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# REPORT ON OIL ENGINE MACHINERY.

No. 17212

17 MAY 1956

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Survey held at \_\_\_\_\_ Date, First Survey \_\_\_\_\_ Last Survey \_\_\_\_\_ 19  
Book. \_\_\_\_\_ Number of Visits \_\_\_\_\_

on the ~~Twin~~ ~~Triple~~ ~~Quadruple~~ ~~Scotstoun~~ vessel Irrawaddy Flotilla Quarter Wheeler - Classed Vessel Tons Gross 200  
YARWADY Order No. E. 4535 When built 6.56.

at Scotstoun, Glasgow By whom built Yarrow & Co. Ltd., Job No. 635 YARD No. 2108 Engine No. 80660 When made 1955-6

Boilers made at Ashton-U-Lyne By whom made The National Gas & O.E. Co. Ltd. Order No. 47489/70 Boiler No. \_\_\_\_\_ When made \_\_\_\_\_

Horse Power 440 Owners The Burma Inland Water Transport Organisation. Port belonging to Rangoon

Power as per Rule 88 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

for which vessel is intended Service on the River Irrawaddy, Burma.

ENGINES, &c. - Type of Engines National R4AM8 2 or 4 stroke cycle 4 Single or double acting Single

Maximum pressure in cylinders 850 psi Diameter of cylinders 9" Length of stroke 12" No. of cylinders 8 No. of cranks 8

Indicated Pressure 115 psi Ahead Firing Order in Cylinders 1, 5, 2, 6, 8, 4, 7, 3 Span of bearings, adjacent to the crank, measured

inner edge to inner edge 10 1/2" Is there a bearing between each crank Yes Revolutions per minute 600

Wheel dia. 55 3/8" Weight 2,840 lbs Moment of inertia of flywheel (lbs. in<sup>2</sup> or Kg. cm.<sup>2</sup>) 1433 Means of ignition Comp. Kind of fuel used Diesel

Material Solid forged dia. of journals 6.622" Crank pin dia. 6.372" Crank webs 8 1/2" Mid. length breadth 2 3/4" Thickness parallel to axis \_\_\_\_\_

Wheel Shaft, diameter \_\_\_\_\_ as per Rule \_\_\_\_\_ Intermediate Shafts, diameter \_\_\_\_\_ as fitted \_\_\_\_\_ Thrust Shaft, diameter at collars \_\_\_\_\_ as per Rule \_\_\_\_\_

Screw Shaft, diameter \_\_\_\_\_ as per Rule \_\_\_\_\_ Is the tube shaft fitted with a continuous liner \_\_\_\_\_

Liner thickness in way of bushes \_\_\_\_\_ as per Rule \_\_\_\_\_ Thickness between bushes \_\_\_\_\_ as fitted \_\_\_\_\_ Is the after end of the liner made watertight in the

propeller boss. \_\_\_\_\_ If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner \_\_\_\_\_

the liner does not fit tightly at the part between the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-

corrosive. \_\_\_\_\_ If two liners are fitted, is the shaft lapped or protected between the liners \_\_\_\_\_ Is an approved Oil Gland or other appliance fitted at the after

end of tube shaft. \_\_\_\_\_ If so, state type \_\_\_\_\_ Length of bearing in Stern Bush next to and supporting propeller \_\_\_\_\_

Propeller, dia. \_\_\_\_\_ Pitch \_\_\_\_\_ No. of blades \_\_\_\_\_ Material \_\_\_\_\_ whether moveable \_\_\_\_\_ Total developed surface \_\_\_\_\_ sq. feet

Moment of inertia of propeller (lbs. in<sup>2</sup> or Kg. cm.<sup>2</sup>) \_\_\_\_\_ Kind of damper, if fitted "Holset" Viscous Type

Method of reversing Engines R/R Gearbox Is a governor or other arrangement fitted to prevent racing of the engine when declutched Yes Means of

lubrication Forced Thickness of cylinder liners 19/32" Are the cylinders fitted with safety valves Yes Are the exhaust pipes and silencers water cooled

Exhaust Manifold Water Cooled If the exhaust is led overboard near the waterline, what means are arranged to prevent water from being syphoned

back to the engine 1 FW Pump 5280 GPH Capacity, 1 SW Pump 8000 GPH Capacity. Cooling Water Pumps, No. \_\_\_\_\_ Is the sea suction provided with an efficient strainer which can be cleared within the vessel \_\_\_\_\_

Engine Pumps worked from the Main Engines, No. \_\_\_\_\_ Diameter \_\_\_\_\_ Stroke \_\_\_\_\_ Can one be overhauled while the other is at work \_\_\_\_\_

Pumps connected to the Main Bilge Line { No. and size \_\_\_\_\_ How driven \_\_\_\_\_

