Rpt. 4b

15 MAY 1960

Date of writing report 26th February, 1960 Received London – Port of Augsburg No. 1353

Survey held at Augsburg No. of visits In shops 22 On vessel – First date 10th November, 1959 Last date 29th January, 1960

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. – Name Ferryboat

Owners Portugese Railway Co. Managers – Gross tons –

Hull built at Viana do Castelo By Estaleiros Navais de Viana do Castelo Port of Registry – Yard No. 48 Year When 1960

Main Engines made at Augsburg By M.A.N. A.G. Eng. No. 402 044/045 When 1959/60

Gearing made at – By –

Donkey boilers made at – By – Blr. Nos. – When

Machinery installed at – By – When

Particulars of restricted service of ship, if limited for classification –

Particulars of vegetable or similar cargo oil notation, if required –

Is ship to be classed for navigation in ice? – Is ship intended to carry petroleum in bulk? –

Is refrigerating machinery fitted? – If so, is it for cargo purposes? – Type of refrigerant –

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

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 two No. of propellers two Brief description of propulsion system engines – rev.-reduction gears – propellers

MAIN RECIPROCATING ENGINES. Licence Name and Type No. G8V 30/45

No. of cylinders per engine 8 Dia. of cylinders 300 mm stroke(s) 450 mm 2 or 4 stroke cycle 4 Single or double acting single

Maximum approved BHP per engine 510 at 348 RPM of engine and RPM of propeller.

Corresponding MIP 7.25 kg/cm^2 *(For DA engines give MIP top & bottom)* Maximum cylinder pressure 52 kg/cm^2 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 power – Are scavenge manifold explosion relief valves fitted? –

FOUR STROKE ENGINES. Is the engine supercharged? no 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 & FOUR STROKE ENGINES--GENERAL. No. of valves per cylinder: Fuel 1 Inlet 1 Exhaust 1 Starting 1 Safety 1

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

Cooling medium for :—Cylinders water 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? trunk-piston Total internal volume of crankcase 4200 m^3 No. and total area of explosion relief devices 6; 81 cm^2 each Are flame guards or traps fitted to relief devices? – Is the crankcase readily accessible? yes 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? by air

Can the engine be directly reversed? no If not, how is reversing obtained? reverse reduction gear

Has the engine been tested working in the shop? yes How long at full power? 6 1/2 hrs.

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 6.4.1960 State barred speed range(s), if imposed below 115 RPM for working propeller 175-205 RPM For spare propeller – Is a governor fitted? no Is a torsional vibration damper or detuner fitted to the shafting? yes

Where positioned? counter coupling side on crankshaft Type 'Hülsenfeder' damper No. of main bearings 9 Are main bearings of ball or roller type? – Distance between inner edges of bearings in way of crank(s) 388 mm Distance between centre lines of side cranks or eccentrics of opposed piston engines –

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

Diameter of journals 205 mm Diameter of crankpins Centre / Side 205 mm Breadth of webs at mid-throw 375x446.67mm Axial thickness of webs 98 mm

If shrunk, radial thickness around eyeholes – Are dowel pins fitted no Crankshaft material Pins / Journals / Webs S.M.Steel C.40 Minimum / Approved Tensile strength 55 kg/mm^2

Diameter of flywheel 1500 mm Weight 2350 kgs. Are balance weights fitted? no 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)* –

NOT FOR CLASSIFICATION PURPOSES

PROVISIONALLY

NOTE GOVERNOR NOT YET FITTED

QMP 30.5.60

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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 .... Material .... Minimum approved tensile strength ....

Shaft separate or integral with crank or wheel shaft? .... Diameter of intermediate shaft .... Material ....

Minimum approved tensile strength .... Diameter of screwshaft cone at large end .... Is screwshaft fitted with a continuous liner? ....

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 .... Thickness between bearings .... Material of screw/tube shaft .... Minimum approved tensile strength ....

Is an approved oil gland fitted? .... If so, state type .... Length of bearing next to and supporting propeller ....

Material of bearing .... 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 .... Pitch .... Built up or solid .... Total developed surface ....

No. of blades .... Blade thickness at top of root fillet .... Blade material .... Moment of inertia of dry propeller ....

If propeller is of special design, state type .... Is propeller of reversible pitch type? .... If so, is it of approved design? ....

State method of control .... Material of spare propeller .... Moment of inertia ....

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)* ....

