

COMMUNICATION EQUIPMENT

Call letter	:	9VVD4
Radio Station normally watched	:	N.A.
Radio Telex	:	YES
Radio Telephony	:	YES
VHF	:	YES
Satellite Communication	Sat-F	: YES
		:
	Sat-C	: YES

MACHINERY

Main Engine	.	Type and make	:	MAN B&W 7S60MC Mark6 / Mitsui Engineering & Ship Building Co., Ltd.
	.	Power	:	MR 13,700 kW x 104 min⁻¹ NR 12,330 kW x 100.4 min⁻¹
	.	Grade of fuel used	:	Up to 380 cSt at 50 Deg. C
Auxiliaries	.	Type and make	:	960KW x 900rpm 4-stroke cycle engine / Daihatsu
	.	Grade of fuel used	:	Up to 380 cSt at 50 Deg. C

Speed
(at NR with 15%SM)

CONSUMPTION/ DAY (based on HFO 40,400kJ/kg (9,650 kcal/kg))

Main Engine
Auxiliary Engine

Permanent bunker capacity allowing an ullage of 2%

HFO	:	3006.2 m³
Diesel	:	221.7 m³
Gas Oil (for I.G.G.)	:	43.1 m³
Galley Fuel	:	-
If Segregate	:	-

(B) CARGO INSTALLATIONS

1. Transportable products and respective quantities, calculated in accordance with IMO – maximum filling formula. (Tonnes)

	CBM 100% at 20°C	CBM 98% at 20°C	Butane SG:0.61 at -5°C	Propane SG:0.58 at -46°C	Butadiene SG:0.622 at 20°C	Ammonia SG:0.610 at 20°C	VCM SG: 0.912 at 20°C
Tank 1	19,057.502	18,676.352	11,392	10,832	--	--	--
Tank 2	21,630.898	21,198.280	12,930	12,296	--	--	--
Tank 3	21,633.954	21,201.275	12,932	12,296	--	--	--
Tank 4	20,976.240	20,556.715	12,540	11,922	--	--	--
Total	83,298.594	81,632.622	49,794	47,346	--	--	--

2. Other transportable products

- a. PROPYLENE : --
- b. BUTYLENE : --
- c. ISO-BUTANE : --

3. TANKS

- 3.1 Working pressure : **2 to 22 kPaG**
- 3.2 Valve setting : **28 kPaG : Positive pressure**
- 2 kPaG : Negative pressure
- 3.3 Maximum vacuum obtainable : **- 2 kPaG**
- 3.4 Maximum specific gravity : **0.61**
- 3.5 Minimum temperature acceptable : **-46 Deg. C**

4. LOADING RATE (TONNES/HOUR) – For Full Cargo Parcels

- 4.1 Ex-atmospheric storage with gas : Butane : **abt. 2,684 TPH 4400 cbm/h**
return : Propane : **abt. 2,552 TPH 4400 cbm/h**
: VCM : **--**
Without vapor return : Butane : **abt. 2,684 TPH 4400 cbm/h**
: Propane : **abt. 2,552 TPH 4400 cbm/h**
: VCM : **--**