Is the cooling water led to the bilges. \_\_\_\_\_ If so, state what special arrangements are made to deal with this water in addition to the ordinary bilge pumping

arrangements \_\_\_\_\_

Power Driven Lubricating Oil Pumps, including spare pump, No. and size Two 1000 GPH each

Are two independent means arranged for circulating water through the Oil Cooler \_\_\_\_\_ Suctions, connected to both main bilge pumps and auxiliary

oil pumps, No. and size:—In machinery spaces \_\_\_\_\_ In pump room \_\_\_\_\_

holds, &c. \_\_\_\_\_

Independent Power Pump Direct Suctions to the engine room bilges, No. and size \_\_\_\_\_

Are all the bilge suction pipes in holds and tunnel well fitted with strum-boxes \_\_\_\_\_ Are the bilge suction in the machinery spaces led from easily

accessible mud-boxes, placed above the level of the working floor, with straight tail pipes to the bilges \_\_\_\_\_

Are all Sea Connections fitted direct on the skin of the Ship \_\_\_\_\_ Are they fitted with valves or cocks \_\_\_\_\_ Are they fixed

sufficiently high on the ship's side to be seen without lifting the platform plates \_\_\_\_\_ Are the overboard discharges above or below the deep water line \_\_\_\_\_

Are they each fitted with a discharge valve always accessible on the plating of the vessel \_\_\_\_\_ Are the blow off cocks fitted with a spigot and brass covering plate \_\_\_\_\_

How are they protected \_\_\_\_\_

Are pipes pass through the deep tanks \_\_\_\_\_ Have they been tested as per Rule \_\_\_\_\_

Are all pipes, cocks, valves and pumps in connection with the machinery and all boiler mountings accessible at all times \_\_\_\_\_

Is the arrangement of valves and their connections such as to prevent the possibility of water passing from the sea or from water tanks into the cargo or machinery

spaces, or from one compartment to another \_\_\_\_\_ Is the shaft tunnel watertight \_\_\_\_\_ Is it fitted with a watertight door \_\_\_\_\_ worked from \_\_\_\_\_

On a wood vessel, what means are provided to prevent leakage of either fuel oil or of lubricating oil from saturating the woodwork \_\_\_\_\_

Main Air Compressors, No. One CS2 Reavell No. of stages Two diameters LP 3 1/2" dia. HP 1 1/2" dia. stroke 3" driven by Vee Belt from Bobbin Coupling.

Auxiliary Air Compressors, No. \_\_\_\_\_ No. of stages \_\_\_\_\_ diameters \_\_\_\_\_ stroke \_\_\_\_\_ driven by \_\_\_\_\_

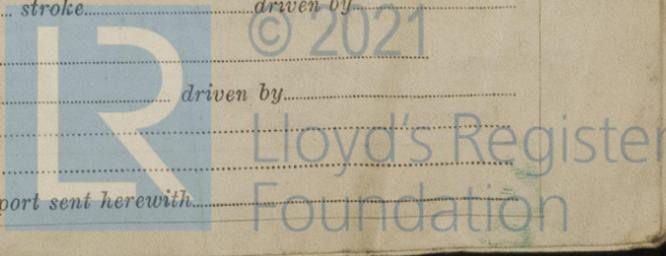
All Auxiliary Air Compressors, No. \_\_\_\_\_ No. of stages \_\_\_\_\_ diameters \_\_\_\_\_ stroke \_\_\_\_\_ driven by \_\_\_\_\_

Is provision made for first charging the air receivers \_\_\_\_\_

Revolving Air Pumps, No. \_\_\_\_\_ diameter \_\_\_\_\_ stroke \_\_\_\_\_ driven by \_\_\_\_\_

Auxiliary Engines crank shafts, diameter \_\_\_\_\_ as per Rule \_\_\_\_\_ No. \_\_\_\_\_ Position \_\_\_\_\_

Have the auxiliary engines been constructed under special survey \_\_\_\_\_ Is a report sent herewith \_\_\_\_\_



G:25441  
G:25442

**AIR RECEIVERS:**—Have they been made under survey Yes State No. of report or certificate 8:25441  
 Is each receiver, which can be isolated, fitted with a safety valve as per Rule Yes  
 Can the internal surfaces of the receivers be examined and cleaned Yes Is a drain fitted at the lowest part of each receiver Yes  
**Injection Air Receivers, No.**                      Cubic capacity of each                      Internal diameter                      thickness                       
 Seamless, welded or riveted longitudinal joint                      Material                      Range of tensile strength                      Working pressure                      by Rules                       
 Actual                       
**Starting Air Receivers, No.** Two Total cubic capacity 10 cu.ft. Internal diameter 17 1/2" thickness 3/8"  
 Longitudinal and circumferential                      Cylindrical plates 28 to 30 tons tensile  
 Seamless, welded                      longitudinal joint                      Material Steel Range of tensile strength                      Working pressure                      by Rules                       
 Actual 350 per sq

**IS A DONKEY BOILER FITTED**                      If so, is a report now forwarded                       
 Is the donkey boiler intended to be used for domestic purposes only                       
**PLANS.** Are approved plans forwarded herewith for shafting Approved 23/6/55. Receivers                      Separate fuel tanks                       
 (If not, state date of approval)                       
 Donkey boilers                      General pumping arrangements                      Pumping arrangements in machinery space                       
 Oil fuel burning arrangements                       
 Have Torsional Vibration characteristics been approved Yes Date of approval 26th July, 1955.

