

GAS FORM-C

CLIPPER QUITO



«Industry leading provider of LPG and petrochemical tonnage»

BASED ON:
OCIMF/SIGTTO
Ship Information Questionnaire for Gas Carriers
2nd Edition 1998

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Solvang ASA dates back to 1936. From very modest beginnings, the shipping company has now developed into one of the world's leading transporters of LPG and petrochemical gases. Solvang ASA has its headquarters in Stavanger, with offices in Oslo and the Philippines.

Solvang has a fleet of modern and efficient vessels - all built in the accordance with the most up to date specifications and fitted with new and efficient technology. Perhaps of greater importance than the modern technology is the way in which the vessels are operated – the people onboard. Good seamanship represents the very core of our business, and we place a firm focus on this area in the form of education, working on attitudes and training.

On every single sailing, we are required to demonstrate the full range of our experience and expertise. Our strength lies in reliable, high-quality deliveries. It is our goal to maintain a steady course towards the future, at the same time as making good use of the experience we have gained.

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1. SECTION A – GENERAL INFORMATION

1.1 PRINCIPAL SHIP PARTICULARS

A1	PRINCIPAL SHIP PARTICULARS		CLIPPER QUITO
1.0	Date Questionnaire Completed		31.07.2017
1.1	Name of vessel		Clipper Quito
1.2	LR/IMO Number		IMO 9630755
1.3	Last Previous Name		N/A
1.3.1	Date of Name change		N/A
1.4	Second Last Name Change		N/A
1.4.1	Date of Name change		N/A
1.5	Third Last Name Change		N/A
1.5.1	Date of Name change		N/A
1.6	Fourth Last Name Change		N/A
1.6.1	Date of Name change		N/A
1.7	Flag		NIS
1.8	Port Of Registry		Stavanger
1.9	Official Number		
1.10	Call Sign		LAPW7
1.11	VSAT		+44 203 145 4956/4955/4956
1.12	Fleet 77		+870 773 158 912
1.13	Fax		
1.14	Mini – M		
1.15	E-mail		master.clipper.quito@solvangship.no
1.16	GSM Mobile		+47 969 03 513
1.17	SAT C		425792 810/811
1.18	Vessel's MMSI Number		257928000
1.19	Max tank pressure	UNIT	
1.19.1	(1) Pressurized	[bar g]	
1.19.2	(2) Semi- Refrigerated	[bar g]	
1.19.3	(3) Refrigerated	[bar g]	0,275/0,400
1.20	Minimum tank temperature	UNIT	
1.20.1	(1) Pressurized	[°C]	
1.20.2	(2) Semi- Refrigerated	[°C]	
1.20.3	(3) Refrigerated	[°C]	-50
A1	OWNERSHIP AND OPERATION		
1.21	REGISTERED OWNER		P/R Clipper Victory II DA
1.22	Visitor's address		Strandkaaien 36
1.22.1	City		N-4005 Stavanger
1.22.2	Country		Norway
1.23	Postal address		P.O. Box 90
1.23.1	City		N-4001 Stavanger
1.23.2	Country		Norway
1.24	Office Telephone Number		+47 51 84 84 00
1.25	Office Fax Number		+47 51 84 84 11
1.26	Office Telex Number		
1.27	Office e-mail Address		solvang-vlgc@solvangship.no
1.28	Number of Years Vessel Owned		4,1
1.29	NAME OF TECHNICAL OPERATOR		Solvang ASA
1.30	Visitor's address		Strandkaaien 36
1.30.1	City		N-4005 Stavanger
1.30.2	Country		Norway
1.31	Postal address		P.O. Box 90
1.31.1	City		N-4001 Stavanger
1.31.2	Country		Norway
1.32	Office Telephone Number		(+47) 51 84 84 00

1.33	Office Fax Number	(+47) 51 84 84 11	
1.34	Office Telex Number		
1.35	Office e-mail Address	solvang-vlgc@solvangship.no	
1.36	Number of Years as vessel Operator	4,1	
1.37	Total number of vessels, Operator	23	
1.38	COMMERCIAL OPERATOR	Solvang ASA	
1.39	Visitor's address	Haakon VII's gt 6	
1.39.1	City	N-0121 Oslo	
1.39.2	Country	Norway	
1.40	Postal address	P.O.Box 1734 Vika	
1.40.1	City	N-0121 Oslo	
1.40.2	Country	Norway	
1.41	Office Telephone Number	(+47) 22 47 19 50	
1.42	Office e-mail Address	chartering@solvangship.no	
1.42.1	Office e-mail Address 2	operation@solvangship.no	
1.43	Number of Years as vessel Operator	4,1	
1.44	Builder	Hyundai HI	
1.45	Name of Yard Vessel Built At	Ulsan, Korea	
1.46	Hull Number	2516	
1.47	Date Keel Laid	29.01.2013	
1.48	Date Launched		
1.49	Date Delivered	26.06.2013	
1.50	Date of Completion of Major Hull Changes (If Any)	N/A	
1.51	If Changes were made, specify changes and yard	N/A	
A1	CLASSIFICATION	UNIT	CLIPPER QUITO
1.52	Classification Society	[Text]	DNV GL
1.53	Class Notation	[Text]	+1A1 TANKER FOR LIQUIFIED GAS
1.53.1	Cont.	[Text]	2G, E0, TMON, BIS, BWM-E(s)
1.53.2	Cont.	[Text]	COAT-PPSPC(B), NAUTICUS, Pluss, NAUT-OC
1.54	If Class Society Changed, Name of Previous society	[Text]	N/A
1.55	If Class Society Changed, Date of Change	[Date]	N/A
1.56	Built in accordance with Regulations:		Approval received
1.56.1	IMO	[Yes/No]	YES
1.56.2	USCG	[Yes/No]	YES
1.56.3	RINA	[Yes/No]	NO
1.56.4	Other	[Yes/No]	NO
1.57	IMO Certification Certificate of Fitness		Approval received
1.57.1	IGC	[Yes/No]	YES
1.57.2	A328	[Yes/No]	NO
1.57.3	A329	[Yes/No]	NO
1.57.4	Letter of compliance	[Yes/No]	NO
1.57.5	Issued By	[Text]	DNV GL
1.58	Unattended Machinery Space certificate	[Yes/No]	Yes (24h)
A1	TONNAGES	UNIT	CLIPPER QUITO
1.59	Nett Registered Tonnage	[NT]	18644
1.60	Gross Tonnage	[GT]	48051
1.61	Suez Canal Tonnage		
1.61.1	Net Tonnage	[NT]	45516,22
1.61.2	Gross Tonnage	[GT]	50613,4
1.62	Panama Canal Tonnage		
1.62.1	Net Tonnage	[NT]	
1.62.2	Gross Tonnage	[GT]	

1.2 HULL DIMENSIONS

A2	HULL DIMENSIONS	UNIT	CLIPPER QUITO
2.1	Length Overall	[m]	225,2
2.2	Length Between Perpendiculars	[m]	220,0
2.3	Distance Bow to Bridge	[m]	186,4
2.4	Distance Bridge Front to Mid-Point Manifold	[m]	76,7
2.5	Distance Bow to Mid-Point Manifold	[m]	109,5
2.6	Extreme Breadth	[m]	36,6
2.7	Extreme Depth	[m]	22,2
2.8	Summer Draught	[m]	12,0
2.9	Corresponding Deadweight	[ton]	55047,0
2.10	Light Displacement/weight	[ton]	18714,0
2.11	Loaded Displacement (Summer)	[ton]	73761
2.12	Cargo Tank Cubic Capacity (100% full)	[m3]	84066,0
2.13	Distance from Keel to Highest Point (With mast down)	[m]	50,2
2.14	Air Draught normal ballast (With mast down)	[m]	43,10

