

REPORT ON MACHINERY.

No. 14999

Port of *Greenock*Received at London Office *TUES. MAR 26 1907*

No. in Survey held at *Greenock* Date, first Survey *18th July 1906* Last Survey *15th March 1907*
 Reg. Book. *119* Supplement on the *Steel S.S. "Strathavon" (Grangemouth & Greenock Dockyard Co. No. 285)* (Number of Visits *97*)
 Master *A. E. Hutchinson* Built at *Greenock* By whom built *Grang. & Lk. Dockyard Co.* Gross *4402.86*
 Engines made at *Greenock* By whom made *J. G. Kincaid & Co. Ltd.* Net *2830.19*
 Boilers made at *Do.* By whom made *Do.* When built *1907*
 Registered Horse Power *353* Owners *Burrell & Son* Port belonging to *Glasgow*
 Nom. Horse Power as per Section 28 *353* Is Refrigerating Machinery fitted for cargo purposes *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"-68"* Length of Stroke *48"* Revs. per minute *40* Dia. of Screw shaft *as per rule 14.33* Material of *Iron*
 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 *58½"*
 Dia. of Tunnel shaft *as per rule 12.695* Dia. of Crank shaft journals *as per rule 13.33* Dia. of Crank pin *13½"* Size of Crank webs *20"x8¾"* Dia. of thrust shaft under
 collars *13½"* Dia. of screw *14-6"* Pitch of Screw *14-9"* No. of Blades *4* State whether moveable *No.* Total surface *95 sq. ft.*
 No. of Feed pumps *2* Diameter of ditto *3½"* Stroke *30"* Can one be overhauled while the other is at work *Yes*
 No. of Bilge pumps *2* Diameter of ditto *4"* Stroke *30"* Can one be overhauled while the other is at work *Yes*
 No. of Donkey Engines *2* Sizes of Pumps *12"x10" & 8"x5½"x8" Duplex* No. and size of Suctions connected to both Bilge and Donkey pumps
 In Engine Room *Four-3½"* In Holds, &c. *Forehold, two-3½"; Main hold, two-3½";*
Deep tank, two-3½"; No. 4 hold, two-3½"; No. 5 hold, two-3½" and Tunnel well, one-3½".
 No. of Bilge Injections *one size 6"* Connected to condenser, or to circulating pump *Cir. p.* Is a separate Donkey Suction fitted in Engine room & size *Yes-3½"*
 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 *none*
 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 *✓*
 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 *13/2/07* ✓ of Stern Tube *13/2/07* ✓ Screw shaft and Propeller *13/2/07* ✓
 Is the Screw Shaft Tunnel watertight *Yes* Is it fitted with a watertight door *Yes* worked from *upper deck*.

BOILERS, &c.—(Letter for record *S*) Manufacturers of Steel *Clydebridge Steel Co. & Messrs D. Colville & Sons.*

Total Heating Surface of Boilers *5509 sq. ft.* Is Forced Draft fitted *No.* No. and Description of Boilers *3 S.S. Multitubular*
 Working Pressure *180 lbs.* Tested by hydraulic pressure to *360 lbs.* Date of test *22/1/07* No. of Certificate *810* ✓
 Can each boiler be worked separately *Yes* Area of fire grate in each boiler *55 sq. ft.* No. and Description of Safety Valves to
 each boiler *Two, spring loaded* Area of each valve *5.94 sq. in.* Pressure to which they are adjusted *184 lbs.* Are they fitted with easing gear *Yes*
 Smallest distance between boilers or uptakes and bunkers or woodwork *3-6"* Mean dia. of boilers *14 ft.* Length *11 ft.* Material of shell plates *Steel*
 Thickness *1¾"* Range of tensile strength *28532 tons* Are the shell plates welded or flanged *No.* Descrip. of riveting: cir. seams *D.R.*
 long. seams *D.B.S. & A.* Diameter of rivet holes in long. seams *1¾"* Pitch of rivets *8½"* Lap of plates or width of butt straps *17½"*
 Per centages of strength of longitudinal joint *87.5* Working pressure of shell by rules *180 lbs.* Size of manhole in shell *16"x12"*
 plate *85.6* Size of compensating ring *32"x28" oval* No. and Description of Furnaces in each boiler *3-Dighton* Material *Steel* Outside diameter *3'-8¾"*
 Length of plain part *top 17" bottom 17"* Thickness of plates *17" 32"* Description of longitudinal joint *welded* No. of strengthening rings *✓*
 Working pressure of furnace by the rules *185 lbs.* Combustion chamber plates: Material *Steel* Thickness: Sides *19" 32"* Back *21" 32"* Top *19" 32"* Bottom *7" 8"*
 Pitch of stays to ditto: Sides *8½"x7¼"* Back *9"x9"* Top *9"x7¼"* If stays are fitted with nuts or riveted heads *nuts* Working pressure by rules *183-189*
 Material of stays *Steel* Diameter at smallest part *2.106 in.* Area supported by each stay *81 sq. in.* Working pressure by rules *234 lbs.* End plates in steam space:
 Material *Steel* Thickness *1½"* Pitch of stays *18½"x17¾"* How are stays secured *D. nuts & washers* Working pressure by rules *181 lbs.* Material of stays *Steel*
 Diameter at smallest part *6.92 in.* Area supported by each stay *330.7 sq. in.* Working pressure by rules *209 lbs.* Material of Front plates at bottom *Steel*
 Thickness *1"* Material of Lower back plate *Steel* Thickness *7/8"* Greatest pitch of stays *13¼"x9"* Working pressure of plate by rules *222 lbs.*
 Diameter of tubes *3½"* Pitch of tubes *4½"x4¾"* Material of tube plates *Steel* Thickness: Front *1"* Back *¾"* Mean pitch of stays *8½"*
 Pitch across wide water spaces *13¼"* Working pressures by rules *204 lbs.* Girders to Chamber tops: Material *Steel* Depth and
 thickness of girder at centre *9½"x13"* Length as per rule *2'-8¾"* Distance apart *9"* Number and pitch of stays in each *3-7¼"*
 Working pressure by rules *185 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
 holes *✓* 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 *✓* How stayed *✓*
 Working pressure of end plates *✓* Area of safety valves to superheater *✓* Are they fitted with easing gear *✓*

