

## REPORT ON MACHINERY.

SAT. 2 APL 1898

Port of *Greenock*

Received at London Office 18

Survey held at *Greenock*Date, first Survey *23<sup>rd</sup> May 1896* Last Survey *30<sup>th</sup> March 1898*(Number of Visits *196*)

look.

on the *Screw Steamer "Arabia"*Tons { Gross *7902.80*  
Net *4167.30*Built at *Greenock* By whom built *Caird & Co. (Lim<sup>d</sup>)*When built *1897 & 8*es made at *Greenock*By whom made *Caird & Co. (Lim<sup>d</sup>)*when made *1897 & 8*rs made at *do*By whom made *do*when made *1897*tered Horse Power *2500*Owners *Peninsular & Oriental S.S. Co.*Port belonging to *Greenock*Horse Power as per Section 28 *1355*Is Electric Light fitted *yes*INES, &c.—Description of Engines *Inverted direct acting triple expansion* No. of Cylinders *Four* No. of Cranks *Four*Diameter of Cylinders *42 1/4, 68, two 74 1/2* Length of Stroke *72* Revolutions per minute *73* Diameter of Screw shaft *as per rule 20 1/4*  
*as fitted 21*Diameter of Tunnel shaft *as per rule 19 1/4* Diameter of Crank shaft journals *21* Diameter of Crank pins *21 1/2* Size of Crank webs *30 x 16*  
*as fitted 19 5/8*Diameter of screw *20 1/2* Pitch of screw *2 1/2* No. of blades *Four* State whether moveable *yes* Total surface *126 sq. ft.*of Feed pumps *Two* Diameter of ditto *5 3/4* Stroke *36* Can one be overhauled while the other is at work *yes*of Bilge pumps *Two* Diameter of ditto *5* Stroke *36* Can one be overhauled while the other is at work *yes*of Donkey Engines *Four* Sizes of Pumps *duplex 10 x 10, two 10 x 10, one 6 x 15* No. and size of Suctions connected to both Bilge and Donkey pumpsEngine Room *4* Stokeholds *four 4 & five separate 4 1/2* In Holds, &c. *Ten 3 1/2 in holds & one 3 in tunnel well*of bilge injections *Five* sizes *4 1/2* Connected to condenser, or to circulating pump *Condenser* Is a separate donkey suction fitted in Engine room & size *yes 4 1/2*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*all connections with the sea direct on the skin of the ship *yes* Are they Valves or Cocks *Both*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*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*at pipes are carried through the bunkers *Bilge, scupper, Distiller &c.* How are they protected *Wood & iron casings*all pipes, cocks, valves, and pumps in connection with the machinery and all boiler mountings accessible at all times *yes*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 *in ship before launching* Is the screw shaft tunnel watertight *yes*it fitted with a watertight door *yes* worked from *Top of engine room*ILLERS, &c.— (Letter for record *S*) Total Heating Surface of Boilers *20,864 sq. ft.* Is forced draft fitted *yes*and Description of Boilers *Three double & three single ended* Working Pressure *170 lbs* Tested by hydraulic pressure to *340 lbs*Date of test *18.10.97* Can each boiler be worked separately *yes* Area of fire grate in each boiler *118 sq. ft.* No. and Description of safety valves toeach boiler *Two direct spring* Area of each valve *17.72 sq. in.* Pressure to which they are adjusted *174 lbs* Are they fittedwith easing gear *yes* Smallest distance between boilers or uptakes and bunkers or woodwork *26* Mean diameter of boilers *15.3*Length *20.0* Material of shell plates *Steel* Thickness *1 1/2* Description of riveting: circum. seams *Lap double straps* long. seams *Double straps treble*Diameter of rivet holes in long. seams *1 1/2* Pitch of rivets *8 3/4 & 4 3/5* Lap of plates or width of butt straps *20 straps*Percentage of strength of longitudinal joint *89* Working pressure of shell by rules *170 lbs* Size of manhole in shell *16 x 12*Size of compensating ring *29 x 30 x 1 1/2* No. and Description of Furnaces in each boiler *Six suspension* Material *Steel* Outside diameter *47*Length of plain part *top 14, bottom 14* Thickness of plates *3 1/2* Description of longitudinal joint *welded* No. of strengthening rings *four*Working pressure of furnace by the rules *200 lbs* Combustion chamber plates: Material *Steel* Thickness: Sides *9/16* Back *1/2* Top *3/8* Bottom *1/2*Pitch of stays to ditto: Sides *7/8 x 7/8* Back *9/16* Top *9/16* If stays are fitted with nuts or riveted heads *none except* Working pressure by rules *172 & 232*Material of stays *Steel* Diameter at smallest part *1 1/8* Area supported by each stay *526.81 sq. in.* Working pressure by rules *196 to 200* End plates in steam space:Material *Steel* Thickness *1* Pitch of stays *7 1/2* How are stays secured *double nuts* Working pressure by rules *184 lbs* Material of stays *Steel*Diameter at smallest part *2 3/4* Area supported by each stay *280 sq. in.* Working pressure by rules *185 lbs* Material of Front plates at bottom *Steel*Thickness *13/16* Material of Lower back plate *Steel* Thickness *1* Greatest pitch of stays *7 1/2* Working pressure of plate by rules *184*Diameter of tubes *2 1/2* Pitch of tubes *3 3/4 x 3 3/4* Material of tube plates *Steel* Thickness: Front *3/8* Back *3/4* Mean pitch of stays *7 1/2*Pitch across wide water spaces *14* Working pressures by rules *231 lbs* Girders to Chamber tops: Material *Steel* Depth andThickness of girder at centre *7 x 3/4 double* Length as per rule *50 3/8* Distance apart *92 8 1/2* Number and pitch of Stays in each *Four 9*Working pressure by rules *170 lbs* Superheater or Steam chest; how connected to boiler *Can the superheater be shut off and the boiler worked*separately *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 *How stayed*If stiffened with rings *Distance between rings* Working pressure by rules *End plates: Thickness*Working pressure of end plates *Area of safety valves to superheater* Are they fitted with easing gear *yes*



