

Date of writing report 17-7-63 Received London Port BOMBAY No. 15875
Survey held at BOMBAY In shops No. of visits On vessel 24 First date 20-3-62 Last date 30-5-63

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. Name "VARIDA" Gross tons 416.31
Owners INDIAN NAVAL HEADQUARTERS Managers Port of Registry
Hull built at BOMBAY By MAZAGON DOCK LTD. Yard No. 196 Year Month 1963 - 5
Main Engines made at LINCOLN By RUSTON HORNSBY LTD. Eng. No. 462073 When 1961-10
Gearing made at SLOUGH BUCKS By MODERN WHEEL DRIVE LTD.
Donkey boilers made at - By - Blr. Nos. - When -
Machinery installed at BOMBAY By MAZAGON DOCK LTD. When 1963
Particulars of restricted service of ship, if limited for classification INDIAN COASTAL SERVICE
Particulars of vegetable or similar cargo oil notation, if required NONE
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 One No. of propellers One Brief description of propulsion system Reverse/Reduction

MAIN RECIPROCATING ENGINES. Licence Name and Type No. Ruston & Hornsby Ltd., Type 5 VEB X M3

No. of cylinders per engine 5 Dia. of cylinders 10 1/2" stroke(s) 14 1/2" 2 or 4 stroke cycle 4 Single or double acting SA

Maximum approved BHP per engine 540 at 600 RPM of engine and 300 RPM of propeller.

Corresponding MIP (For DA engines give MIP top & bottom) Maximum cylinder pressure Machinery numeral 108

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. 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 Inlet Exhaust Starting Safety

Material of cylinder covers Material of piston crowns Is the engine equipped to operate on heavy fuel oil?

Cooling medium for :-Cylinders Fresh Water Pistons Fuel valves Overall diameter of piston rod for double acting engines

Is the rod fitted with a sleeve? Is welded construction employed for: Bedplate? Frames? Entablature? Is the crankcase separated from the underside of pistons? Is the engine of crosshead or trunk piston type? No. and total area of explosion relief devices Are flame guards or traps fitted to relief devices? Is the crankcase readily accessible? 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? Built up Seating How is the engine started? Compressed Air

Can the engine be directly reversed? No If not, how is reversing obtained? Reserve/Reduction Gear Box

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

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 4-9-61 State barred speed range(s), if imposed for working propeller 450-515 rpm For spare propeller Is a governor fitted? Yes Is a torsional vibration damper or detuner fitted to the shafting? -

Where positioned? Type No. of main bearings 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 dowel pins fitted? Crankshaft material Journals Approved

Diameter of flywheel Weight balance weights fitted? Total weight Tensile strength Radius of gyration

Diameter of flywheel shaft Material Minimum approved tensile strength

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

SEE NOTTINGHAM RPT. NO. FE 1849 DATED 28-11-61

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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 F & A of Pinion Faces Is gearing of epicyclic type? No

PCD of pinions: First reduction 14.9275" Second reduction PCD of wheels: First reduction Main 30.0956"

Material of pinions BS GK3 Tensile strength 60/66 Tons/SQ.IN. Material of wheel rims BS EN 9 Tensile strength 45/50 Tons/s

Are gear teeth surface hardened? No How are teeth finished? Diameter of pinion journals F.4 1/4" A.4" Wheel shaft journals F.6" A.6 1/2"

Are the wheels of welded construction? No Is gearcase of welded construction? Yes Has the wheel/gearcase been heat treated on completion of welding? Yes Where is the propeller thrust bearing located? Integral with gear case Are gear bearings of ball or roller type? No

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 Metalastic Doulastic Coupling Type BB2

Can the main engine be used for purposes other than propulsion when declutched? No If so, what?

