

29 MAY 1961

all recd. 9/5

Rpt. 4b 6/6

ADMIN/F 9/6

Date of writing report 15.5.1961

Surveyed at Helsingfors

NO. of visits 24

On vessel

First date 3.12.60

Last date 28.4.61

DEPT

For completion of Abo-Surveyors' report No. 379.

Received London

Port Helsingfors

No. 8048

In shops

No. of visits

On vessel 24

First date

3.12.60

Last date

28.4.61

## FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. 93394 Name "PARANAGUA" Gross tons 4000

Owners Comissao de Marinha Mercantile Managers Port of Registry Rio de Janeiro

Hull built at Helsinki By VALMET Oy, Helsingin Telakka Yard No. 203 When 1961-4

Main Engines made at Rautpohja By VALMET Oy Eng. No. 103 When 1960

Gearing made at By

Donkey boilers made at Gothenburg By AB Lindholmens Varv Blr. Nos. 3452 When 1960

Machinery installed at Helsinki By VALMET Oy When 1961

Particulars of restricted service of ship, if limited for classification

Particulars of vegetable or similar cargo oil notation, if required Vegetable Oil in Midship and Fwd Deep Tanks

Is ship to be classed for navigation in ice? No Is ship intended to carry petroleum in bulk? No

Is refrigerating machinery fitted? Yes If so, is it for cargo purposes? No Type of refrigerant Freon-12

Is the refrigerating machinery compartment isolated from the propelling machinery space? Yes Is the refrigerated cargo installation intended to be classed? Yes

The following particulars should be given as fully and as clearly as possible. Where the answer is "No" or "None", say so! Ticks and other signs of doubtful meaning are not to be used. Where the wording is not applicable to the installation, a black line may be inserted. If the main engines have been constructed at another port and are covered by a separate report, the particulars given in that report need not be repeated below, but the port and report number should be stated

No. of main engines No. of propellers Brief description of propulsion system

MAIN RECIPROCATING ENGINES. Licence Name and Type No.

No. of cylinders per engine Dia. of cylinders stroke(s) 2 or 4 stroke cycle Single or double acting

Maximum approved BHP per engine at RPM of engine and 170 RPM of propeller.

Corresponding MIP (For DA engines give MIP top &amp; bottom) Maximum cylinder pressure Machinery numeral

Are the cylinders arranged in Vee or other special formation? If so, number of crankshafts per engine

TWO STROKE ENGINES. Is the engine of opposed piston type? If so, how are upper pistons connected to crankshaft?

Is the exhaust discharged through ports in the cylinders or through valve(s) in the cylinder covers? No. and type of mechanically driven scavenge pumps or blowers per engine and how driven

No. of exhaust gas driven scavenge blowers per engine Where exhaust gas driven blowers only are fitted, can the engine operate with one blower out of action?

If a stand-by or emergency pump or blower is fitted, state how driven No. of scavenge air coolers Scavenge air pressure at full power Are scavenge manifold explosion relief valves fitted?

FOUR STROKE ENGINES. Is the engine supercharged? Are the undersides of the pistons arranged as supercharge pumps? No. of exhaust gas driven blowers per engine No. of supercharge air coolers per engine Supercharge air pressure Can engine operate without supercharger?

TWO &amp; FOUR STROKE ENGINES--GENERAL. No. of valves per cylinder: Fuel Inlet Exhaust Starting Safety

Material of cylinder covers Material of piston crowns Is the engine equipped to operate on heavy fuel oil?

Cooling medium for :—Cylinders Pistons Fuel valves Overall diameter of piston rod for double acting engines

Is the rod fitted with a sleeve? Is welded construction employed for: Bedplate? Frames? Entablature? Is the crankcase separated from the

underside of pistons? Is the engine of crosshead or trunk piston type? Total internal volume of crankcase No. and total area of explosion relief

devices Are flame guards or traps fitted to relief devices? Is the crankcase readily accessible? If not, must the engine be removed for

overhaul of bearings, etc? Is the engine secured directly to the tank top or to a built-up seating? How is the engine started?

