

REPORT ON MACHINERY.

No. 7328

Date of writing Report 28th Jan 1914 When handed in at Local Office 30th Jan 1914 Port of Belfast Received at London Office MON. FEB. 2 - 1914

No. in Survey held at Belfast Date, First Survey 23rd Aug 1912 Last Survey 22nd Jan 1914
Reg. Book. on the Y.S.S. Orduna (Number of Visits 120)

Master J. M. C. Taylor Built at Belfast By whom built Harland & Wolff L^{td} Tons { Gross 15499 Net 9548 When built 1914

Engines made at Belfast By whom made - when made -

Boilers made at - By whom made - when made -

Registered Horse Power Not for Reg. Bk. Owners Pacific Steam Navigation Co. Ltd. Belonging to Liverpool
Nom. Horse Power as per Section 28 1643 Is Refrigerating Machinery fitted for cargo purposes Yes Is Electric Light fitted Yes

ENGINES, &c.—Description of Engines Twin Screw 4 cyl. Triple Expansion and L.P. Turbine Cylinders 8 No. of Cranks 8
 Dia. of Cylinders 26½ - 42 - 47½ - 47½ Length of Stroke 51 Revs. per minute 80 Dia. of Screw shaft as per rule 15.08 Material of screw shaft as fitted 16.0 - J. Steel
 Is the screw shaft fitted with a continuous liner the whole length of the stern tube Yes Is the after end of the liner made water tight in the propeller boss Yes If the liner is in more than one length are the joints burned ✓ 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 ✓ Length of stern bush 5-6 ✓
 Dia. of Tunnel shaft as per rule 14.13 ✓ Dia. of Crank shaft journals as per rule 14.84 ✓ Dia. of Crank pin 16 ✓ Size of Crank web 29½ x 11½ ✓ Dia. of thrust shaft under rollers 15½ ✓ Dia. of screw 17-6 ✓ Pitch of Screw 21-3 ✓ No. of Blades 3 ✓ State whether moveable Yes Total surface 80 sq. ft.
 No. of Feed pumps 2 ✓ Can one be overhauled while the other is at work ✓
 No. of Bilge pumps - Diameter of ditto - Stroke - Can one be overhauled while the other is at work ✓
 No. of Donkey Engines 2 ✓ Sizes of ditto - No. and size of Suctions connected to both Bilge and Donkey pumps
 Engine Room Ordinary 6-3½ + 6-2½ ✓ In Holds, &c. Ordinary 13-3½ + 12-2½ ✓
 Emergency 3-6 ✓ Emergency 12-6 + 1-4½ ✓
 No. of Bilge Injections 2 ✓ sizes 13½ ✓ Connected to condenser, or to circulating pump Pump Is a separate Donkey Suction fitted in Engine room & size 3-4½ ✓
 Are all the bilge suction pipes fitted with roses Yes ✓ Are the roses in Engine room always accessible Yes ✓ Are the sluices on Engine room bulkheads always accessible ✓
 Are all connections with the sea direct on the skin of the ship Yes ✓ Are they Valves or Cocks Both ✓
 Are they fixed sufficiently high on the ship's side to be seen without lifting the stowhold plates Yes ✓ Are the Discharge Pipes above or below the deep water line Below ✓
 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 are carried through the bunkers Fore hold suction ✓ How are they protected Wood casings ✓
 Are all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times Yes ✓
 Are the Bilge Suction Pipes, Cocks, and Valves arranged so as to prevent any communication between the sea and the bilges Yes ✓

Dates of examination of completion of fitting of Sea Connections 28-6-13 of Stern Tube 13/8/13 Screw shaft and Propeller 19/9/13
Is the Screw Shaft Tunnel watertight State to be Is it fitted with a watertight door Yes ✓ worked from Bridge & Upper C. Room

BOILERS, &c.—(Letter for record S ✓) Manufacturers of Steel W. Colville & Sons L^{td}