STRAIGHT SHAFTING. Diameter of thrustshaft Material Minimum approved tensile strength

Shaft separate or integral with crank or wheel shaft? Diameter of intermediate shaft 5" Material O.H. Forged Steel

Minimum approved tensile strength Diameter of screwshaft cone at large end 6 1/16" Is screwshaft fitted with a continuous liner? No

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 O.H. Forged Steel Minimum approved tensile strength

Is an approved oil gland fitted? Yes If so, state type Newark Length of bearing next to and supporting propeller 2' - 0"

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 6' - 0" Pitch 4.06 ft. @ 0.6 RAD. Built up or solid Solid Total developed surface 15 sq.ft.

No. of blades Four Blade thickness at top of root fillet 59 mm @ 0.3 RAD. Blade material MANG BRONZE Moment of inertia of dry propeller 2125 lb.ft.²

If propeller is of special design, state type Is propeller of reversible pitch type? No If so, is it of approved design?

State method of control Material of spare propeller None Supplied Moment of inertia

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

No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate) One @ 8.3 cu.ft./min. 350 lb/sq.in W.P.

At port side engine room belt driven by Ruston Hornsby hand start diesel eng. type IYBZ. ENG. NOT. CERT. C 33457 25-4-61 Comp. LON. CERT. D 78410 5-1-61.

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) Two at forward end engine room @ 11.2 cu.ft. each mounted horizontally one above the other - upper NOT. CERT. C34674 30-10-61. Lower NOT. CERT. C34671 27-10-61.

How are receivers first charged Aux. comp/hand start diesel engine. Maximum working pressure of starting air system 300 lb. 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 Gear Box: One

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure One main and one aux. daily service tank on port side of casing at top of engine room. One galley oil tank on starboard side of casing.

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) Five @ Forward end.

Bilge, S.W. circulating, F.W. Cooling, Lub.Oil Pressure, Lub.Oil crankcase scavenge.

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 Cooling	Sea	Feed Tanks	Lub. Oil	Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lub. Oil	Piston Cooling	
General Service	X	X	X									X		X		
Starboard side electric driven 20/40 tons/HR.																
Cargo Pump starbd. forward electric driven																
Cargo Pump Port forward Electric driven										X				X		
Standby Lub.Oil Belt driven from port Gen.													X		X	
Oil fuel transfer port forward semi rotary hand operated											X			X		

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room 1 @ 2" in forward and after cofferdams 1 @ 3" in deep tank (Bilge or Ballast)

No. and size connected to main bilge line in main engine room 1 @ 2" on centre line aft. 1 @ 2" on centre line F'wd. In tunnel

In aux. engine room Size and position of direct bilge suction in machinery spaces 1 @ 2 1/2" on centre line aft

Size and position of emergency bilge suction in machinery spaces 1 @ 4" ss f'wd. on stb'd cargo 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 oil used 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)
Port	Oil Engine 6 YEZ	Ruston Hornsby	Not. Cert. C 33626 30-5-61	90 KVA Alternator
Starboard	6 YEZ	Ruston Hornsby	Not. Cert. C 33626 21-4-61	90 KVA Alternator
Port	IYBZ	Ruston Hornsby	Not. Cert. D 78410 5-1-61	Aux. air compressor

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 one @ 90 KVA Is an electric generator driven by Main Engine? No

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.) One AEG moving vane hydraulic motor, Two electric driven hydraulic pumps (Port & Starboard) Two electric converter sets (forward and after, starboard side)

Have the Rule Requirements for fire extinguishing arrangements been complied with? Yes Brief description of arrangements In ER extinguishers 1 @ 10 Gal. 2 @ 2 gal. foam 1 Qt. C.F.C. at switchboard - 1 Hydrant 2 1/2" with hose and spray nozzle - 2 sand boxes with scoops total capacity 8 cu.ft. remote controls to O.F. tanks. vent fans GS & Cargo pumps - Fire pumps GS & M.E. attached bilge - closed funnel. On Deck - 2 1/2" fire main 4 Hydrants 5 hoses 1 nozzle 2 @ 2 gal. extinguishers.

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 15th May 1963 4 Hours Does this machinery installation contain any features of a novel or experimental nature? (Give particulars)

Plunger active rudder fitted with 75 HP electric motor and bronze propeller 650 mm dia. 420 mm pitch.