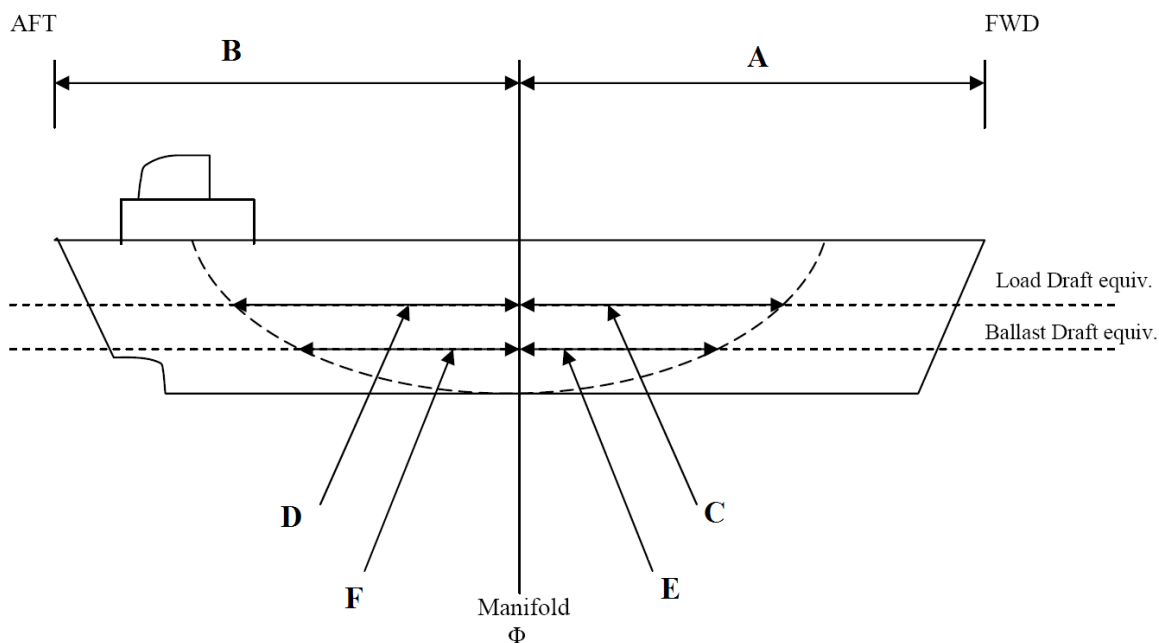
1.3 IMMERSION

A3	IMMERSION	UNIT	CLIPPER QUITO
3.1	Normal Ballast Draught	[TPC]	63,20
3.1.1	Draught	[m]	7,1
3.2	Loaded Draught	[TPC]	70,58
3.2.1	Draught	[m]	12,02

1.4 LOADED PARTICULARS

A4	LOADED PARTICULARS	UNIT	CLIPPER QUITO		
4.1	Cargo:		Propane	n-Butane	Propylene
4.2	Density:	[ton/m3]	0,58	0,601	0,61
4.3	Cargo	[ton]	47783	49513	50255
4.4	Bunkers	[ton]	3080,86	3080,859781	3080,859781
4.5	D0	[ton]			
4.6	Fresh Water	[ton]	417	417	417
4.7	Stores/Spares	[ton]	115	115	115
4.8	Lube Oil	[ton]	109	109	109
4.9	Ballast	[ton]	0	0	0
4.10	Deadweight Const.	[ton]	18714	18741	18741
4.11	Draught - Forward	[m]	11,04	11,44	11,61
4.11.1	Aft	[m]	11,9	12,02	12,07
4.11.2	Equiv.	[m]	11,47	11,73	11,84

1.5 PARALLEL MID-BODY DIMENSIONS



A5	PARALLEL MID-BODY DIMENSIONS	UNIT	CLIPPER QUITO
5.1	A Manifold to FWD	[m]	109,48
5.2	B Manifold to AFT	[m]	115,73
5.3	Loaded draft equiv-		
5.3.1	C Manifold to FWD side tangent line	[m]	40,825
5.3.2	D Manifold to AFT side tangent line	[m]	60,977
5.4	Ballast draft equiv.		
5.4.1	E Manifold to FWD	[m]	40,813
5.4.2	F Manifold to AFT	[m]	46,917

1.6 BUNKER CAPACITIES

A6	BUNKER CAPACITIES	UNIT	CLIPPER QUITO
6.1	HFO	[Grade]	IFO 380 (Standard)
6.1.1	Capacity @ 100 %	[m3]	2755,2
6.2	LSHFO	[Grade]	N/A
6.2.1	Capacity @ 100 %	[m3]	N/A
6.3	Diesel Oil	[Grade]	DO
6.3.1	Capacity @ 100 %	[m3]	392,7

1.7 FUEL CONSUMPTION DETAILS

Average speed and consumption, based on max force 4 Beaufort and 15% Sea Margin.

Vessel use mainly HFO for all consumers. DO/GO for INCN and when Rules & Regulations demands it for other consumers

A7	FUEL CONSUMPTION DETAILS	UNIT	CLIPPER QUITO
7.1	LOADED CONDITION		*About
7.2	Average speed over 12 months	[kn]	
7.3	Average consumption, Main engine	[ton/day]	
7.4	Consumption, AUX		
7.4.1	LPG	[ton/day]	4,6
7.4.2	Ethylene	[ton/day]	
7.5	Average consumption, AUX		
7.5.1	LPG	[ton/day]	
7.5.2	Ethylene	[ton/day]	
7.6	BALLAST CONDITION		
7.7	Average speed over 12 months	[kn]	
7.8	Average consumption, Main engine	[ton/day]	
7.9	Average consumption, AUX	[ton/day]	
7.10	PORT/IDLE		
7.11	Average consumption, AUX, Loading	[ton/day]	6,2
7.12	Average consumption, AUX, Discharging	[ton/day]	5,9
7.13	Average consumption, AUX, Idle	[ton/day]	2,7
7.14	Average consumption, Boiler (depending on weather)	[ton/day]	0,5
7.15	OTHER		
7.16	INCN (When operating) - MDO/MGO	[ton/day]	4
7.17	IGG-plant (When operating)	[ton/day]	12
7.18	ME CONSUMPTION GRAPH/KNOTS		LOADED BALLAST
7.18.1	14	[ton/day]	32,5 31,5
7.18.2	15	[ton/day]	38,0 36,0
7.18.3	16	[ton/day]	44,5 42,5
7.18.4	16,5	[ton/day]	48,0 46,0
7.18.5	17	[ton/day]	52,0 50,0

**Consumption of AUX will increase with 0,2-1,0 MT/24h when systems for exhaust gas cleaning is running, depending on sulfur content in fuel oil, load of engines, alkalinity, degree of cleaning, etc

1.8 MAIN ENGINE PARTICULARS

A8	MAIN ENGINE PARTICULARS	UNIT	CLIPPER QUITO
8.1	Main Engine Make and Type	[Text]	Hyundai-B&W 6S60MC-C8.1
8.2	No of Units	Pcs	1
8.3	Maximum Continuous Rating (MCR)	[kW]	12600
8.3.1	RPM	[RPM]	92,7
8.4	Total Available Power	kW	12 600
8.5	Normal service Power	kW	11 340

1.9 AUXILIARY PLANT

A9	AUXILIARY PLANT	UNIT	CLIPPER QUITO
9.1	Make and Type of Auxiliary Generators	[Text]	MAN B&W Holeby 8H21/32
9.2	Main Generators	[Pcs]	
9.2.1	No of Units	[Pcs]	3

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9.2.2	Maximum Generator Output per Unit	[kW]	1 280
9.3	Generators, other	[Yes/No]	NO
9.3.1	No of Units	[Pcs]	N/A
9.3.2	Maximum Generator Output per Unit	[kW]	N/A
9.4	Shaft Generator	[kW]	N/A
9.5	Total Available Power	[kW]	3840
9.6	Emergency Generator	[kW]	130
9.7	Emergency Fire Pump	[Text]	
9.7.1	Type	[Text]	Vertical Centrifugal
9.7.2	Delivery Pressure	[Bar]	10
9.7.3	Motive Power	[Text]	Electric
9.7.4	If Electrical, Indicate Power Required in kW	[kW]	45
9.8	Steering Gear Type		Cylinder
9.8.1	kW to Steer the Vessel with One Pump Unit	[kW]	45

