

REPORT ON MACHINERY.

Port of Sunderland

Received at London Office

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No. in Survey held at Sunderland Date, first Survey 21st June Last Survey 10th Dec 1901
 Reg. Book. on the Screw steamer "Morana" (Number of Visits 29)
 Master Volazio Built at Sunderland By whom built John Priestman & Co (91) Tons } Gross 3807
 Engines made at Sunderland By whom made Richardson Westgarth & Co L^{td} (1218) when made 1901 } Net 2437
 Boilers made at Sunderland By whom made Richardson Westgarth & Co L^{td} when made 1901
 Registered Horse Power 312 Owners Societa in Azioni Ungaro Croata per la Nav. hiberna Port belonging to Trieste
 Nom. Horse Power as per Section 28 312 Is Refrigerating Machinery fitted No Is Electric Light fitted No

ENGINES, &c.—Description of Engines Triple Expansion No. of Cylinders 3 No. of Cranks 3
 Dia. of Cylinders 25" - 41" - 67" Length of Stroke 45" Revs. per minute 65 Dia. of Screw shaft as per rule 12.51 Lgth. of stern bush 4'-6"
 Dia. of Tunnel shaft as per rule 11.32 Dia. of Crank shaft journals as per rule 11.92 Dia. of Crank pin 12.5" Size of Crank webs 18" x 8 3/8" Dia. of thrust shaft under collars 13 1/2" Dia. of screw 16'-6" Pitch of screw 16'-0" No. of blades 4 State whether moveable No Total surface 770 sq ft
 No. of Feed pumps 2 Diameter of ditto 3" Stroke 30" Can one be overhauled while the other is at work Yes
 No. of Bilge pumps 2 Diameter of ditto 3" Stroke 30" Can one be overhauled while the other is at work Yes
 No. of Donkey Engines Two Sizes of Pumps 11x10 + 5 1/2 x 3 1/2 x 5" No. and size of Suctions connected to both Bilge and Donkey pumps
 In Engine Room Three of 3 1/2" In Holds, &c.

No. of bilge injections 1 sizes 5" Connected to condenser, or to circulating pump OP Is a separate donkey suction fitted in Engine room & size Yes 4"
 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 Yes
 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 stokehold plates Yes Are the discharge pipes above or below the deep water line Above
 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 None How are they protected Yes
 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
 When were stern tube, propeller, screw shaft, and all connections examined in dry dock New Vessel Is the screw shaft tunnel watertight Yes
 Is it fitted with a watertight door Yes worked from Top Platform

BOILERS, &c.— (Letter for record S) Total Heating Surface of Boilers 4840 sq ft Is forced draft fitted No
 No. and Description of Boilers 3 E. Cyl^{rs} Multitubular Working Pressure 160 lbs Tested by hydraulic pressure to 320 lbs
 Date of test 19.9.01 Can each boiler be worked separately Yes Area of fire grate in each boiler 57.5 sq ft No. and Description of safety valves to each boiler two direct Spring Area of each valve 8.3" Pressure to which they are adjusted 165 lbs Are they fitted with easing gear Yes
 Smallest distance between boilers or uptakes and bunkers or woodwork 5'-9" Mean dia. of boilers 15'-9 5/8" Length 10'-6" Material of shell plates S
 Thickness 1 3/16" Range of tensile strength 28/33 Are they welded or flanged No Descrip. of riveting: cir. seams DR Cap long. seams DR B.S
 Diameter of rivet holes in long. seams 1 1/32" Pitch of rivets 8 1/4" Lap of plates or width of butt straps 16 1/2"
 Per centages of strength of longitudinal joint rivets 86.11% Working pressure of shell by rules 163.4 lbs Size of manhole in shell 16" x 12"
 Size of compensating ring Hanged No. and Description of Furnaces in each boiler 3 Morrison Material S Outside diameter 49 1/4"
 Length of plain part top 12" Thickness of plates crown 3/32" Description of longitudinal joint Weld No. of strengthening rings Yes
 Working pressure of furnace by the rules 166.5 Combustion chamber plates: Material S Thickness: Sides 11/16" Back 11/16" Top 11/16" Bottom 25/32"
 Pitch of stays to ditto: Sides 11 x 8 1/2" Back 11 1/2 x 8 1/2" Top 11 x 8 1/2" If stays are fitted with nuts or riveted heads Nuts Working pressure by rules 160 lbs
 Material of stays S Diameter at smallest part 1.788 Area supported by each stay 98" Working pressure by rules 165 lbs End plates in steam space:
 Material Steel Thickness 1 5/32" Pitch of stays 21 x 17" How are stays secured DR x 20 Working pressure by rules 164 lbs Material of stays Steel
 Diameter at smallest part 6.1" Area supported by each stay 357" Working pressure by rules 170 Material of Front plates at bottom Steel
 Thickness 3/4" Material of Lower back plate Steel Thickness 3/4" Greatest pitch of stays 18 x 8 1/2" Working pressure of plate by rules 197 lbs
 Diameter of tubes 3 1/4" Pitch of tubes 4 1/2" x 4 1/2" Material of tube plates S Thickness: Front 3/4" Back 3/4" Mean pitch of stays 11 1/4"
 Pitch across wide water spaces 14 1/2" Working pressures by rules 192 lbs Girders to Chamber tops: Material Steel Depth and thickness of girder at centre 8 3/4" x 1 1/2" Length as per rule 29.6" Distance apart 11" Number and pitch of Stays in each 2 of 8 1/2"
 Working pressure by rules 165 lbs Superheater or Steam chest; how connected to boiler None Can the superheater be shut off and the boiler worked separately Yes
 Diameter Yes Length Yes Thickness of shell plates Yes Material Yes Description of longitudinal joint Yes Diam. of rivet holes Yes Pitch of rivets Yes Working pressure of shell by rules Yes Diameter of flue Yes Material of flue plates Yes Thickness Yes
 If stiffened with rings Yes Distance between rings Yes Working pressure by rules Yes End plates: Thickness Yes How stayed Yes
 Working pressure of end plates Yes Area of safety valves to superheater Yes Are they fitted with easing gear Yes

