

Rpt. 4b

Date of writing report 5.8.1959. Received London Port Of Mombasa. No. 1426.
Survey held at Mombasa. No. of visits In shops - On vessel 20 First date 12.12.57 Last date 29.7.59.

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. 92868 Name "Southern Enterprise" Gross tons 239
Owners Southern Line Ltd. Managers - Port of Registry Mombasa.
Hull built at Bolnes. By Boeles Schpps & Mach. Yard No. - Year Month When 1927-3.
Main Engines made at Ashton under Lyne. By National Gas Engine Co. Eng. No. 54057 When 1943.
Gearing made at Ashton under Lyne. By National Gas Engine Co.
Donkey boilers made at None By - Blr. Nos. - When -
Machinery installed at Mombasa. By Southern Engineering Works Ltd. When 1959.
Particulars of restricted service of ship, if limited for classification For East African coasting service, Seychelles and Comoro Islands.

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? 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 1 No. of propellers 1 Brief description of propulsion system Vertical heavy oil H.A.U.M. 6 type.

MAIN RECIPROCATING ENGINES. Licence Name and Type No. National Gas Engine Co. H.A.U.M. 6
No. of cylinders per engine 6 Dia. of cylinders 10 in. stroke(s) 13 in. 2 or 4 stroke cycle 4 Single or double acting Single
Maximum approved BHP per engine 500 at 600 RPM of engine and 300 RPM of propeller.
Corresponding MIP 130 lbs. (For DA engines give MIP top & bottom) Maximum cylinder pressure 800 lbs Machinery numeral 120
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 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 Napier No. of supercharge air coolers per engine None Supercharge air pressure 3 lbs in. sq. Can engine operate without supercharger? Yes. @ 500 R.P.M.

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 S.W. Pistons Splash oil Fuel valves None Overall diameter of piston rod for double acting engines None

Is the rod fitted with a sleeve? 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 75 cu.ft. No. and total area of explosion relief devices 4 x 6 in diam. 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? Floors. BUILT UP How is the engine started? Air.
Can the engine be directly reversed? No. If not, how is reversing obtained? Reversing gearbox. (OIL OPERATED.)
Has the engine been tested working in the shop? No. How long at full power? -

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 4.6.1959 State barred speed range(s), if imposed BETWEEN 260-300 and above 530
for working propeller 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? No. Distance between inner edges of bearings in way of crank(s) 123 in. 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 7 1/4 in. Diameter of crankpins 7 in. Breadth of webs at mid-throw 8 1/2 Axial thickness of webs 2 15/16 in.
If shrunk, radial thickness around eyeholes - Are dowel pins fitted? - Crankshaft material: Journals Steel Webs Steel
Minimum Approved Previously Tensile strength

Diameter of flywheel 37 1/2 in. Weight 2550 lbs. Are balance weights fitted? No. Total weight - Radius of gyration -
Diameter of flywheel shaft 7 1/4 in. Material steel Minimum approved tensile strength -
Flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) integral with crankshaft.

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? Single If single, position of gear thrust bearing After end. Is gearing of epicyclic type? No.
 PCD of pinions: First reduction Second reduction PCD of wheels: First reduction Main
 Material of pinions Steel Tensile strength Material of wheel rims Steel Tensile strength
 Are gear teeth surface hardened? How are teeth finished? Diameter of pinion journals Crankshaft diameter shaft journals Shaft. Are the wheels of welded construction? No. Is gearcase of welded construction? No. Has the wheel/gearcase been heat treated on completion of welding? Where is the propeller thrust bearing located? in gearbox. Are gear bearings of ball or roller type? Roller, ball thrust.

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.

National H.A.M. oil operated friction clutch between engine and line shaft.
 Can the main engine be used for purposes other than propulsion when declutched? Yes. If so, what? Bilges, fire M.E. S.W. circulating.

STRAIGHT SHAFTING. Diameter of thrustshaft 5 3/4 in. Material Steel Minimum approved tensile strength
 Shaft separate or integral with crank or wheel shaft? separate Diameter of intermediate shaft 1 1/2" / 8 3/8" 7" Material Steel
 Minimum approved tensile strength Diameter of screwshaft cone at large end 6 in. Is screwshaft fitted with a continuous liner? Yes.
 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 .43 in. Thickness between bearings full Material of screw/tube shaft steel Minimum approved tensile strength
 Is an approved oil gland fitted? No. If so, state type Length of bearing next to and supporting propeller 26 in.
 Material of bearing Lignum vitae. In multiple screw vessels is the liner between stern tube and A bracket continuous? None If not, is the exposed length of shafting between liners readily visible in dry dock?

