

Rpt. 4b

Date of writing report 11/7/59 To 13/10/59.

Received London

Port GREENOCK

No. 26491.

Survey held at PORT GLASGOW

No. of visits In shops } 33  
On vessel }

First date 7/5/59.  
13/4/59.

Last date 26/8/59.  
25/9/59.

# FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. 41369.

Name "MAKOURIA"

Gross tons 560.96

Owners BRITISH GUIANA RAILWAYS

Managers

Port of Registry GEORGETOWN

Hull built at PORT GLASGOW

By FERGUSON BROTHERS (PORT GLASGOW) LTD. Yard No. 428

Year Month  
When 1959/9

Main Engines made at STAMFORD LINES.

By BLACKSTONE & CO. LTD.

Eng. No. M.86158/9.

When 1959/9

Gearing made at SLOUGH

By MODERN WHEEL DRIVE LTD.

Donkey boilers made at

By

Blr. Nos.

When

Machinery installed at PORT GLASGOW

By FERGUSON BROTHERS (PORT GLASGOW) LTD.

When 1959/9

Particulars of restricted service of ship, if limited for classification VEHICULAR & PASSENGER FERRY  
SERVICE AT DEMARARA & ON THE RIVERS BERBICE & ESSIQUIBO

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? 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 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 UNI-DIRECTIONAL ENGINES DRIVE SCREWSHAFTS  
THRO' REVERSE SINGLE REDUCTION GEAR BOXES.

MAIN RECIPROCATING ENGINES. Licence Name and Type No. LISTER BLACKSTONE EVMGR 6 TYPE DIESEL ENGINES

No. of cylinders per engine 6

Dia. of cylinders 8 3/4"

stroke(s) 11 1/2"

2 or 4 stroke cycle 4

Single or double acting SINGLE

Maximum approved BHP per engine 1255

at

600

RPM of engine and 300

RPM of propeller.

Corresponding MIP 102 lbs/sq"

(For DA engines give MIP top & bottom)

Maximum cylinder pressure 800 lbs/sq"

Machinery numeral 102

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?

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?

Is a stand-by or emergency pump or blower is fitted, state how driven

No. of scavenge air coolers. Scavenge air pressure at full

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

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 2 IN SERIES Safety 1

Material of cylinder covers CAST IRON

Material of piston crowns ALUM. ALLOY

Is the engine equipped to operate on heavy fuel oil? No

Cooling medium for: Cylinders FRESH WATER

Pistons NIL

Fuel valves NIL

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 44 ft<sup>3</sup>

No. and total area of explosion relief

ices 4 x 44 sq"

Are flame guards or traps fitted to relief devices? YES

Is the crankcase readily accessible? YES

If not, must the engine be removed for

haul of bearings, etc?

Is the engine secured directly to a built-up seating? YES

How is the engine started? COMPRESSED AIR.

Can the engine be directly reversed? No

If not, how is reversing obtained? THRO' REVERSE SINGLE REDUCTION GEAR BOXES

Has the engine been tested working in the shop? YES

How long at full power? 4 HOURS + 1 HOUR ON 10% OVERLOAD.

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 25/11/58 & 27/1/59 429K

Working propeller NONE

For spare propeller NONE

Is a governor fitted? YES

Is a torsional vibration damper or detuner fitted to the shafting? YES

Are positioned 1. FREE END OF CRANKSHAFT. 2. IN FLYWHEEL COUPLING

Type 2. VISCOUS.

No. of main bearings 8

Are main bearings of ball or roller

Distance between inner edges of bearings in way of crank(s) 10 1/16

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 6 3/4"

Diameter of crankpins 6 1/8"

Centre

Breadth of webs at mid-throw 7 3/4"

Axial thickness of webs 2 1/32"

Crank, radial thickness around eyeholes

Are dowel pins fitted?

Crankshaft material Journals EN.8

Minimum

Diameter of flywheel 38"

Weight 1860

Are balance weights fitted? YES

Total weight 295.5 lbs.

Radius of gyration 0.706 ft.

