

Rpt. 4b /NK

Date of writing report

Survey held at NORTH SHIELDS

Received London

Port NEWCASTLE-ON-TYNE

No. 116492

No. of visits In shops 20

First date 16-8-59

Last date 14-10-59

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. Name "PULBOROUGH" ex Gertrude Wiener Gross tons 942
 Owners Stephenson Clarke Ltd. Managers Port of Registry London
 Hull built at Bremen By Rolandwerf GmbH Yard No. 860 Year Month When 1956
 Main Engines made at Kiel By Maschinenbau Kiel Aktiengesellschaft Eng. No. 15757 When 1956
 Gearing made at By
 Donkey boilers made at Hamburg By Ottensener Eisenwerk Blr. Nos. 5861 When 1956
 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? No Is ship intended to carry petroleum in bulk? Yes
 Is refrigerating machinery fitted? Yes If so, is it for cargo purposes? No Type of refrigerant FREON
 Is the refrigerating machinery compartment isolated from the propelling machinery space? Yes Is the refrigerated cargo installation intended to be classed? No

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 1 No. of propellers 1 Brief description of propulsion system Oil engine directly coupled to screwshaft
 MAIN RECIPROCATING ENGINES. Licence Name and Type No. Maschinenbau Kiel Aktiengesellschaft (Mak) Mau 423A
 No. of cylinders per engine 8 Dia. of cylinders 290 m/m strokes 420 m/m 2 or 4 stroke cycle 4 Single or double acting Single
 Maximum approved BHP per engine 800 at 375 RPM of engine and 375 RPM of propeller.
 Corresponding MIP 8.7 KG/cm² (For D/E engines give MIP top & bottom) Maximum cylinder pressure 45 atmos Machinery numeral 160
 Are the cylinders arranged in Vee or other special formation? No

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? Yes Are the undersides of the pistons arranged as supercharge pumps? No No. of exhaust gas driven blowers per engine 1
 No. of supercharge air coolers per engine None Supercharge air pressure .38 KG/cm² Can engine operate without supercharger? Yes

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 Cast iron Is the engine equipped to operate on heavy fuel oil? No
 Cooling medium for: Cylinders Fresh Water Pistons None Fuel valves None

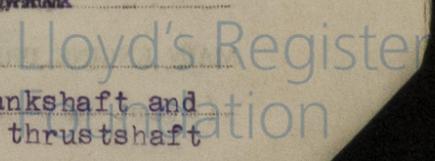
Is welded construction employed for: Bedplate? No Frames? No Entablature? No Is the crankcase separated from the underside of pistons? No
 Is the engine of crosshead or trunk piston type? Trunk Total internal volume of crankcase 160 cu.ft. No. and total area of explosion relief devices 4 - 95 sq.ins.
 Are flame guards or traps fitted to relief devices? Yes Is the crankcase readily accessible? Yes
 Is the engine secured directly to the tank top or to a built-up seating? Built up seating How is the engine started? Compressed air
 Can the engine be directly reversed? Yes

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 16-10-59 State barred speed range(s), if imposed for working propeller 255/285 RPM For spare propeller
 Is a governor fitted? Yes Is a torsional vibration damper or detuner fitted to the shafting? Yes

Where positioned? Ford. end of crankshaft Type Maschinenbau Keil Aktiengesellschaft No. of main bearings 9 Are main bearings of ball or roller type? No
 Distance between inner edges of bearings in way of crank(s) 13 1/4"

Crankshaft type: Built, semi-built, solid. (State which) Solid
 Diameter of journals 7.086" Diameter of crankpins Centre 7.086" Breadth of webs at mid-throw 1 1/2" Axial thickness of webs 3.65"
 Crankshaft material Journals Forged Approved Tensile strength
 Webs steel

Diameter of flywheel 1200 m/m Weight 2079 KGS. Are balance weights fitted? No
 Diameter of flywheel shaft None
 Flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) Flywheel is on coupling between crankshaft and thrustshaft



MAIN GAS TURBINES - Name and Type No.

No. of sets of turbines Open or closed cycle at 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
 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
 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 44)

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? Separate Diameter of intermediate shaft 163 mm 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 Material 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 1 Can they be declutched? Yes

No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate) 1 Driven through clutch by star. aux Diesel engine. 1 hand operated (port aft)

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) 2 main 500 litres each. 1 aux. 35 litres.

2 main on star. side. Aux. on port side eng. room.

How are receivers first charged? Aux. Receiver Hand Charged Maximum working pressure of starting air system 30 atmos. 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 2 - engine room fwd. at poop deck level. 1 - engine room port at casing level. 1 - overflow tank under star. genr.

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) 2 - main lub. oil. 1 - F.W. Cooling. 2 - S.W. circulating (Star. used as General Service 25 cub. metres/hr.)

