

# REPORT ON MACHINERY.

2106

Port of WEST HARTLEPOOL

Received at London Office THUR, 24 JUN 1897

No. in Survey held at WEST HARTLEPOOL Date, first Survey \_\_\_\_\_ Last Survey 30<sup>th</sup> April, 1897

Reg. Book. \_\_\_\_\_ on the S.S. "Lai-Ao-Ku" (Number of visits) \_\_\_\_\_ Tons } Gross } Net }

Master \_\_\_\_\_ Built at Millers By whom built Lu Raylton & Co 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 do do when made 1897

Registered Horse Power \_\_\_\_\_ Owners \_\_\_\_\_ Port belonging to \_\_\_\_\_

Com. Horse Power as per Section 28 552 Is Electric Light fitted \_\_\_\_\_

ENGINES, &c.—Description of Engines \_\_\_\_\_ No. of Cylinders \_\_\_\_\_ No. of Cranks \_\_\_\_\_

Diameter of Cylinders \_\_\_\_\_ Length of Stroke \_\_\_\_\_ Revolutions per minute \_\_\_\_\_ Diameter of Screw shaft \_\_\_\_\_

Diameter of Tunnel shaft \_\_\_\_\_ Diameter of Crank shaft journals \_\_\_\_\_ Diameter of Crank pin \_\_\_\_\_ Size of Crank webs \_\_\_\_\_

Diameter of screw \_\_\_\_\_ Pitch of screw \_\_\_\_\_ No. of blades \_\_\_\_\_ State whether moveable \_\_\_\_\_ Total surface \_\_\_\_\_

No. of Feed pumps \_\_\_\_\_ Diameter of ditto \_\_\_\_\_ Stroke \_\_\_\_\_ Can one be overhauled while the other is at work \_\_\_\_\_

No. of Bilge pumps \_\_\_\_\_ Diameter of ditto \_\_\_\_\_ Stroke \_\_\_\_\_ Can one be overhauled while the other is at work \_\_\_\_\_

No. of Donkey Engines \_\_\_\_\_ Sizes of Pumps \_\_\_\_\_ No. and size of Suctions connected to both Bilge and Donkey pumps \_\_\_\_\_

Engine Room \_\_\_\_\_ In Holds, &c. \_\_\_\_\_

No. of bilge injections \_\_\_\_\_ sizes \_\_\_\_\_ Connected to condenser, or to circulating pump \_\_\_\_\_ Is a separate donkey suction fitted in Engine room & size \_\_\_\_\_

Are all the bilge suction pipes fitted with roses \_\_\_\_\_ Are the roses in Engine room always accessible \_\_\_\_\_ Are the sluices on Engine room bulkheads always accessible \_\_\_\_\_

Are all connections with the sea direct on the skin of the ship \_\_\_\_\_ Are they Valves or Cocks \_\_\_\_\_

Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates \_\_\_\_\_ Are the discharge pipes above or below the deep water line \_\_\_\_\_

Are they each fitted with a discharge valve always accessible on the plating of the vessel \_\_\_\_\_ Are the blow off cocks fitted with a spigot and brass covering plate \_\_\_\_\_

That pipes are carried through the bunkers \_\_\_\_\_ How are they protected \_\_\_\_\_

Are all pipes, cocks, valves, and pumps in connection with the machinery and all boiler mountings accessible at all times \_\_\_\_\_

Are the bilge suction pipes, cocks, and valves arranged so as to prevent any communication between the sea and the bilges \_\_\_\_\_

When were stern tube, propeller, screw shaft, and all connections examined in dry dock \_\_\_\_\_ Is the screw shaft tunnel watertight \_\_\_\_\_

Is it fitted with a watertight door \_\_\_\_\_ worked from \_\_\_\_\_

BOILERS, &c.— (Letter for record S.) Total Heating Surface of Boilers 10,070 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 \_\_\_\_\_

Each boiler Two Spring Area of each valve 7.06 Pressure to which they are adjusted 185 Are they fitted \_\_\_\_\_

Easing gear yes Smallest distance between boilers or uptakes and bunkers or woodwork 18" Mean diameter of boilers 171.0"

Length 10.0" Material of shell plates Steel Thickness 1 3/8" Description of riveting: circum. seams Lap long. seams Butt straps

Diameter of rivet holes in long. seams 1 3/8" Pitch of rivets 8 1/2" Lap of plates or width of butt straps 19 1/2"

Percentages of strength of longitudinal joint \_\_\_\_\_ 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 3/8" No. and Description of Furnaces in each boiler 3 Morrison Material Steel Outside diameter 3.7"

Length of plain part \_\_\_\_\_ Thickness of plates \_\_\_\_\_ 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 2 3/32" Back 2 3/32" Top 3" Bottom 2 7/8"

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 nuts 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: \_\_\_\_\_

Material Steel Thickness 1 3/8" Pitch of stays 18" x 1 1/4" How are stays secured nuts Working pressure by rules 240 Material of stays Steel

Diameter at smallest part 2 7/8" Area supported by each stay 306" Working pressure by rules 191 Material of Front plates at bottom Steel

Thickness 3/8" 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 2 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 \_\_\_\_\_

Thickness of girder at centre 8 x 1 1/8" 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 \_\_\_\_\_

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 \_\_\_\_\_

**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.

*Thomas Richardson*

Director.

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

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

Certificate (if required) to be sent to \_\_\_\_\_  
 not to work on or below the space for Committee's Minute.

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

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



Committee's Minute  
 Assigned