4.2 Ex-pressurized storage without return line: **Not practical**

	30 °C	20 °C	10 °C	0 °C
Butane	-	-	-	-
Propane	-	-	-	-
VCM	-	-	-	-

5. CARGO PUMPS

- 5.1 Type : **ELECTRIC MOTOR DRIVEN SUBMERGED CENTRIFUGAL**
Make : **Ebara Corporation in Japan**
How many : **Main Cargo Pump : 8 sets**
 : **Emergency Cargo Pump : 4 sets**
Maximum specific gravity : **0.61**
- 5.2 Capacity (CbM/Hour) : **550 m3/hr (Main) / 250 m3/hr (Emerg.)**
Two speed or variable speed : **SINGLE SPEED**
Working pressure maximum : **Maximum 10 bar**
- 5.3 Location : **Main : at aft bottom of each side of cargo tank**
 : **Emerg. : at aft bottom of starboard side of cargo tank**
Removable : **NO**
- 5.4 Booster pumps : **Yes**
Type : **Horizontal Centrifugal type, electric motor driven**
Maker : **Hamworthy Svanehoj A/S**
- 5.5 Capacity (CbM/Hour) : **300 m3/h at 150 mTH**
Working pressure : **Maximum 20bar**
- 5.6 Location : **MAIN DECK PORT SIDE FWD. OF COMP.ROOM**
- 5.7 Time to discharge a full liquid cargo using all pumps against back pressure at pump
1 bar : **Abt. 20 HRS**
5 bars : **Abt. 24 HRS**
10 bars : **Abt. 140 HRS**
- 5.8 Nominal back pressure when working : **Abt. 570 kPaG**
In series corresponding head : **100 mTH + 150mTH**
 : **(Main cargo pump + booster pump)**
Maximum back pressure : **Abt. 700 kPaG**
Nominal pressure at rail (propane) : **Abt. 350 kPaG**
- 5.9 What amount of cargo remains in tank after completion pumping before stripping:(@ trim = 2m)
- liquid : **Abt. 200m3**
- vapour : **Abt. 300 m3**

6. STRIPPING

- 6.1 Stripping system, if any : **NO**
- 6.2 Time required to remove all traces of liquid cargo as stated in 5.9 for:
- PROPANE : **Abt. 84 HRS (sparging)**
- BUTANE : **Abt. 48 HRS (sparging)**

7. CARGO COMPRESSORS

7.1 Type : **Electric motor driven reciprocating two stage**
Make : **Suction Gas Engine Mfg.Co., Ltd.**
How many : **5**
Total Calories/ hr : **189,000 kcal/hr for Propane**
260,000 kcal/hr for Butane

7.2 Are compressors oil free : **YES**

7.3 Can they reliquety VCM without risk : **--.**

7.4 State time to bring full cargo of butane to atmospheric pressure from : **--**

8. INERT GAS SYSTEM

8.1 Does the vessel use inert gas? : **YES**
If so, state utilization and quantities : **When hold spaces and cargo tanks/lines to be required for inerting and gasfreeing.**
HOLDS: 20,900 M3, CARGO TKS: 83,270 M3

8.2 Can the vessel produce inert gas? :
If so, state type and composition of gas produce:
O2 - MAX 1% BY VOLUME
CO2 - Abt. 13 % BY VOLUME
CO - MAX 1000 PPM

8.3 Maximum production obtainable : **3000 NM3/HR**

8.4 State if there are storage facilities for inert gas onboard: **NITROGEN BOTTLES**
- Size : **10 BOTTLES EACH 47 LITRES**
- Pressure : **15 Mpa**

8.5 State if any shore supply of nitrogen may be required: :
- for what purpose : **FOR PURGING SHIP/SHORE CONNECTION**
- what quantities : **--**

9. GAS FREEING

9.1 State method used giving all details : **1. Warm up by hot gas supplied from compressors.**
2. Inerting by Inert Gas Generator
3. Aeration by portable turbine fan.

9.2 State time required including stripping : **Abt. 130 HRS**

10. CHANGING GRADE

10.1 From completion discharge of cargo **A**, time required in hours and inert gas in CBM required to reach a tank and gas installation
Butane to Propane : Abt. 70 HRS – IG not used
Propane to Butane : Abt. 40 HRS – IG not used

10.2 Can this operation be carried out at sea? : **Yes, provided other cargo grade is also being carried on board.**

10.3 Can the ship measure the number of ppm in vapour phase? : **NO**

10.4 Has vessel deck tank for changing grade/cooling operations? : **NO**

10.5 Deck tanks : **-NOT FITTED-**
Capacity : --
Purpose : --

11. COOLING BEFORE LOADING :

12. CARGO REHEATER

12.1 State heating source : **SEA WATER**

12.2 State discharging rate for propane and anhydrous ammonia to be brought from atmospheric pressure to 0°C. (Sea temperature: + 15°C)
PROPANE:- FROM -42°C TO -5°C @ 600 M3/HR

