

GAS FORM-C

CLIPPER STAR



«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.

«Industry leading provider of LPG and petrochemical tonnage»

1. SECTION A – GENERAL INFORMATION

1.1 PRINCIPAL SHIP PARTICULARS

A1	PRINCIPAL SHIP PARTICULARS		CLIPPER STAR
1.0	Date Questionnaire Completed		13.03.2017
1.1	Name of vessel		Clipper Star
1.2	LR/IMO Number		IMO 9247807
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		LAWX5
1.11	VSAT		+44 207 858 5764
1.12	Fleet 77		
1.13	Fax		
1.14	Mini – M		
1.15	E-mail		master.clipper.star@solvangship.no
1.16	GSM Mobile		+47 951 84 449
1.17	SAT C		
1.18	Vessel's MMSI Number		258779000
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
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 LGC DA
1.22	Visitor's address		Haakon VII Gate 8
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-lgc@solvangship.no
1.28	Number of Years Vessel Owned		13,9
1.29	NAME OF TECHNICAL OPERATOR		Solvang ASA
1.30	Visitor's address		Haakon VII Gate 8
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-lgc@solvangship.no
1.36	Number of Years as vessel Operator		13,9
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	13,9	
1.44	Builder	Kawasaki	
1.45	Name of Yard Vessel Built At	Sakaide shipyard	
1.46	Hull Number	1522	
1.47	Date Keel Laid	26.06.2002	
1.48	Date Launched	20.08.2002	
1.49	Date Delivered	26.03.2003	
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 STAR
1.52	Classification Society	[Text]	DNV GL
1.53	Class Notation	[Text]	+1A1 TANKER FOR LIQUIFIED GAS
1.53.1	Cont.	[Text]	2G, E0, NALITICUS
1.53.2	Cont.	[Text]	PLUS-1 TMON
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 recieved
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 recieved
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]	YES
1.57.5	Issued By	[Text]	DNV GL
1.58	Unattended Machinery Space certificate	[Yes/No]	Yes (24h)
A1	TONNAGES	UNIT	CLIPPER STAR
1.59	Nett Registered Tonnage	[NT]	11053
1.60	Gross Tonnage	[GT]	34970
1.61	Suez Canal Tonnage		
1.61.1	Net Tonnage	[NT]	32107,23
1.61.2	Gross Tonnage	[GT]	36774,4
1.62	Panama Canal Tonnage		
1.62.1	Net Tonnage	[NT]	28963
1.62.2	Gross Tonnage	[GT]	

1.2 HULL DIMENSIONS

A2	HULL DIMENSIONS	UNIT	CLIPPER STAR
2.1	Length Overall	[m]	205,0
2.2	Length Between Perpendiculars	[m]	195,0
2.3	Distance Bow to Bridge	[m]	169,0
2.4	Distance Bridge Front to Mid-Point Manifold	[m]	64,0
2.5	Distance Bow to Mid-Point Manifold	[m]	105,0
2.6	Extreme Breadth	[m]	32,2
2.7	Extreme Depth	[m]	20,2
2.8	Summer Draught	[m]	12,0
2.9	Corresponding Deadweight	[ton]	44807,0
2.10	Light Displacement/weight	[ton]	15830,0
2.11	Loaded Displacement (Summer)	[ton]	60637,0
2.12	Cargo Tank Cubic Capacity (100% full)	[m3]	58155,2
2.13	Distance from Keel to Highest Point (With mast down)	[m]	47,7
2.14	Air Draught normal ballast (With mast down)	[m]	40,2

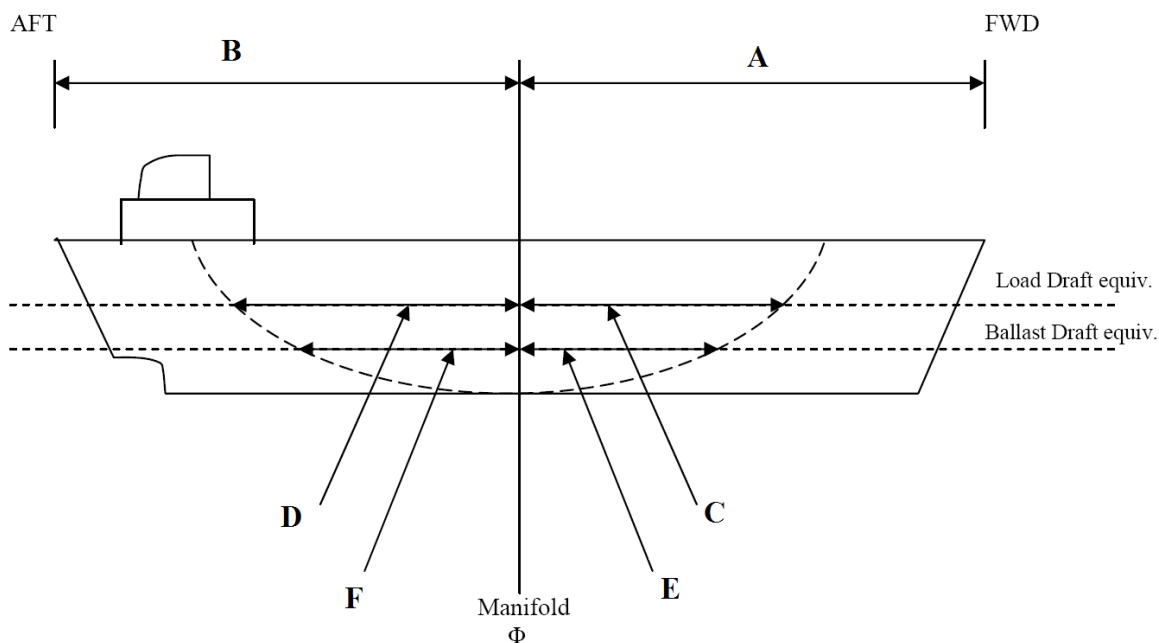
1.3 IMMERSION

A3	IMMERSION	UNIT	CLIPPER STAR
3.1	Normal Ballast Draught	[TPC]	51,40
3.1.1	Draught	[m]	7,2
3.2	Loaded Draught	[TPC]	56,5
3.2.1	Draught	[m]	12,02