1.10 POWER/SPEED INFORMATION

A10	POWER/SPEED INFORMATION	UNIT	CLIPPER QUITO
10.1	Trial Data		
10.1.1	NCR	[kW]	11340
10.1.2	MCR	[kW]	12492
10.1.3	Speed	[kn]	NCR 18,4 / MCR 19,1
10.1.4	Draught	[m]	F 5,72 M 6,91 A 8,09
10.2	Normal Service Speed		
10.2.1	NCR	[kW]	
10.2.2	MCR	[kW]	
10.2.3	Speed	[kn]	
10.2.4	Draught	[m]	

1.11 THRUSTERS

A11	THRUSTERS	UNIT	CLIPPER QUITO
11.1	Make and Type	[Text]	N/A
11.2	No. Installed	[Pcs]	N/A
11.3	Location and Rated Bollard Pull or kW output	[kW]	N/A

1.12 FRESH WATER

A12	FRESH WATER	UNIT	CLIPPER QUITO
12.1	Capacity of Distilled Tanks	[ton]	N/A
12.2	Capacity of F/D.W. Ts	[ton]	462
12.3	Daily Consumption	[ton/day]	9
12.4	Daily Evaporator Output	[ton/day]	30

1.13 BALLAST CAPACITIES AND PUMPS

A13	BALLAST CAPACITIES AND PUMPS	UNIT	CLIPPER QUITO	
13.1	Tank Capacities		Capacity [m3]	Tanks [Pcs]
13.1.1	Forepeak	[Col]	992,70	1
13.1.2	Wing or Side tanks	[Col]	18616,4	8
13.1.3	Aft Peak	[Col]	1152,8	1
13.1.4	Other	[Col]		
13.1.5	Other	[Col]		
13.1.6	Total	[Col]	20 761,90	10
13.2	Ballast Pumps			
13.2.1	Capacity per pump	[m3/h]	800	
13.2.2	Model	[Text]		
13.2.3	Type	[Text]	Electric	
13.2.4	Setting	[Text]	Vertical Centrifugal	
13.3	No of Pumps	[Pcs]	2	
13.4	Total Capacity	[m3/h]	1600	
13.5	Location	[Text]	Engine Room	
13.6	Control Location	[Text]	CCR, Engine Room	

1.14 MOORING

A14	MOORING EQUIPMENT	UNIT	CLIPPER QUITO			
14.1	Mooring wires (On drums)		FWD	FWD DECK	AFT DECK	POOP
14.1.1	Number	[Pcs]				
14.1.2	Diameter	[mm]				
14.1.3	Length	[m]				
14.1.4	Maximum Breaking Load	[ton]				
14.2	Mooring wire tails		FWD	FWD DECK	AFT DECK	POOP
14.2.1	Number	[Pcs]				
14.2.2	Type	[Text]				
14.2.3	Diameter	[mm]				
14.2.4	Length	[m]				
14.2.5	Maximum Breaking Load	[ton]				
14.3	Mooring ropes (On drums)		FWD	FWD DECK	AFT DECK	POOP
14.3.1	Number	[Pcs]	6	2	2	6
14.3.2	Type	[Text]	MAXI-CARAT	MAXI-CARAT	MAXI-CARAT	MAXI-CARAT
14.3.3	Diameter	[mm]	68	68	68	68
14.3.4	Length	[m]	220	220	220	220
14.3.5	Maximum Breaking Load	[ton]	88	88	88	88
14.4	Mooring winches		FWD	FWD DECK	AFT DECK	POOP
14.4.1	Number	[Pcs]	3	1	1	3
14.4.2	[S]ingle/[D]ouble drums	[S/D]	Double	Double	Double	Double
14.4.3	Split drums	[Yes/No]	YES	YES	YES	YES
14.4.4	Motive power	[Text]	Hydraulic	Hydraulic	Hydraulic	Hydraulic
14.4.5	Heaving power	[ton]	33	33	33	33
14.4.6	Brake capacity	[ton]	70,4	70,4	70,4	70,4
14.4.7	Hauling speed	[m/s]	0,25	0,25	0,25	0,25
14.5	Wires/ropes not on drums		WIRES	ROPES	EM'GENCY	
14.5.1	Number	[Pcs]		3/3		
14.5.2	Type	[Text]		MAXI-CARAT		
14.5.3	Diameter	[mm]		68		
14.5.4	Length	[m]		220		

14.5.5	Maximum Breaking Load	[ton]		88	
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A14	ANCHORS AND WINDLASSES	UNIT	CLIPPER QUITO
14.5.1	Windlass Motive Power (e.g. Steam, Hydraulic)	[Text]	Hydraulic
14.5.2	Hauling Power	[ton]	33,5
14.5.3	Brake Holding Power	[ton]	206
14.5.4	Anchor Type	[Text]	Bower Anchor HHP
14.5.5	Weight	[kg]	8775
14.5.6	Is Spare Carried	[Yes/No]	No
14.5.7	Cable Diameter	[mm]	84
14.5.8	No of Shackles Port	[Pcs]	12
14.5.9	No of Shackles Starboard	[Pcs]	13
14.6	TOWING EQUIPMENT		
14.6.1	Is Ship fitted with a Towing Bracket AFT(drum)	[Yes/No]	Yes
14.6.2	If Yes, state SWL	[ton]	204
14.6.3	Is Towing Chain provided	[Yes/No]	YES
14.6.4	Dimensions of Towing Wire - Diameter	[mm]	80
14.6.5	Length	[m]	100
14.7	Windage on Ballast Draught		
14.7.1	End-on	[m2]	
14.7.2	Lateral	[m2]	

Mooring diagram is provided in the appendix.

1.15 NAVIGATIONAL EQUIPMENT

A15	NAVIGATIONAL EQUIPMENT	UNIT	CLIPPER QUITO
15.1	Magnetic Compass	[Yes/No]	YES
15.2	Off Course Alarm – Magnetic	[Yes/No]	YES
15.3	Gyro Compass	[Yes/No]	YES
15.3.1	Specify number	[Pcs]	2
15.4	Off Course Alarm – Gyro	[Yes/No]	YES
15.5	Bridge Repeaters	[Yes/No]	YES
15.5.1	Specify Number	[Pcs]	5
15.6	Radar 3 GHz	[Yes/No]	YES
15.7	Radar 9 GHz	[Yes/No]	YES
15.8	Are Radars Gyro Stabilized	[Yes/No]	YES
15.9	Radar Plotting Equipment	[Yes/No]	YES
15.10	ARPA	[Yes/No]	YES
15.11	ECDIS (Electric Display and Information System)	[Yes/No]	YES
15.11.1	Make/Type	[Text]	Kongsberg/K-Bridge
15.12	Depth Echo Sounder with Recorder	[Yes/No]	NO
15.13	Depth Echo Sounder without Recorder	[Yes/No]	YES
15.14	Speed/Distance Indicator	[Yes/No]	YES
15.15	Doppler Log	[Yes/No]	YES
15.16	Speed of Approach Doppler	[Yes/No]	YES
15.17	Rudder Angle Indicator	[Yes/No]	YES
15.18	Rudder Angle Indicator on Each Bridge Wing	[Yes/No]	YES
15.19	R.P.M Indicator	[Yes/No]	YES
15.20	R.P.M Indicator on Each Bridge Wing	[Yes/No]	YES
15.21	Controllable Propeller Pitch Indicator	[Yes/No]	NO
15.22	Thruster (s) indicator	[Yes/No]	NO
15.23	Rate of turn Indicator	[Yes/No]	YES
15.24	Radio Direction Finder	[Yes/No]	NO
15.25	NAVTEX Receiver	[Yes/No]	YES
15.26	GPS	[Yes/No]	YES
15.27	Transit SATNAV	[Yes/No]	NO
15.28	DECCA navigator	[Yes/No]	NO
15.29	Omega	[Yes/No]	NO
15.30	Loran C	[Yes/No]	NO
15.31	Weather Route System	[Yes/No]	YES
15.32	Sextant(s)	[Yes/No]	YES
15.33	Signal Lamp ALDIS	[Yes/No]	YES
15.34	Anemometer	[Yes/No]	YES
15.35	Engine Order Recorder	[Yes/No]	YES
15.36	Course Recorder	[Yes/No]	NO
15.37	Steering motor controls controls fitted on bridge wings	[Yes/No]	NO
15.38	Is bridge Equipped with a “Dead Man” Alarm Equipment	[Yes/No]	YES
15.39	What chart outfit coverage is provided	[Yes/No]	
15.39.1	Worldwide	[Yes/No]	YES
15.39.2	Limited	[Yes/No]	
15.39.3	If Limited Please Indicate	[Text]	
15.40	Formal Chart Correction System in use	[Yes/No]	YES
15.41	Electronic Chart System in use	[Yes/No]	YES

