

REPORT ON MACHINERY

No. 15674

MON. NOV. 10. 1919

Date of writing Report 4th Nov 1919 When handed in at Local Office 5th Nov 1919 Port of Liverpool
 No. in Survey held at Liverpool Date, First Survey Dec 4th 1918 Last Survey 29th Oct 1919
 Reg. Book. S.S. "Sunbank" on the S.S. "Sunbank" (Number of Visits 34)
 Master Burntilland Built at Burntilland By whom built Burntilland P. B. & Co. Ltd Tons Gross 1919 Net 1919
 Engines made at Liverpool By whom made Messrs Douglas & Grant when made 1919
 Boilers made at Renfrew By whom made Messrs Babcock & Wilcox when made 1919
 Registered Horse Power 513 Owners Earl Shipping Co. Ltd Port belonging to Liverpool
 Nom. Horse Power as per Section 28 513 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

ENGINES, &c.—Description of Engines Triple Inverted No. of Cylinders 3 No. of Cranks 3
 Dia. of Cylinders 25" 41" 68" Length of Stroke 45" Revs. per minute 80" Dia. of Screw shaft 13.5" Material of screw shaft S
 Is the 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 in the 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 between the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive No
 If two liners are fitted, is the shaft lapped or protected between the liners Yes Length of stern bush 60"
 Dia. of Tunnel shaft 12.4" Dia. of Crank shaft journals 13.03" Dia. of Crank pin 13.25" Size of Crank webs 45.5x24.5x5.5/16 Dia. of thru shaft under collars 13.25" Dia. of screw 16-0" Pitch of Screw 16-3" No. of Blades 4 State whether moveable No Total surface 80
 No. of Feed pumps 2 Halls Diameter of ditto 10x7x2.1 Stroke 4" Can one be overhauled while the other is at work Yes
 No. of Bilge pumps 2 Diameter of ditto 3" Stroke 2 4" Can one be overhauled while the other is at work Yes
 No. of Donkey Engines 2 Sizes of Pumps 10.5x12.5x2.1 9.5x7x1.8 No. and size of Suctions connected to both Bilge and Donkey pumps Two 3" at each hold
 In Engine Room Two 3" Clirkhelda Two 3" In Holds, &c. Two 3" at each hold One 3" funnel well
 No. of Bilge Injections 1 sizes 11" Connected to condenser, or to circulating pump Pump Is a separate Donkey Suction fitted in Engine room & size Yes 3.5"
 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 None
 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 Both
 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
 Dates of examination of completion of fitting of Sea Connections 13-6-19 of Stern Tube 13-6-19 Screw shaft and Propeller 7-7-19
 Is the Screw Shaft Tunnel watertight Yes Is it fitted with a watertight door Yes worked from Upper platform of E R

BOILERS, &c.—(Letter for record 5) Manufacturers of Steel Water Tube boilers
 Total Heating Surface of Boilers 8289 Is Forced Draft fitted Yes No. and Description of Boilers 2 Water Tube boilers
 Working Pressure 180 lbs Tested by hydraulic pressure to 260 lbs Date of test 10-10-19 No. of Certificate 762
 Can each boiler be worked separately Yes Area of fire grate in each boiler 84.5 No. and Description of Safety Valves to each boiler 2 direct spring Area of each valve 9" Pressure to which they are adjusted 185 lbs Are they fitted with easing gear Yes
 Smallest distance between boilers or uptakes and bunkers or woodwork no side bumpers Mean dia. of boilers _____ Length _____ Material of shell plates _____
 Thickness _____ Range of tensile strength _____ Are the shell plates welded or flanged _____ Descrip. of riveting: cir. seams _____
 long. seams _____ Diameter of rivet holes in long. seams _____ Pitch of rivets _____ Lap of plates or width of butt straps _____
 Per centages of strength of longitudinal joint _____ Working pressure of shell by rules _____ Size of manhole in shell _____
 Size of compensating ring _____ No. and Description of Furnaces in each boiler _____ Material _____ Outside diameter _____
 Length of plain part _____ Thickness of plates _____ Description of longitudinal joint _____ No. of strengthening rings _____
 Working pressure of furnace by the rules _____ Combustion chamber plates: Material _____ Thickness: Sides _____ Back _____ Top _____ Bottom _____
 Pitch of stays to ditto: Sides _____ Back _____ Top _____ If stays are fitted with nuts or riveted heads _____ Working pressure by rules _____
 Material of stays _____ Diameter at smallest part _____ Area supported by each stay _____ Working pressure by rules _____ End plates in steam space: _____
 Material _____ Thickness _____ Pitch of stays _____ How are stays secured _____ Working pressure by rules _____ Material of stays _____
 Diameter at smallest part _____ Area supported by each stay _____ Working pressure by rules _____ Material of Front plates at bottom _____
 Thickness _____ Material of Lower back plate _____ Thickness _____ Greatest pitch of stays _____ Working pressure of plate by rules _____
 Diameter of tubes _____ Pitch of tubes _____ Material of tube plates _____ Thickness: Front _____ Back _____ Mean pitch of stays _____
 Pitch across wide water spaces _____ Working pressures by rules _____ Girders to Chamber tops: Material _____ Depth and thickness of girder at centre _____ Length as per rule _____ Distance apart _____ Number and pitch of stays in each _____
 Working pressure by rules _____ 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 holes _____ Pitch of rivets _____ Working pressure of shell by rules _____ Diameter of flue _____ Material of flue plates _____ Thickness _____
 If 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 _____