No. of starting air receivers. *(Main and Aux. State capacity of each, position in ship and Port and No. of Certificate)* 2 x 2oo ltrs. Augsburg Certificate 60/24 60/24
15872/873 11th Februa

How are receivers first charged? - Maximum working pressure of starting air system 30kg/cm^2 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 -

MAIN ENGINE DRIVEN PUMPS *(No. and Purpose)*
1 cooling water pump: 23.8 m^3/h
1 bilge pump: 23.8 m^3/h
1 freshwater pump: 28 m^3/h

INDEPENDENT PUMPS Name below essential pumps, state position and how driven. Give capacity of bilge pumps.	Service for which each pump is connected to be marked thus X — SUCTION									DELIVERY						
	Bilge Main	Bilge Direct	Ballast Main	Oil Fuel	Fresh Water Cooling	Sea	Feed Tanks	Lub. Oil		Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lub. Oil	Piston Cooling

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room ....

No. and size connected to main bilge line in main engine room .... In tunnel ....
In aux. engine room .... Size and position of direct bilge suctions in machinery spaces ....
Size and position of emergency bilge suctions in machinery spaces ....

Is the bilge or ballast system fitted with means for separating oily water on the overboard discharge side? .... Do the piping arrangements comply with the Rules including special requirements for ships carrying petroleum in bulk, cargo oil or classed for navigation in ice? *(strike out words not applicable).* ....

STEAM & OIL ENGINE AUXILIARIES

Position of each	Type	Made by	Port and No. of Rpt. or Cert.	Driven Machinery (For electric generators, state output)

Is electric current used for essential services at sea? .... If so, state the minimum No. and capacity of generators required in order that the ship may operate at sea .... Is an electric generator driven by Main Engine? ....

STEAM INSTALLATION. No. of donkey boilers burning oil fuel .... W.P. .... Type ....
Position ....

Is a superheater fitted? .... Are these boilers also heated by exhaust gas? .... No. of donkey boilers heated by exhaust gas only? .... 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 .... Is steam essential for operation of the ship at sea? .... Are any steam pipes over 3 ins. bore? .... If so, what is their material? .... For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? .... No. of oil burning pressure units .... No. of steam condensers .... No. of Evaporators ....

STEERING GEAR. *(State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars)* ....

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

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

Maschinenfabrik Augsb.-Nürnberg A.G.
ppa. [signature] [signature]
Builder

012888-012897-00382/2

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.

These heavy oil main engines have been constructed under special survey in accordance with the requirements of the Rules and otherwise with the approved plans. The material used was tested and the workmanship was found satisfactory.

The engines were tested running on makers' test bed under full-, over- and partial loads with satisfactory results. In my opinion the engines can be recommended for the notation ✠ L.M.C.(with date) when the whole machinery has been satisfactorily fitted on board and tried under full working conditions.

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 LLOYD'S AUG 1484 G.H. 27.11.59 LLOYD'S AUG 1485 G.H. 16.12.59

CRANKSHAFT OR ~~ROTORSHAFT~~ LLOYD'S AUG 1484/6026A G.H. 15.12.59
LLOYD'S AUG 1485/6027A G.H. 16.12.59

FLYWHEEL SHAFT –

THRUSTSHAFT –

GEARING –

INTERMEDIATE SHAFTS –

SCREW AND TUBE SHAFTS –

PROPELLERS –

OTHER IMPORTANT ITEMS –

Is the installation a duplicate of a previous case? no **If so, state name of vessel** –

Date of approval of plans for crankshaft 17.8.53 **Straight shafting** 15.12.1959 **Gearing** – **Clutch** –

Separate oil fuel tanks – **Pumping arrangements** – **Oil fuel arrangements** –

Cargo oil pumping arrangements – **Air receivers** – **Donkey boilers** –

Dates of examination of principal parts:—

Fitting of stern tube – **Fitting of propeller** – **Completion of sea connections** – **Alignment of crankshaft in main bearings** –

Engine chocks & bolts – **Alignment of gearing** – **Alignment of straight shafting** – **Testing of pumping arrangements** –

Oil fuel lines – **Donkey boiler supports** – **Steering machinery** – **Windlass** –

Date of Committee FRIDAY 12 MAY 1960

Decision See Lis 8985

Special Survey Fee DM 1.400.-

2 x crankshaft 160.-
2 x running test 200.-

Expenses 40.-

Total .... DM 1.800.-

Date when A/c rendered 29.4.1960

8.3.60

10m.4.57. T. (MADE & PRINTED IN ENGLAND)