1.16 COMMUNICATIONS EQUIPMENT

A16	COMMUNICATIONS EQUIPMENT	UNIT	CLIPPER QUITO
16.1	Main Transmitted Including Radio Telephone Distress Frequency	[Yes/No]	YES
16.2	Main Receiver Including Radio Telephone Distress Frequency	[Yes/No]	YES
16.3	Radio Telephone Distress Frequency Watch Receiver	[Yes/No]	YES
16.4	Main Radio Antenna	[Yes/No]	YES
16.5	Reserve Radio Antenna	[Yes/No]	NO
16.6	Main and Reserve Installations Electrically Separate and Independent	[Yes/No]	YES
16.7	2182 kHz Bridge auto Alarm	[Yes/No]	YES
16.8	Alarm Signal Generating Device	[Yes/No]	YES
16.9	VHF Radio (s)	[Yes/No]	YES
16.9.1	Specify Number	[Pcs]	3
16.10	Portable VHF/UHF Radios	[Yes/No]	YES
16.10.1	Specify Type and Number	[Pcs]	10
16.11	Are Sets Intrinsically Safe	[Yes/No]	YES
16.12	Inmarsat Satellite System	[Yes/No]	YES
16.13	Specify System Type A, B, C, F or VSAT	[Text]	FBB / VSAT
16.14	Is the ship equipped as per GMDSS Requirements	[Yes/No]	YES
16.15	If Yes, which area of operation is vessel certified to operate in	[Text]	A1,A2,A3
16.15.1	EPIRB	[Yes/No]	YES
16.15.2	SARTS	[Yes/No]	YES
16.16	Emergency Lifeboat Transceiver	[Yes/No]	NO
16.17	At least Three Survival craft Two-way Radio Telephone Apparatus	[Yes/No]	YES
16.18	Full Set of Publications	[Yes/No]	YES

2. SECTION B – CARGO SYSTEMS

2.1 GENERAL INFORMATION

B1	CARGO - GENERAL INFORMATION		CLIPPER QUITO	
1.1	List Products Which the Ship is Certified to Carry			
1.1.1	1.	Butane		
1.1.2	2.	Butane/propane		
1.1.3	3.	Propane		
1.1.4	4.	Propylene		
1.1.5	5.			
1.1.6	6.			
1.1.7	7.			
1.1.8	8.			
1.1.9	9.			
1.1.10	10.			
1.1.11	11.			
1.1.12	12.			
1.1.13	13.			
1.1.14	14.			
1.1.15	15.			
1.1.16	16.			
1.1.17	17.			
1.1.18	18.			
1.1.19	19.			
1.1.20	20.			
1.1.21	21.			
1.1.22	22.			
1.1.23	23.			
1.1.24	24.			
1.2	Transport and Carriage Condition		UNIT	
1.3	Minimum Allowable Tank Temperature		[Celsius]	-50
1.3.1	Maximum Allowable Tank Pressure (Seagoing setting)		[bar g]	0,25
1.3.2	Maximum Allowable Tank Pressure (Harbour setting)		[bar g]	0,45
1.4	Grades which can be Loaded or Discharged Simultaneously		[Pcs]	2
1.5	Grades which can be Transported Simultaneously		[Pcs]	2
1.6	Number of Products Re-liquefied Simultaneously		[Pcs]	2
1.7	State Natural Tank Segregations (Possible combinations)		UNIT	
1.7.1	1.		[Tank]	2 & 1+3+4
1.7.2	2.		[Tank]	1+3 & 2+4
1.7.3	3.		[Tank]	1+2+3+4

2.2 CARGO TANKS

B2	CARGO TANKS	UNIT	CLIPPER QUITO
2.1	Cargo Tanks		
2.1.1	Type	[Text]	Type A
2.1.2	Material	[Text]	Carbon Manganese LT
2.2	Maximum Allowable Relief Valve setting	[bar g]	
2.3	Safety Valve Set Pressure – If Variable Give Range of Pilot Valves		
2.3.1	Seagoing setting	[bar g]	0,275
2.3.2	Harbour setting	[bar g]	0,4
2.4	Maximum Vacuum	[bar g]	
2.5	Maximum Cargo Density (98% full)	[kg/m3]	610
2.6	Maximum Rate of Cool-Down	[C/h]	

2.7	State any Limitations regarding Partially Filled Tanks	[Text]	
2.7.1	Cont.	[Text]	
2.8	State Allowable Combinations of Filled and Empty Tanks	[Text]	
2.8.1	Cont.	[Text]	

2.3 CARGO TANK CAPACITIES

B3	CARGO TANK CAPACITIES	UNIT	CLIPPER QUITO				
3.1	Capacity	Tank	1	2	3	4	Total
3.1.1	100 %	[m3]	17994	22547	22547	20978	84066
3.1.2	98 %	[m3]	17634	22096	22096	20558	82385
3.2	Cargo						
3.2.1	iso-butane	[ton]	10475	13125	13125	12212	48936
3.2.2	Propane	[ton]	10228	12816	12816	11924	47783
3.2.3	Butadiene	[ton]	11480	14385	14385	13384	53632
3.2.4	Propylene	[ton]					
3.2.5	Ammonia	[ton]					
3.2.6	Butylene/Butenes	[ton]	10475	13125	13125	12212	48936
3.2.7	n-butane	[ton]	10598	13280	13280	12356	49513
3.2.8	Ethylene	[ton]					

- Cargoes may not be applicable for vessel. Check which cargoes the vessel is certified to carry.

2.4 LOADING RATES

VR = Vapour Return, W/O VPR = Without Vapour Return

B4	LOADING RATES	UNIT	CLIPPER QUITO			
			REFRIGERATED		PRESSURE	
4.1	Cargo	[m3/h]	VR	W/O VR	VR	W/O VR
4.1.1	1 Butane	[m3/h]	2777	2777		
4.1.2	2 Propane	[m3/h]	2777	2777		
4.1.3	3	[m3/h]				
4.1.4	4	[m3/h]				
4.1.5	5	[m3/h]				
4.1.6	6	[m3/h]				
4.1.7	7	[m3/h]				
4.1.8	8	[m3/h]				
4.1.9	9	[m3/h]				
4.1.10	10	[m3/h]				
4.1.11	11	[m3/h]				
4.1.12	12	[m3/h]				
4.1.13	13	[m3/h]				
4.1.14	14	[m3/h]				
4.1.15	15	[m3/h]				
4.1.16	16	[m3/h]				
4.1.17	17	[m3/h]				
4.1.18	18	[m3/h]				
4.1.19	19	[m3/h]				
4.1.20	20	[m3/h]				

2.5 DISCHARGING – GENERAL

Pumping curves for cargo main pumps and booster pumps are given in the appendix.

