

Rpt. 4b

Date of writing report 18.9.63

Received London

Port GREENOCK, 23 OCT 1963 No. 27341

Survey held at GREENOCK

No. of visits
In shops }
On vessel 16

First date 29.7.63 Last date 17.9.63

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. Name **M.S. RAYLIGHT** Gross tons **177**

Owners **ROSS & MARSHALL LTD.** Managers **ROSS & MARSHALL LTD** Port of Registry **GREENOCK**

Hull built at **GREENOCK** By **SCOTTS S. B & E CO. LTD.** Yard No. **695** Year **63** Month **9**

Main Engines made at **OPENSHAW MAN.** By **CROSSLEY BROS. LTD.** Eng. No. **148466** When **63** 9

Gearing made at **LONDON** By **MODERN WHEEL DRIVE LTD.** Gear No. **12909** When **63** 9

Aux./donkey boilers made at **NONE** By Blr. Nos. When

Machinery installed at **GREENOCK** By **SCOTTS SHIPBUILDING & ENGINEERING CO. LTD.** When **63** 9

Particulars of restricted service of ship, if limited for classification **FOR U.K & EIRE SERVICE.**

Particulars of vegetable or similar cargo oil notation, if required **NONE**

If ship is to be classed for navigation in ice, state whether Class 1, 2 or 3 **No.** Is ship an oil tanker? **No.**

Is refrigerating machinery fitted? **No.** 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 should 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 all other relevant particulars must be given and the port and report number should be stated.

No. of main engines **ONE** No. of propellers **ONE** Brief description of propulsion system **OIL ENGINE DRIVING THROUGH REVERSE REDUCTION GEARBOX & METALASTIK COUPLING.**

MAIN RECIPROCATING ENGINES. Licence Name and Type No. **CROSSLEY TYPE EGL 6/75.**

No. of cylinders per engine **6** Dia. of cylinders **7"** stroke(s) **9"** 2 or 4 stroke cycle **2** Single or double acting **SINGLE**

Maximum BHP per engine approved for this installation **300** at **750** RPM of engine and **200** RPM of propeller.

Corresponding MIP **92** (For DA engines give MIP top & bottom) Maximum cylinder pressure **1280 P.S.I.** Machinery numeral **60**

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? **No.** 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? **PORTS** No. and type of mechanically driven scavenge pumps or blowers per engine and how driven **ONE GEAR**

No. of exhaust gas driven scavenge blowers per engine **NONE** 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 **NONE** No. of scavenge air coolers Scavenge air pressure at full power **4.5" Hg.** Are scavenge manifold explosion relief valves fitted? **YES.**

TWO AND FOUR STROKE ENGINES. Is the engine supercharged? **No.** Are the undersides of the pistons arranged as supercharge pumps? **No.** No. of exhaust gas driven blowers per engine **NONE** No. of supercharge air coolers per engine Supercharge air pressure Can engine operate without supercharger?

No. of valves per cylinder: Fuel **ONE** Inlet **TWO** Exhaust Starting **ONE** Safety **ONE**

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 **OIL SPLASH** Fuel valves 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 **19.14 cu. ft.** No. and total area of explosion relief devices **2 x 16.18** Are flame guards or traps fitted to relief devices? **YES.** 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? **BUILTUP SEATING** How is the engine started? **COMPRESSED AIR.**

Can the engine be reversed? **No.** If not, how is reversing obtained? **BY GEARBOX.**

Has the engine been tested working in the shop? **YES** How long at full power? **5 HOURS.** **6.3.63** **558 G.**

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system **5.4.63** State barred speed range(s), if imposed for working propeller **NONE** For spare propeller 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? **PLAIN** Distance between inner edges of bearings in way of crank(s) **8 7/8"** Distance between centre lines of side cranks or eccentrics of opposed piston engines

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

Diameter of journals **4 3/4"** Diameter of crankpins Centre **4 3/4"** Breadth of webs at mid-throw **AS APP'D** Axial thickness of webs **AS APP'D.**

If shrunk, radial thickness around eyeholes Are dowel pins fitted? Crankshaft material: Journals **O.H. STEEL** Minimum Approved Tensile strength **45/55 TONS/SQ IN.**

Diameter of flywheel **28"** Weight **592** Are balance weights fitted? **YES** Total weight Radius of gyration **2.095 kg m²**

Diameter of flywheel shaft Material Minimum approved tensile strength

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

INFORMATION FROM MANCHESTER F.E. RPT. 840

013224-013231-0202 1/2

Lloyd's Register
Foundation

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. State Port and report No.)