**SPARE GEAR.**

Has the spare gear required by the Rules been supplied Yes  
 State the principal additional spare gear supplied As required by Rules

The foregoing is a correct description, and the particulars of the engine, as supplied, are as approved for Torsional Vibration Characteristics  
L.S. Allen THE NATIONAL GAS AND OIL ENGINE Co. Ltd. Manufacturer.

Dates of Survey while building  
 During progress of work in shops - - - 1955 November 28th, 29th, 30th. December 2nd, 5th, 16th. 1956. April 24th, 25th.  
 During erection on board vessel - - -  
 Total No. of visits                       
 Dates of examination of principal parts  
 Column 30.11.55 Covers 2.12.55 Pistons 24.3.56 Rods                      Liners                      Connecting rods 2.12.55  
 Crank shaft 29.11.55 Crank-Gearbox                      Flywheel shaft 25.3.56 Thrust shaft                      Intermediate shafts                      Tube shaft                       
 Screw shaft                      Propeller                      Stern tube                      Engine seatings                      Engine holding down bolts                       
 Completion of fitting sea connections                      Completion of pumping arrangements                      Engines tried under working conditions                       
 Crank shaft, material                      Identification mark 31.12.56. Flywheel shaft, material OH Steel Identification mark                       
 Thrust shaft, material                      Identification mark                      Intermediate shafts, material                      Identification marks                       
 Tube shaft, material                      Identification mark                      Screw shaft, material                      Identification mark                       
 Identification marks on air receivers 5/4243 Lloyd's Test 700 lbs WP 350 lbs. 8.12.55 ATR LDS  
5/4244 Lloyd's Test 700 lbs WP 350 lbs. 8.12.55 ATR LDS  
 Welded receivers, state Makers' Name J & H. McLaren Ltd., Leeds.  
 Is the flash point of the oil to be used over 150°F                       
 Have the requirements of the Rules for oil fuel pipes and tank fittings been complied with                       
 Description of fire extinguishing apparatus fitted                       
 Is the vessel (not being an oil tanker) fitted for carrying oil as cargo                      If so, have the requirements of the Rules been complied with                       
 If the notation for ice strengthening is desired, state whether the requirements in this respect have been complied with                       
 Is this machinery duplicate of a previous case No If so, state name of vessel                     

**General Remarks** (State quality of workmanship, opinions as to class, Speed restrictions, &c. This machinery has been constructed under special survey of tested materials in accordance with the Secretary's letters, approved plans and Requirements of the Rules. Crankcase explosion devices are fitted. The Torsional Vibration Characteristics of the shafting installation of this main machinery have been examined in conjunction with the Engine Builder's calculations and will be approved for engine speed of 600 R.P.M. and the corresponding paddle speed of 43.6 R.P.M. 3594  
 The materials and workmanship are good and the engine, when tested in the builder's works under full load conditions for 4 hours, 10% overload for 1 hour, 75% load and 50% load for 1/2 hour each Ahead, and 1 hour on 2/3 load and 3/4 speed, astern, showed satisfactory results. In the opinion of the undersigned this machinery is suitable for installation in a vessel to be classed with this Society for the purpose intended. Attached are:-

Manchester Report F548 covering Crankshaft No. 2668.  
 Leeds Certificates C25441, C25442 covering Air Receivers 4243, 4244. Manchester Cert. No.C.8903 covering Engine No.80660.  
 To be credited through Glasgow Office.  
 The amount of Entry Fee £ 31 : -  
 Special                      £                      :                      : When applied for 16.5 19 569  
 Donkey Boiler Fee...                      £                      :                      : When received                      19                       
 Travelling Expenses (if any) £ 1 : 15 :

E. J. Reid  
 Engineer Surveyor to Lloyd's Register of Shipping.

This engine has been efficiently installed on board listed under full working conditions and found satisfactory.

Committee's Minute                       
 Assigned                     

GLASGOW 7 AUG 1956  
 SEE ACCOMPANYING MACHINERY REPORT

Lloyd's Register Foundation

Certificate (if required) to be sent to Committee's Minute. (The Surveyors are requested not to write on or below the space for Committee's Minute.)