Diameter of flywheel shaft 6 3/4"

Material EN.8 STEEL

Minimum approved tensile strength 40 TONS/sq"

Wheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) INTEGRAL WITH CRANKSHAFT.

Lloyd's Register Foundation

010478 - 010483 - 0327 1/2

PARTICULARS TAKEN FROM LONDON L. E. REG. NO. 140008.



<b>MAIN GAS TURBINES.</b>	Name and Type No.	BHP per set	at	RPM of output shaft
No. of sets of turbines	Open or closed cycle			
How is drive transmitted to propeller shaft?				
<b>ARRANGEMENT OF TURBINES.</b> <i>(A small diagram should be attached showing gas cycle.)</i>	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
compressor blades	No. of air coolers per set	No. of heat exchangers per set		How are turbines started?
Are the turbines operated in conjunction with free piston gas generators?				
How is reversing effected?	Diameter of working pistons	Diameter of compressor pistons		No. of double
Total No. of free piston gas generators				
minute at full power	Gas delivery pressure	Gas delivery temperature		Have the turbines and attached equipment been tested
in the shop?	How long at full power?			
<b>ELECTRIC PROPULSION</b> <i>(Reciprocating engines or gas turbines. Electrical particulars to be reported on Form 4d.)</i>				
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. *As applicable*)

Is gearing of single or double helical type? SINGLE If single, position of gear thrust bearing AFTER FINAL PINION Is gearing of epicyclic type? NONE

PCD of pinions: First reduction 10.5937" Second reduction            PCD of wheels: First reduction 21.4281" Main           

Material of pinions ALLOY STEEL Tensile strength 60/66 Tens/A" Material of wheel rims CARBON STEEL Tensile strength 45/50

Are gear teeth surface hardened? No How are teeth finished? GEAR CUT Diameter of pinion journals 4 1/8" Wheel           

journals FORB - 5 1/4" Are the wheels of welded construction? No Is gearcase of welded construction? No Has the wheel/gearcase been heat treated on con           

of welding?            Where is the propeller thrust bearing located? AFT OF FINAL WHEEL Are gear bearings of ball or roller type? NONE

CLUTCHES, FLEXIBLE COUPLINGS, ETC. If a clutch or other flexible coupling is used, describe its operation in detail. RUBBER BONDED FLEXIBLE COUPLING BETWEEN ENGINE & GEARBOX  
description and, for clutches, state how operated. HYDRAULIC CLUTCHES IN GEARBOX.

Can the main engine be used for purposes other than propulsion when declassified.....

STRAIGHT SHAFTING. Thrust is incorporated in gear box - see above. Minimum approved tensile strength.....

Diameter of thrust shaft..... Material.....

Minimum approved tensile strength \_\_\_\_\_ Diameter of screwshaft cone at large end \_\_\_\_\_ Is screwshaft fitted with a \_\_\_\_\_

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 \_\_\_\_\_

Is an approved oil gland fitted? YES If so, state type NEWARK Length of bearing next to and supporting propeller 2-00

WHITE METAL Is multiple screw vessels is the liner between stern tube and A bracket continuous? YES If not, is the exposed length of shafting 1-00

PROPELLER. Diameter of propeller 4.5 ft. Pitch 5.2 ft. Built up or solid SOLID Total developed surface 9.3 sq. ft.

If propeller is of special design, state type \_\_\_\_\_  
State method of control \_\_\_\_\_  
Material of spare propeller MANG. B. RODZ E  
Moment of inertia 62,950 lbs

No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate)

SOUTHAMPTON CERT. 13542 — 32L. CYL. COMPRESSOR  
10.2 F.M.D. DRIVEN BY HAND STAM  
LISTED DIESEL. AUX. ENG. RM. FORD.

