Rpt. 4b

REPORT ON OIL ENGINE MACHINERY.

No. 11655

Received at London Office 1 JAN 1936

Date of writing Report ... 19... When handed in at Local Office 31st Dec 1935. Port of Belfast

No. in Reg. Book. 37964 on the ~~Single~~ Twin ~~Triple~~ Quadruple } Screw vessel EMPIRE STAR Tons { Gross / Net

Survey held at Belfast Date, First Survey 19th January Last Survey 20th Dec 1935 Number of Visits 160

Built at Belfast By whom built Harland & Wolff Ld. Yard No. 957 When built 1935

Engines made at Belfast By whom made Harland & Wolff Ld Engine No. 957 When made 1935

Donkey Boilers made at Belfast By whom made Harland & Wolff Ld. Boiler No. 957 When made 1935

Brake Horse Power 12.000 Owners Blue Star Line Ld. Port belonging to Belfast

Nom. Horse Power as per Rule 2463 Is Refrigerating Machinery fitted for cargo purposes Yes Is Electric Light fitted Yes

Trade for which vessel is intended Ocean going. 24 7/16 55 1/8

OIL ENGINES, &c.

Type of Engines Harland & Wolff - B & W. Airless injection 2 or 4 stroke cycle 4 Single or double acting double

Maximum pressure in cylinders 700 lbs" Diameter of cylinders 620 mm. Length of stroke 1400 mm. No. of cylinders 12 No. of cranks 12

Span of bearings, adjacent to the Crank, measured from inner edge to inner edge 946 mm. Is there a bearing between each crank Yes

Revolutions per minute 98 Flywheel dia. 2489 mm. Weight 2400 Kgs. Means of ignition Compression Kind of fuel used diesel

Crank Shaft, dia. of journals as per Rule approved as fitted 485 bred 115 mm. Crank pin dia. 485 mm. Crank Webs Mid. length breadth 860 mm. Mid. length thickness 285 mm. shrunk Thickness parallel to axis 285 mm. Thickness around eyehole 232.5 mm.

Flywheel Shaft, diameter as per Rule / as fitted / **Intermediate Shafts,** diameter as per Rule approved as fitted 17¼" **Thrust Shaft,** diameter at collars as per Rule Approved as fitted 454 mm.

Tube Shaft, diameter as per Rule / as fitted / **Screw Shaft,** diameter as per Rule approved as fitted 19" Is the ~~tube~~ screw shaft fitted with a continuous liner Yes

Bronze Liners, thickness in way of bushes as per Rule 28·25"/32 as fitted 15/16" Thickness between bushes as per rule 21·1"/32 as fitted 25/32" Is the after end of the liner made watertight in the propeller boss Yes If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner

If 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 the tube shaft No. Length of Bearing in **Stern Bush** next to and supporting propeller 76"

Propeller, dia. 18'-0" Pitch 20'-0" No. of blades 3 Material Mn. Br. whether Moveable No Total Developed Surface 77 sq. feet

Method of reversing Engines air motor Is a governor or other arrangement fitted to prevent racing of the engine when declutched Yes Means of lubrication forced Thickness of cylinder liners 42 mm. Are the cylinders fitted with safety valves Yes Are the exhaust pipes and silencers ~~water cooled or~~ lagged with non-conducting material Yes If the exhaust is led overboard near the waterline, what means are arranged to prevent water from being syphoned back to the engine Funnel

Cooling Water Pumps, No. 3 Salt of 280 Tons; 2 Fresh of 280 Tons Is the sea suction provided with an efficient strainer which can be cleared within the vessel Yes

Bilge Pumps worked from the **Main Engines,** No. None Diameter Stroke Can one be overhauled while the other is at work

Pumps connected to the **Main Bilge Line** { No. and Size Three - Ballast 200 Tons - Bilge 110 Tons - General Service 80 Tons / How driven Electric Motors.

Ballast Pumps, No. and size One - 200 Tons **Lubricating Oil Pumps,** including Spare Pump, No. and size Three - 230 Tons

Are two independent means arranged for circulating water through the **Oil Cooler** Yes **Suctions,** connected to both Main Bilge Pumps and Auxiliary Bilge Pumps, No. and size:—In Machinery Spaces 4 of 3½" - 2 of 2" In Tunnel 2 of 2½" 1 of 3"

In Holds, &c. 6 - of 3½" Forward Cofferdam + duct Keel 3 of 2"

Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size Three Ballast pumps 6" - ~~Bilge pumps~~ 5" - Gen. Service pumps 5"

Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes Yes Are the Bilge Suctions 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 Yes

Are all **Sea Connections** fitted direct on the skin of the ship Yes Are they fitted with Valves or Cocks Yes

Are they fixed sufficiently high on the ship's side to be seen without lifting the platform plates Yes Are the Overboard Discharges ~~above or~~ below the deep water line except oily bilge discharge

Are they each fitted with a Discharge Valve always accessible on the plating of the vessel Yes Are the Blow Off Cocks fitted with a spigot and brass covering plate Yes

What pipes pass through the bunkers None How are they protected

What pipes pass through the deep tanks None 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 Yes

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 Yes Is the Shaft Tunnel watertight Yes Is it fitted with a watertight door Yes worked from Upper deck

If 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. None No. of stages Diameters Stroke Driven by

Auxiliary Air Compressors, No. Two No. of stages Two Diameters 400 mm + 400-350 mm Stroke 260 mm. Driven by Electric Motors

Small Auxiliary Air Compressors, No. One No. of stages two Diameters 180-54 mm + 54 mm Stroke 115 mm. Driven by Steam Engine

Scavenging Air ~~Pumps~~ Blowers, No. None Four capacity of each ~~Diameter~~ 311 m³/min. at 1·2 atmos. abs. ~~Stroke~~ and 306 r.p.m. Driven by Geared from Main Engines

Auxiliary Engines crank shafts, diameter as per Rule 201.5 mm. as fitted 280 mm.