1.4 LOADED PARTICULARS

A4	LOADED PARTICULARS	UNIT	CLIPPER STAR		
4.1	Cargo:		Propane	VCM	Ammonia
4.2	Density:	[ton/m3]	0,58		0,68
4.3	Cargo	[ton]	33835,00		39580
4.4	Bunkers	[ton]	3518,45		3518,44565
4.5	DO	[ton]			
4.6	Fresh Water	[ton]	262,00		262
4.7	Stores/Spares	[ton]	392		392
4.8	Lube Oil	[ton]	126		126
4.9	Ballast	[ton]	777		777
4.10	Deadweight Const.	[ton]			
4.11	Draught – Forward	[m]	10,98		11,63
4.11.1	Aft	[m]	11,98		12,21
4.11.2	Equiv.	[m]			

1.5 PARALLEL MID-BODY DIMENSIONS



A5	PARALLEL MID-BODY DIMENSIONS	UNIT	CLIPPER STAR
5.1	A Manifold to FWD	[m]	105,00
5.2	B Manifold to AFT	[m]	100
5.3	Loaded draft equiv-		
5.3.1	C Manifold to FWD side tangent line	[m]	36,4
5.3.2	D Manifold to AFT side tangent line	[m]	57,7
5.4	Ballast draft equiv.		
5.4.1	E Manifold to FWD	[m]	36,2
5.4.2	F Manifold to AFT	[m]	49,8

1.6 BUNKER CAPACITIES

A6	BUNKER CAPACITIES	UNIT	CLIPPER STAR
6.1	HFO	[Grade]	IFO 380 (Standard)
6.1.1	Capacity @ 100 %	[m3]	2522,1
6.2	LSHFO	[Grade]	N/A
6.2.1	Capacity @ 100 %	[m3]	N/A
6.3	Diesel Oil	[Grade]	D0
6.3.1	Capacity @ 100 %	[m3]	1135,6

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 STAR
7.1	LOADED CONDITION		*About
7.2	Average speed over 12 months	[kn]	16,00
7.3	Average consumption, Main engine	[ton/day]	43
7.4	Consumption, AUX		
7.4.1	Butane	[ton/day]	4,5
7.4.2	Propane/Ammonia	[ton/day]	4-9
7.5	Average consumption, AUX		
7.5.1	Butane	[ton/day]	4,5
7.5.2	Propane/Ammonia	[ton/day]	6
7.6	BALLAST CONDITION		
7.7	Average speed over 12 months	[kn]	16
7.8	Average consumption, Main engine	[ton/day]	41
7.9	Average consumption, AUX	[ton/day]	4
7.10	PORT/IDLE		
7.11	Average consumption, AUX, Loading	[ton/day]	8,5
7.12	Average consumption, AUX, Discharging	[ton/day]	6
7.13	Average consumption, AUX, Idle	[ton/day]	3,5
7.14	Average consumption, Boiler (depending on weather)	[ton/day]	2,0-3,0
7.15	OTHER		
7.16	INCN (When operating) - MDO/MGO	[ton/day]	0,2
7.17	IGG-plant (When operating)	[ton/day]	0,2
7.18	ME CONSUMPTION GRAPH/KNOTS		LOADED BALLAST
7.18.1	16,2	[ton/day]	47,0 45,0
7.18.2	16	[ton/day]	43,0 41,0
7.18.3	15	[ton/day]	34,0 32,0
7.18.4	13	[ton/day]	25,0 23,0
7.18.5	10	[ton/day]	18,0 17,0

1.8 MAIN ENGINE PARTICULARS

A8	MAIN ENGINE PARTICULARS	UNIT	CLIPPER STAR
8.1	Main Engine Make and Type	[Text]	KAWASAKI-MAN B&W 5S60MC-C
8.2	No of Units	Pcs	1
8.3	Maximum Continuous Rating (MCR)	[kW]	11275
8.3.1	RPM	[RPM]	105
8.4	Total Available Power	kW	11 275
8.5	Normal service Power	kW	10 147

1.9 AUXILIARY PLANT

A9	AUXILIARY PLANT	UNIT	CLIPPER STAR
9.1	Make and Type of Auxiliary Generators	[Text]	MAN B&W Holeby 8L23/30h
9.2	Main Generators	[Pcs]	
9.2.1	No of Units	[Pcs]	2
9.2.2	Maximum Generator Output per Unit	[kW]	1 470
9.3	Generators, other	[Yes/No]	MAN B&W Holeby 5L23/30

9.3.1	No of Units	[Pcs]	1
9.3.2	Maximum Generator Output per Unit	[kW]	1 050
9.4	Shaft Generator	[kW]	N/A
9.5	Total Available Power	[kW]	3990
9.6	Emergency Generator	[kW]	200
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]	15

1.10 POWER/SPEED INFORMATION

A10	POWER/SPEED INFORMATION	UNIT	CLIPPER STAR
10.1	Trial Data		
10.1.1	NCR	[kW]	10 150
10.1.2	MCR	[kW]	11 275
10.1.3	Speed	[kn]	17,4
10.1.4	Draught	[m]	7,25
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 STAR
11.1	Make and Type	[Text]	Kawasaki KT-157B3
11.2	No. Installed	[Pcs]	1,00
11.3	Location and Rated Bollard Pull or kW output	[kW]	1200

1.12 FRESH WATER

A12	FRESH WATER	UNIT	CLIPPER STAR
12.1	Capacity of Distilled Tanks	[ton]	N/A
12.2	Capacity of F/D.W. Ts	[ton]	262,20
12.3	Daily Consumption	[ton/day]	10,00
12.4	Daily Evaporator Output	[ton/day]	30,00

1.13 BALLAST CAPACITIES AND PUMPS

A13	BALLAST CAPACITIES AND PUMPS	UNIT	CLIPPER STAR	
13.1	Tank Capacities		Capacity [m3]	Tanks [Pcs]
13.1.1	Forepeak	[Col]	601,20	1
13.1.2	Wing or Side tanks	[Col]	14195,4	8
13.1.3	Aft Peak	[Col]	602,3	1
13.1.4	Other	[Col]		
13.1.5	Other	[Col]		
13.1.6	Total	[Col]	15 398,90	10
13.2	Ballast Pumps			
13.2.1	Capacity per pump	[m3/h]	800	
13.2.2	Model	[Text]	SVA300MU	
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, Bridge	