ONE BOTTLE OF 5 Ft.<sup>3</sup> IN AUX. MACHINERY ROOM ON G. NOTTINGHAM CERT. NO 29687. 300 lbs

accordance with the Rules? YES Has the starting of the main engines been tested and found satisfactory? YES

OR SALT 1-PORT ENG. 1-STAR No. of main engine fresh water coolers 1-STAR No. of main engine lubricating oil coolers 1-STAR 1-PORT ENG. 1-STAR (Each gear box has one l.o. cooler) 1-STAR 1-PORT ENG. 1-STAR

ONE EACH PRESSURE AND SCAVENGE LUBRICATION OIL PUMPS.

Name below essential pumps, state position and how driven. Give capacity of bilge pumps.

new driven. One capacity of engine pumps.

GENERAL SERVICE PUMP. MOTOR  
MAIN ENG. RM. FORT. 100 TON  
BILGE PUMP. MOTOR, TON  
Aux. MACH. RM. FORT. 33-3  
FUEL OIL TRANSFER PUMP  
MAIN ENG. RM. STARBO. MOTOR  
GEARBOX LUB. OIL STAND BY  
MAIN ENG. RM. CENTRE. MOTOR  
EMERGENCY FIRE PUMP.  
ON VEHICLE DECK. FORD  
STEERING GEAR LUB. OIL MOTOR  
MAIN ENG. RM. STARBO. MOTOR  
HYDRAULIC PUMPS.  
MAIN ENG. RM. PORT X STAR. A  
SEAWATER PRESSURE PUMP.  
Aux. MACH. RM. STAR. FORD.  
FRESHWATER PRESSURE PUMP.  
Aux. MACH. RM. STAR. FORD  
SEAWATER PRESS. PUMP STAND  
BY. Aux. MACH. RM. STAR. FORD

HAND OPERATED DOWN TO  
PUMP. END, FORO. AT DECK LEVEL

TURNABLE MACH. SPACE - 1x2 1/2. TURNABLE RECESS - 1x2 1/2

o. and size connected to main bilge line in main engine room 1x2 1/2" (only Bilge 1x1") In tunnel \_\_\_\_\_

aux. engine room (Ford, OF MAIN ENG. RM.  $1 \times 12"$  (ONLY BILGE  $1 \times 1"$ ) Size and position of direct bilge suction in machinery spaces  
M. -  $1 \times 5"$  CENTRE STAG. Size and position of emergency bilge suction in machinery spaces

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 **in accordance**

~~solid requirements for ships carrying petroleum in bulk, cargo oil or classed for navigation in ice~~ (strike out words not applicable). **YES**

Position of each	Type	Made by	Port and No. of Rpt. or Cert.	Driven Machinery (For electric generators, state output)
AUX. ENG. RM. FORD. PORTSIDE. (N° 86102)	4SCSA. 3CYL.	BLACKSTONE & CO. LTD.	LONDON CERT. N° D65249	65 K.W. GENERATOR.
AUX. ENG. RM. FORD. STARBOARD. (N° 86103)	" "	" "	" " 391	" " " "
AUX. ENG. RM. FORD. BETWEEN AUX. DIESELS.	4SCSA. 5CYL.	LISTER BLACKSTONE TYPE 311. MARINE LTD.	BRISTOL. " 1911	AIR COMPRESSOR & AUX. AUX. AIR COMPRESSOR.
VEHICLE DECK. FORD.	4SCSA. 5CYL.	PETTERAS LTD.	LONDON " 1911	" D.63854. FIRE PUMP.

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

Is an electric generator driven by Main Engine? No

AM INSTALLATION. No. of donkey boilers burning oil fuel \_\_\_\_\_ W.P. \_\_\_\_\_ Type \_\_\_\_\_

Are these boilers also heated by exhaust gas? ☐

Are these boilers also heated by exhaust gas?..... No. of donkey boilers heated by exhaust gas only?..... W.P. ....

Position..... Can the exhaust heated boilers deliver steam directly to.....

.....  
 Port and No. of report on donkey

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

No. of steam condensers..... No. of Evaporators.....