B5	DISCHARGING – GENERAL	UNIT	CLIPPER QUITO
5.1	Cargo Pumps	[Text]	Deepwell
5.1.1	Type of Pumps	[Text]	Centrifugal
5.1.2	Number per Tank	[Pcs]	2
5.1.3	Rate (per pump)	[m3/h]	600
5.1.4	Delivery Head	[mlc]	120
5.1.5	Maximum Density	[kg/m3]	690
5.2	Booster Pumps		
5.2.1	Type of Pumps	[Text]	Centrifugal
5.2.2	Number	[Pcs]	2
5.2.3	Rate (per pump)	[m3/h]	600
5.2.4	Delivery Head	[mlc]	115
5.2.5	Maximum Density	[kg/m3]	610

2.6 DISCHARGE PRESSURE

B6	DISCHARGE PERFORMANCE	UNIT	CLIPPER QUITO
6.1	Fully Refrigerated, Full Cargo Discharge Times (all pumps):		VR W/O VR
6.1.1	Manifold Back Pressure (1 kg/cm2) x	[h]	19 19
6.1.2	Manifold Back Pressure (5 kg/cm2) x	[h]	19 19
6.1.3	Manifold Back Pressure (10 kg/cm2) ^	[h]	
6.2	Pressurized, Full Cargo Discharge Times (all pumps):		VR W/O VR
6.2.1	Manifold Back Pressure (1 kg/cm2) ^	[h]	
6.2.2	Manifold Back Pressure (5 kg/cm2) ^	[h]	
6.2.3	Manifold Back Pressure (10 kg/cm2) ^	[h]	

x = Based on largest single tank volume

^ = Based on discharging tanks one at a time

2.7 UNPUMPABLES

B7	UNPUMPABLES	UNIT	CLIPPER QUITO
7.1	Unpumpables, liquid		
7.1.1	Tank 1	[m3]	8
7.1.2	Tank 2	[m3]	8
7.1.3	Tank 3	[m3]	8
7.1.4	Tank 4	[m3]	8
7.1.5	Total	[m3]	32

2.8 VAPORISING UNPUMPABLES

B8	VAPORISING UNPUMPABLES	UNIT	CLIPPER QUITO
8.1	Process Used	[Text]	Hot Gas / Puddle heating
8.2	Time to Vaporize Liquid Unpumpables After Discharge:		
8.2.1	Propane	[h]	8
8.2.2	Butane	[h]	12
8.2.3	Ammonia	[h]	
8.2.4		[h]	
8.2.5		[h]	

2.9 RELIQUEFACTION PLANT

B9	RELIQUEFACTION PLANT	UNIT	CLIPPER QUITO
9.1	Plant Design Conditions		
9.1.1	Air Temperature	[°C]	45
9.1.2	Sea Temperature	[°C]	32
9.2	Plant Type		
9.2.1	Single Stage/Direct	[Yes/No]	NO
9.2.2	Two Stage / Direct	[Yes/No]	NO
9.2.3	Three Stage / Direct	[Yes/No]	YES
9.2.4	Coolant Type	[Text]	Seawater
9.3	Compressors		
9.3.1	Type	[Text]	Sulzer + Burckhardt
9.3.2	Model	[Text]	4K165-3P_1
9.3.3	Number	[Psc]	2
9.3.4	Capacity (per unit)	[m3/h]	800 - 3000
9.3.5	Are they oil free?	[Yes/No]	YES

2.10 COOLING CAPACITY

B10	COOLING CAPACITY	UNIT	CLIPPER QUITO	
10.1	State Cooling Capacity (per compressor, 2-stage @ - 0.4 bar g)		SW 32 [°C]	SW 15 [°C]
10.1.1	1 Propane @ -42 [°C]	[kcal/h]		
10.1.2	2 Propane @ -20 [°C]	[kcal/h]		
10.1.3	3 Propane @ -5 [°C]	[kcal/h]		
10.1.4	4 Butane @ -42 [°C]	[kcal/h]		
10.1.5	5 Butane @ -20 [°C]	[kcal/h]		
10.1.6	6 Butane @ -5[°C]	[kcal/h]		
10.1.7	7	[kcal/h]		

2.11 CARGO TEMP. LOWERING CAPABILITY

B11	CARGO TEMPERATURE LOWERING CAPABILITY	UNIT	CLIPPER QUITO
11.0	Time taken to lower the temp of:		
11.1	Propane from ...0 [°C] to -42 [°C]	[h]	
11.2	-5[°C]to -42[°C]	[h]	
11.3	-38[°C] to -42[°C]	[h]	
11.4	+20[°C] to -0,5[°C]	[h]	
11.5	+10[°C] to -0,5[°C]	[h]	
11.6	Butane from +20[°C] to -0.5[°C]	[h]	
11.7	+10[°C] to -0.5[°C]	[h]	
11.8	+10[°C] to -5[°C]	[h]	
11.9	Butadiene from +20[°C] to -5[°C]	[h]	
11.10	Propylene from -20[°C] to -47[°C]	[h]	
11.11	Ammonia from -15[°C] to -33[°C]	[h]	

2.12 INERT GAS

B12	INERT GAS	UNIT	CLIPPER QUITO
12.1	Main IG Plant		
12.1.1	Type of System	[Text]	Combustion
12.1.2	Capacity	[m3/h]	5300
12.1.3	Type of Fuel Used	[Text]	MDO/MGO
12.1.4	Composition of I.G.		
12.1.5	Max O2	[%]	0,5
12.1.6	Max CO2	[%]	14
12.1.7	Max Nox	[%]	Traces
12.1.8	Max N2	[%]	Balance
12.2	Lowest Dewpoint Achievable	[°C]	-40
12.3	Used for	[Text]	Purging
12.4	Auxiliary IG or Nitrogen Plant		N/A
12.4.1	Type of System	[Text]	N/A
12.4.2	Capacity	[m3/h]	N/A
12.5	Lowest Dewpoint Achievable	[°C]	N/A
12.6	Used for	[Text]	N/A
12.7	Nitrogen generator installed?	[Yes/No]	NO
12.7.1	Liquid storage Capacity	[m3]	N/A
12.7.2	Daily Boil-Off Loss	[m3]	N/A
12.7.3	Maximum Supply Pressure	[Bar]	N/A
12.7.4	Supply Capacity	[m3/h]	N/A
12.7.5	Used For	[Text]	N/A
12.7.6	HP Nitrogen	[Nm3]	N/A

2.13 CARGO TANK INTERTING/DE-INERTING

B13	CARGO TANK INTERTING/DE-INERTING	UNIT	CLIPPER QUITO
13.1	Time Taken From Fresh Air to Under 5% O2 at -25oC Dewpoint	[h]	40
13.2	Time taken from cargo Vapor to Fully Inert at - 25oC Dewpoint when:		
13.2.1	IG density less than product	[h]	25
13.2.2	IG density greater than product	[h]	

2.14 GAS FREEING TO FRESH AIR

B14	GAS FREEING TO FRESH AIR	UNIT	CLIPPER QUITO
14.1	Plant Used	[Text]	Gas free fans
14.1.1	Number of fans	[Pcs]	2
14.1.2	Total capacity	[m3/h]	20000
14.2	Time taken from Fully Inert Condition to Fully Breathable Air	[h]	48

2.15 CHANGING CARGO GRADES

The table below show the number of hours needed to change grades from the removal of unpumpables to tanks fit to load. The quantity of inert gas consumed during the operation is also indicated.

B15	CHANGING CARGO GRADES	UNIT	CLIPPER QUITO	
15.1	From propane to:		[h]	[m3]
15.1.1	Iso-butane	[COL]		
15.1.2	Ammonia	[COL]		
15.2	From Iso-butane to:		[h]	[m3]
15.2.1	Propane	[COL]		
15.2.2	Ammonia	[COL]		
15.3	From ammonia to:		[h]	[m3]
15.3.1	Propane	[COL]		
15.3.2	Iso-butane	[COL]		

2.16 DECK TANK CAPACITIES

B16	DECK TANK CAPACITIES	UNIT	CLIPPER QUITO
16.1	Deck tank	[Yes/No]	NO
16.2	Deck tank capacities		N/A
16.2.1	1 Propane	[ton]	N/A
16.2.2	2 Ammonia	[ton]	N/A
16.2.3	3 Ethylene	[ton]	N/A
16.3	Maximum Allowable Relief Valve Setting	[bar g]	N/A
16.4	Lowest Permissible Temperature	[°C]	N/A
16.5	Materials	[Text]	N/A

2.17 PRE-LOADING CONDITIONS

The table below indicates time and quantity of coolant required to cool down cargo tanks from ambient temperature and fully gassed up state sufficient to allow loading to commence.