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.)

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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 machinery of this vessel has been installed under special survey in accordance with the Rules, the approved plans and the Secretary's letters. The quality of the materials and the workmanship is good. The machinery was examined under full working conditions and found satisfactory, no gear hammer or rough running being noted above the idling speed of 150 rpm or outwith the provisional barred range of 450 - 515 rpm. As an additional precaution however and with the owners concurrence the idling speed was adjusted to 200 rpm. The auxiliary air compressor has been installed in a well ventilated part of the engine room. The machinery is, in our opinion eligible to be classed in the Register Book with record of + LMC 5-63 and notation of OIL ENG., O.G. and Torsional Endorsement "Machinery not to be operated continuously below 150 rpm or between 450 and 515 rpm" when the survey has been completed.

To complete the survey the following remains to be done.

- The main cables from generators to switchboard to be replaced with cables of rule carrying capacity.
- Ship to ship supply circuit to be installed with cables of rule carrying capacity.
- Notice board to be fitted at shore to ship connecting box.
- Main engine tachometer to be marked with barred speed range.
- One jet nozzle for engine room hose to supply.
- One additional jet nozzle for deck hoses to supply.

R. McIntosh
 Engineer Surveyor to Lloyd's Register of Shipping.
 (R. McIntosh & S. Batra).

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 Lloyds 6813 8-3-60 JN 17503 C14808/A25628 KUY TED Gear Box No.12573 8-10-61 London.

INTERMEDIATE SHAFTS S297-8 Lloyds LTH 3918 WC 13-7-61

SCREW AND TUBE SHAFTS S297-8 Lloyds LTH 3918 WC 13-7-61 Muff Coupling 297-8 Lloyds LTH 3918 WC 13-7-61

PROPELLERS GLS Cert.No.72548 Lloyds BG 17-8-61 P225 Rudder Propeller Lloyds HAM.60/3191 8-11-60 AK.

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 **6-7-61** Gearing _____ Clutch _____

Separate oil fuel tanks **Main & Aux. Service 21-3-61** Galley Oil **7-8-62** Pumping arrangements **27-7-61 & 31-1-62** Oil fuel arrangements **21-3-61**

Cargo oil pumping arrangements _____ Air receivers _____ Donkey boilers _____

Dates of examination of principal parts:-

Fitting of stern tube **4-5-62** Fitting of propeller **20-3-62 (Shop)** **16-5-62 (Ship)** Completion of sea connections **14-5-62** Alignment of crankshaft in main bearings **4-10-62**

Engine chocks & bolts **4-9-62** Alignment of gearing **4-9-62** Alignment of straight shafting **30-7-62** Testing of pumping arrangements **13 & 17-5**

Oil fuel lines **4-10-62** Donkey boiler supports _____ Steering machinery **19-2-63/15-5-63** Windlass **15-5-63**

Date of Committee **FRIDAY 21 AUG 1964** Special Survey Fee **Rs. 1200/-**

Decision _____

Expenses **Rs. 140/-**

Date when A/c rendered **23/8/63**

Rpt. 9a.

Port of BOMBAY

Continuation of Report No. 15875 dated

29 AUG 1963 on the

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"VARIDA" MAZAGON DOCK LTD. YARD NO.196.

Standby Lub. Oil Pump - Cardiff Cert. F 8477 ✓ - 2-2-61.

Pleuger Motor Propeller - Hamburg Cert. 60/3191 ✓ - 15-11-60.

Main engine FW cooler - Serck Radiators Cert. ✓ - 3-1-61

Main engine Lub.oil Cooler - Serck Radiators Cert. ✓ - 9-9-60.

Valves Glasgow M 2167 ✓ - 27-9-61.

Glasgow C 73436 ✓ - 2-10-61.

Glasgow C 73375 ✓ - 29-9-61.

Glasgow C 73353 ✓ - 26-9-61.

Glasgow C 73244 ✓ - 19-9-61.

R. McIntosh