1.14 MOORING

A14	MOORING EQUIPMENT	UNIT	CLIPPER STAR			
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	64	64	64
14.3.4	Length	[m]	220	220	220	220
14.3.5	Maximum Breaking Load	[ton]	84	84	84	84
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]	20	20	15	20
14.4.6	Brake capacity	[ton]	50	50	50	50
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]	2	2/2		
14.5.2	Type	[Text]	Steel	MAXI-CARAT		
14.5.3	Diameter	[mm]	28	68		
14.5.4	Length	[m]	100	220		

14.5.5	Maximum Breaking Load	[ton]	50	94	
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A14	ANCHORS AND WINDLASSES	UNIT	CLIPPER STAR
14.5.1	Windlass Motive Power (e.g. Steam, Hydraulic)	[Text]	Hydraulic
14.5.2	Hauling Power	[ton]	20
14.5.3	Brake Holding Power	[ton]	67
14.5.4	Anchor Type	[Text]	Bower AC-14
14.5.5	Weight	[kg]	7 425
14.5.6	Is Spare Carried	[Yes/No]	NO
14.5.7	Cable Diameter	[mm]	78
14.5.8	No of Shackles Port	[Pcs]	12
14.5.9	No of Shackles Starboard	[Pcs]	12
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]	80
14.6.3	Is Towing Chain provided	[Yes/No]	YES
14.6.4	Dimensions of Towing Wire - Diameter	[mm]	57
14.6.5	Length	[m]	160
14.7	Windage on Ballast Draught		
14.7.1	End-on	[m2]	135,93
14.7.2	Lateral	[m2]	865,95

Mooring diagram is provided in the appendix.

1.15 NAVIGATIONAL EQUIPMENT

A15	NAVIGATIONAL EQUIPMENT	UNIT	CLIPPER STAR
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]	
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]	Transas
15.12	Depth Echo Sounder with Recorder	[Yes/No]	YES
15.13	Depth Echo Sounder without Recorder	[Yes/No]	NO
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]	YES
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]	YES
15.37	Steering motor controls controls fitted on bridge wings	[Yes/No]	YES
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]	
15.39.2	Limited	[Yes/No]	YES
15.39.3	If Limited Please Indicate	[Text]	
15.40	Formal Chart Correction System in use	[Yes/No]	
15.41	Electronic Chart System in use	[Yes/No]	YES

1.16 COMMUNICATIONS EQUIPMENT

A16	COMMUNICATIONS EQUIPMENT	UNIT	CLIPPER STAR
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]	
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]	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]	
16.15.1	EPIRB	[Yes/No]	YES
16.15.2	SARTS	[Yes/No]	YES
16.16	Emergency Lifeboat Transceiver	[Yes/No]	YES
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 STAR	
1.1	List Products Which the Ship is Certified to Carry			
1.1.1	1.	Ammonia		
1.1.2	2.	Butane		
1.1.3	3.	Butane/propane		
1.1.4	4.	Butadiene		
1.1.5	5.	Butylene		
1.1.6	6.	Propane		
1.1.7	7.	Propylene		
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]	0,275
1.3.2	Maximum Allowable Tank Pressure (Harbour setting)		[bar g]	0,4
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 STAR
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]	0,4
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]	0,25
2.5	Maximum Cargo Density (98% full)	[kg/m3]	685
2.6	Maximum Rate of Cool-Down	[C/h]	10

2.7	State any Limitations regarding Partially Filled Tanks	[Text]	NO
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 STAR				
3.1	Capacity	Tank	1	2	3	4	Total
3.1.1	100 %	[m3]	14413	14843	14845	15241	59342
3.1.2	98 %	[m3]	14125	14546	14548	14936	58155
3.2	Cargo						
3.2.1	iso-butane	[ton]	8390	8640	8642	8872	34544
3.2.2	Propane	[ton]	8192	8437	8438	8663	33730
3.2.3	Butadiene	[ton]	9195	9470	9471	9723	37859
3.2.4	Propylene	[ton]	8616	8873	8874	9111	35475
3.2.5	Ammonia	[ton]	9605	9891	9893	10157	39546
3.2.6	Butylene/Butenes	[ton]	8390	8640	8642	8872	34544
3.2.7	n-butane	[ton]	8489	8742	8743	8977	34951
3.2.8	Ethylene	[ton]					

- Cargoes may not be applicable for this 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 STAR			
			REFRIGERATED		PRESSURE	
4.1	Cargo	[m3/h]	VR	W/O VR	VR	W/O VR
4.1.1	1 Butane	[m3/h]	2000	2000		
4.1.2	2 Propane	[m3/h]	2000	2000		
4.1.3	3 Ammonia	[m3/h]	2000	2000		
4.1.4	4 Butane (0-30°C)	[m3/h]			1000	1000
4.1.5	5 Propane (0°C)	[m3/h]			200	200
4.1.6	6 Propane (10°C)	[m3/h]			100	100
4.1.7	7 Propane (20°C)	[m3/h]			100	1000
4.1.8	8 Propane (30°C)	[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 STAR
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]	500
5.1.4	Delivery Head	[mlc]	130
5.1.5	Maximum Density	[kg/m3]	685
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]	500
5.2.4	Delivery Head	[mlc]	130
5.2.5	Maximum Density	[kg/m3]	685

2.6 DISCHARGE PRESSURE

B6	DISCHARGE PERFORMANCE	UNIT	CLIPPER STAR
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]	15 15
6.1.2	Manifold Back Pressure (5 kg/cm2) x	[h]	20 20
6.1.3	Manifold Back Pressure (10 kg/cm2) ^	[h]	50 50
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 STAR
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 STAR
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]	20
8.2.4		[h]	
8.2.5		[h]	

2.9 RELIQUEFACTION PLANT

B9	RELIQUEFACTION PLANT	UNIT	CLIPPER STAR
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]	YES
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]	3K140-3A
9.3.3	Number	[Psc]	4
9.3.4	Capacity (per unit)	[m3/h]	Varies
9.3.5	Are they oil free?	[Yes/No]	YES