VERTICAL DONKEY BOILER—Manufacturers of Steel

| 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 | |
| If fitted with easing gear | If steam from main boilers can enter the donkey boiler | Dia. of donkey boiler | Length | | |
| Material of shell plates | Thickness | Range of tensile strength | Descrip. of riveting long. seams | | |
| Dia. of rivet holes | Whether punched or drilled | Pitch of rivets | Lap of plating | Per centage of strength of joint | Rivets Plates |
| Working pressure of shell by rules | Thickness of shell crown plates | Radius of do. | No. of stays to do. | Dia. of stays | |
| Diameter of furnace Top | Bottom | Length of furnace | Thickness of furnace plates | Description of joint | |
| Working pressure of furnace by rules | Thickness of furnace crown plates | Stayed by | | | |
| Diameter of uptake | Thickness of uptake plates | Thickness of water tubes | Dates of survey | | |

SPARE GEAR. State the articles supplied:— 1 set of air p. + 1 set of Cir. p. valves. 2 valves + seats for feed pumps + also 2 valves + seats for bilge pumps. 2 main bearings, 4 top end, 4 bottom end, 1 set of coupling, 6 junk ring, 6 gylt. cover, and six valve easing cover, bolts + nuts. 100 bolts + nuts + washers, assorted. 15. valve spring. 1 escape valve spring for each gylt. 1 relief valve + spring for feed pumps. 8 boiler plain + 2 stay tubes, 12 Condenser tubes + 24 fernules. 1/2 set fire bars, one cast iron propeller. 1 tail end shaft complete. 3 check valves + 3 crank shaft coupling bolts + nuts.

The foregoing is a correct description,
John G. Macrae & Co Ltd Manufacturer.

Dates of Survey while building
 During progress of work in shops - 1906 July 18 19 22 Sep 5 6 8 11 12 13 15 17 19 20 21 24 26 27 28 Oct 2 4 5 9 10 11 12 15 18 20 22
 During erection on board vessel - 23 24 25 26 27 29 30 31 Nov 2 5 6 7 8 9 10 12 13 14 15 16 19 21 22 23 24 26 27 28 29 30 Dec 3 4
 Total No. of visits 8 9 11 12 13 15

97.

Is the approved plan of main boiler forwarded herewith *in London office for S.D. Strathclyde*

Dates of Examination of principal parts—Cylinders 25/1/07 Slides 1/2/07 Covers 4/2/07 Pistons 28/1/07 Rods 28/1/07
 Connecting rods 28/1/07 Crank shaft 21/1/07 Thrust shaft 8/3/07 Tunnel shafts 8/3/07 Screw shaft 7/2/07 Propeller 13/2/07
 Stern tube 13/2/07 Steam pipes tested 5/3/07 + 9/3/07 Engine and boiler seatings 8/3/07 Engines holding down bolts 7/3/07
 Completion of pumping arrangements 13/3/07 Boilers fixed 8/3/07 Engines tried under steam 15/3/07
 Main boiler safety valves adjusted 13/3/07 Thickness of adjusting washers *Starb B. 5 1/4 P 3/4 Centre B. 5 3/8 P 1/4 Port B. 5 5/16 P 5/16*
 Material of Crank shaft *Steel* Identification Mark on Do. *h^o 651 S. 06. A.T.P.* Material of Thrust shaft *Steel* Identification Mark on Do. *h^o 652 S. 06. A.T.P.*
 Material of Tunnel shafts *Steel* Identification Marks on Do. *h^o 653-8 S. 06. A.T.P.* Material of Screw shafts *Iron* Identification Marks on Do. *h^o 808 A.T.G.*
 Material of Steam Pipes *Copper* Test pressure *400 lbs.*

General Remarks (State quality of workmanship, opinions as to class, &c. *workmanship and material good.*)
 The Engines and Boilers have been built under special survey and have been efficiently fitted on board, tried under a full pressure of steam and found to work satisfactory. They are now in safe working condition and eligible, in my opinion, to be classed with notation **+ L.M.C. 3.07.**

Marks on Main B^{rs}

h^o 810
 Lloyds Test.
 360 lbs.
 22/1/07 R.E.

It is submitted that
 this vessel is eligible for
 THE RECORD

✠ LMC 3.07.

28/1/07
28/3/07

The amount of Entry Fee. £ 3: : : When applied for, 19/3/1907
 Special £ 37: 13: : :
 Donkey Boiler Fee £ : : : When received, 22/3/1907
 Travelling Expenses (if any) £ : : :
 Glasgow 25 MAR 1907

R. Elliott
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

Committee's Minute

Assigned

+ LMC. 3.07.

MACHINERY CERTIFICATE
 WRITTEN 26.3.07



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