

Rpt. 4a.

## REPORT ON MACHINERY.

No. 15790

Received at London Office JUL 21 1920

Date of writing Report 15<sup>th</sup> July 1920 When handed in at Local Office 19/7/1920

Port of Hartlepool

No. in Survey held at Hartlepool

Date, First Survey 21<sup>st</sup> May 1919 Last Survey 15<sup>th</sup> July 1920

Reg. Book.

(Number of Visits)

on the *Geared Turbines for the s.s. "Huronui"*Gross 9266  
Net 5846Master Built at *Middlesbrough* By whom built *See R. Dixon & Co. Ltd. No. 596* When built 1920Engines made at *Hartlepool* By whom made *Richardsons, Wainwright & Co. Ltd. No. 742* when made 1920Boilers made at *Middlesbrough* By whom made *Richardsons, Wainwright & Co. Ltd.* when made 1920NOMINAL Registered Horse Power 1018 Owners *Federal Steam Navigation Co. Ltd.* Port belonging to *London*Shaft Horse Power at Full Power 5000 Is Refrigerating Machinery fitted for cargo purposes *No.* Is Electric Light fitted *Yes*TURBINE ENGINES, &c.—Description of Engines *Brown Curtis Double Reduction Turbine* No. of Turbines *Two*Diameter of Rotor Shaft Journals, H.P.  $4\frac{1}{2}$  L.P.  $8$  Diameter of Pinion Shaft  $\frac{1}{2}$  between Helices  $\frac{1}{2}$  — 10.2 between Helices  $\frac{1}{2}$  L.P.Diameter of Journals  $4\frac{1}{2}$  — L.P.  $8$  Distance between Centres of Bearings  $12\frac{1}{2}$  —  $2\frac{3}{4}$  —  $2\frac{3}{4}$  — Diameter of Pitch Circle  $HP = 8.3554$  L.P.  $12.2108$ Diameter of Wheel Shaft  $18\frac{1}{2}$  —  $17\frac{1}{2}$  — Distance between Centres of Bearings  $4\frac{1}{2}$  —  $4\frac{1}{2}$  — Diameter of Pitch Circle of Wheel  $HP = 8.3554$  L.P.  $12.2108$ Width of Face  $HP = 22$  —  $LP = 22$  Diameter of Thrust Shaft under Collars  $14\frac{1}{4}$  —  $(16\frac{1}{2}$  —  $neck)$  Diameter of Tunnel Shaft as per rule  $16\frac{1}{2}$  —No. of Screw Shafts *one* Diameter of same as per rule  $17\frac{1}{4}$  — as fitted  $18\frac{1}{2}$  — Diameter of Propeller  $19-6$  Pitch of Propeller  $18-8$ No. of Blades *four* State whether Moveable *No* Total Surface  $126\frac{1}{2}$  — Diameter of Rotor Drum, H.P. *See* L.P. *See* Astern *See*Thickness at Bottom of Groove, H.P. *See* L.P. *See* Astern *See* Revs. per Minute at Full Power, Turbine  $HP 3320$  —  $LP 3200$  Propeller  $80\frac{1}{2}$  —  $77\frac{1}{2}$  —  $LP 1816$  —  $1750$ 