VERTICAL DONKEY BOILER— Manufacturers of Steel

No. **14615** Description **Vertical with horizontal fire tubes**
 Made at **Annan** By whom made **Messrs Lochrane & Co** When made **1919** Where fixed **Upper deck**
 Working pressure **100 lbs** tested by hydraulic pressure to Date of test No. of Certificate Fire grate area **41 sq ft** Description of Safety Valves **direct spring** No. of Safety Valves **2** Area of each **9 sq in** Pressure to which they are adjusted **100 lbs** Date of adjustment **24-10-19**
 If fitted with easing gear **Yes** If steam from main boilers can enter the donkey boiler **No** 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
 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:— **Two connecting rod top end bolts nuts. Two connecting rod top end bolts nuts. Two main bearing bolts nuts. One set of coupling bolts nuts. One set of feet & bridge pump valves. A quantity of assorted bolts nuts. Iron of various sizes.**

For **DOUGLAS & GRANT, Ltd.**

The foregoing is a correct description,

Manufacturer.

James S. Anderson Director.

Dates of Survey while building
 During progress of work in shops -- **1918 Dec. 4, 1919 Jan 11, 12 Feb 12, March 4, 11, 28 April 4, 15, 25, May 2, 6, 13, 23, 27, June 3, 6, 10, 13, 14, 27, July 7, 14, 29, Aug 4, Sept 5, 12, 23 Oct 4, 10, 20, 24, 27, 29**
 During erection on board vessel ---
 Total No. of visits **34**

Is the approved plan of main boiler forwarded herewith **Yes**

Dates of Examination of principal parts—Cylinders **6-6-19** Slides **14-6-19** Covers **17-6-19** Pistons **13-6-19** Rods **13-5-19**
 Connecting rods **28-3-19** Crank shaft **4-4-19** Thrust shaft **10-6-19** Tunnel shafts **4-6-19** Screw shaft **5-6-19** Propeller **13-6-19**
 Stern tube **27-5-19** Steam pipes tested **20-10-19** Engine and boiler seatings **27-10-19** Engines holding down bolts **29-10-19**
 Completion of pumping arrangements **27-10-19** Boilers fixed **24-10-19** Engines tried under steam **29-10-19**
 Main boiler safety valves adjusted **27-10-19** Thickness of adjusting washers **S.P. 1/2 S 1/2. C.P. 1/2 S 1/2. P.P. 1/2 S 1/2. D.B. 1/2 P 1/2**
 Material of Crank shaft **S** Identification Mark on Do. **4896** Material of Thrust shaft **S** Identification Mark on Do. **2281 AF**
 Material of Tunnel shafts **S** Identification Marks on Do. **2261 AF** Material of Screw shafts **S** Identification Marks on Do. **2281 AF**
 Material of Steam Pipes **Lap welded steel** Test pressure **540 lbs**

General Remarks (State quality of workmanship, opinions as to class, &c.)
 The machinery of this vessel has been built under special survey. The materials & workmanship are good, in my opinion the vessel is eligible for record of L.M.C. 10-19. Elect light after the water tube boilers were assembled on board they were tested to twice the working pressure found high, satisfactory. The machinery has been efficiently fitted on board.

It is submitted that this vessel is eligible for THE RECORD + L.M.C. 10. 19. F.D. 3 Water Tube Boiler Subject to the Water Tube Boiler being surveyed annually.

James S. Anderson
 J.R. Williamson
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping

The amount of Entry Fee .. £ **51.14.4** When applied for, **68.19**
 Special .. £
 Donkey Boiler Fee .. £
 Travelling Expenses (if any) £

Committee's Minute **TUE NOV. 25. 1919**
 Assigned **+ L.M.C. 10. 19 F.D. subject**



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