DONKEY BOILER— No. *one* Description *Vertical with cross stay*
 Made at *Stockton* By whom made *Piley Bros* When made *30-10-01* Where fixed *on deck*
 Working pressure *80 lb.* tested by hydraulic pressure to *160 lb.* No. of Certificate *2617* Fire grate area *28 sq ft* Description of safety valves *direct spring*
 No. of safety valves *2* Area of each *4.9 sq ft* Pressure to which they are adjusted *80 lb.* If fitted with easing gear *yes* If steam from main boilers can enter the donkey boiler *no*
 Dia. of donkey boiler *7'-9"* Length *16'-0"* Material of shell plates *S* Thickness *15/32"* Range of tensile strength *27/32*
 Descrip. of riveting long seams *Hi Riv Lap* Dia. of rivet holes *15/16* Whether punched or drilled *dr* Pitch of rivets *4/8*
 Lap of plating *6 1/2"* Per centage of strength of joint Rivets *86%* Thickness of shell crown plates *19/32* Radius of do. *5 ft* No. of Stays to do. *8*
 Dia. of stays *2" eff* Diameter of furnace Top *6'-1"* Bottom *6'-5"* Length of furnace *5'-3"* Thickness of furnace plates *21/32* Description of joint *Lap*
 Thickness of furnace crown plates *19/32* Stayed by *as above* Working pressure of shell by rules *89 lb.*
 Working pressure of furnace by rules *82 lb.* Diameter of uptake *19"* Thickness of uptake plates *1/2"* Thickness of water tubes *3/8"*

SPARE GEAR. State the articles supplied:— *Two top and bottom end bolts & nuts, two main bearing bolts & nuts, spare coupling bolts and nuts, spare feed & bilge pump valves, assorted iron bolts & nuts. (Spare tail shaft, spare propeller, air & circulating pump valves.)*

The foregoing is a correct description,
 of Main Engines & Boilers Manufactured by *J. & C. St. Russell* CHIEF DRAUGHTSMAN
 RICHARDSONS, WESTGARTH & CO., LTD

Dates of Survey while building
 During progress of work in shops:— *1901. June 21, July 3, 12, 17, 22, 25, 30, August 18, 16, 21, 28, 29, Sept 4, 12, 18, 19, Oct 10, 14, 28, Nov 1*
 During erection on board vessel:— *4, 7, 21, 22, 25, 26, 28, Dec 4, 10.*
 Total No. of visits *29*

Is the approved plan of main boiler forwarded herewith *yes*
 " " " " donkey " *no*
 " " " " " " *retained for duplicate*

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

Machinery constructed under old rules.

Material of screw shaft *Wrot Iron* Is the screw shaft fitted with a continuous liner the whole length of the stern tube *no*
 Is the after end of the liner made water tight in the propeller boss *no* 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 *✓*

The machinery built under Special Survey the material and workmanship found good and efficient. The main boilers and steam pipes tested under hydraulic pressure to 320 lb. " and found sound and efficient in every respect at that pressure.

The Engine tried under steam at their working pressure and found satisfactory.

In our opinion this vessel is worthy of the notification L M C 12. 01 to be made in the Register Book

It is submitted that this vessel is eligible for THE RECORD, + L M C 12. 01

The amount of Entry Fee. £ 3 : : When applied for, 31.12.01
 Special £ 35 : 12 : :
 Donkey Boiler Fee £ : : :
 Travelling Expenses (if any) £ : : : When received, 20-1-02

For F. W. Fillmore and self. J.W.F.
By Leonard & Shallcross
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

Committee's Minute TUES, 7 JAN 1902

Assigned

+ L M C 12, 01



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