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. Full particulars to be reported on Form 4e.) Port..... LONDON Report No. CERT. NO. M.W.D. 2665

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. METALASTIK TYPE B.B.1 FLEXIBLE COUPLING.

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

STRAIGHT SHAFTING. Diameter of thrustshaft..... Material..... STEEL B.S. EN.9..... Minimum approved tensile strength 45/50 TONS/IN.²

Shaft separate or integral with crank or wheel shaft?..... INTEGRAL WITH GEAR BOX..... Diameter of intermediate shaft 4 5/8"..... Material FORGED STEEL

Minimum approved tensile strength 28 TONS/IN.²..... Diameter of screwshaft, cone at large end 5 1/2"..... Is screwshaft fitted with a continuous liner? YES

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 1/2"..... Thickness between bearings..... How is the after end of the liner made watertight in the propeller boss? RUBBER RING

Material of screw/tube shaft. FORGED STEEL..... Minimum approved tensile strength 28 TONS/IN.²..... Is an approved oil gland fitted? NO..... If so, state type.....

Length of bearing next to and supporting propeller 1' 8 3/8"..... 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. If of special design, state type NO..... Is it of reversible pitch type? NO

If so, is it of approved design?..... State method of control.....

Propeller	Diameter	Pitch	Built or solid	Total developed surface	No. of blades	Blade thickness at top of root fillet	Blade material	Tensile strength TONS/IN. ²	Design moment of inertia of propeller (dry)	For Class 1 or 2 ice strengthening only			
										Blade thickness at 25% radius	Blade thickness at tip	Length of blade section at 25% radius	Rake of blade
Working	6' 3"	VARIABLE SOLID	16 ft	4	2.16"	MILD STEEL	31	1560	-	-	-	-	-
Exhaust								183 FT ²					

AIR COMPRESSORS & RECEIVERS. No. of main engine driven compressors per engine ONE..... Can they be declutched? NO

No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate) 12.9 CU. FT. F.A.D., HAND START AUX ENGINE, PORT SIDE, SOU. D. 21707 DATED 10.4.63.

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) ONE MAIN PORT SIDE FOR'D 5 CU. FT. CAPACITY, NOTT. CERT. NO. 33.557 DATED 15.5.61.

How are receivers first charged? HAND START OIL ENG. DRIVEN AIR COMP. Maximum working pressure of starting air system 350 P.S.I. 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 ONE..... No. of main engine lubricating oil coolers ONE

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure ONE PORT SIDE TOP PLATFORM.

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) ONE BILGE & SEA WATER CIRC. 1880 G.P.H. TWO LUB. OIL SUCTION 1540 G.P.H. LIFT 2420 G.P.H. ONE FRESH WATER CIRC. 1880 G.P.H.

23 OCT 1963

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 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	OVER BOARD
FIRE & BILGE PORT AFT. ELECT. DRIVE 10 TONS/HR.	X		X			X				X			X			X
G.S. ATTACHED TO PORT AUX ENGINE 20 TONS/HR.	X	X	X			X				X			X			X
O. P. TRANSFER PORTSIDE FORD ELECT. DRIVE				X								X				
GEARBOX STANDBY L.O.								X							X	
STAB'D AFT. ELECT. DRIVE																
		</														

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room ONE 2" AFT

No. and size connected to main bilge line in main engine room ONE 2" AFT

Size and position of direct bilge suctions in machinery spaces ONE 2" CENTRE

Size and position of emergency bilge suctions in machinery spaces ONE 2" FORWARD

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 oil tankers, ships carrying cargo oil or classed for navigation in ice Class 1, 2 or 3? (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)
PORT SIDE	2 CYL. HAND	LISTER	BRISTOL CERT. NO. S.C. 12099	D.C. GENERATOR 110V. 4.5 S.A. G.S. PUMP. AIR COMPRESSOR.
	STARTED AIR COOLED OIL ENGINE.	BLACKSTONE MARINE LTD.		

