

Rpt. 4b

Date of writing report 16.9.60 Received London Port HAMBURG No. 9894  
Survey held at Hamburg No. of visits In shops On vessel 7 First date 29.4.60 Last date 12.9.60

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. Name Yard No. 50 Gross tons 100  
Owners Transport Department Ghana Managers - Port of Registry -  
Hull built at Hamburg-Altenwerder By Rudolf Meier & Söhne Yard No. 50 Year Month When 1960  
Main Engines made at Kassel By Henschel-Werke GmbH. Eng. No. 904024 When 1960  
Gearing made at Hameln By Eisenwerke Reintjes GmbH.  
Donkey boilers made at None By - Blr. Nos. - When -  
Machinery installed at Hamburg-Altenwerder By Rudolf Meier & Söhne When 1960

Particulars of restricted service of ship, if limited for classification Twin Screw Passenger Launch River Volta Service

Particulars of vegetable or similar cargo oil notation, if required -  
Is ship to be classed for navigation in ice? no Is ship intended to carry petroleum in bulk? no  
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 2 No. of propellers 2 Brief description of propulsion system 2 oil engines 4 SCSA geared to two screwshafts

MAIN RECIPROCATING ENGINES. Licence Name and Type No. Henschel type GR 1416, Serial No. 521

No. of cylinders per engine 6 Dia. of cylinders 135 mm stroke(s) 155 mm 2 or 4 stroke cycle 4 Single or double acting single

Maximum approved BHP per engine 160 at 1600 RPM of engine and 800 RPM of propeller.

Corresponding MIP 8.9 kg/cm<sup>2</sup> (For DA engines give MIP top & bottom) Maximum cylinder pressure 85 kg/cm<sup>2</sup> Machinery numeral 31.6 64

Are the cylinders arranged in Vee or other special formation? no 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 none 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 2 Exhaust 2 Starting 1 Safety 1

Material of cylinder covers cast iron Material of piston crowns Aluminium Is the engine equipped to operate on heavy fuel oil? no

Cooling medium for :-Cylinders sea water Pistons no cooling Fuel valves no cooling Overall diameter of piston rod for double acting engines -

Is the rod fitted with a sleeve? - Is welded construction employed for: Bedplate? no Frames? no Entablature? no Is the crankcase separated from the underside of pistons? no Is the engine of crosshead or trunk piston type? trunk Total internal volume of crankcase see HNO RE- No. and total area of explosion relief devices none Are flame guards or traps fitted to relief devices? no Is the crankcase readily accessible? yes If not, must the engine be removed for overhaul of bearings, etc.? yes Is the engine secured directly to the tank top or to a built-up seating? built up sea- How is the engine started? with air Can the engine be directly reversed? no If not, how is reversing obtained? by single reversing gear

Has the engine been tested working in the shop? yes How long at full power? 8 hours

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 4.7.60 State barred speed range(s), if imposed for working propeller not below 650 RPM For spare propeller not below 650 RPM Is a governor fitted? yes Is a torsional vibration damper or detuner fitted to the shafting? no

Where positioned? - Type - No. of main bearings 7 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 -

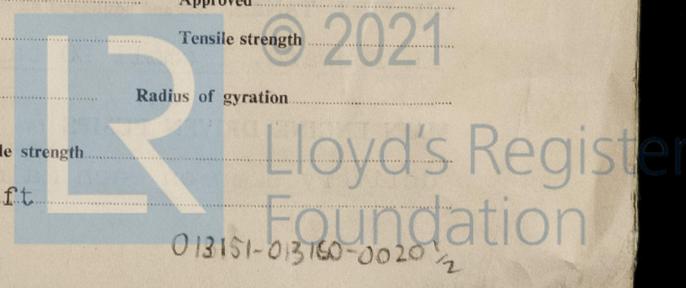
Crankshaft type: Built, semi-built, solid. (State which) - Diameter of journals - Diameter of crankpins Centre - Breadth of webs at mid-throw - Axial thickness of webs - Side - Pins - Minimum - If shrunk, radial thickness around eyeholes - Are dove pins fitted? - Crankshaft material Journals - Approved - Webs - Tensile strength

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) integral with crankshaft

SEE HNO IE-REPORT No. 105



013151-013160-002012

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? \_\_\_\_\_ 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 \_\_\_\_\_ multiple disc. clutches operated by oil

Can the main engine be used for purposes other than propulsion when declutched? yes If so, what? electric light

STRAIGHT SHAFTING. Diameter of thrust shaft HNO FE-Rpt. 105 Material \_\_\_\_\_ Minimum approved tensile strength \_\_\_\_\_

Shaft separate or integral with crank or wheel shaft? integral Diameter of intermediate shaft 65 mm Material SM-steel  
 Minimum approved tensile strength 44 kg/mm<sup>2</sup> Diameter of screwshaft cone at large end 75 mm Is screwshaft fitted with a continuous liner? no  
 Diameter of tube shaft. (If these are separate shafts) none 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 SM-steel Minimum approved tensile strength 44 kg/m  
 Is an approved oil gland fitted? yes If so, state type LECO, Lübeck Length of bearing next to and supporting propeller 300 mm  
 Material of bearing white metal 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 800 mm Pitch 635 mm Built up or solid solid Total developed surface 0.243 m<sup>2</sup>