Can the engine be directly reversed? If not, how is reversing obtained?

Has the engine been tested working in the shop? How long at full power?

CRANK &amp; FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 25.11.59 State barred speed range(s), if imposed 4599

for working propeller For spare propeller Is a governor fitted? Is a torsional vibration damper or detuner fitted to the shafting?

Where positioned? Type No. of main bearings Are main bearings of ball or roller

type? Distance between inner edges of bearings in way of crank(s) Distance between centre lines of side cranks or eccentrics of opposed piston engines

Crankshaft type: Built, semi-built, solid. (State which)

Diameter of journals Diameter of crankpins Centre Breadth of webs at mid-throw Axial thickness of webs

Side Pins Minimum

If shrunk, radial thickness around eyeholes Are dowel pins fitted? Crankshaft material Journals Approved

Diameter of flywheel Weight Are balance weights fitted? Total weight Radius of gyration

Diameter of flywheel shaft Material Minimum approved tensile strength

Flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which)

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# MAIN GAS TURBINES. Name and Type No.

No. of sets of turbines \_\_\_\_\_ Open or closed cycle \_\_\_\_\_ BHP per set \_\_\_\_\_ at \_\_\_\_\_ RPM of output shaft \_\_\_\_\_

How is drive transmitted to propeller shaft? \_\_\_\_\_

ARRANGEMENT OF TURBINES. HP drives \_\_\_\_\_ at \_\_\_\_\_ RPM HP gas inlet temperature \_\_\_\_\_ pressure \_\_\_\_\_  
 (A small diagram should be attached showing gas cycle.) IP drives \_\_\_\_\_ at \_\_\_\_\_ RPM IP gas inlet temperature \_\_\_\_\_ pressure \_\_\_\_\_  
 LP drives \_\_\_\_\_ at \_\_\_\_\_ RPM LP gas inlet temperature \_\_\_\_\_ pressure \_\_\_\_\_

No. of air compressors per set \_\_\_\_\_ Centrifugal or axial flow type? \_\_\_\_\_ Material of turbine blades \_\_\_\_\_ Material of compressor blades \_\_\_\_\_  
 No. of air coolers per set \_\_\_\_\_ No. of heat exchangers per set \_\_\_\_\_ How are turbines started? \_\_\_\_\_

How is reversing effected? \_\_\_\_\_ Are the turbines operated in conjunction with free piston gas generators? \_\_\_\_\_

Total No. of free piston gas generators \_\_\_\_\_ Diameter of working pistons \_\_\_\_\_ Diameter of compressor pistons \_\_\_\_\_ No. of double strokes per minute at full power \_\_\_\_\_ Gas delivery pressure \_\_\_\_\_ Gas delivery temperature \_\_\_\_\_ Have the turbines and attached equipment been tested working in the shop? \_\_\_\_\_ How long at full power? \_\_\_\_\_

## ELECTRIC PROPULSION (Reciprocating engines or gas turbines. Electrical particulars to be reported on Form 4d.)

No. of generators \_\_\_\_\_ KW per generator \_\_\_\_\_ at \_\_\_\_\_ RPM AC or DC? \_\_\_\_\_ Position \_\_\_\_\_

No. of propulsion motors \_\_\_\_\_ SHP per motor \_\_\_\_\_ at \_\_\_\_\_ RPM Position \_\_\_\_\_

How is power obtained for excitation of generators? \_\_\_\_\_ Motors? \_\_\_\_\_

## REDUCTION GEARING (Reciprocating engines or gas turbines. A small line sketch should be attached showing arrangement of gearing.)