LINK GEAR. (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars). HYLAND HYDRAULIC (LEADS CERT. NO. 34554)  
 VING CHUINER OPERATING OVER FIXED RAILS WITH RACK ATTACHED OPERATES CENTRE TILLER.  
 VE. BY STARBO. TILLERS OPERATED BY CENTRE TILLER THRO' LINK GEAR. VSG PUMP IN ENGINE ROOM  
 VE. BY ELECTRIC MOTOR. GEAR CAL BY C-46 OPERATES

10. WITH 2X 2 1/2" IN. ALEX. MACHT RM. - 1X 10' GAL. L. E. CAN. HOSE COING. - 1X 2 1/2" IN. EACH ENG.

Is 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-

sea trials of main engines 7/9/59 - 6 Hours.

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

regarding description of the main engine and installation is correct and the particulars are as approved for torsional vibration characteristics (strike out words not applicable, SGOV) TD

.....  
*Peter Ferguson* DIRECTOR

010478-010483 830731



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 HAS BEEN CONSTRUCTED UNDER SPECIAL SURVEY IN ACCORDANCE WITH THE APPROVED PLANS AND THE RULES OF THIS SOCIETY. THE MATERIALS AND THE WORKMANSHIP ARE GOOD. THE MACHINERY HAS BEEN EFFICIENTLY INSTALLED ON BOARD THE VESSEL AND TRIED UNDER WORKING CONDITIONS WITH SATISFACTORY RESULTS. THE MACHINERY IS ELIGIBLE TO BE CLASSED IN THE REGISTER BOOK WITH THE RECORD OF + LMC 9/59 AND NOTATIONS TS 04, 2-4SA DIL ENG

Sum  
19/10/59

H.K. Taylor.

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

FLYWHEEL SHAFT

THRUSTS  
INCORPORATED  
GEAR BOXES

INTERMEDIATE SHAFTS

SCREW

PROPELLERS

OTHER IMPORTANT ITEMS

SEE LONDON F.E. RPT. NO 140008.

SEE CERT. NOS M.W.D. 1931 & 1932. (LONDON)

LEITH CERT. NO 2560.

WORKING [PORT. LR 2560. LTH. 22/1/59]  
STAR. LR 2561. LTH. 26/5/59  
SPARE - PORT. LR 2859, STAR. LR 2860. LTH. 7/8/59  
WORKING [PORT. SCIMITAR 4828. LR. F.C.L. 11/3/59  
STAR " " LR. F.C.L. 11/3/59

" " " 2859.

LIVERPOOL " " 4955.

" " " 4956.

TAILSHAFT LOOSE COUPLINGS.

[PORT & STARBOARD]  
[WORKING SHAFTS]

LR 654. W.C. 4/3/59.

LEITH " " 4756

Is the installation a duplicate of a previous case? No  
If so, state name of vessel \_\_\_\_\_  
Date of approval of plans for crankshaft 29/1/59. Straight shafting 10/12/58. Gearing \_\_\_\_\_ Clutch \_\_\_\_\_  
Separate oil fuel tanks 18/4/58 & 17/2/59. Pumping arrangements 2/6/59. Oil fuel arrangements 15/1/59.  
Cargo oil pumping arrangements \_\_\_\_\_ Air receivers \_\_\_\_\_ Donkey boilers \_\_\_\_\_  
Dates of examination of principal parts:—  
Fitting of stern tubes 21/5/59 Fitting of propellers FINAL } P. 22/5/59, S. 27/5/59. Completion of sea connections 2/7/59 Alignment of crank shaft in main bearings \_\_\_\_\_  
Engine chocks & bolts 27/7/59. Alignment of gearing BOXES & \_\_\_\_\_ Alignment of straight shafting 12/6/59 Testing of pumping arrangements 18/7/59  
Oil fuel lines 27/8/59. Donkey boiler supports \_\_\_\_\_ Steering machinery 7/9/59 Windlass 7/9/59  
Date of Committee \_\_\_\_\_  
Decision Deferred for completion  
GLASGOW 27 OCT 1959  
INSTALLATION } £36-0-0.  
Special Survey Fee

Expenses

Date when A/c rendered 14<sup>th</sup> OCT. 19