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

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

Position.....

Is a superheater fitted?..... Are these boilers also heated by exhaust gas?..... No. of aux./donkey boilers heated by exhaust gas only?..... W.P. Type.....

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 aux./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 including particulars of alternative means of steering).....

HAND TYPE ROD & CHAIN. ALTERNATIVE MEANS BLOCKS & TACKLE.

Have the Rule Requirements for fire extinguishing arrangements been complied with? YES..... Brief description of arrangements 3-2 GALL. PORTABLE FOAM (1 E.R. TOP PLATFORM 1- E.R. BOTTOM PLATFORM) 1- 10T. C.T.C. (AT SWITCH BOARD) 1- SANDBOX WITH SCOOP (BOTTOM PLATFORM) 1- HYDRANT WITH 30' CANVAS HOSE WITH COMBINED JET SPRAY NOZZLE (TOP PLATFORM AT E.A. ENTRANCE). THIS ARRANGEMENT COMPLIES WITH M.O.T. REQUIREMENTS FOR THIS CLASS OF SHIP. COPY OF THEIR APPROVAL LETTER WILL BE FORWARDED WHEN AVAILABLE.

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 17.9.63. 6 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.)

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.

MANUAL CONTROL (BLOCTUBE SYSTEM) FOR THE MAIN ENGINE IS PROVIDED ON THE BRIDGE BY MEANS OF WHICH STARTING, STOPPING, REVERSING & SPEED REGULATIONS CAN BE CARRIED OUT, IN ADDITION TO THE NORMAL HAND CONTROLS AT THE ENGINE. THIS WAS TESTED UNDER WORKING CONDITIONS DURING THE SEA TRIAL AND FOUND TO OPERATE SATISFACTORILY.

THE MACHINERY HAS BEEN CONSTRUCTED UNDER SPECIAL SURVEY IN ACCORDANCE WITH THE RULES AND APPROVED PLANS. THE MATERIALS AND WORKMANSHIP ARE GOOD. THE MACHINERY HAS BEEN EFFICIENTLY INSTALLED ON BOARD THE SHIP AND TRIED UNDER FULL WORKING CONDITIONS WITH SATISFACTORY RESULTS. THE MACHINERY IS ELIGIBLE TO BE CLASSED IN THE REGISTER BOOK WITH THE RECORD +LMC 9.63 AND THE NOTATIONS T.S.C.L. OIL ENGINE 2.S.A.

N.B. NO GEAR HAMMER WAS EXPERIENCED ON SEA TRIALS.

THE SCREW SHAFT KEYWAY IS OF SLED-RUNNER TYPE AND IN ACCORDANCE WITH C. 1002.

W. Gilmer Lee
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

SEE MAN. F.E. RPT NO 840

CRANKSHAFT OR ROTOR SHAFT

FLYWHEEL SHAFT

THRUST SHAFT

GEARING

INTERMEDIATE SHAFTS LLOYDS SLD 4282 J.M. 22.3.63.

SCREW AND TUBE SHAFTS LLOYDS SLD 4283 J.M. 22.3.63.

PROPELLERS L.R. 40507 GLS. J.D. 2.7.63.

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

Straight shafting 2.7.63

Gearing

Separate oil fuel tanks 28.5.63

Pumping arrangements

3.6.63

Oil fuel arrangements

3.6.63

Gease oil pumping arrangements

Air receivers

Auxiliary boilers

Dates of examination of principal parts:-

Fitting of stern tube 8.8.63

Fitting of propeller 9.8.63

Completion of sea connections 2.9.63

Alignment of crankshaft in main bearings

Engine chocks & bolts 12.9.63

Alignment of gearing 12.9.63

Alignment of straight shafting 9.9.63

Testing of pumping arrangements 16.9.63

Oil fuel lines 3.9.63

Boiler holer supports

Steering machinery 17.9.63

Windlass 16.9.63

Date of Committee

Decision +LMC

ES.

ISCL

9.63.

Special Survey Fee

£25.

Expenses

Date when A/c rendered

28th SEPT. 1963.