Is gearing of single or double helical type? \_\_\_\_\_ If single, position of gear thrust bearing \_\_\_\_\_ Is gearing of epicyclic type? \_\_\_\_\_

PCD of pinions: First reduction \_\_\_\_\_ Second reduction \_\_\_\_\_ PCD of wheels: First reduction \_\_\_\_\_ Main \_\_\_\_\_

Material of pinions \_\_\_\_\_ Tensile strength \_\_\_\_\_ Material of wheel rims \_\_\_\_\_ Tensile strength \_\_\_\_\_

Are gear teeth surface hardened? \_\_\_\_\_ How are teeth finished? \_\_\_\_\_ Diameter of pinion journals \_\_\_\_\_ Wheel shaft \_\_\_\_\_

journals \_\_\_\_\_ Are the wheels of welded construction? \_\_\_\_\_ Is gearcase of welded construction? \_\_\_\_\_ Has the wheel/gearcase been heat treated on completion \_\_\_\_\_

of welding? \_\_\_\_\_ Where is the propeller thrust bearing located? \_\_\_\_\_ Are gear bearings of ball or roller type? \_\_\_\_\_

## CLUTCHES, FLEXIBLE COUPLINGS, ETC. If a clutch or other flexible connection is fitted between engine/turbine and gearing or between engine and line shafting give brief description and, for clutches, state how operated

Can the main engine be used for purposes other than propulsion when declutched? \_\_\_\_\_ If so, what? \_\_\_\_\_

STRAIGHT SHAFTING. Diameter of thrustshaft 360 mm Material Forged steel Minimum approved tensile strength 44 kg/sq. mm

Shaft separate or integral with crank or wheel shaft? Separate Diameter of intermediate shaft 295 mm Material Electro steel

Minimum approved tensile strength 50 kg/sq. mm Diameter of screwshaft cone at large end 340 mm Is screwshaft fitted with a continuous liner? Yes

Diameter of tube shaft. (If these are separate shafts) \_\_\_\_\_ Is tube shaft fitted with a continuous liner in way of stern tube \_\_\_\_\_ Thickness of screw/tube shaft liner at \_\_\_\_\_

bearings 20 mm Thickness between bearings 19 mm Material of screw/tube shaft Electro steel Minimum approved tensile strength 50 kg

Is an approved oil gland fitted? No If so, state type \_\_\_\_\_ Length of bearing next to and supporting propeller 1400 mm

Material of bearing lignum vitae In multiple screw vessels is the liner between stern tube and A bracket continuous? \_\_\_\_\_ If not, is the exposed length of shafting between \_\_\_\_\_

liners readily visible in dry dock? \_\_\_\_\_

PROPELLER. Diameter of propeller 4115 mm Pitch 3265 mm Built up or solid solid Total developed surface 7,43 sq. m

No. of blades 4 Blade thickness at top of root fillet 142 mm Blade material Bronze Moment of inertia of dry propeller 14,680 kg/

If propeller is of special design, state type Helistone Is propeller of reversible pitch type? No If so, is it of approved design? \_\_\_\_\_

State method of control \_\_\_\_\_ Material of spare propeller Cast iron Moment of inertia about 26,500 kg

## AIR COMPRESSORS & RECEIVERS. No. of main engine driven compressors per engine \_\_\_\_\_ Can they be declutched? \_\_\_\_\_

No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate) Three independently driven: Two on Platform Deck, one in Engine Casing. Two driven by el. motors, one driven by Harbour Diesel Capacities: 2 x 122 m<sup>3</sup>/h. + one 28 m<sup>3</sup>/h. - Cert. HAM 59/2389 A-D and Cert. HAM 60/2902.

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) 2 Main Receivers on ps on Upper Platform Deck, 4.5 m<sup>3</sup> each, Cert. Turku S/C 530-531, one Aux. Receiver on ps aft, 150 liters, Cert. No. 628/4.5.61. One Bottle for Harbour Set on Poop Deck, 2 cub. ft. Cert. Manchester C 2970.

How are receivers first charged? Air Bottle charged by hand compressor. Maximum working pressure of starting air system 25 atm. Are the safety devices in accordance with the Rules? Yes Has the starting of the main engines been tested and found satisfactory? Yes

COOLERS. No. of main engine fresh water coolers 1 No. of main engine lubricating oil coolers 1

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure One for Aux. Engines, one for Harb one for Boiler and one for Range Fuel. (Settling tank and daily service tank for Main Engine forming part of hull construction).

