Certifying authority	SMAI S.r.l.
	OXYGEN ANALYSER	
22.14	Manufacturer	
22.15	Type	MSA - dragher
	FIXED GAS DETECTOR	
22.16	Manufacturer	
22.17	Type	
22.18	No of points detected	
	PORTABLE GAS DETECTOR	
22.19	Number 5	
22.20	Manufacturer	
22.21	Type MSA	
	TOXIC GAS INDICATOR	
22.22	Number 2	
22.23	Type MSA	
	TOXIC GAS INDICATOR TUBES	
22.24	Number 6	
22.25	Products Cloropre 5/a – Vinyl Cloride 0,5/b – Ethylene 50/a	
22.26	Exp.dates	
	TANKSCOPE	
22.27	Type MSA	

B23 CARGO SAMPLING

23.1 Fill the following table

CARGO TANKS	SAMPLE POINTS TOP	MIDDLE	BOTTOM
1	80 %	40 %	1,5 %
2			
3			
4			
5			
6			

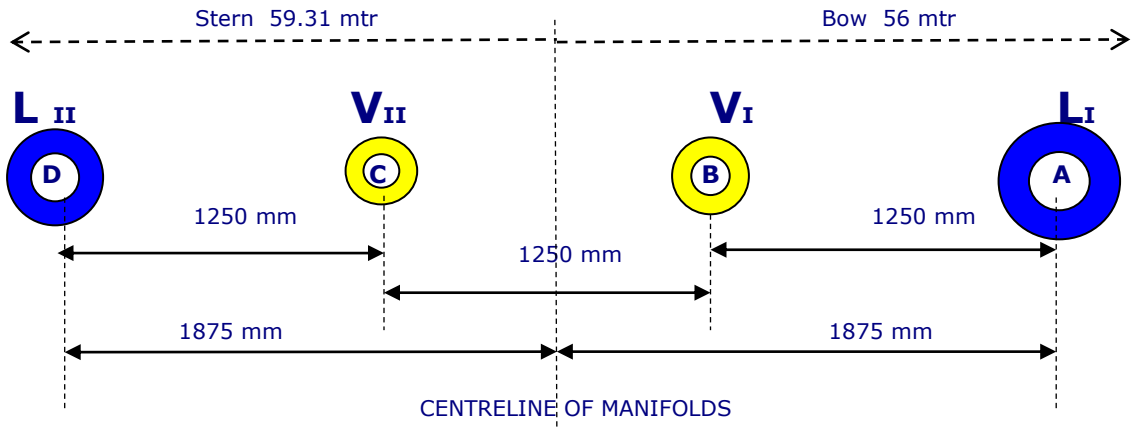
23.2 Can sample be drawn from:

- Tank vapour outlet yes
- Manifold liquid line yes
- Manifold vapour line yes
- Pump discharge line yes

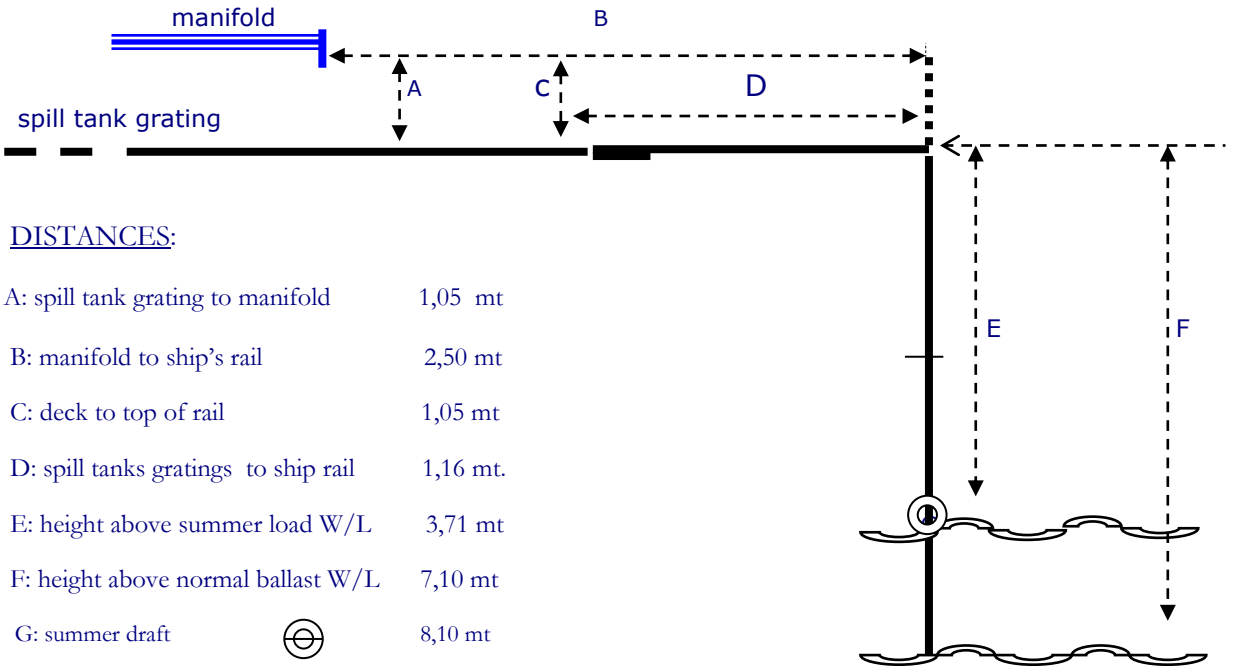
23.3 State connection type and size ½" valve with pipe

B24 CARGO MANIFOLD ARRANGEMENTS

CARGO MANIFOLDS



Pipe Flange	Duty	Rating	Size	Raised (R) or Flat (F) face
A	Liquid system I	Ansi **300**	**8"**	R
B	Vapour " I	Ansi **150**	**4"**	R
C	Vapour " II	Ansi **150**	**4"**	R
D	Liquid system II	Ansi **300**	**8"**	R



DISTANCES:

A: spill tank grating to manifold 1,05 mt

B: manifold to ship's rail 2,50 mt

C: deck to top of rail 1,05 mt

D: spill tanks gratings to ship rail 1,16 mt.

E: height above summer load W/L 3,71 mt

F: height above normal ballast W/L 7,10 mt

G: summer draft ⊖ 8,10 mt

B25 CARGO MANIFOLD REDUCERS

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

25.1 AISI class 300	8"to 6" 8" to 4"
25.2	
25.3	
25.4 AISI class 300 to class 150	4"to 6" // 6"to 4" // 8" to 12" //8" to 6"
25.5	
25.6	
25.7 AISI class 150	4" to 8"
25.8	

B26 MANIFOLD DERRICK/CRANE

26.1	Is Manifold Derrick provided	no	
26.2	Is Manifold Crane provided	yes	
26.3	Is lifting equipment same port and starboard		
	If not give details		
26.4	State SWL at maximum outreach	1,5	tonns

B27 STORES HANDLING

27.1 Stores crane location and SWL starboard aft 1,5 tons