B17	PRE-LOADING CONDITIONS	UNIT	CLIPPER QUITO		
17.1	Product		Quantity [ton]	VPR [h]	W/O VPR [h]
17.1.1	Propane	[COL]	500	16	16
17.1.2	Butane	[COL]	600	8	8
17.1.3	Butadiene	[COL]			
17.1.4	Propylene	[COL]			
17.1.5	Ammonia	[COL]			
17.1.6	VCM	[COL]			

2.18 VAPORISER

B18	VAPORISER	UNIT	CLIPPER QUITO
18.1	Type of Vaporizer	[Text]	Tube
18.2	Number Fitted	[Pcs]	1
18.3	Capacity (per unit) – Propane	[Nm3/h]	4800
18.3.1	Liquid Supply rate	[m3/h]	42
18.3.2	Delivery temperature	[°C]	
18.4	Capacity (per unit) – Ammonia	[Nm3/h]	N/A
18.4.1	Liquid Supply rate	[m3/h]	
18.4.2	Delivery temperature	[°C]	
18.5		[Nm3/h]	
18.5.1		[m3/h]	
18.5.2		[°C]	

2.19 BLOWER

B19	BLOWER	UNIT	CLIPPER QUITO
19.1	Type of Blower	[Text]	
19.2	Number fitted	[Pcs]	
19.3	Rated Capacity (per unit)	[Nm ³ /h]	
19.4	Delivery Pressure	[Bar]	

2.20 CARGO RE-HEATER

Cargo re-heater capacities are given in the appendix.

B20	CARGO RE-HEATER	UNIT	CLIPPER QUITO
20.1	Type of re-heater	[Text]	Shell/tube
20.2	Number Fitted	[Pcs]	1
20.3	Heating Medium	[Medium]	Seawater
20.4	Discharge rates, SW = 15[°C], to raise product temperature:		
20.4.1	Propane from -42[°C] to 0[°C]	[ton/h]	400
20.4.2	Ammonia from -33[°C] to 0[°C]	[ton/h]	N/A
20.5	Cargo Heater Curve:	[Yes/No]	

2.21 HYDRATE CONTROL

B21	HYDRATE CONTROL	UNIT	CLIPPER QUITO
21.1	Type of Depressant	[Medium]	Etanol
21.2	Depressant Freezing Point Temperature	[°C]	-114
21.3	Max capacity of depressant	[Liter]	800
21.4	Means of Injection	[Text]	Hand pump
21.5	Any other system used	[Text]	Hot gas

2.22 CARGO MEASUREMENT

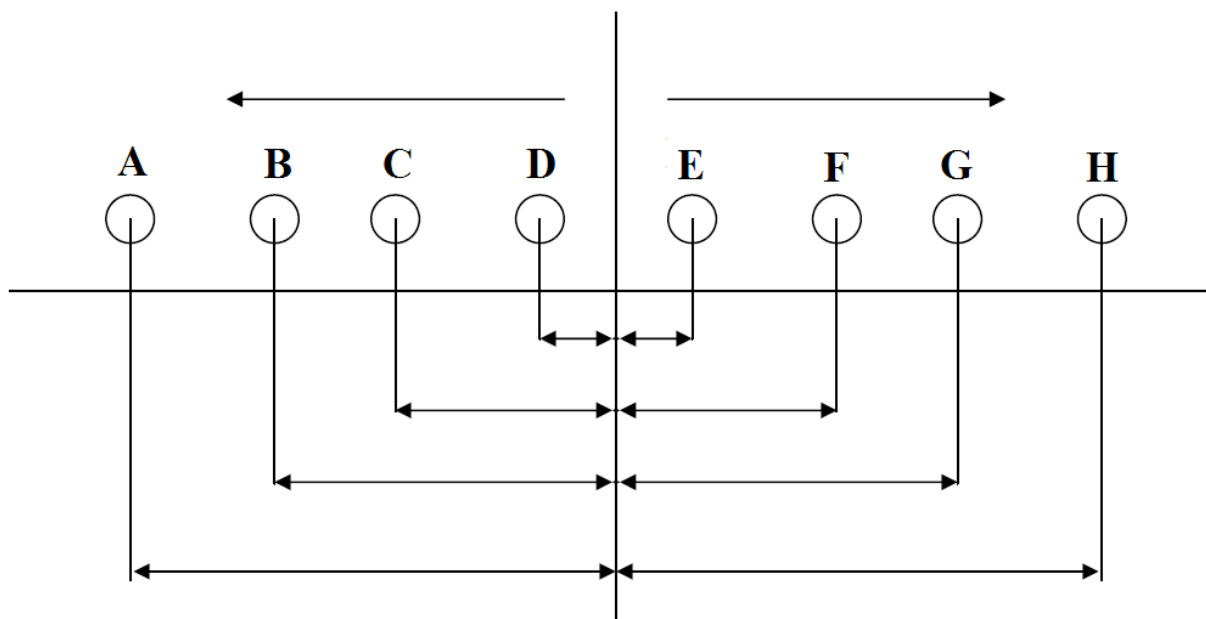
B22	CARGO MEASUREMENT	UNIT	CLIPPER QUITO
22.1	Level Gauges		
22.1.1	Are level gauges Local or Remote	[Text]	Remote
22.1.2	Manufacturer	[Text]	Kongsberg
22.1.3	Type	[Text]	Radar
22.1.4	Rated Accuracy	[-]	± 5 mm
22.1.5	Certifying Authority	[Text]	Intertek
22.2	Temperature Transmitter		
22.2.1	Manufacturer	[Text]	Kongsberg
22.2.2	Type	[Text]	Res. Thermometer
22.2.3	Rated Accuracy	[-]	
22.2.4	Certifying Authority	[Text]	Intertek
22.3	Pressure Transmitter		
22.3.1	Manufacturer	[Text]	Yokogawa El. CO
22.3.2	Type	[Text]	Abs. Press
22.3.3	Rated Accuracy	[-]	
22.3.4	Certifying Authority	[Text]	Intertek
22.4	Oxygen Analyzer		

22.4.1	Manufacturer	[Text]	RIKEN KEIKI
22.4.2	Type	[Text]	GX-8000
22.4.3	Lowest Level Measurable		
22.5	Fixed Gas Analyzer		
22.5.1	Manufacturer	[Text]	RIKEN KEIKI
22.5.2	Type	[Text]	RKK-2002K
22.6	Cargo Tank Calibration Tables		
22.6.1	Are Cargo Tank Calibration tables available	[Yes/No]	YES
22.6.2	Measuring Company	[Text]	Intertek
22.6.3	Certifying Authority	[Text]	NKK
22.6.4	Calibration calculated tocm ½ cm.....	[Yes/No]	YES
22.6.5	Tables established tocmcm.....mm	[Yes/No]	
22.6.6	Trim and List corrections Available	[YES/NO]	YES
22.6.7	Temperature Corrections available	[YES/NO]	YES
22.6.8	Float Gauge Tape Corrections Available	[YES/NO]	YES

2.23 CARGO SAMPLING

B23	CARGO SAMPLING	UNIT	CLIPPER QUITO			
23.1	Cargo tank sample level	[Tank]	1	2	3	4
23.1.1	Top	[Yes/No]	Yes	Yes	Yes	Yes
23.1.2	Middle	[Yes/No]	Yes	Yes	Yes	Yes
23.1.3	Bottom	[Yes/No]	Yes	Yes	Yes	Yes
23.2	Can sample be drawn from?					
23.2.1	Tank Vapor Outlet	[Yes/No]	YES			
23.2.2	Manifold Liquid Line	[Yes/No]	YES			
23.2.3	Manifold Vapor Line	[Yes/No]	YES			
23.2.4	Pump Discharge Line	[Yes/No]	YES			
23.3	State connection					
23.3.1	Type	[Text]				
23.3.2	Size	[Inch]	0,5			