2.10 COOLING CAPACITY

B10	COOLING CAPACITY	UNIT	CLIPPER STAR	
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]	140000	
10.1.2	2 Propane @ -20 [°C]	[kcal/h]	245000	
10.1.3	3 Propane @ -5 [°C]	[kcal/h]	280000	
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]	480000	
10.1.7	7	[kcal/h]		

2.11 CARGO TEMP. LOWERING CAPABILITY

B11	CARGO TEMPERATURE LOWERING CAPABILITY	UNIT	CLIPPER STAR
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]	48
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]	48
11.7	+10[°C] to -0.5[°C]	[h]	30
11.8	+10[°C] to -5[°C]	[h]	40
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 STAR
12.1	Main IG Plant		
12.1.1	Type of System	[Text]	Gas Oil Burning
12.1.2	Capacity	[m3/h]	5500
12.1.3	Type of Fuel Used	[Text]	MDO/MGO
12.1.4	Composition of I.G.		
12.1.5	Max O2	[%]	0,1
12.1.6	Max CO2	[%]	15
12.1.7	Max Nox	[%]	Traces
12.1.8	Max N2	[%]	Balance
12.2	Lowest Dewpoint Achievable	[°C]	-40
12.3	Used for	[Text]	
12.4	Auxiliary IG or Nitrogen Plant		
12.4.1	Type of System	[Text]	Buffer tank
12.4.2	Capacity	[m3/h]	20
12.5	Lowest Dewpoint Achievable	[°C]	-25
12.6	Used for	[Text]	Void Space padding
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 STAR
13.1	Time Taken From Fresh Air to Under 5% O2 at -25oC Dewpoint	[h]	48
13.2	Time taken from cargo Vapor to Fully Inert at - 25oC Dewpoint when:		
13.2.1	IG density less than product	[h]	36
13.2.2	IG density greater than product	[h]	48

2.14 GAS FREEING TO FRESH AIR

B14	GAS FREEING TO FRESH AIR	UNIT	CLIPPER STAR
14.1	Plant Used	[Text]	Blowers
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]	17

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 STAR	
15.1	From propane to:		[h]	[m3]
15.1.1	Iso-butane	[COL]		
15.1.2	Ammonia	[COL]	130	88500
15.2	From Iso-butane to:		[h]	[m3]
15.2.1	Propane	[COL]	36	88500
15.2.2	Ammonia	[COL]	130	88500
15.3	From ammonia to:		[h]	[m3]
15.3.1	Propane	[COL]	140	88500
15.3.2	Iso-butane	[COL]	120	88500

2.16 DECK TANK CAPACITIES

B16	DECK TANK CAPACITIES	UNIT	CLIPPER STAR
16.1	Deck tank	[Yes/No]	NO
16.2	Deck tank capacities		
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 STAR		
17.1	Product		Quantity [ton]	VPR [h]	W/O VPR [h]
17.1.1	Propane	[COL]	400	24	48
17.1.2	Butane	[COL]	400	24	24
17.1.3	Butadiene	[COL]	400	24	48
17.1.4	Propylene	[COL]			
17.1.5	Ammonia	[COL]			
17.1.6	VCM	[COL]			

2.18 VAPORISER

B18	VAPORISER	UNIT	CLIPPER STAR
18.1	Type of Vaporizer	[Text]	Shell and tube
18.2	Number Fitted	[Pcs]	1
18.3	Capacity (per unit) – Propane	[Nm3/h]	4000
18.3.1	Liquid Supply rate	[m3/h]	10
18.3.2	Delivery temperature	[°C]	-10
18.4	Capacity (per unit) – Ammonia	[Nm3/h]	3600
18.4.1	Liquid Supply rate	[m3/h]	10
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 STAR
19.1	Type of Blower	[Text]	Centrigugal
19.2	Number fitted	[Pcs]	2
19.3	Rated Capacity (per unit)	[Nm3/h]	20000
19.4	Delivery Pressure	[Bar]	0,16

2.20 CARGO RE-HEATER

Cargo re-heater capacities are given in the appendix.

B20	CARGO RE-HEATER	UNIT	CLIPPER STAR
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]	500
20.4.2	Ammonia from -33[°C] to 0[°C]	[ton/h]	450
20.5	Cargo Heater Curve:	[Yes/No]	YES

2.21 HYDRATE CONTROL

B21	HYDRATE CONTROL	UNIT	CLIPPER STAR
21.1	Type of Depressant	[Medium]	Other
21.2	Depressant Freezing Point Temperature	[°C]	-117
21.3	Max capacity of depressant	[Liter]	1000
21.4	Means of Injection	[Text]	Hand pump
21.5	Any other system used	[Text]	

