

## REPORT ON MACHINERY.

Port of Belfast

Received at London Office

18

No. in Survey held at BelfastDate, first Survey Jan 6<sup>th</sup> 1893 Last Survey Jan 16<sup>th</sup> 1894

Reg. Book.

(Number of Visits 33)on the Steel screw steamer "Ardanrose"Tons { Gross 2128  
Net 1360Master Belfast Built at Belfast By whom built Workman Clark & Co Ltd When built 1894-1Engines made at Belfast By whom made Workman Clark & Co Ltd when made 1894-1Boilers made at Belfast By whom made Workman Clark & Co Ltd when made 1894-1Registered Horse Power 250 Owners Clark & Service Port belonging to GlasgowNom. Horse Power as per Section 28 236

ENGINES, &c.— Description of Engines Triple Expansion No. of Cylinders 3

Diameter of Cylinders 22 : 36 : 60 Length of Stroke 42 Revolutions per minute 75 Diameter of Screw shaft as per rule 11.13  
as fitted 11.3/4

Diameter of Tunnel shaft as per rule 10.57 Diameter of Crank shaft journals 11 3/4 Diameter of Crank pin 11 3/4 Size of Crank webs 8 x 16 1/4  
as fitted 11 1/4

Diameter of screw 15' 0" Pitch of screw 16' 0" No. of blades 24 State whether moveable no Total surface 66 sq. ft.

No. of Feed pumps 2 Diameter of ditto 3 1/2" Stroke 21" Can one be overhauled while the other is at work yes

No. of Bilge pumps 2 Diameter of ditto 4" Stroke 21" Can one be overhauled while the other is at work yes

No. of Donkey Engines four Sizes of Pumps Weirs feed 8 x 6 x 21" No. and size of Suctions connected to both Bilge and Donkey pumps  
in Engine Room { 3" centre suction } Cameron's double acting ballast 10 x 8 x 9  
{ 2 3/4" each wing } Cameron's double acting ballast 6 x 4 x 4 In Holds, &c. No 1 hold, one 2 1/2". No 2 hold, two 2 3/4"  
No 3 hold, two 2 3/4" No 4 hold, one 2 3/4" Tunnel suction 2"

No. of bilge injections 1 sizes 4 1/2" Connected to condenser, or to circulating pump Yes Is a separate donkey suction fitted in Engine room & size yes, 3"

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 Valves & Cocks

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 Fore well suction pipe How are they protected wood casing

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 before launching Is the screw shaft tunnel watertight yes

Is it fitted with a watertight door yes worked from upper engine room platform

BOILERS, &c.— (Letter for record S) Total Heating Surface of Boilers 3580

No. and Description of Boilers Two single-ended Working Pressure 180 Tested by hydraulic pressure to 360

Date of test 21.9.93 Can each boiler be worked separately yes Area of fire grate in each boiler 36.66 No. and Description of safety valves to  
each boiler Two, Turnbells Area of each valve 8.29 Pressure to which they are adjusted 185 lb Are they fitted  
with easing gear yes Smallest distance between boilers or uptakes and bunkers or woodwork 12" Mean diameter of boilers 13' 0"

Length 11' 6" Material of shell plates steel Thickness 1 1/16" Description of riveting: circum. seams uns. doub. riv. long. seams double butt  
centre line riv.

Diameter of rivet holes in long. seams 1 5/16" Pitch of rivets 9" Lap of plates or width of butt straps 19 3/8 x 1"

Percentage of strength of longitudinal joint 88.2 Working pressure of shell by rules 199 Size of manhole in shell 16 x 12  
plate 85.4

Size of compensating ring 2' 7" x 2' 3" No. and Description of Furnaces in each boiler 2 ribbed Material Steel Outside diameter 45 1/4"

Length of plain part top Thickness of plates crown 5/8" Description of longitudinal joint weld No. of strengthening rings 10 ribs  
bottom 5/8"

Working pressure of furnace by the rules 205 Combustion chamber plates: Material steel Thickness: Sides 9/16" Back 9/16" Top 9/16" Bottom 1/16"

Pitch of stays to ditto: Sides 7 x 8 1/4" Back 7 5/8" Top 7 5/8" x 7" If stays are fitted with nuts or riveted heads nuts Working pressure by rules 180

Material of stays steel Diameter at smallest part 1 3/8" (41 5/8) Area supported by each stay 58" Working pressure by rules 204 End plates in steam space:

Material steel Thickness 1/8" Pitch of stays 17 x 14 How are stays secured doubt nuts Working pressure by rules 207 Material of stays steel  
small washers

Diameter at smallest part 2 1/2" Area supported by each stay 238 Working pressure by rules 190 Material of Front plates at bottom steel

Thickness 15/16" Material of Lower back plate steel Thickness 15/16" Greatest pitch of stays as approx Working pressure of plate by rules 180

Diameter of tubes 2 1/2" Pitch of tubes 3 7/8" x 3 3/4" Material of tube plates steel Thickness: Front 7/8" Back 3/4" Mean pitch of stays 7 7/8"

Pitch across wide water spaces 14 1/4" Working pressures by rules 180 Girders to Chamber tops: Material steel Depth and  
thickness of girder at centre 8 1/2" x 1 1/2" Length as per rule 28" Distance apart 7 7/8" Number and pitch of Stays in each 3 at 7"

Working pressure by rules 239 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 -

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 -

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DONKEY BOILER— Description Vertical with 4 cross tubes in furnace.

