

# REPORT ON MACHINERY.

Port of WEST HARTLEPOOL

THUR, 24 JUN 1897

No. in Survey held at WEST HARTLEPOOL Date, first Survey 30<sup>th</sup> April, 1897  
Reg. Book. S. S. "Lai-Ao-Ku" Last Survey 30<sup>th</sup> April, 1897  
on the S. S. "Lai-Ao-Ku" (Number of visits) 1  
Gross Tons 1897  
Net Tons 1897  
Built at Middlesbrough By whom built La. Raylton & Co. Ltd. When built 1897  
Engines made at Hartlepool By whom made J. Richardson & Son Ltd. when made 1897  
Boilers made at do By whom made do when made 1897  
Registered Horse Power 552 Owners do Port belonging to do  
Horse Power as per Section 28 552 Is Electric Light fitted do

Engines, &c.—Description of Engines  
No. of Cylinders 2 No. of Cranks 2  
Diameter of Cylinders 18" Length of Stroke 18" Revolutions per minute 180 Diameter of Screw shaft 12"  
Diameter of Tunnel shaft 10" Diameter of Crank shaft journals 10" Diameter of Crank pin 10" Size of Crank webs 10"  
Diameter of screw 10" Pitch of screw 10" No. of blades 10" State whether moveable 10" Total surface 10"  
No. of Feed pumps 10" Diameter of ditto 10" Stroke 10" Can one be overhauled while the other is at work 10"  
No. of Bilge pumps 10" Diameter of ditto 10" Stroke 10" Can one be overhauled while the other is at work 10"  
No. of Donkey Engines 10" Sizes of Pumps 10" No. and size of Suctions connected to both Bilge and Donkey pumps 10"  
Engine Room 10" In Holds, &c. 10"  
No. of bilge injections 10" sizes 10" Connected to condenser, or to circulating pump 10" Is a separate donkey suction fitted in Engine room & size 10"  
Are all the bilge suction pipes fitted with roses 10" Are the roses in Engine room always accessible 10" Are the sluices on Engine room bulkheads always accessible 10"  
Are all connections with the sea direct on the skin of the ship 10" Are they Valves or Cocks 10"  
Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates 10" Are the discharge pipes above or below the deep water line 10"  
Are they each fitted with a discharge valve always accessible on the plating of the vessel 10" Are the blow off cocks fitted with a spigot and brass covering plate 10"  
That pipes are carried through the bunkers 10" How are they protected 10"  
Are all pipes, cocks, valves, and pumps in connection with the machinery and all boiler mountings accessible at all times 10"  
Are the bilge suction pipes, cocks, and valves arranged so as to prevent any communication between the sea and the bilges 10"  
When were stern tube, propeller, screw shaft, and all connections examined in dry dock 10" Is the screw shaft tunnel watertight 10"  
Is it fitted with a watertight door 10" worked from 10"

Boilers, &c.— (Letter for record S.) Total Heating Surface of Boilers 10,010 Is forced draft fitted no  
No. and Description of Boilers Two Single ended Working Pressure 180 Tested by hydraulic pressure to 300  
Date of test 25.2.97 Can each boiler be worked separately yes Area of fire grate in each boiler 53.62 No. and Description of safety valves to 10"  
Each boiler Two Spring Area of each valve 7.06 Pressure to which they are adjusted 185 Are they fitted 10"  
Easing gear yes Smallest distance between boilers or uptakes and bunkers or woodwork 18" Mean diameter of boilers 12.0  
Length 10.0 Material of shell plates Steel Thickness 1 3/4" Description of riveting: circum. seams Lap long. seams Butt  
Diameter of rivet holes in long. seams 1 3/4" Pitch of rivets 8 1/2" Lap of plates or width of butt straps 19 1/2"  
Percentages of strength of longitudinal joint 85 Working pressure of shell by rules 187 Size of manhole in shell 13" x 16 1/2"  
Size of compensating ring 2.6 x 2.6 x 1 3/4" No. and Description of Furnaces in each boiler 3 Morrison Material Steel Outside diameter 3.4"  
Length of plain part 6.0 Thickness of plates 9" Description of longitudinal joint Welded No. of strengthening rings 4  
Working pressure of furnace by the rules 205 Combustion chamber plates: Material Steel Thickness: Sides 3 3/4" Back 3 3/4" Top 8" Bottom 8"  
Pitch of stays to ditto: Sides 8 1/2" Back 9 3/4" Top 8 1/4" If stays are fitted with nuts or riveted heads Yes Working pressure by rules 187  
Material of stays Steel Diameter at smallest part 1 1/2" Area supported by each stay 93 Working pressure by rules 258 End plates in steam space: 10"  
Material Steel Thickness 1 3/4" Pitch of stays 18 x 1 1/4" How are stays secured Welded Working pressure by rules 240 Material of stays Steel  
Diameter at smallest part 2 3/8" Area supported by each stay 306 Working pressure by rules 191 Material of Front plates at bottom Steel  
Thickness 7/8" Material of Lower back plate Steel Thickness 7/8" Greatest pitch of stays 12" Working pressure of plate by rules 183  
Diameter of tubes 3 1/4" Pitch of tubes 4 1/2" Material of tube plates Steel Thickness: Front 1" Back 1 3/16" Mean pitch of stays 9"  
Pitch across wide water spaces 14 1/2" Working pressures by rules 189 Girders to Chamber tops: Material Iron Depth and 10"  
Thickness of girder at centre 8 x 1 1/2" Length as per rule 2.5" Distance apart 8 1/2" Number and pitch of Stays in each Two 8 1/4"  
Working pressure by rules 196 Superheater or Steam chest; how connected to boiler None Can the superheater be shut off and the boiler worked 10"  
separately 10" Diameter 10" Length 10" Thickness of shell plates 10" Material 10" Description of longitudinal joint 10" Diam. of rivet 10"  
Pitch of rivets 10" Working pressure of shell by rules 10" Diameter of flue 10" Material of flue plates 10" Thickness 10"  
stiffened with rings 10" Distance between rings 10" Working pressure by rules 10" End plates: Thickness 10" How stayed 10"  
Working pressure of end plates 10" Area of safety valves to superheater 10" Are they fitted with easing gear 10"

**DONKEY BOILER—** Description

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 :—

The foregoing is a correct description,  
 For **THOMAS RICHARDSON & SONS, LIMITED,** Manufacturer.

Dates { During progress of  
 of Survey { work in shops - -  
 while { During erection on  
 building { board vessel - -  
 Total No. of visits

**Director.**

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

Certificate (if required) to be sent to

The amount of Entry Fee. . . £ : : When applied for, . . . 18  
 Special . . . £ : : When received, . . . 18  
 Donkey Boiler Fee . . . £ : :  
 Travelling Expenses (if any) £ : :

Committee's Minute

Assigned

*Richard Smith & Paddy Howell*  
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.



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 Foundation