2.22 CARGO MEASUREMENT

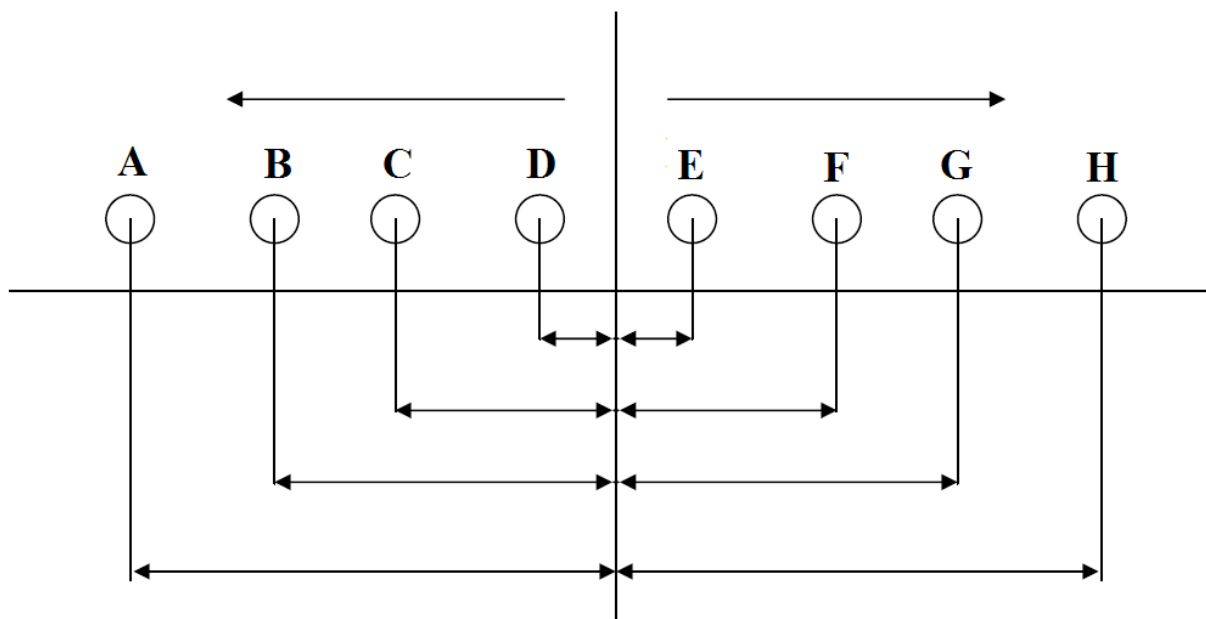
B22	CARGO MEASUREMENT	UNIT	CLIPPER STAR
22.1	Level Gauges		
22.1.1	Are level gauges Local or Remote	[Text]	Both
22.1.2	Manufacturer	[Text]	Kongsberg
22.1.3	Type	[Text]	Float
22.1.4	Rated Accuracy	[-]	± 3 mm
22.1.5	Certifying Authority	[Text]	DNV
22.2	Temperature Transmitter		
22.2.1	Manufacturer	[Text]	Kongsberg
22.2.2	Type	[Text]	PT100
22.2.3	Rated Accuracy	[-]	0,3
22.2.4	Certifying Authority	[Text]	DNV
22.3	Pressure Transmitter		
22.3.1	Manufacturer	[Text]	Kongsberg
22.3.2	Type	[Text]	Transmitter
22.3.3	Rated Accuracy	[-]	2 mbar
22.3.4	Certifying Authority	[Text]	DNV
22.4	Oxygen Analyzer		

22.4.1	Manufacturer	[Text]	Servomex
22.4.2	Type	[Text]	Xendos 1800
22.4.3	Lowest Level Measurable		0.01% O2
22.5	Fixed Gas Analyzer		
22.5.1	Manufacturer	[Text]	Bravida
22.5.2	Type	[Text]	Catalytic
22.6	Cargo Tank Calibration Tables		
22.6.1	Are Cargo Tank Calibration tables available	[Yes/No]	YES
22.6.2	Measuring Company	[Text]	NKKK
22.6.3	Certifying Authority	[Text]	DNV
22.6.4	Calibration calculated tocm ½ cm.....	[Yes/No]	YES
22.6.5	Tables established tocmcm.....mm	[Yes/No]	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 STAR
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]	Open loop
23.3.2	Size	[Inch]	0,5

2.24 CARGO MANIFOLD



B24	CARGO MANIFOLD	UNIT	CLIPPER STAR			
24.1	Distance from center of manifold to:					
24.1.1	Stern	[m]	99,9			
24.1.2	Bow	[m]	104,9			
24.1.3	A	[mm]	5850			
24.1.4	B	[mm]	5050			
24.1.5	C	[mm]	3750			
24.1.6	D	[mm]	1250			
24.1.7	E	[mm]	1250			
24.1.8	F	[mm]	3750			
24.1.9	G	[mm]	4970			
24.1.10	H	[mm]	5270			
24.2	Flange		Duty [Bar]	ASA	Size ["]	[R]aised/[F]lat
24.2.1	A	[COL]	Fuel Oil	100	8	F
24.2.2	B	[COL]	Gas Oil	100	6	F
24.2.3	C	[COL]	Cargo Liquid	250	14	R
24.2.4	D	[COL]	Cargo Vapour	100	10	R
24.2.5	E	[COL]	Cargo Vapour	100	10	R
24.2.6	F	[COL]	Cargo Liquid	250	14	R
24.2.7	G	[COL]	Other	100	6	F
24.2.8	H	[COL]	Fuel Oil	100	8	F
24.3	Height above uppermost continuous deck	[mm]	1246			
24.4	Distance from ship side	[mm]	3500			
24.5	Height above load waterline	[mm]	9910			
24.6	Height above light waterline	[mm]	14100			

2.25 CARGO REDUCERS

B25	CARGO REDUCERS	CLIPPER STAR
25.0	ANSI 300	ANSI 300 -150
25.1	2 off 14"NB 300# ' 12"NB 300#	2 off 14"NB 300# ' 16"NB 150#
25.2	2 off 14"NB 300# ' 10"NB 300#	2 off 14"NB 300# ' 14"NB 150#
25.3	2 off 14"NB 300# ' 8"NB 300#	2 off 14"NB 300# ' 12"NB 150#
25.4	1 off 14"NB 300# ' 6"NB 300#	2 off 14"NB 300# ' 10"NB 150#
25.5	2 off 14"NB 300# ' 6"NB 300#	2 off 14"NB 300# ' 8"NB 150#
25.6		
25.7		
25.8		
25.9		
25.0	ANSI 150	FUEL
25.1	2 off 10"NB 150# ' 12"NB 150#	
25.2	2 off 10"NB 150# ' 8"NB 150#	
25.3	2 off 10"NB 150# ' 6"NB 150#	
25.4		
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 STAR
26.1	Is ESD connection to Shore available?	[Yes/No]	YES
26.1.1	System	[Text]	Electric
26.1.2	Type of plug	[Text]	Nato standard
26.3	Is Hose or cables Available on Board	[Yes/No]	YES
26.3.1	Specify Length	[m]	50
26.3.2	Specify type	[Text]	SIG 04 cable

2.27 MANIFOLD DERRICK/CRANE

B27	MANIFOLD DERRICK/CRANE	UNIT	CLIPPER STAR
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]	22,5
27.3.3	Capacity at max. Outreach	[ton]	7,5

2.28 STORES HANDLING

B28	STORES HANDLING	UNIT	CLIPPER STAR
28.1	Number of cranes	[Pcs]	2
28.1.1	Location(s)	[Text]	Aft