PROPELLER. Diameter of propeller 68 in. Pitch 59 in. Built up or solid solid Total developed surface
 No. of blades 4 Blade thickness at top of root fillet Blade material bronze Moment of inertia of dry propeller 203,350 lbs in.sq.
 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 Cast iron. Moment of inertia

AIR COMPRESSORS & RECEIVERS. No. of main engine driven compressors per engine None. Can they be declutched?
 No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate) Two, driven by port aux. engine and starbd aux. engine.
 No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) Two, 11 cubic feet each fitted upper and lower in E.R.(P.S.A.).

How are receivers first charged? Aux. engines hand started? Maximum working pressure of starting air system 350 lbs 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 as sump is S.W. Cooled.

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure One at top of engine room at fwd end.

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) 2 (S.W., both for bilge, ME circulating and fire.)

Two lubricating oil pumps.

INDEPENDENT PUMPS Name below essential pumps, state position and how driven. Give capacity of bilge pumps.	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
One, aux.eng.driven(S.S)	X	X				X				X			X		
40 tons/hr.															
Two ME driven 23 tons/hr	X	X				X				X			X		
each.															
One, lub.oil aux.engine								X						X	
driven(S.S).															
Two hand operated O.F.				X								X			
transfer(Fwd).															
Three hand pumps spaces		X													
fwd(on forecastle).															
One hand pump F.W. aft		X													
(on poop).															
One 12 in. hand pump E.R.		X													
(on aft peak head).															

BILGE SUCTIONS. No. and size in each cargo oil tank 5 in. diam.(6 in all).

No. and size connected to main bilge line in main engine room Two 2 1/2 in diam. In tunnel No tunnel.

Size and position of direct bilge suction in machinery spaces 2 1/2 in in centre fwd and after ends E.R. Size and position of emergency bilge suction in machinery spaces One centre E.R. 2 1/2 in.

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 diesel 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)
ER (S.S.)	Oil engine	Peters 11.5 HP.	-	1 compressor, 1 bilge, ME circ, fire, ME lub.oil.
ER (P.S.)	Oil engine	Fairbanks Morse 15 HP	Lloyds 117 13.8.41 W.H.S.	1 compressor, 1 generator (3K.W.).

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. 7 1/2 K.W.

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) Hand operated (main and auxiliary).

Have the Rule Requirements for fire extinguishing arrangements been complied with? Yes. Brief description of arrangements Three 2 gall foamite portable fitted E.R. fwd, aft and (P.S.). One electric next switchboard, 2 fire hoses (P & S). Two 2 gall portable in deck pump room, others adjacent on poop deck.
 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 29.7.1959. 4 HRS. 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.

The old machinery has been removed and a 600 B.H.P. National Gas Engine Co. vertical H.A.U.M. 6 heavy oil engine built 1943 fitted in its place together with port auxiliary engine and air receivers ex 'Isle of St. Anne', the existing intermediate and screw shafts (have been retained, a short make up bobbin piece was made from tested material and fitted, the propeller from Isle of St. Anne was fitted to the screwshaft. The stern frame orifice was built up by welding and machined and the after peak bulkhead was modified to suit the new higher centre of the engine.

The machinery has not been built under survey but has been installed under special survey in accordance with the Rules, approved plans and Secretary's letters. The quality of materials and workmanship are good and the machinery is considered eligible in my opinion to be classed with the Society as LMC N.E. made 1943 refitted 1959 with fresh record of E.S. 7.59 with barred speed range between 260 and 300 R.P.M. and not above 530 R.P.M. for main engine and T.S.C.L.

[Signature]
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

FLYWHEEL SHAFT

THRUSTSHAFT

GEARING

INTERMEDIATE SHAFTS

SCREW AND TUBE SHAFTS

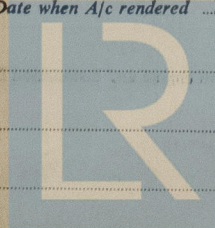
PROPELLERS

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 Straight shafting 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 6.3.1959 Fitting of propeller 20.3.1959 Completion of sea connections 20.3.1959 Alignment of crankshaft in main bearings 6.7.1959
Engine chocks & bolts 6.7.1959 Alignment of gearing Alignment of straight shafting 6.7.1959 Testing of pumping arrangements 29.7.
Oil fuel lines Donkey boiler supports Steering machinery hand 29.7.1959 Windlass hand 29.7.1959
Date of Committee FRIDAY - 2 OCT 1959
Decision See Rpt. 9. Special Survey Fee Please see Rpt. 9.

Expenses

Date when A/c rendered 29.7.1959



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