2.24 CARGO MANIFOLD



B24	CARGO MANIFOLD	UNIT	CLIPPER QUITO			
24.1	Distance from center of manifold to:					
24.1.1	Stern	[m]	115,73			
24.1.2	Bow	[m]	109,48			
24.1.3	A	[mm]				
24.1.4	B	[mm]	5880			
24.1.5	C	[mm]	3630			
24.1.6	D	[mm]	1380			
24.1.7	E	[mm]	870			
24.1.8	F	[mm]	3120			
24.1.9	G	[mm]	5370			
24.1.10	H	[mm]				
24.2	Flange		Duty [Bar]	ASA	Size ["]	[R]aised/[F]lat
24.2.1	A	[COL]				
24.2.2	B	[COL]	Cargo Vapour	150	10	R
24.2.3	C	[COL]	Cargo Liquid	300	14	R
24.2.4	D	[COL]	Cargo Liquid	300	14	R
24.2.5	E	[COL]	Cargo Vapour	150	10	R
24.2.6	F	[COL]	Cargo Vapour	150	10	R
24.2.7	G	[COL]	Cargo Liquid	300	14	R
24.2.8	H	[COL]				
24.3	Height above uppermost continuous deck	[mm]	2110			
24.4	Distance from ship side	[mm]	4250			
24.5	Height above load waterline	[mm]	12310			
24.6	Height above light waterline	[mm]	17260			

2.25 CARGO REDUCERS

B25	CARGO REDUCERS	CLIPPER QUITO
25.0	ANSI 300	ANSI 300 -150
25.1	2 off 16"NB 300# ' 14"NB 300#	2 off 16"NB 150# ' 14"NB 300#
25.2	2 off 14"NB 300# ' 12"NB 300#	2 off 14"NB 300# ' 14"NB 150#
25.3	2 off 14"NB 300# ' 10"NB 300#	2 off 14"NB 300# ' 12"NB 150#
25.4	2 off 14"NB 300# ' 8"NB 300#	2 off 14"NB 300# ' 10"NB 150#
25.5		2 off 14"NB 300# ' 8"NB 150#
25.6		2 off 10"NB 300# ' 10"NB 150#
25.7		
25.8		
25.9		
25.0	ANSI 150	FUEL
25.1	2 off 12"NB 150# ' 10"NB 150#	
25.2	2 off 12"NB 150# ' 10"NB 150#	
25.3	2 off 10"NB 150# ' 8"NB 150#	
25.4	2 off 10"NB 150# ' 6"NB 150#	
25.5		
25.6		
25.7		
25.8		
25.9		

2.26 CONNECTION TO SHORE FOR ESD/COM SYSTEMS

B26	CONNECTIONS TO SHORE FOR ESD AND COM. SYSTEMS	UNIT	CLIPPER QUITO
26.1	Is ESD connection to Shore available?	[Yes/No]	YES
26.1.1	System	[Text]	
26.1.2	Type of plug	[Text]	
26.3	Is Hose or cables Available on Board	[Yes/No]	YES
26.3.1	Specify Length	[m]	35
26.3.2	Specify type	[Text]	

2.27 MANIFOLD DERRICK/CRANE

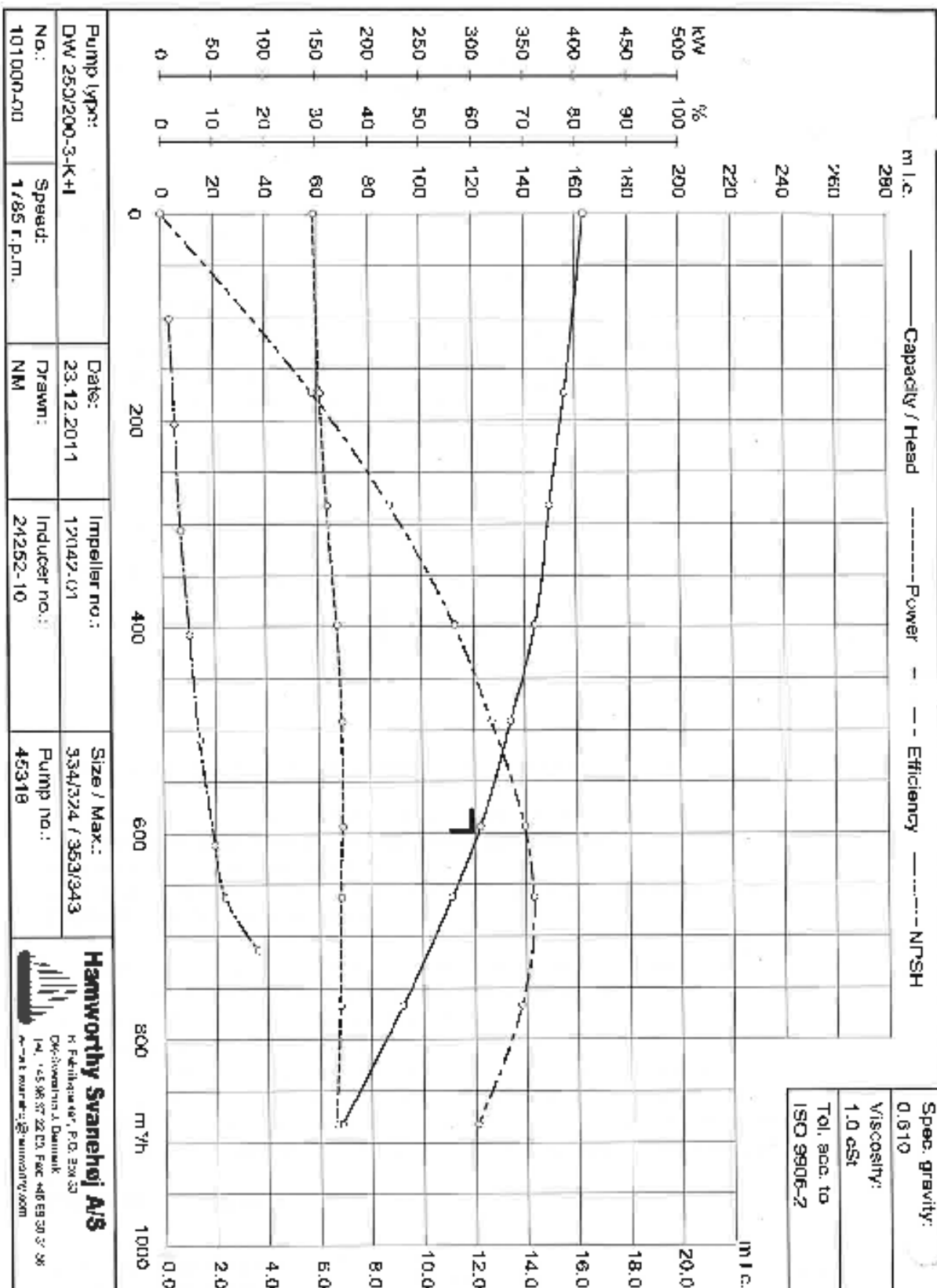
B27	MANIFOLD DERRICK/CRANE	UNIT	CLIPPER QUITO
27.1	Is Manifold Derrick Provided?	[Yes/No]	NO
27.2	Is Manifold Crane Provided?	[Yes/No]	YES
27.3	Is Lifting equipment Same P&SB?	[Yes/No]	NO
27.3.1	If NO, give details	[Text]	Center
27.3.2	Maximum outreach	[m]	6,7
27.3.3	Capacity at max. Outreach	[ton]	10