3. APPENDIX/DRAWINGS

3.1 CARGO PUMPS

Fig. 10.1 Performance curve - Deepwell pumps

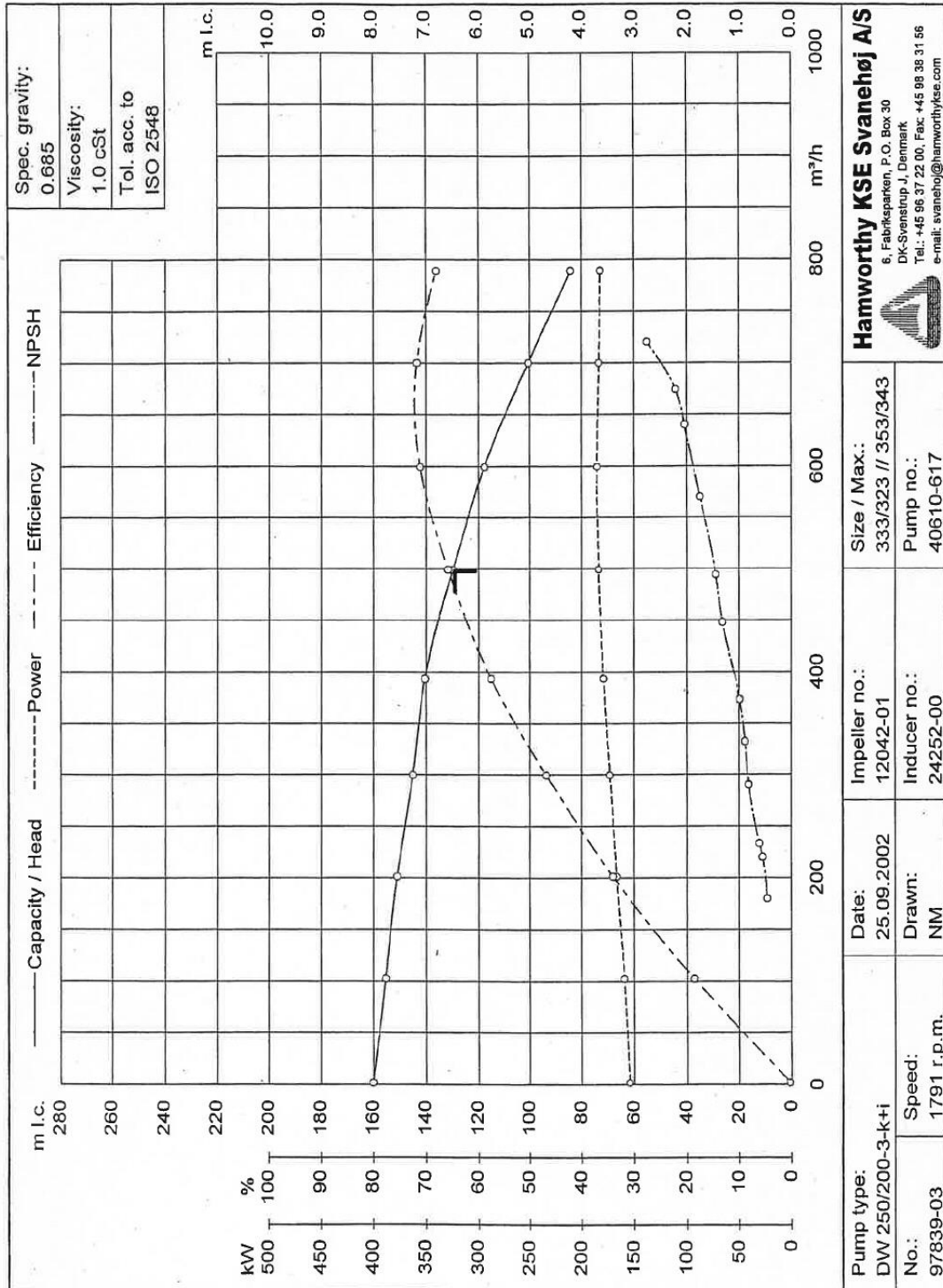
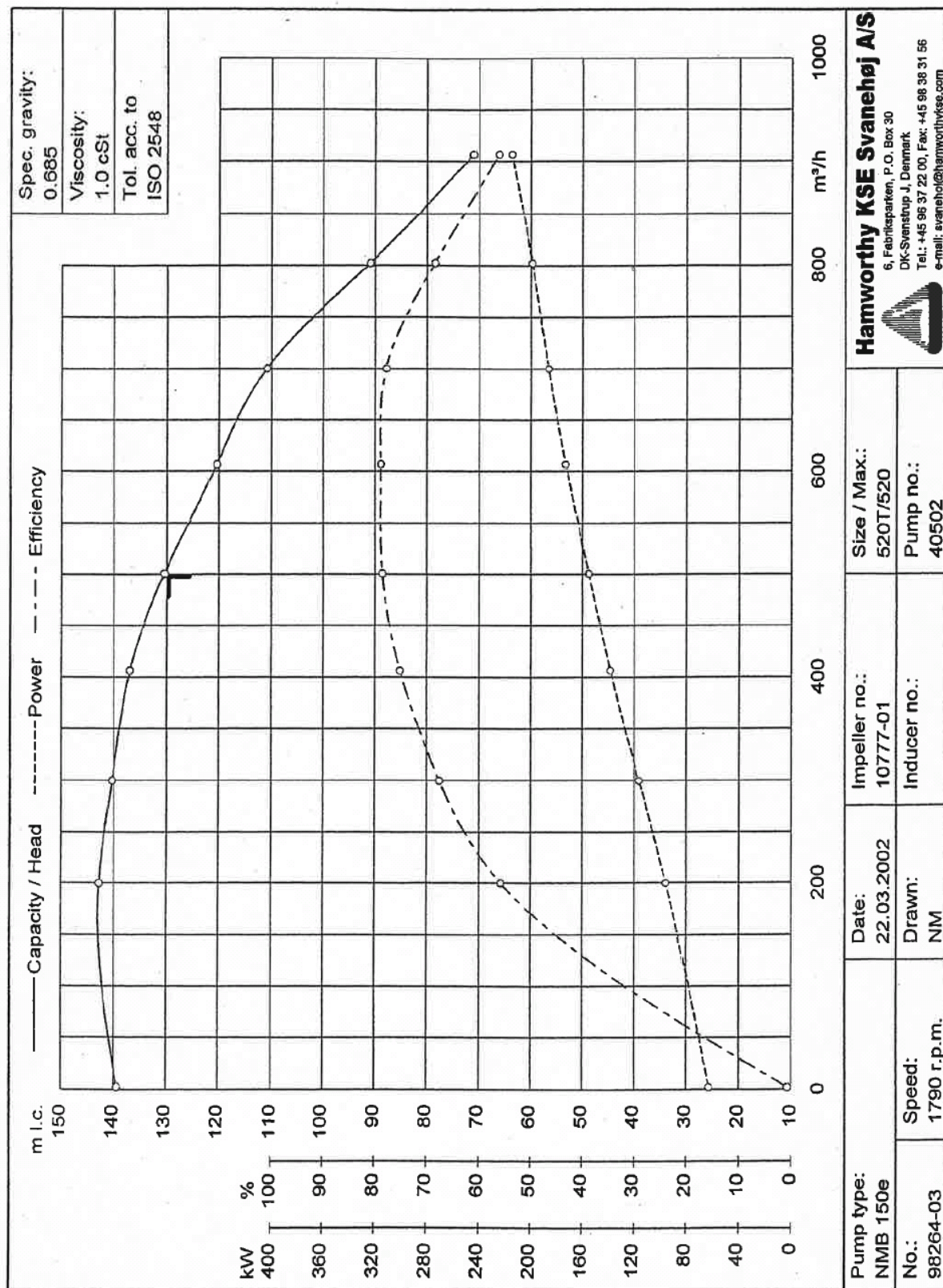