## PARTICULARS OF BLADING.

	H.P.			L.P.			H.P. ASTERN.		
	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.
1ST EXPANSION	$\left\{ \begin{array}{l} PCD = 27 \\ 1\frac{1}{4} \end{array} \right.$	$28\frac{1}{2}$	$\left. \begin{array}{l} 1 \\ 1 \end{array} \right\} \text{one wheel}$	$2\frac{3}{4}$	$54\frac{3}{4}$	$\left. \begin{array}{l} 1 \\ 1 \end{array} \right\}$	$\left\{ \begin{array}{l} PCD = 30 \\ 1\frac{1}{4} \end{array} \right.$	$31\frac{1}{2}$	$\left. \begin{array}{l} 1 \\ 1 \end{array} \right\} \text{one wheel}$
2nd	$1\frac{1}{2}$	$28\frac{1}{2}$	1	$2\frac{3}{4}$	$55\frac{3}{8}$	1	$2\frac{3}{8}$	$32\frac{3}{8}$	1
3rd	$1\frac{1}{2}$	$28\frac{1}{2}$	1	$3\frac{3}{8}$	$56\frac{3}{8}$	1	$2\frac{3}{8}$	$33\frac{3}{8}$	1
4th	$1\frac{1}{2}$	$28\frac{3}{8}$	1	$3\frac{3}{8}$	$54\frac{1}{8}$	1			
5th	$1\frac{1}{2}$	$28\frac{1}{2}$	1	$4\frac{1}{4}$	$58\frac{1}{4}$	1			
6th	$2\frac{1}{4}$	$29\frac{1}{2}$	1	$4\frac{1}{4}$	$59\frac{1}{8}$	1			
7th	$2\frac{3}{8}$	$34\frac{3}{8}$	1	$5\frac{1}{8}$	$61\frac{1}{8}$	1			
8th	$3\frac{3}{8}$	$30\frac{3}{8}$	1	$6\frac{3}{8}$	$63\frac{3}{8}$	1			
No. and size of Feed pumps	2. <i>Wicks</i> $10 \times 13\frac{1}{2} \times 26$			1. <i>Wicks</i> $8 \times 12 \times 22$			$RO = 63$ <u>L.P. Astern</u>		
No. and size of Bilge pumps	1. <i>Campan</i> $6 \times 6 \times 6$			1. $10\frac{1}{2}$			$1\frac{1}{2}$		
No. and size of Bilge suction in Engine Room	5 $\frac{1}{2}$ $3\frac{1}{2}$			$11\frac{1}{4}$			$2\frac{1}{4}$		
							$64\frac{1}{2}$		
							$65\frac{1}{4}$		
							$66$		
							$66\frac{3}{8}$		
							$67\frac{1}{4}$		