2.28 STORES HANDLING

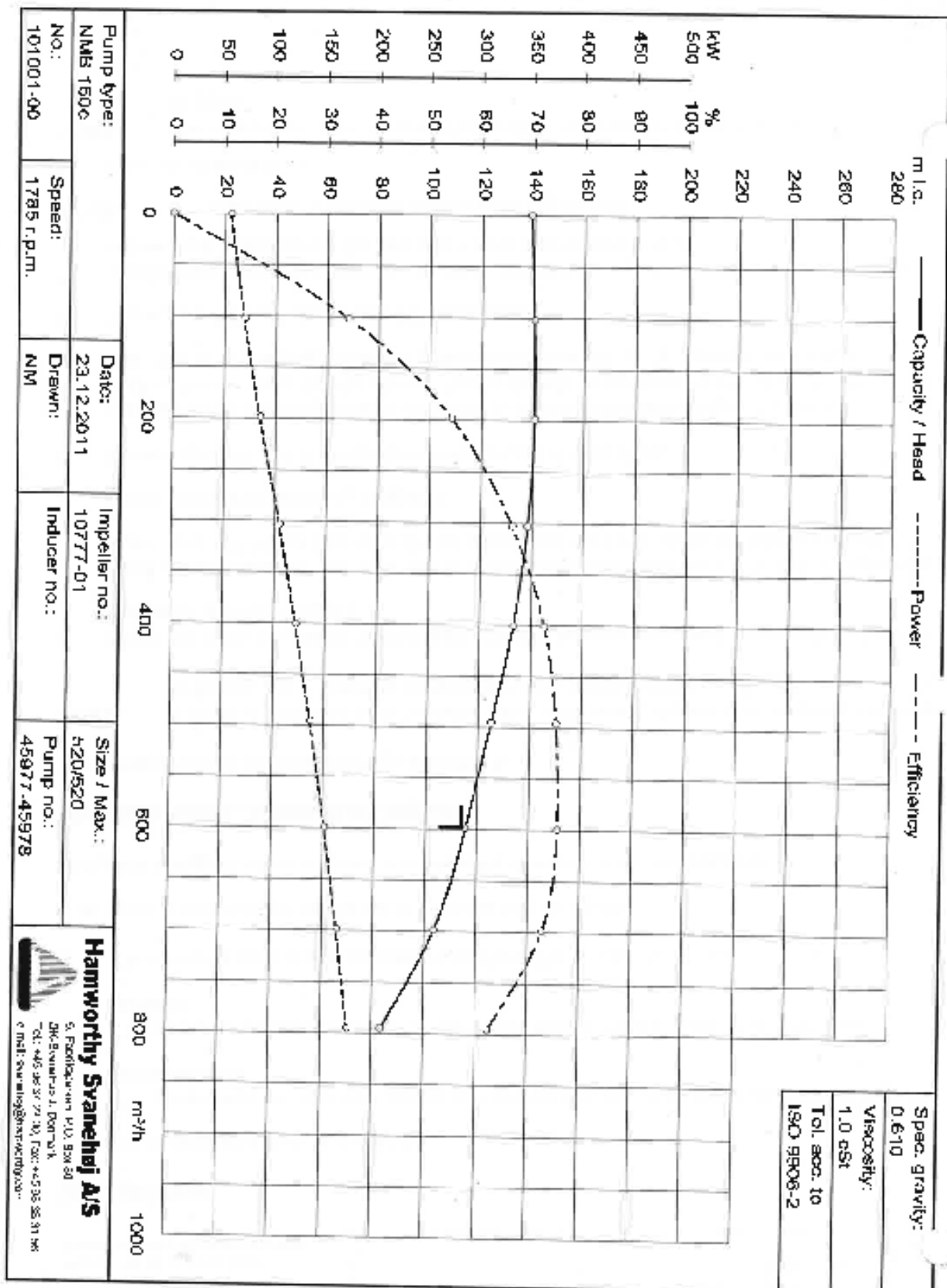
B28	STORES HANDLING	UNIT	CLIPPER QUITO
28.1	Number of cranes	[Pcs]	2
28.1.1	Location(s)	[Text]	P/S Bridge deck

3. APPENDIX/DRAWINGS

3.1 CARGO PUMPS



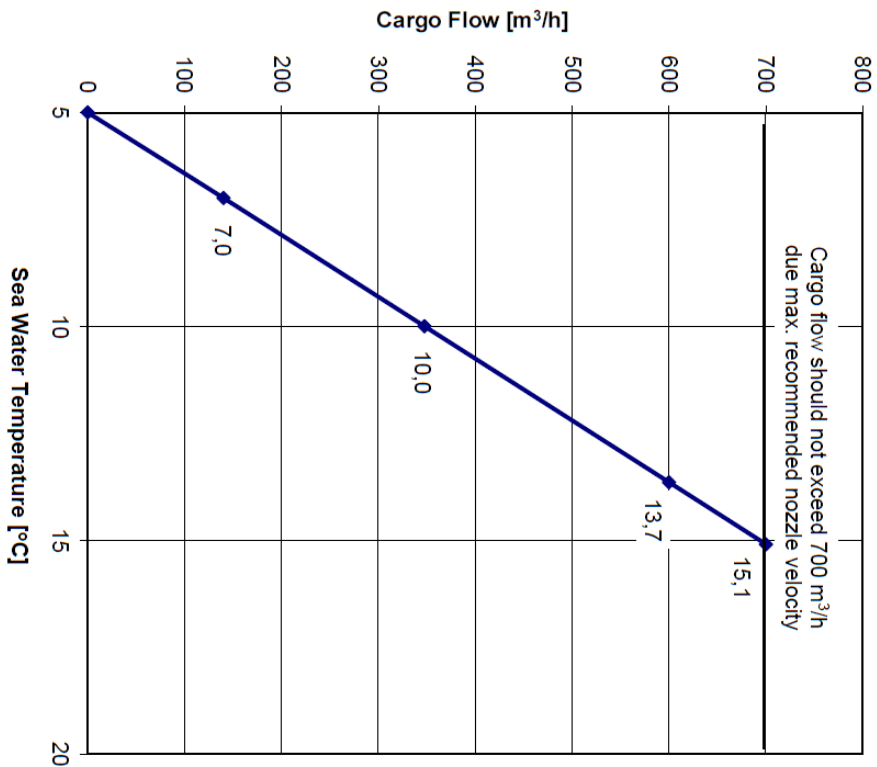
3.2 BOOSTER PUMPS



3.3 RE-HEATER CAPACITY, BUTANE

3.4 RE-HEATER CAPACITY, PROPANE

Cargo Heater Capacity Propane



PROPANE

Cargo Heater Design

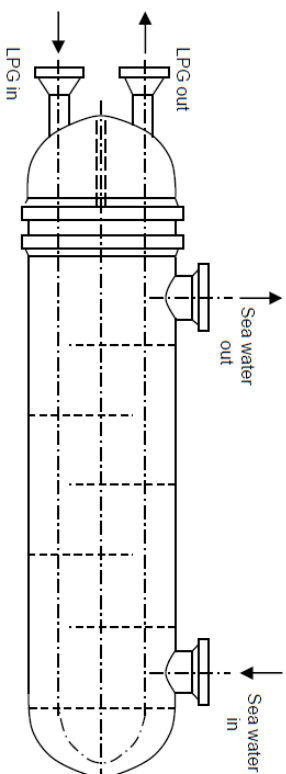
Hamworthy Oil & Gas Systems type 240/335/122.3/2U TI
Tube bundle in titan (ASTM B338 Gr 2), U type

Operating Conditions

Propane (liquid)
Cargo inlet Temperature -42 °C
Cargo outlet temperature 0 °C
Cargo inlet pressure 7 bar g
Sea water consumption 900 m³/h

Example similar to Design Case:

Required capacity 600 m³/h
Min. sea water temp. 13.7 °C



Note:

Sea water outlet temperature should not be less than 5°C

Project: 400776/77
Customer: Hyundai Heavy Industries Co. Ltd.

	Date	Sign	Scale	Capacity Diagram	Page: 2
Draw.	22.05.2013	MAS		Cargo Heater	of 12
Design	22.05.2013	JDM		240/335/122.3/2U TI	
Check.	22.05.2013	MN			
Hamworthy Oil & Gas Systems a.s Norway				1315546	
				Rev. 00	
				22.05.2013	

3.5 MOORING DIAGRAM

