

# REPORT ON MACHINERY.

No. 25331

Received at London Office

ED. JUL. 17. 1912

Writing Report 19 When handed in at Local Office 16. 7. 1912 Port of Sunderland  
 in Survey held at Sunderland Date, First Survey 2 Feb Last Survey 22 July 1911  
 Book. on the S.S. "Hornfels" (Number of Visits 37) Gross 3424.317  
 Tons Net 2079.346 When built 1912  
 Built at Stockton By whom built Craig Taylor & Co Ltd (151)  
 Made at Sunderland By whom made North Eastern Marine Eng Co Ltd (2061) when made 1912  
 Made at Sunderland By whom made North Eastern Marine Eng Co Ltd when made 1912  
 Registered Horse Power 396 Owners H. B. Horcu Port belonging to duke  
 Horse Power as per Section 28 396 Is Refrigerating Machinery fitted for cargo purposes no Is Electric Light fitted yes

**ENGINES, &c.—Description of Engines** Triple expansion No. of Cylinders Three No. of Cranks Three  
 Cylinders 25" x 41" x 68" Length of Stroke 45" Revs. per minute 69 Dia. of Screw shaft 11.02" Material of screw shaft Steel  
 Screw shaft fitted with a continuous liner the whole length of the stern tube yes Is the after end of the liner made water tight  
 Propeller boss yes If the liner is in more than one length are the joints burned yes If the liner does not fit tightly at the part  
 The bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive yes If two  
 fitted, is the shaft lapped or protected between the liners yes Length of stern bush 4'-9"  
 Tunnel shaft as per rule 12.4" Dia. of Crank shaft journals as per rule 13.04" Dia. of Crank pin 13.4" Size of Crank webs 20" x 8" Dia. of thrust shaft under  
 as fitted 12.7" as fitted 13.4" Dia. of screw 14'-3" Pitch of Screw 14'-0" No. of Blades 4 State whether moveable no Total surface 94 sq ft  
 Feed pumps Two Diameter of ditto 3'-2" Stroke 24" Can one be overhauled while the other is at work yes  
 Bilge pumps Two Diameter of ditto 4" Stroke 24" Can one be overhauled while the other is at work yes  
 Donkey Engines Three Sizes of Pumps Ballast 2 off. 4" x 9" x 10" Feed 1 off. 4" x 6" x 10" No. and size of Suctions connected to both Bilge and Donkey pumps  
 Engine Room 4 @ 3'-9" dia. In Holds, &c. Two 3 1/2" in each hold, also one  
1/2" in afterhold well. One 3 1/2" tunnel well  
 Bilge Injections 1 size 5'-9" Connected to condenser, or to circulating pump C.P. Is a separate Donkey Suction fitted in Engine room & size yes 3'-9"  
 Are 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 have  
 Connections with the sea direct on the skin of the ship yes Are they Valves or Cocks Both  
 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  
 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  
 Pipes are carried through the bunkers have How are they protected yes  
 Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times yes  
 Bilge Suction Pipes, Cocks, and Valves arranged so as to prevent any communication between the sea and the bilges yes  
 Examination of completion of fitting of Sea Connections 22.5.12 of Stern Tube 21.6.12 Screw shaft and Propeller 21.6.12  
 Screw Shaft Tunnel watertight yes Is it fitted with a watertight door yes worked from top platform

**BOILERS, &c.—(Letter for record)** D. Manufacturers of Steel Spence & Sons  
 Heating Surface of Boilers 5064 Is Forced Draft fitted yes No. and Description of Boilers Two single ended  
 Working Pressure 180 lbs Tested by hydraulic pressure to 360 lbs Date of test 9.5.12 No. of Certificate 3014  
 Can each boiler be worked separately yes Area of fire grate in each boiler 60.8 sq ft No. and Description of Safety Valves, to  
 Boiler Two direct spring Area of each valve 11.04 sq in Pressure to which they are adjusted 185 lbs Are they fitted with easing gear yes  
 Minimum distance between boilers or uptakes and bunkers or woodwork 18" Mean dia. of boilers 15'-13" Length 11'-9" Material of shell plates Steel  
 Tensile strength 28 3/4 tons Are the shell plates welded or flanged no Descrip. of riveting cir. seams D.R.  
 Seams T.R.D.B.S. Diameter of rivet holes in long. seams 1 1/2" Pitch of rivets 9 1/2" Lap of plates or width of butt straps 19 1/8"  
 Advantages of strength of longitudinal joint rivets 92 Working pressure of shell by rules 184 lbs Size of manhole in shell 16" x 12"  
 Compensating ring 2'-11 1/2" x 2'-7 1/2" x 1 1/2" No. and Description of Furnaces in each boiler Three Corrugated Material Steel Outside diameter 4'-7 1/2"  
 Thickness of plates 9" Description of longitudinal joint weld. No. of strengthening rings yes  
 Working pressure of furnace by the rules 185 lbs Combustion chamber plates: Material Steel Thickness: Sides 5/8" Back 5/8" Top 5/8" Bottom 5/8"  
 Working pressure of stays by the rules 208 lbs If stays are fitted with nuts or riveted heads nuts Working pressure by rules 208 lbs  
 Material of stays Steel Diameter at smallest part 1.5" Area supported by each stay 64.5 sq in Working pressure by rules 186 lbs End plates in steam space:  
 Material Steel Thickness 1 3/8" Pitch of stays 22" x 20" How are stays secured D.N. Wash. Working pressure by rules 202 lbs Material of stays Steel  
 Diameter at smallest part 8.29" Area supported by each stay 440 sq in Working pressure by rules 196 lbs Material of Front plates at bottom Steel  
 Thickness 3" Material of Lower back plate Steel Thickness 1/2" Greatest pitch of stays 14 1/2" x 8 3/16" Working pressure of plate by rules 190 lbs  
 Diameter of tubes 2 1/2" Pitch of tubes 3 3/4" x 3 3/4" Material of tube plates Steel Thickness: Front 2 1/2" Back 3/4" Mean pitch of stays 9 1/16"  
 Pitch across wide water spaces 13 1/4" Working pressures by rules 225 lbs Girders to Chamber tops: Material Steel Depth and  
 Thickness of girder at centre 2 @ 4 1/2" x 15" Length as per rule 32 5/8" Distance apart 4 5/8" Number and pitch of stays in each 3 @ 8"  
 Working pressure by rules 183 lbs Superheater or Steam chest; how connected to boiler have Can the superheater be shut off and the boiler worked  
 Separately yes Diameter yes Length yes Thickness of shell plates yes Material yes Description of longitudinal joint yes Diam. of rivet  
 Pitch of rivets yes Working pressure of shell by rules yes Diameter of flue yes Material of flue plates yes Thickness yes  
 Stiffened with rings yes Distance between rings yes Working pressure by rules yes End plates: Thickness yes How stayed yes  
 Working pressure of end plates yes Area of safety valves to superheater yes Are they fitted with easing gear yes