Fig. 10.1

3.2 BOOSTER PUMPS

Fig. 10.2 Performance curve - Booster pumps



3.3 RE-HEATER CAPACITY, AMMONIA

AMMO...A

HEATING CAPACITY
FLOW RATE

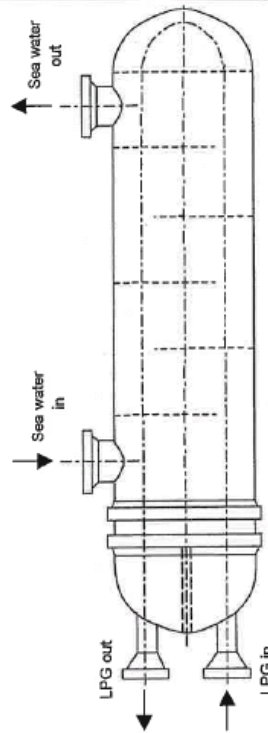
Inlet temperature -33 °C
Outlet temperature 0 °C

Cargo Heater

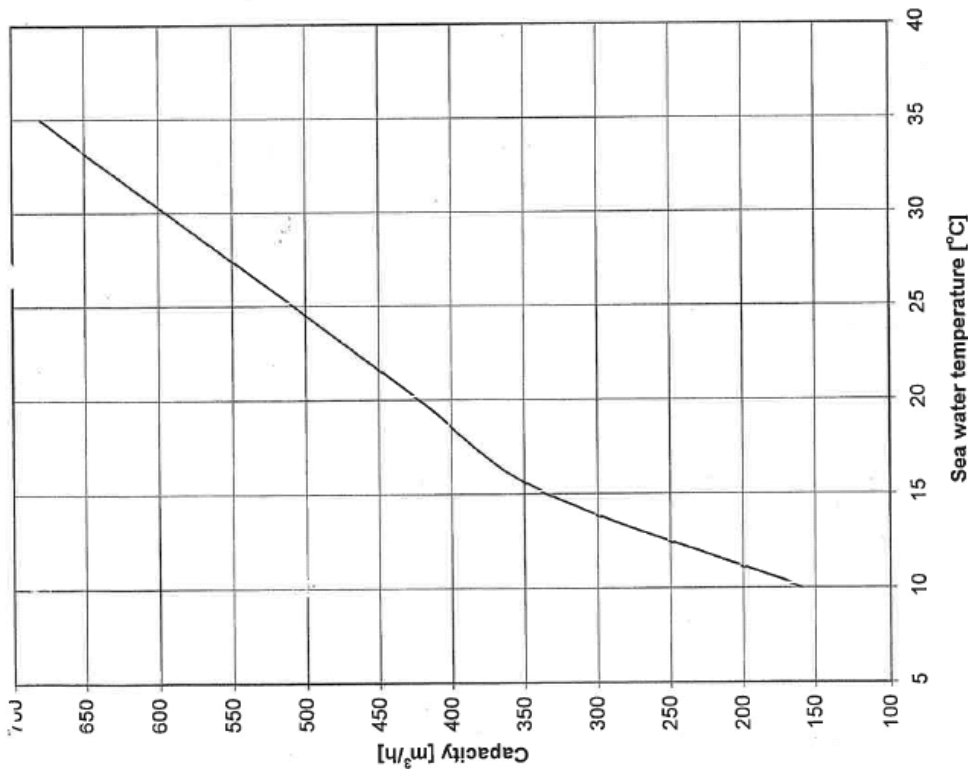
HamworthyKSE type 210/274/128.3/2U TI
Tube bundle in Titanium, U type

Example:

Sea water consumption = 800 m³/h
Sea water temperature = 15 °C
The cargo to be heated from -33 °C to 0 °C at discharging.
Found capacity = 335 m³/h (Sea water at 15 °C)