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	Aux. Cond.
Standby Lub. oil								X								
E.R. Port. Electric								X							X	
General Service. E.R. Star.																
30 cub. metres/hr. Electric	X		X			X				X			X			X
Fuel Oil transfer					X							X				
E.R. Port frd. Electric.					X							X				
Fuel Oil transfer					X							X				
E.R. Side. Hand operated					X							X				
Bilge. 60 cub. metres/hr.					X					X			X			
Clutch on star. Aux. Diesel			X			X				X			X			X
Condenser circulating.						X										
E.R. Side.						X										
Feed water.						X				X						
E.R. Side. Electric.						X				X						
Steam Feed Injector						X				X						
General Service. Forecastle						X				X						
30 cub. metres/hr. Electric	X					X							X			

BILGE SUCTIONS. No. and size in each hold, deck tank or pump room 2 - 3 1/2" bore

No. and size connected to main bilge line in main engine room 1 - 80 m/m. Star. Side. 1 - 65 m/m. Port Side 1 - 65 m.m. aft well

Size and position of direct bilge suction in machinery spaces 1 - 65 m/m Port side

Size and position of emergency bilge suction in machinery spaces 1 - 65 m/m Port side

Is the bilge or ballast system fitted with means for separating oily water on the overboard discharge side? Yes Do the piping arrangements comply with the Rules including special requirements for ships carrying petroleum in bulk, cargo of 200 litres or more? 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)
E.R. Port side	Diesel 3 Cyl. 4 str.	Daimler Benz	-	Alternator 56 KVA 0.8 P.F.
E.R. Star. side	" " " "	" " " "	-	Alternator 50 MVA 0.8 P.F.
				Compressor. Bilge 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 1 - 50 K.V.A. Is an electric generator driven by Main Engine? Yes 40 kw

STEAM INSTALLATION. No. of donkey boilers burning oil fuel 1 W.P. 127 lb./in.2 Type Vertical multitubular

Position Engine Room Ford. First Flat. Is a superheater fitted? No Are these boilers also heated by exhaust gas? No No. of donkey boilers heated by exhaust gas only? None W.P.

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? No Port and No. of report on donkey boilers Newcastle 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? Gravity

For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? Yes No. of oil burning pressure units Feed No. of steam condensers 1 No. of Evaporators None

STEERING GEAR. (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars) Electric - Hydraulic (One motor/pump unit) controlled from bridge and poop; emergency direct by hand from poop.

Have the Rule Requirements for fire extinguishing arrangements been complied with? Yes Brief description of arrangements Steam smothering in engine room and boiler flat. 10 gall. and 4 gall. foam extinguishers in E.R. Portable C.O.2 at switchboard

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 14.9.59. 2 hours Does this machinery installation contain any features of a novel or experimental nature? (Give particulars) No

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)

BREMEN REPORT
 SEE: 037

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 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 of this vessel was originally built to Germanischer Lloyd Survey. The entire installation, including the donkey boiler but excluding the screwshaft and sea connections, has been opened out, examined and found or placed in accordance with Rules, approved plans, and the Secretary's letters (for screwshaft and sea connections see Bremen Report. The materials and workmanship, as far as could be seen, are good. Scantlings of machinery and boilers are as per approved plans giving reasonable allowance for wear and tear. The boiler has been examined, seen under steam, safety valves adjusted at 127 lb./in.², tested for accumulation of pressure, and all found satisfactory. The machinery was examined under full power conditions with satisfactory results and is eligible in our opinion for classification with the records LMC 9-59: 1 DB oil fired, W.P. 127 lb./in.². Fitted for oil fuel flash point above 150°F.

Chas R Rowcliffe H. Poll
 Engineer Surveyor to Lloyd's Register of Shipping
 C.R. ROWCLIFFE & H. POLL

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

RODS

CRANKSHAFT OR MOTOR SHAFT 30182 43602 59730 D 466G L G.L. Lloyds KLN. H.R. 466. 2.1.56.

FLYWHEEL SHAFT

THRUST SHAFT

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 24-8-59. Straight shafting 24-8-59. Gearing Clutch

Separate oil fuel tanks 24-8-59. Pumping arrangements 24-8-59. Oil fuel arrangements 24-8-59.

Cargo oil pumping arrangements 24-8-59. Air receivers 24-8-59. Donkey boilers 24-8-59.

Dates of examination of principal parts:—

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

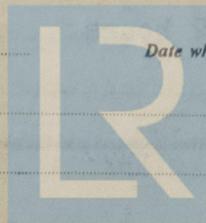
Engine chocks & bolts Alignment of gearing Alignment of straight shafting Testing of pumping arrangements

Oil fuel lines Donkey boiler supports Steering machinery Windlass

Date of Committee FRIDAY -4 DEC 1959 Special Survey Fee SEE Rpt. 1

Decision See Rpt. 1

Expenses



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 Date when A/c rendered

Lloyd's Register
 Foundation