AIR RECEIVERS:—

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 Yes What means are provided for cleaning their inner surfaces Open ends.

Is there a drain arrangement fitted at the lowest part of each receiver Yes

High Pressure Air Receivers, No. (Two) 3 on Aux. Eng. Plate Cubic capacity of each 180 Litres Internal diameter 14" thickness ½"

Seamless, ~~lap welded or riveted longitudinal joint~~ Yes Material Steel Range of tensile strength 28/32 Tons Working pressure by Rules 966 lbs"

Starting Air Receivers, No. Two Total cubic capacity 1800 Cub. ft. Internal diameter 6'-4⅛" thickness 1 1/16"

~~Seamless, lap welded or~~ riveted longitudinal joint Yes Material Steel Range of tensile strength 28/32 Tons Working pressure by Rules 363 lbs"

W1128-0272

IS A DONKEY BOILER FITTED? Yes - two ✓ *If so, is a report now forwarded?* Yes ✓

PLANS. *Are approved plans forwarded herewith for Shafting* 29.1.35; 25.2.35; 25.3.35 *Receivers* 19.3.35 *Separate Tanks* 10.4.35
(If not, state date of approval)

Donkey Boilers 11.3.35 *General Pumping Arrangements* 1.4.35 *Oil Fuel Burning Arrangements* 18.2.35

SPARE GEAR In accordance with the rules - see attached list ✓

The foregoing is a correct description,

For HARLAND AND WOLFF, LIMITED.
A. G. Marshall *Manufacturer.*
Assistant Secretary.

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Dates of Survey while building — During progress of work in shops — During erection on board vessel	1935 Jan 19. Feb 7.8. Apl 5.18.20.27.30 Apl 2.3.7.8.9.10.15.20.23.24.27.28.29.30.31 June 3.4.5.6.7.10.17.19.20.24.26.27.28 July 4.5.8.9.10.11.16.17.18.22.23.24.30.31 Aug. 1.2.5.6.7.8.12.13.14.15.16.17.20.21.22.23.24.26.27.28.29.30 Sept. 2.3.4.5.6.9.10.11.12.13.14.16.17.18.19.20.21.23.25.26.27.28.30 Oct. 1.2.3.4.7.8.9.10.11.12.14.15.16.17.18.19.20.21.22.23.24.25.28.29-30 Nov. 1.2.4.5.6.7.8.11.12.13.14.15.19.20.21.22.26.27.28.29.30. Dec 2.3.4.5.6.9.10.12.13.15.16.17.18.19.20
Total No. of visits	160

Dates of Examination of principal parts—*Cylinders* 27.8.35 to 2.11.35 *Covers* 22.7.35 to 16.12.35 *Pistons* 5.7.35 to 25.10.35 *Rods* 3.9.35 and 12.9.35 *Connecting rods* 29.8.35 and 12.9.35

Crank shaft 14.8.35 and 21.9.35 *Flywheel shaft* ✓ *Thrust shaft* 14.8.35 and 23.9.35 *Intermediate shafts* 22.8.35 29.8.35 and 6.9.35 *Tube shaft* ✓

Screw shaft 31.7.35 + 17.9.35 *Propeller* 8.10.35 + 5.11.35 *Stern tube* 13.8.35 *Engine seatings* 17.9.35 *Engines holding down bolts* 27.11.35 and 4.12.35

Completion of fitting sea connections 9.12.35 *Completion of pumping arrangements* 16.12.35 *Engines tried under working conditions* 12.12.35

Crank shaft, Material S.M. Steel *Identification Mark* LLOYD'S 221-222 *Flywheel shaft, Material* ✓ *Identification Mark* ✓

Thrust shaft, Material S.M. Steel *Identification Mark* LLOYDS 9881-71 *Intermediate shafts, Material* S.M. Steel *Identification Marks* LLOYD'S 558-546-463-442-5.. {9820-9848-9800-4.. {392-14

Tube shaft, Material ✓ *Identification Mark* ✓ *Screw shaft, Material* S.M. Steel *Identification Mark* LLOYD'S 392-9794-9..

Is the flash point of the oil to be used over 150° F. Yes ✓

Is this machinery duplicate of a previous case Yes *If so, state name of vessel* "Australia Star" ✓

General Remarks *(State quality of workmanship, opinions as to class, &c.*

The machinery of this vessel has been constructed under special survey. The workmanship and materials are good. The main and auxiliary machines have been efficiently installed and tried under working conditions with satisfactory results. The main generators were constructed under survey & the electrical installation tested and tried at satisfactorily. In our opinion the vessel is eligible for notation in the Society's Register Book

✠ L.M.C. 12.35 C.L. 2 D.Bs. 100 lbs" OIL ENGINES.

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

The amount of Entry Fee ...	£ 6 : — :	When applied for,
Special	£ 161 - 11 - 6	31st Dec 1935.
Donkey Boiler Fee ...	£ 8 : 8 - 0	When received,
AIR RESERVOIRS ~~Travelling Expenses (if any)~~	£ 8 : 8 - 0	7.1 1936

R Lee Arnott & Charles G Hunter
Engineer Surveyors to Lloyd's Register of Shipping.

Committee's Minute FRI. 10 JAN 1936

Assigned + Lmc. 12.35 Oil Eng 2 DB - 100 lbs