**VERTICAL DONKEY BOILER—** Manufacturers of Steel

No. 1011 Description Donkey Boiler

Made at                      By whom made                      When made                      Where fixed                     

Working pressure tested by hydraulic pressure to                      Date of test                      No. of Certificate                      Fire grate area                      Description of Safety                     

Valves                      No. of Safety Valves                      Area of each                      Pressure to which they are adjusted                      Date of adjustment                     

If fitted with casing gear                      If steam from main boilers can enter the donkey boiler                      Dia. of donkey boiler                      Length                     

Material of shell plates                      Thickness                      Range of tensile strength                      Descrip. of riveting long, seams                     

Dia. of rivet holes                      Whether punched or drilled                      Pitch of rivets                      Lap of plating                      Per centage of strength of joint                      Rivets                      Plates                     

Working pressure of shell by rules                      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                     

Working pressure of furnace by rules                      Thickness of furnace crown plates                      Radius of do.                      Stayed by                     

Diameter of uptake                      Thickness of uptake plates                      Thickness of water tubes                      Dates of survey                     

**SPARE GEAR.** State the articles supplied:— One tail shaft, one piston rod, one eccentric strap, one slide spindle, one air pump rod, one set each top & bottom end bearings, two safety valve springs, 50 Cords tubes, two of each bolts & nuts for top & bottom ends & main bearings, two main bearing bolts & nuts, 1 set coupling bolts, 1 set feed & bilge pump valves, assorted bolts nuts & iron.

The foregoing is a correct description,

per pro NORTH EASTERN MARINE ENGINEERING Co., LTD.

S. T. Harrison *per pro*  
Secretary.

Dates of Survey while building

During progress of work in shops --	1912 Feb. 2, 14, 21, 29, Mar 8, 12, 19, 21, 25, 28, Apr. 1, 10, 11, 16, 17, 26, 30, May 3, 7, 8, 9, 15, 21, 31
	During erection on board vessel ---
	Total No. of visits

June 6, 19, 19, 21, 28, July 1, 4, 8, 9, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31

Is the approved plan of main boiler forwarded herewith Yes

" " " donkey " " " Yes

Dates of Examination of principal parts—Cylinders 30-4-12 Slides 30-4-12 Covers 1-4-12 Pistons 1-4-12 Rods 19-3-12

Connecting rods 19-3-12 Crank shaft 1-12 Thrust shaft 14-4-12 Tunnel shafts 21-5-12 Screw shaft 21-5-12 Propeller 30-4-12

Stern tube 6-6-12 Steam pipes tested 16-4-12, 9-4-12 Engine and boiler seatings 22-5-12 Engines holding down bolts 1-4-12

Completion of pumping arrangements 28-6-12 Boilers fixed 28-6-12 Engines tried under steam 9-4-12

Main boiler safety valves adjusted 9-4-12 Thickness of adjusting washers 0.09 9/16 5/16; 0.09 9/16 5/16

Material of Crank shaft Steel Identification Mark on Do. 23-6-H-2 Material of Thrust shaft Steel Identification Mark on Do. 3619 H.K.

Material of Tunnel shafts Steel Identification Marks on Do. 3619 H.K. Material of Screw shafts Steel Identification Marks on Do. 1403 M.B. Work

Material of Steam Pipes Wrought Iron lap welded 5 3/8" bore x 5/16" thick Test pressure 540 lbs.

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

This machinery has been put under special survey, the materials and workmanship are of good quality & the hydraulic test of the boiler proved satisfactory, the whole of the machinery has been securely fitted in board & satisfactorily tried under steam & is in good safe working condition & eligible in our opinion to be classed & have record + L.M.C. 7.12 when the survey is complete.

To complete the survey the hold sections have to be fitted, Middlesex surveyors notified.

All the hold sections have now been satisfactorily fitted

Wm Harrison  
23.7.12

It is submitted that  
this vessel is eligible for  
**THE RECORD. + L.M.C. 7.12**

FD. *[Signature]*  
19.8.12

The amount of Entry Fee .. £ 3 : 0 : 0 When applied for, 16.7.12

Special .. .. £ 38 : 16 : 0

Donkey Boiler Fee .. .. £           

Travelling Expenses (if any) £            When received, Per Doc. 1.8.12

William Dutton & Wm Harrison  
Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

Committee's Minute TUE. AUG. 13. 1912

Assigned thru 7.12

MACHINERY CERTIFICATE  
WRITTEN.



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