DONKEY BOILER— Description *see other report attached*

Made at \_\_\_\_\_ By whom made \_\_\_\_\_

When made \_\_\_\_\_ Where fixed \_\_\_\_\_

Working pressure \_\_\_\_\_ tested by hydraulic pressure to \_\_\_\_\_ No. of Certificate \_\_\_\_\_ Fire grate area \_\_\_\_\_ Description of safety valves \_\_\_\_\_

No. of safety valves \_\_\_\_\_ Area of each \_\_\_\_\_ Pressure to which they are adjusted \_\_\_\_\_ If fitted with easing gear \_\_\_\_\_ If steam from main boiler \_\_\_\_\_

enter the donkey boiler \_\_\_\_\_ Diameter of donkey boiler \_\_\_\_\_ Length \_\_\_\_\_ Material of shell plates \_\_\_\_\_ Thickness \_\_\_\_\_

Description of riveting long. seams \_\_\_\_\_ Diameter of rivet holes \_\_\_\_\_ Whether punched or drilled \_\_\_\_\_ Pitch of rivets \_\_\_\_\_

Lap of plating \_\_\_\_\_ Per centage of strength of joint \_\_\_\_\_ Rivets \_\_\_\_\_ 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 \_\_\_\_\_ Descri \_\_\_\_\_

joint \_\_\_\_\_ Thickness of furnace crown plates \_\_\_\_\_ Stayed by \_\_\_\_\_ Working pressure of shell by rules \_\_\_\_\_

Working pressure of furnace by rules \_\_\_\_\_ Diameter of uptake \_\_\_\_\_ Thickness of uptake plates \_\_\_\_\_ Thickness of water tubes \_\_\_\_\_

SPARE GEAR. State the articles supplied:— *2 bronze propeller blades, 1 screw shaft, 1 length crank shaft, 1 Fan Engine, 1 H.P. Cylinder Cover, 1 H.P. V.I.P. piston 1 set packing rings for each piston, 1 H.P. V.I.P. piston valve & Chamber, 1 L.P. Slide Valve, 1 H.P. 1 L.P. V.I.P. Valve & pin, 1 gland in hole for each Cylinder stuffing box, Spare springs for reversing gear.*

The foregoing is a correct description,

FOR CAIRD AND COMPANY, LIMITED,

Manufacturer.