In Holds, &c. 2 of  $3\frac{1}{2}$  in each hold and 1 of  $2\frac{1}{2}$  in

## General Well.

No. of Bilge Injections *1* sizes  $1\frac{1}{2}$  — Connected to condenser, or to circulating pump *See* Is a separate Donkey Suction fitted in Engine Room & size  $3\frac{1}{2}$  —Are all the bilge suction pipes fitted with roses *Yes* Are the roses in Engine room 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 *Below*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 *None* How are they protected *Yes*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*Is the Screw Shaft Tunnel watertight *Yes* Is it fitted with a watertight door *Yes* worked from *Top platform*BOILERS, &c.—(Letter for record (S)) Manufacturers of Steel *J. Spencer & Sons Ltd.*Total Heating Surface of Boilers *13335* Is Forced Draft fitted *Yes* No. and Description of Boilers *5 Cyl. Multitubular*Working Pressure  $190\frac{1}{2}$  Tested by hydraulic pressure to  $380\frac{1}{2}$  Date of test  $13.3.20$  No. of Certificate *6098*Can each boiler be worked separately *Yes* Area of fire grate in each boiler  $65\frac{1}{2}$  No. and Description of Safety Valves toeach boiler *Two direct Spring loaded* Area of each valve  $11.04$  Pressure to which they are adjusted  $190\frac{1}{2}$  Are they fitted with easing gear *Yes*Smallest distance between boilers or uptakes and bunkers or woodwork  $1-9$  Mean dia. of boilers  $15-4$  Length  $11-1\frac{1}{2}$  Material of shell plates *Steel*Thickness  $1\frac{1}{32}$  Range of tensile strength  $28/32$  Are the shell plates welded or flanged *No* Descrip. of riveting: cir. seams *DR lap*long. seams *DR lap* Diameter of rivet holes in long. seams  $1\frac{1}{2}$  Pitch of rivets  $10\frac{1}{4}$  Lap of plates or width of butt straps  $22\frac{1}{2}$ Per centages of strength of longitudinal joint plates  $84.2$  Working pressure of shell by rules  $215\frac{1}{2}$  Size of manhole in shell  $14 \times 13$ Size of compensating ring  $36 \times 30 \times 1\frac{1}{2}$  No. and Description of Furnaces in each Boiler *3 Morrison* Material *Steel* Outside diameter  $49\frac{3}{4}$ Length of plain part *top* Thickness of plates *crown*  $1\frac{1}{16}$  Description of longitudinal joint *Weld* No. of strengthening rings *Yes*Working pressure of furnace by the rules  $215\frac{1}{2}$  Combustion chamber plates: Material *Steel* Thickness: Sides  $2\frac{3}{32}$  Back  $1\frac{1}{16}$  Top  $2\frac{3}{32}$  Bottom  $1$ Pitch of stays to ditto: Sides  $10 \times 14 \times 8$  Back  $10 \times 8$  Top  $11 \times 8$  Bottom  $9 \times 8$  If stays are fitted with nuts or riveted heads *Nuts* Working pressure by rules  $190\frac{1}{2}$ Material of stays *Steel* Diameter at smallest part  $2\frac{1}{32}$  Area supported by each stay  $88.6$  Working pressure by rules  $206\frac{1}{2}$  End plates in steam spaceMaterial *Steel* Thickness  $1\frac{1}{32}$  Pitch of stays  $23 \times 16 \times 7\frac{1}{8}$  How are stays secured *All nuts & washers* Working pressure by rules  $193$  Material of stays *Steel*Diameter at smallest part  $6.1$  Area supported by each stay  $324$  Working pressure by rules  $194\frac{1}{2}$  Material of Front plates at bottom *Steel*Thickness  $3\frac{1}{32}$  Material of Lower back plate *Steel* Thickness  $2\frac{3}{32}$  Greatest pitch of stays  $15 \times 8$  Working pressure of plate by rules  $196\frac{1}{2}$ Diameter of tubes  $2\frac{1}{2}$  Pitch of tubes  $3\frac{3}{4}$  Material of tube plates *Steel* Thickness: Front  $3\frac{1}{32}$  Back  $1\frac{1}{16}$  Mean pitch of stays  $4.5$ Pitch across wide water spaces  $13\frac{1}{2}$  Working pressures by rules  $240\frac{1}{2}$  Girders to Chamber tops: Material *Steel* Depth andthickness of girder at centre  $9 \times 7\frac{1}{8}$  Length as per rule  $2-9$  Distance apart  $11-9$  Number and pitch of stays in each  $3-8 \times 11$ Working pressure by rules  $194\frac{1}{2}$  Steam dome: description of joint to shell *Yes* % of strength of joint *100* Diameter  $2020$ Thickness of shell plates *Material* Description of longitudinal joint *Yes* Diameter of rivet holes *Yes* Pitch of rivets *Yes*Working pressure of shell by rules *Yes* Crown plates: Thickness *Yes* How stayed *Yes*



SUPERHEATER. Type \_\_\_\_\_ Date of Approval of Plan \_\_\_\_\_ Tested by Hydraulic Pressure to \_\_\_\_\_  
Date of Test \_\_\_\_\_ Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler \_\_\_\_\_  
Diameter of Safety Valve \_\_\_\_\_ Pressure to which each is adjusted \_\_\_\_\_ Is Easing Gear fitted \_\_\_\_\_

IS A DONKEY BOILER FITTED? no If so, is a report now forwarded? ✓

SPARE GEAR. State the articles supplied:— One complete turbine & gearing bearing bushes for each size fitted  
Adjusting block pads and liners of various thicknesses: one Sentinel valve spring of each size fitted  
Two bolts, studs & nuts for each size used in rotor bearings: half set of packing rings & springs for rotor shaft  
glands: 1 set of bolts & nuts for Gear & Turbine casing: high speed pinion for each size: 1 set of coupling bolts & nuts  
1 propeller: 1 set of feed pump valves: 1 set of Bilge pump valves & seats: 1 set of main & auxiliary feed check  
valves: 3 Safety valve springs: 1 Screw Shaft: 3 Safety valve springs: 200 assorted bolts & nuts: 1 set of  
iron etc.