No. of blades 3 Blade thickness at top of root fillet 28 mm Blade material bronze Moment of inertia of dry propeller 6.25 kgm<sup>2</sup>  
 If propeller is of special design, state type no Is propeller of reversible pitch type? no 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 1 of 200 ltr/min on each main engine Can they be declutched? yes

No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate) hand air compressor of 1.8 m<sup>3</sup>/h capacity in engine room  
 No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) 4 - 50 ltr. each, ER port fwd & aft starboard fwd & aft, MHM Cert. No. 60/302  
 How are receivers first charged? hand air compressor Maximum working pressure of starting air system 30 kg/cm<sup>2</sup> 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 none No. of main engine lubricating oil coolers none

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure 1 - DO daily tank of 3000 ltr. capacity ER forward, 1 small DO tank as emergency in ER casing

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) 2 - SW cooling pumps, 1 - bilge pump, 1 - lub. oil pump, 1 - DO delivery pump on each main engine

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
(The table is mostly empty with a diagonal line drawn across it.)															

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room 1 - 1 1/2 inch (cargo hold); 1 - 1 1/2 inch (fore peak)  
1 - 1 1/2 inch (aft peak)  
 No. and size connected to main bilge line in main engine room 1 - 1 1/2 inch In tunnel \_\_\_\_\_  
 In aux. engine room \_\_\_\_\_ Size and position of direct bilge suction in machinery spaces 1 - 1 1/2 inch  
 Size and position of emergency bilge suction in machinery spaces 1 - 1 1/2 inch by hand bilge pump  
 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 petroleum in bulk, cargo oil or classed for navigation in ice? (strike out words not applicable). 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)
(The table is mostly empty with a diagonal line drawn across it.)				

Is electric current used for essential services at sea? no 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? yes, 1 on each ME (vee-belt driven) 24 V 54 Amp each

STEAM INSTALLATION. No. of donkey boilers burning oil fuel none 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? 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 \_\_\_\_\_

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 none No. of Evaporators none

STEERING GEAR. (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars) 1 hand operated chain gear

Have the Rule Requirements for fire extinguishing arrangements been complied with? yes Brief description of arrangements 1 - 1 1/2" hydrant with hose and jet and spray nozzle, 2 - 10 ltr. hand foam extinguisher

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 3.9.60 6 hours Does this machinery installation contain any features of a novel or experimental nature? (Give particulars) none

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).



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.

This machinery has been built under Special Survey in conformity with the Rule Requirements the approved plans and the Secretary's letters.

The material and workmanship are good.

The installation has been properly installed in the above vessel, examined under full working condition and is eligible in my opinion to be classed as follows:-

\* LMC 9.60 and the notation TS(OG), 2 Oil Engines geared to two screwshafts, 160 BHP, 31.6 M subject to satisfactory examination at the port of destination.

Note:- These main engines are not to be operated continuously below 650 RPM (slight gear hammer between 450 and 630 RPM)

A notice board to this effect has been fitted to the engine, control platform and the tachometer marked accordingly.

*E. Owen*

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 ROTORSHAFT } see HNO FE Report No. 105

FLYWHEEL SHAFT }

THRUSTSHAFT }

GEARING LLOYD'S HNO No.s 3399/3400 14.6.60 CS

INTERMEDIATE SHAFTS LLOYD'S HAM 1064A/60 WOD 22.6.60

SCREW AND TUBE SHAFTS LLOYD'S HAM 1064/60 WOD 22.6.60

PROPELLERS LLOYD'S HAM 60/1066 A&B 22.6.60 WOD

OTHER IMPORTANT ITEMS Stern tubes: LLOYD'S TEST HAM No. 1082/60 WOD 3 kg/cm<sup>2</sup> 22.6.60

Cast steel coupling flanges:- LLOYD'S KEL 1763 JH 26.7.57 HAM 22.6.60 WOD

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

Date of approval of plans for crankshaft see HNO Rpt. No. 105 Straight shafting 20.4.60 Gearing see HNO FE Rpt. (gear & clutch) Clutch

Separate oil fuel tanks - Pumping arrangements 12.8.60 Oil fuel arrangements 12.8.60

Cargo oil pumping arrangements - Air receivers see att. Cert. Donkey boilers -

Dates of examination of principal parts:-

Fitting of stern tube 5.7.60 Fitting of propeller 6.7.60 Completion of sea connections 5.8.60 Alignment of crankshaft in main bearings 3.9.60

Engine chocks & bolts 5.8.60 Alignment of gearing 5.8.60 Alignment of straight shafting 5.8.60 Testing of pumping arrangements 3.9.60

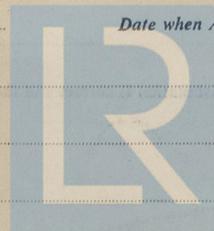
Oil fuel lines 3.9.60 Donkey boiler supports - Steering machinery - Windlass 3.9.60

Date of Committee THURSDAY 15 DEC 1960 Special Survey Fee DM 375.--

Decision See Rpt. 1.

Expenses DM 1.56.--

Date when A/c rendered No. 1823 24-10-60



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