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) One fuel oil booster pump.

Service for which each pump is connected to be marked thus X

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INDEPENDENT PUMPS Name below essential pumps, state position and how driven. Give capacity of bilge pumps.	SUCTION										DELIVERY							To sea To sea Hydro- phone  Boiler Service Tank To deck connection
	Bilge Main	Bilge Direct	Ballast Main	Oil Fuel	Fresh Water Cool- ing	Sea	Feed Tanks	Lub. Oil		Boiler Feed	Salt Water Cool- ing	Fresh Water Cool- ing	Oil Fuel Tanks	Fire Main	Lub. Oil	Piston Cool- ing		
Bilge P(ps aft) Electr.	X	X				X								X				
Ballast P(ps) Electr.	X	X	X	X		X							X					
Fresh Water P(ss)Electr.			X						Fresh Water Tank									
O.F.Transfer P(ps)Electr.			X	X									X					
Fire Pump(ps)Electr.						X								X				
Boiler Fuel P(ps)Electn.									Boiler Fuel Tank									
Vegetable Oil Pump(in pump room) Electr.									Veget. Tank									
Two Salt Water Cooling Pumps (ss) Electr.						X X					X X							
Salt and Fresh Water Cooling P (ss) El.					X	X					X	X						
Two Fresh Water Cooling Pumps (ss) El.					X X							X X						
Two Lub.Oil P(ss)Electr.								X X							X X	X X		
Two Boiler Feed Pumps (ps) Steam						X X	X X			X X								

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room No.1 Hold: 2 x 3". - Pump Room: 1 x 2". - No.2 Hold: 2 x 3". - No.3 Hold: 2 x 3". - No.4 Hold: 2 x 3".

No. and size connected to main bilge line in main engine room 4 x 3". In tunnel No tunnel

In aux. engine room No separate Aux. Eng. room Size and position of direct bilge suctions in machinery spaces 5" ss and 5" ps.

Size and position of emergency bilge suctions in machinery spaces See above

Is the bilge or ballast system fitted with means for separating oily water on the overboard discharge side? No Do the piping arrangements comply with the Rules including special requirements for ships carrying cargo oil? Yes

special requirements for ships carrying cargo oil? Yes

## STEAM & OIL ENGINE AUXILIARIES

Position of each	Type	Made by	Port and No. of Rpt. or Cert.	Driven Machinery (For electric generators, state output)
ss aft in Eng. room	Valmet B&W 520-MTBH-30	Valmet Oy, Linnavuori	Turku Cert. 18.1.61	AC-Generator 210 kVA
entre " " " "	"	"	" " " "	" " " "
ps " " " "	"	"	" " " "	" " " "
On poop deck in Engine room	National IE 6	National	Manchester 334/6.9.60	80 kVA
In Pump room	Bukh EH 100	Bukh Co.	Copenhagen 29.8.60	Fire Extinguishing Pump

Is electric current used for essential services at sea? Yes If so, state the minimum No. and capacity of generators required in order that the ship may operate at sea Two generators, 350 kVA

Is an electric generator driven by Main Engine? No

STEAM INSTALLATION. No. of donkey boilers burning oil fuel 1 W.P. 100 lbs. Type Vertical; comb. oil fired and exhaust heated.

Position On Poop deck inside engine casing.

Is a superheater fitted? no Are these boilers also heated by exhaust gas? Yes No. of donkey boilers heated by exhaust gas only? none W.P. -

Type - Position - Can the exhaust heated boilers deliver steam directly to the steam range or do they operate only as economisers in conjunction with oil fired boilers? -

Port and No. of report on donkey boilers Got. 25978

Is steam essential for operation of the ship at sea? no Are any steam pipes over 3 ins. bore? no If so, what is their material? -

For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? Yes No. of oil burning pressure units one No. of steam condensers none No. of Evaporators none

STEERING GEAR. (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars) Atlas, Electro Hydraulic, two rams, two electrically driven hydraulic pumps.