Total Heating Surface of Boilers 28410 sq. ft. of Draft fitted No No. and Description of Boilers 6-W End. Cylinders
 Working Pressure 215 lbs Tested by hydraulic pressure to 430 lbs Date of test 5-9-13 No. of Certificate 454
 Can each boiler be worked separately Yes ✓ Area of fire grate in each boiler 118½ sq. ft. No. and Description of Safety Valves to each boiler 3-Direct Spring Area of each valve 9.62 sq. Pressure to which they are adjusted 215 lbs Are they fitted with easing gear Yes ✓
 Smallest distance between boilers or uptakes and bunkers or woodwork About 22 Mean dia. of boilers 15-0 Length 19-6 Material of shell plates Steel
 Thickness 1¾ Range of tensile strength 29-33 tons Are the shell plates welded or flanged No ✓ Descrip. of riveting: cir. seams Lap & J. ✓
 Cir. seams Butt Seams Diameter of rivet holes in long. seams 1¾ Pitch of rivets 10½ Lap of plates or width of butt straps 22¾ ✓
 Percentages of strength of longitudinal joint rivets 88.6 Working pressure of shell by rules 250 lbs Size of manhole in shell 16- x 12- ✓
 No. of compensating ring McNeill's No. and Description of Furnaces in each boiler 6-Manson's Material Steel Outside diameter 47½ ✓
 Length of plain part top ✓ Thickness of plates crown } 4/16 ✓ Description of longitudinal joint Weld ✓ No. of strengthening rings ✓
 Working pressure of furnace by the rules 238 lbs Combustion chamber plates: Material Steel Thickness: Sides 2½ ✓ Back ✓ Top 2½ ✓ Bottom 2 ✓
 No. of stays to ditto: Sides 8½ x 8- ✓ Back ✓ Top 8 x 4½ ✓ If stays are fitted with nuts or riveted heads Nuts inside Working pressure by rules 228 lbs ✓
 Material of stay Steel Diameter at smallest part 1½ x 1½ Area supported by each stay 65 sq. Working pressure by rules 243 lbs ✓ End plates in steam space:
 Material Steel Thickness 1½ ✓ Pitch of stays 17½ x 15 ✓ How are stays secured Screwed into plate ✓ Working pressure by rules 218 lbs ✓ Material of stays Steel
 Diameter at smallest part 2¼ ✓ Area supported by each stay 260 sq. Working pressure by rules 258 lbs ✓ Material of Front plates at bottom Steel
 Thickness 5/8 ✓ Material of Lower back plate ✓ Thickness ✓ Greatest pitch of stays ✓ Working pressure of plate by rules ✓
 Diameter of tubes 2½ ✓ Pitch of tubes 4- x 4- ✓ Material of tube plates Steel Thickness: Front 5/8 ✓ Back 13/16 ✓ Mean pitch of stays 8- x 8- ✓
 Pitch across wide water spaces 14 ✓ Working pressures by rules 291 lbs with 4 Double ✓ Chamber tops: Material Iron Depth and
 Thickness of girder at centre 9- x (7- x 2) Length as per rule 51- ✓ Distance apart 8- x 8½ ✓ Number and pitch of stays in each 6-7½ ✓
 Working pressure by rules 342 lbs Superheater or Steam chest; how connected to boiler - Can the superheater be shut off and the boiler worked
 Separately Diameter Length Thickness of shell plates Material Description of longitudinal joint Diam. of rivet
 Pitch of rivets Working pressure of shell by rules Diameter of flue Material of flue plates Thickness

If stiffened with rings Distance between rings Working pressure by rules End plates: Thickness Hoop stayed
Working pressure of end plates Area of safety valves to superheater Are they fitted with easing gear



Port of Belfast Continuation of Report No. 732 dated 30th Jan on the

VERTICAL DONKEY BOILER— Manufacturers of Steel

Table with columns: No., Description, Made at, By whom made, When made, Where fixed, Working pressure, tested by hydraulic pressure to, Date of test, No. of Certificate, Fire grate area, Description of Safety Valves, No. of Safety Valves, Area of each, Pressure to which they are adjusted, Date of adjustment, etc.

SPARE GEAR. State the articles supplied:— see other sheet

The foregoing is a correct description, For Harland & Wolff, Ltd.,

Manufacturer.

Dates of Survey: During progress of work in shops - 1912; - Aug 23, Sep 4, Oct 10, 22, 28, Nov 6, 8, 12, 14, 19, 21, 27 and during erection on board vessel - up to Jan 23 - 1914, Total No. of visits 120

Is the approved plan of main boiler forwarded herewith

Yes

Table with columns: Dates of Examination of principal parts, Connecting rods, Crank shaft, Thrust shaft, Tunnel shafts, Screw shaft, Propeller, etc.

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

The machinery of this vessel has been made under Special Survey, and in accordance with the Rules.

The workmanship and the materials are of good description throughout, and on trial in Belfast Lough, the machinery worked satisfactorily.

A system of Emergency electrically driven Bilge Pumps has been fitted in this vessel, in lieu of hand pumps in the holds, as approved by the Committee. This is to be completed on arrival at Liverpool, and a copy of a letter to the Surveyors is appended.

Table with columns: The amount of Entry Fee, Special, Donkey Boiler Fee, Travelling Expenses (if any)

When applied for, 28-1-14, When received, 2/2/14, R. F. D. Beveridge, Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

TUE. FEB. 10. 1914

Committee's Minute

Assigned

+ Lmb 2.14

Table titled 'I.S.S. Arduna - List of Pumps (Independent)' listing various pumps and their specifications, such as '2 Main Feed, Weirs 18" x 13" x 24"', '1 Sanitary (Weirs) 8" x 9" x 18"', etc.

Spare Gear

Table listing spare gear items, including '1 set propeller studs + nuts (black) 2 male + 2 female black stops each section', '2 piston rods + nuts', '2 crosshead shoes', etc.

R. F. D. Beveridge, Lloyd's Register Foundation