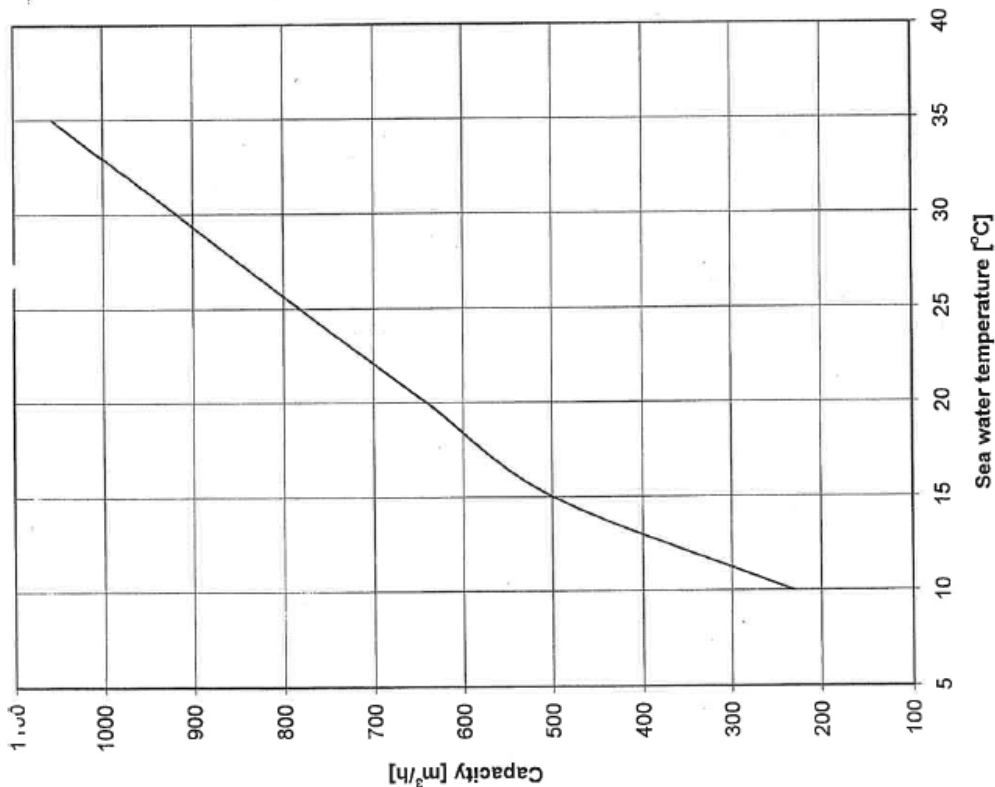
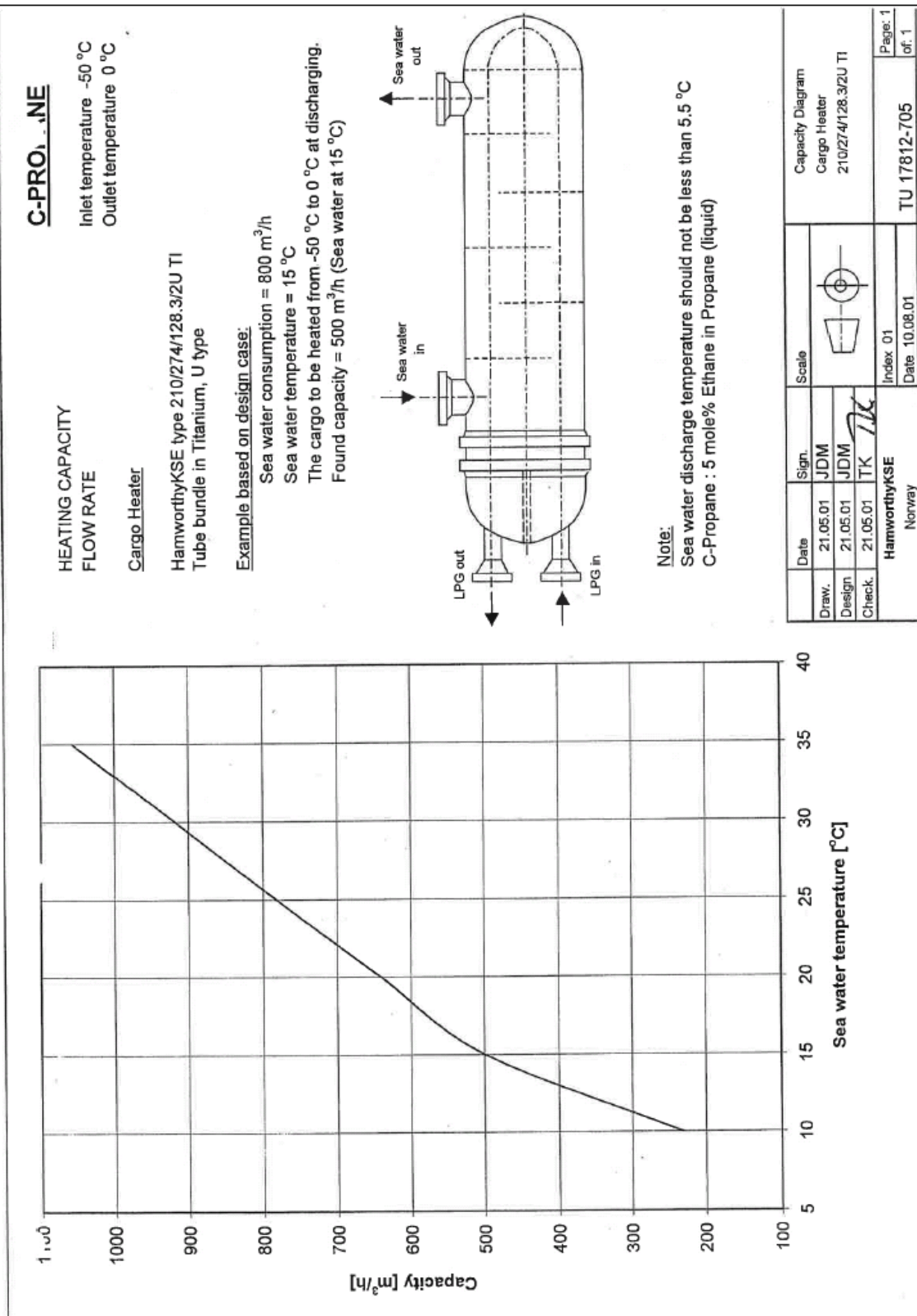


Note:
Sea water discharge temperature should not be less than 5.5 °C



Draw.	Date	Sign.	Scale	Capacity Diagram
Design	10.08.01	JDM		Cargo Heater
Check	10.08.01	TK		210/274/128.3/2U TI
HamworthyKSE Norway				TU 17812-758
Index 00 Date 10.08.01				Page: 1 of: 1

3.4 RE-HEATER CAPACITY, PROPANE



3.5 MOORING DIAGRAM