The foregoing is a correct description,

H. H. HARRISON & CO. LIMITED,

Manufacturers

TURBINE DEPT

Dates of Survey while building \_\_\_\_\_  
During progress of work in shops \_\_\_\_\_  
During erection on board vessel \_\_\_\_\_  
Total No. of visits \_\_\_\_\_  
1919 May 21-29 June 19-26 July 12-14 17-31 Aug 13-15 18-22 26 Sep 11-19 25-29 Oct 9-16 21-27  
28 Nov 3-5 7-10 11-13 19-21 25-26 Dec 1-2 6-8 9-11 16-18 22-23 1920 Jan 7-8 20-22 28-29 Feb 4-9 11-13 16-20 24-26  
27 Mar 5-8 9-12 15-18 22-24 29-31 Apr 8-14 20-23 30 May 4-11 15-31 June 7-9 14-17 July 5-13 18-20  
Mdb. 1919 Aug 27 Sep 4-17 24 Oct 1-7 10-13 16-20 28 Nov 1-4 6-10 12-14 17-20 24 Dec 1-4 12-17 19 21 23 25 27 29 31  
16 19 22 23 27 28 29 31 1 2 3 5 8 13 17 27 29 31 1 2 3 5 8 13 17 27 29 31 1 2 3 5 8 13 17 27 29 31  
Is the approved plan of main boiler forwarded herewith ✓

Dates of Examination of principal parts—Casings 24/5/19 to 18/3/20 Rotors 21/1/19 to 22/12/19 Blading 19/1/19 to 19/9/19 Gearing 26/1/19 to 9/6/20  
Rotor shaft 21/5/19 to 22/12/19 Thrust shaft 26/1/19 to 8/4/20 Tunnel shafts 24 H-19 Screw shaft 21/5/19 to 22/12/19 Propeller 14/3/20  
Stern tube 5-3-20 Steam pipes tested 17-20-24-29-20 Engine and boiler seatings 31.6.20 Engines holding down bolts 16-9-20  
Completion of pumping arrangements 4.11.20 Boilers fixed 4.10.20 Engines tried under steam 18.1.21  
Main boiler safety valves adjusted 2.10.20 Thickness of adjusting washers Sha A 1/4 F 1/8 Identification Mark on Do 11/1/19  
Material and tensile strength of Rotor shafts steel 34 to 38 ton Identification Mark on Do 11/1/19  
Material and tensile strength of Pinion shafts steel 44.8 & 42.6 Identification Mark on Do 11/1/19  
Material of Wheel shaft SM steel Identification Mark on Do 11/1/19 Material of Thrust shaft SM steel Identification Mark on Do 11/1/19  
Material of Tunnel shafts Steel Identification Marks on Do 24/4/20 Material of Screw shafts SM steel Identification Marks on Do 11/1/19  
Material of Steam Pipes lap welded iron Test pressure 600 lb  
Is an installation fitted for burning oil fuel no Is the flash point of the oil to be used over 150°F. ✓  
Have the requirements of Section 49 of the Rules been complied with ✓

Is this machinery a duplicate of a previous case no If so, state name of vessel \_\_\_\_\_

General Remarks (State quality of workmanship, opinions as to class, etc.) These turbine engines & double  
Reduction gearing have been built under special survey the material  
and workmanship are sound & good. The H.P. & L.P. pressure passages  
have been tested by Hyd. pressure to 380 lbs. The L.P. casing tested to 40 lbs. per sq. in.  
The Nozzle steam pipe to 570 lbs., the Reduction pipe to 50 lbs., the main oil  
carrier to 120 lbs. The engines & gearing were tried in the works at full speed  
ahead without load working well rendering the vessel eligible in my opinion  
to have the notation \* LMC 190 lbs. when the survey is complete by installing  
& trying at sea. This machinery has been efficiently installed and proved satisfactory in the official trials  
The vessel is eligible in our opinion to have the notation of \* L.P. 1.21 made in the Register Book.

The amount of Entry Fee £ 205/18/2  
Special Mdb. 102.19.1  
Donkey Boiler Fee £  
Travelling Expenses (if any) £

When applied for, 24.1.1921

When received, 5-2-21

A. D. Dwyer & Wm. Cowie  
Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute

Assigned

TUE FEB 11 1921

L.M.C. 1.21

CERTIFICATE WRITTEN



© 2020

Lloyd's Register Foundation