Made at Belfast By whom made Workman, Clark & Co. Ltd. When made 1893 Where fixed In storehold

Working pressure 80 tested by hydraulic pressure to 160 No. of Certificate 172 Wire grate area 28 Description of safety valves Turnbuckle

No. of safety valves two Area of each 7.07 Pressure to which they are adjusted 85 1/2 If fitted with easing gear yes If steam from main boilers can enter the donkey boiler no

Diameter of donkey boiler 7' 3" Length 12' 6" Material of shell plates steel Thickness 1/2"

Description of riveting long. seams doub. riv. lap. Diameter of rivet holes 7/8" Whether punched or drilled drilled Pitch of rivets 1 1/8"

Lap of plating 4 1/8" Per centage of strength of joint Rivets 71 Plates 69.5 Thickness of shell crown plates 9/16" Radius of do. flat No. of Stays to do. 9

Dia. of stays. 2" iron Diameter of furnace Top 5' 2" Bottom 6' 9" Length of furnace 6' 6" Thickness of furnace plates 21/32 Description of

joint sing. riv. lap Thickness of furnace crown plates 9/16 Stayed by nine 2" iron stays Working pressure of shell by rules 88 1/2

Working pressure of furnace by rules 80 Diameter of uptake 19" Thickness of uptake plates 1/2" Thickness of water tubes 3/8" iron

SPARE GEAR. State the articles supplied:— Crank shaft length. Propeller shaft. 2 Con. rod top end bolt

& 2 hollow do. 2 main bearing bolts. Set coupling bolts. Set feed & bilge pump valves. Propeller. A.P. rod

eccentric strap. Set crank pin brasses. Set air & ex p. valves. Set boiler check valves. Cyl escape v. of

safety valve spring. Feed relief spring. Set crosshead brasses. Fire bars, boiler tubes, condenser tubes

The foregoing is a correct description, PRO WORKMAN, CLARK & CO., LIMITED, Assorted iron, bolts & nuts

Manufacturer. Chas. B. Allan DIRECTOR

General Remarks (State quality of workmanship, opinions as to class, &c.) The machinery has been built and

special survey throughout. Each length of main steam pipe & the main & donkey boilers have all been tested by water pressure as required by Rule.

The machinery is duplicate of that fitted in the sister vessel "Ardaandhu" by the same builders (Bel. rep. 4261). A tracing of the main boiler accomp. this report but the approved tracings of main & donkey boilers were forwarded with the report on the "Ardaandhu".

The vessel ran a satisfactory trial in the Belfast Lough on the 16th & the safety valves of main & donkey boilers were found to have been correctly adjusted.

The furnaces are fitted with Howden's system of forced draught.

The machinery in my opinion renders the vessel eligible for the record + LMC 1.94 in the Register Book.

It is submitted that this vessel is eligible for THE RECORD + LMC 1-94

On acct of leakage at seams of the fronts of the furnaces. The seams were riveted with larger rivets - W.A. 31-1-94

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

MACHINERY CERTIFICATE

Certificate (if required) to be sent to WRITTEN.

The amount of Entry Fee.. £ 2 : 0 : When applied for, Special .. .. £ 31 : 16 : 12 Jan 94 Donkey Boiler Fee .. .. £ : : When received, Travelling Expenses (if any) £ : : 22 Jan 94

Committee's Minute

FRI 2 FEB 1894

Assigned

+ LMC 1.94

A. L. Jones

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



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Belfast

Continuation of Report No. 4328 dated 16<sup>th</sup> January on the  
1894

Steel S. S. "Ardaraose"

This vessel after her trial on the 16<sup>th</sup> inst proceeded to Ardaraose, & after leaving there on her voyage to Patras, Greece, she put back to this port on the 20<sup>th</sup> inst with the front seams of the furnace flues leaking above the bars.

These seams were marked in the drawing double riveted with holes  $\frac{3}{16}$  diam. pitched at 3"; the pitch was actually made about  $3\frac{3}{8}$ " and this departure from the approved drawing was not noticed by me at the time.

Forced draught, on Howden's system, is supplied to the furnaces, &

this case the furnace fronts were so fitted that the front seams of the flues were entirely & quite unnecessarily exposed to the heat of the fires.

These seams have now been riveted above the bars, the holes having been rimed out to  $\frac{15}{16}$  diam. and an arch has been built in each furnace to protect the seam.

A 2" longitudinal stay has also been now fitted between the furnaces as it was thought that this might render the seams less liable to give trouble.

The vessel proceeded on her voyage this morning

A. L. Jones

29<sup>th</sup> Jan<sup>y</sup> 1894



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