Have the Rule Requirements for fire extinguishing arrangements been complied with? Yes Brief description of arrangements Fire Extinguishing Pumps.

CO<sub>2</sub> for holds and engine room. Portable CO<sub>2</sub> and foam fire extinguishers.

Has the spare gear required by the Rules been supplied? Yes Has all the machinery been tried under full working conditions and found satisfactory? Yes Date and duration of full-power sea trials of main engines 14.4.61. six hours.

Does this machinery installation contain any features of a novel or experimental nature? (Give particulars) -

The foregoing description of the main engine and installation is correct and the particulars are as approved for torsional vibration characteristics (strike out words not applicable).

VALMET Oy

Th. Lundberg

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## GENERAL REMARKS

State if the machinery has been constructed and/or installed under special survey in accordance with the Rules, approved plans and Secretary's letters. State quality of materials and workmanship and give recommendations for classification, including any special notation to be assigned. Where existing machinery is submitted for classification the circumstances should be explained as fully as possible.

The Machinery has been installed under Special Survey in accordance with the Rules, approved plans and Secretary's letters. Quality of materials and workmanship found good. I recommend that this Machinery be entered in the Register Book with the notation +LMC 4.61, TS (CL) 4.61 and DBS 4.61.

*A. Carter*  
Engineer Surveyor to Lloyd's Register of Shipping.

## PARTICULARS OF IDENTIFICATION MARKS ((Including Port of origin) of important Forgings and Castings. (Copies of certificates should be forwarded with report.)

RODS

CRANKSHAFT ~~OR ROTOR SHAFT~~

FLYWHEEL SHAFT

THRUST SHAFT

~~GEARING~~

INTERMEDIATE SHAFTS LR 23535 and 23540 BS 15.10.59 Hfs. Cert. No. 7285.

SCREW ~~AND DONKEY~~ SHAFTS L.R. 23445, 4.9.59 BS. Hfs Cert. No. 7253 (Liner Lloyd's Rot. A.v.H. 4-9-59. Cert. No. 59 30)

PROPELLERS

OTHER IMPORTANT ITEMS Spare Screw Shaft: LR 23350 BS 19.8.59 Hfs. Cert. No. 7232.  
(Liner: Lloyd's Rot. J.W. 7-7-59. Cert. No. 59 2558).

Spare Propeller: LLOYD'S Rot. 14-2-61 A.v.H. Cert. No. 610667.

Is the installation a duplicate of a previous case? Yes If so, state name of vessel "Guanabara"

Date of approval of plans for crankshaft 20.2.59 Straight shafting 28.1.59 Gearing - Clutch -

Separate oil fuel tanks 25.6.59 Pumping arrangements 14.10.58 and 9.10.58 Oil fuel arrangements 3.4.59

Cargo oil pumping arrangements 19.11.59 Air receivers Donkey boilers 23.10.59

Dates of examination of principal parts:-

Fitting of stern tube 9.12.60 Fitting of propeller 13.12.60 Completion of sea connections 14.12.60 Alignment of crankshaft in main bearings 24.2.61

Engine chocks & bolts 24.2.61 Alignment of gearing - Alignment of straight shafting 24.2.61 Testing of pumping arrangements 12.4.

Oil fuel lines 3.3.61 Donkey boiler supports 24.2.61 Steering machinery 5.4.61 Windlass 5.4.61

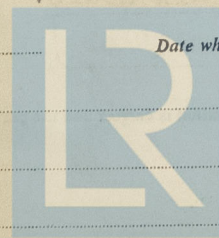
Date of Committee THURSDAY 13 JUL 1961 Special Survey Fee

Decision

+ LMC } SB 100 Gs  
TS (CL) 4.61.

Expenses

Date when A/c rendered



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