13. CARGO VAPORIZER

In case vapour gas is needed to feed compressors, can vessel produce its own if no shore available:
Yes

14. REFRIGERATING APPARATUS

14.1 Is it independent of cargo? : **Yes**
Is so, state cooling agents : **SEA WATER**

14.2 What minimum temperature can be maintained : **- 46°C**

14.3 What time required at sea to lower by 1°C the full cargo of : **Propane = 40 Hrs / Butane = 25 Hrs WITH 5 COMPRESSORS**

15. MEASURING APPARATUS

What gauges on board? : **Magnetic Float type Liquid Level Gauge**
Type : **INTRINSICALLY SAFE TYPE LEVEL MASTER**
Location : **EACH CARGO TANK, PORT & STBD.**

16. SAMPLES

16.1 State how tank atmosphere samples can be taken and where from?
SAMPLE PIPES ARE PROVIDED (TOP, MIDDLE, BOTTOM)

Standard of fitting? : **Sampling valve mouth out dia M42**
16.2 Same question for cargo : **Sampling valve mouth out dia M42**
16.3 Are sample bottles available on board? : **NO**

17. CARGO LINES

17.1 Is ship fitted with a port and starboard cargo manifold? **YES**

17.2 Position of cargo manifold
- distance from stern : **119.0 m**
- distance form stem : **111.0 m**
- height above deck : **1.77 m**
- distance from ship's rail : **4.0 m (WITH FIXED REDUCER)**
- underside keel to manifold : **23.45 m**

- 17.3 Liquid line
 FWD - diameter : **16"**
 - flange-size : **PCD 540MM; HOLE DIA 29MM; 16 BOLTS**
 - type : **ANSI 150; RAISED FACE**
 AFT - diameter : **- as above -**
 - flange-size : **--**
 - type : **--**
- Gas line
 - diameter : **10"**
 - type : **ANSI 150; RAISED FACE; PCD 362MM; HOLE DIA 25MM, 12 BOLTS**
- 17.4 What reducers on board? **ANSI 150** : **16 X 12 – 2nos; 16 X 10 – 2nos; 16 X 8 – 2nos
 10 x 12 – 2nos; 10 x 8 – 2nos; 10 x 6 – 2nos**
- 17.5 Is ship fitted with stern discharge? **- NO -**
 - Liquid line - diameter : **--**
 - flange – size : **--**
 - type : **--**

18. HOSES

- Are serviceable hoses available on board? : **- NO -**
- 18.1 Two pieces, each : **-**
 Length : **-**
 Diameter : **-**
 Flange-size : **-**
 Type : **-**
 Bending radius : **-**
- 18.2 Minimum temperature acceptable : **-**
 Maximum pressure acceptable : **-**
- 18.3 For what products are hoses suitable? : **-**

19. DERRICKS

- Hose cranes : **YES**
 - Where situated : **MANIFOLD**
 - Lifting capacity : **5 TONNES**
 - Maximum distance ship's side of lifting hook when derrick swung outboard? : **5.0 M**

20. SPECIAL FACILITIES

- 20.1 How many grades can be segregated? : **2 GRADES**
 Indicate systems : **A : PROPANE**
B : BUTANE
- Alternatively : **A : --**
B : --

- 20.2 How many cooled? : 2
- 20.3 Can vessel sail with slack cargo tanks? : YES

LIST OF REDUCERS ON BOARD (see 17.4)

Diameter/ Type	Diameter/ Type	Minimum Temperature
400 mm ANSI	300 mm ANSI	-46
400 mm ANSI	250 mm ANSI	-46
400 mm ANSI	200mm ANSI	-46
250 mm ANSI	300 mm ANSI	-46
250 mm ANSI	200 mm ANSI	-46
250 mm ANSI	150mm ANSI	-46

REDUCER SHAPE:

“Y” for low temperature reducers (- 45°C)

“T” for normal temperature reducers (0°C)