

REPORT ON MACHINERY.

Port of Greenock

WED. 7 OCT 1896

Received at London Office

No. in Survey held at Greenock & Port Glasgow Date, first Survey 14th Jun Last Survey 14th Dec 1896
Reg. Book. 14 on the Twin screw Steamer "Rio Affia" (Number of Visits 11)

Master C. A. Arundrup Built at Port Glasgow By whom built Russell & Co. Tons { Gross 460
Net 313
When built 1896

Engines made at Greenock By whom made John S. Kincaid & Co. when made 1896

Boilers made at Glasgow By whom made Ross & Duncan when made 1896

Registered Horse Power 90 Owners C. A. Bernard & Co. Port belonging to Para.

Nom. Horse Power as per Section 28 80

ENGINES, &c. — Description of Engines Inverted, Direct acting, Triple Expansion No. of Cylinders Six
Diameter of Cylinders Two 10" Two 16" Two 26" Length of Stroke 21" Revolutions per minute 189 Diameter of Screw shaft as per rule 4.99
Diameter of Tunnel shaft as fitted 5.58 Diameter of Crank shaft journals 5.58 Diameter of Crank pins 5.58 Size of Crank webs 7 1/2 x 4"
Diameter of screws 6" 0 Pitch of screws 8.16 No. of blades Three State whether moveable yes Total surface 13.6 in each
No. of Feed pumps one on each engine Diameter of ditto 2 1/2 Stroke 10 1/2 Can one be overhauled while the other is at work yes
No. of Bilge pumps one on each engine Diameter of ditto 2 1/2 Stroke 10 1/2 Can one be overhauled while the other is at work yes
No. of Donkey Engines Two Sizes of Pumps duplex 3 1/2 x 5" single 3 x 6 1/2" No. and size of Suctions connected to both Bilge and Donkey pumps
In Engine Room Three - 2" In Holds, &c. Eight - 2"

No. of bilge injections Two sizes 2 3/4 Connected to condenser, or to circulating pump Circ pump Is a separate donkey suction fitted in Engine room & size Yes - 2"
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 no line
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 Nine 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
When were stern tube, propeller, screw shaft, and all connections examined in dry dock on 11th before launching Is the screw shaft tunnel watertight no tunnel
Is it fitted with a watertight door — worked from shafts protected with iron casings

BOILERS, &c. — (Letter for record S) Total Heating Surface of Boilers 1447 sq ft
No. and Description of Boilers One Cylindrical return tubular Working Pressure 175 lbs Tested by hydraulic pressure to 350 lbs
Date of test 10.9.96 Can each boiler be worked separately — Area of fire grate in each boiler 60 sq ft No. and Description of safety valves to
each boiler Two Direct Spring Area of each valve 5.94 sq in Pressure to which they are adjusted 180 lbs Are they fitted
with easing gear Yes Smallest distance between boilers or uptakes and bunkers or woodwork 9" Mean diameter of boilers 156"
Length 10' 6" Material of shell plates Steel Thickness 1/8" Description of riveting: circum. seams Cap 2 Rivets long. seams Double Rivets 5 Rivets
Diameter of rivet holes in long. seams 13/16" Pitch of rivets 8 1/2" Lap of plates or width of butt straps 17 1/4 x 1 1/2"
Per centages of strength of longitudinal joint 86.6 Working pressure of shell by rules 176 lbs Size of manhole in shell 12 1/2 x 16 1/2"
Size of compensating ring 6" x 1 1/2" No. and Description of Furnaces in each boiler Three ribbed Material Steel Outside diameter 41"
Length of plain part 7' 3" Thickness of plates 7' 17/32" Description of longitudinal joint weld No. of strengthening rings ribs
Working pressure of furnace by the rules 184 lbs Combustion chamber plates: Material Steel Thickness: Sides 5/8" Back 19/32" Top 1/16" Bottom 5/8" and up
Pitch of stays to ditto: Sides 6 x 8 1/2" Back 8 x 8 3/8" Top 8 1/2 x 9 1/8" stays are fitted with nuts or riveted heads nuts Working pressure by rules approach
Material of stays Steel Diameter at smallest part 1.76 sq in Area supported by each stay 67 sq in Working pressure by rules 210 lbs End plates in steam space:
Material Steel Thickness 7/8" Pitch of stays 18 3/4" How are stays secured Double nuts Working pressure by rules 175 lbs Material of stays Steel
Diameter at smallest part 7.39 sq in Area supported by each stay 352 sq in Working pressure by rules 175 lbs Material of Front plates at bottom Steel
Thickness 3/4" Material of Lower back plate Steel Thickness 3/4" Greatest pitch of stays 13 3/4" Working pressure of plate by rules 287 lbs
Diameter of tubes 3 1/2" Pitch of tubes 4 1/16" Material of tube plates Steel Thickness: Front 7/8" Back 11/32" Mean pitch of stays 9 3/4"
Pitch across wide water spaces 14 1/4" Working pressures by rules 249, 176 Girders to Chamber tops: Material Steel Depth and
thickness of girder at centre 7 1/2 x 2 x 1/8" Length as per rule 27 Distance apart 9 3/8" Number and pitch of Stays in each 2 x 8 1/2"
Working pressure by rules 208 lbs Superheater or Steam chest; how connected to boiler none 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 —

DONKEY BOILER— Description *see attached Report.*

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 boilers can
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 _____ Description of
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 Connecting rod bolts. 2 piston rod bolts. 3 main bearing bolts.
1 set of Coupling bolts. 1 set of Sea & Bilge pump valves. 1/2 set assorted bolts & nuts. Iron of various sizes
1 set of piston Springs. 2 propeller bosses & 18 blades. 1 screw shaft. 1 crank shaft. 1 pair
main bearing bushes. 1 do for connecting rod top & bottom ends. 1 do for top end of eccentric*

The foregoing is a correct description,

John G. Ruiscald & Co. Manufacturer.

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

*These Engines have been specially surveyed during construction
quality of workmanship good.*

*The boiler has been built under the conditions of special survey
of good material and workmanship.*

*The above machinery has been securely fitted on board, and worked
satisfactorily under steam, and are in our opinion eligible to be noted
in Register Book. **LMC. 10, 96***

Spare gear continued

*brasses for valve motion. do for pump lever links. 1/2 set Condenser tubes
1/2 set Main boiler tubes. 1 set fire bars for Main & Donkey Boilers.
1 set of valves for Circulating pump.*

It is submitted that
this vessel is eligible for
THE RECORD + L.M.C. 10.96.

*J.G.R.
7.10.96*

Certificate (if required) to be sent to _____

The amount of Entry Fee. £ 1 : :
Special " " £ : :
Donkey Boiler Fee " " £ : :
Travelling Expenses (if any) £ : :
When applied for, 1.11.96
When received, 10.10.96

A. G. Herbert
Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

MACHINERY CERTIFICATE

Committee's Minute **FRI. 9 OCT 1896**

Assigned _____

+ LMC 10, 96



Lloyd's Register
Foundation

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