*Reinhardt*

Dates	During progress of work in shops—	During erection on board vessel—	Total No. of visits
1896. May 23, June 18, 29, July 13, 15, 18, 21, 24, 29, Aug 4, Sept 1, Oct 9, 15, 17, 22, 27, 30, Nov 2, 3, 5, 7, 10, 13, 17, 19, 21, 25, 27, Dec 1, 7, 10, 14, 19, 23, 26, 29, 31, 1897. Jan 1, 2, 5, 15, 18, 21, 25, 28, Feb 4, 1, 4, 6, 9, 10, 15, 16, 22, 25, 27, March 2, 4, 9, 10, 16, 18, 22, 24, 26, 29, April 1, 6, 7, 9, 12, 15, 16, 19, 22, 23, 26, 29, May 1, 4, 19, 20, 25, 29, June 1, 4, 7, 9, 10, 11, 15, 17, 19, 29, July 12, 14, 16, 19, 21, 24, 28, Aug 2, 4, 7, 11, 13, 14, 17, 21, 24, 27, 28, 30, 31, Sept 2, 5, 17, 18, 20, 22, 23, 27, 30, Oct 1, 5, 7, 9, 11, 13, 14, 18, 20, 21, 23, 26, 28, 29, 30, Nov 2, 4, 8, 12, 15, 18, 19, 24, 27, Dec 1, 2, 4, 8, 9, 11, 14, 15, 16, 17, 21, 22, 27, 1898. Jan 10, 13, 14, 18, 20, 22, 26, 27, 28, 29, Feb 4, 1, 2, 4, 7, 9, 12, 15, 16, 18, 21, 23, 26, March 1, 2, 4, 7, 12, 16, 17, 19, 22, 25, 26, 30, 1906.			

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

*These Engines and Boilers have been specially surveyed and construction, quality of workmanship good. Crankshafts and other shaft delivered turned by the makers. Thrust, tunnel, & screw shafts examined being finished in lathe and found apparently sound. Tested all main pipes by hydraulic pressure to 340 lbs per sq in and found them satisfactory. The Engines and Boilers are satisfactorily fitted in vessel. And been tested under full steam, they are now in good order and satisfactory working condition, and are in my opinion eligible to be noted in Register Book. **LMC 3, 98.***

*The Main Boilers are fitted with forced draught (Howard's system)*

*Spare gear Continued*

*a set of bushes with bolts for both ends of one Connecting rod, 1 air pump bucket & rod, & head valves with seats & guards complete, 75 tubes & 225 packing ferrules for Condenser, 1 set of feed & bilge pump valves & seats, 1 set valves for sanitary pump, 1 H.P. eccentric pulley, 1 escape valve spring for each size Cylinder, 2 do for feed pumps, 1 Centre for valve quadrant with 3 sets gun metal liners, 1 iron worm for turning gear, 2 main bearing bolts & nuts, 9 do for crankshaft couplings, 2 sets do for tunnel & screw shafts, 12 studs for Cylinder covers, 24 do for joint rings, 6 do for Cylinder stuffing boxes, 4 do for feed pumps, 6 do for air pump covers, 2 do for air pump bucket & valves, 2 do for air valves, 4 springs for main boiler safety valves, 2 sets Manhole & Mud hole doors for 1 Main Boiler, 1 set do for 2 Boilers, 1 set fire bar hearer for two Main Boilers, 1 set do for 2 Boilers, a quantity of bolts nuts & rings as required.*

The amount of Entry Fee..	£	3	:	"	:	"	When applied for,
Special .....	£	87	:	15	:	"	30/3/1898
Donkey Boiler Fee ..	£	"	:	"	:	"	When received,
Travelling Expenses (if any) £	£	"	:	"	:	"	31/3/1898

Committee's Minute

Assigned

TUES. 5 APR 1898

**LMC 3, 98**

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

*It is submitted that this vessel is eligible for THE RECORD. + L. & C. F. D. Greenock District, Lloyd's Register Foundation*