

## REPORT ON MACHINERY

MON. DEC. 16 1913

Received at London Office

Date of writing Report 19 When handed in at Local Office 14/12 10/12 Port of Sunderland  
 No. in Survey held at Sunderland Date, First Survey 24 May Last Survey 6 Dec 1912  
 Reg. Book. on the Steel S.S. Ethel Duncan (Number of Vents 40)  
 Master Murphy Built at Alcoa By whom built MacKay Bros. & Co. Tons { Gross 2510  
 Engines made at Sunderland By whom made North Eastern Marine Eng Co Ltd. (2016) Net 1091  
 Boilers made at Sunderland By whom made North Eastern Marine Eng Co Ltd. When built 1912  
 Registered Horse Power 254 Owners J. J. Duncan & Co. when made 1912  
 Nom. Horse Power as per Section 28 254 Is Refrigerating Machinery fitted for cargo purposes no Port belonging to Cardiff  
 Is Electric Light fitted yes

ENGINES, &c.—Description of Engines Triple expansion No. of Cylinders Three No. of Cranks Three  
 Dia. of Cylinders 22" x 36" x 50" Length of Stroke 39" Revs. per minute 85 Dia. of Screw shaft as per rule 12.06" Material of screw shaft Steel  
 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 yes If two  
 liners are fitted, is the shaft lapped or protected between the liners yes Length of stern bush 148.2"  
 Dia. of Tunnel shaft as per rule 10.86" Dia. of Crank shaft journals as per rule 11.4" Dia. of Crank pin 11.2" Size of Crank webs 17.2" x 4" Dia. of thrust shaft under  
 collars 11.2" Dia. of screw 14.6" Pitch of Screw 15-14 1/2" No. of Blades 4 State whether moveable no Total surface 41.5 sq. ft.  
 No. of Feed pumps One pair Diameter of ditto 8.2" Stroke 18" Can one be overhauled while the other is at work yes  
 No. of Bilge pumps Two Diameter of ditto 3.2" Stroke 21" Can one be overhauled while the other is at work yes  
 No. of Donkey Engines Two Sizes of Pumps 9" x 10" x 10" No. and size of Suctions connected to both Bilge and Donkey pumps  
 In Engine Room and Bilge room 4 @ 3" dia. In Holds, &c. 2 @ 2 3/4" dia. for hold.  
 No. of Bilge Injections 1 sizes 6" Connected to condenser, or to circulating pump centrifugal pump Is a separate Donkey Suction fitted in Engine room & size yes 3"  
 Are all the bilge suction pipes fitted with roses yes Are the roses in Engine room always accessible yes Are the clutches on Engine room bulkheads 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 above  
 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 Auxiliary steam exhaust pipes & hold How are they protected Wood casing.  
 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 9-10-12 of Stern Tube 11-11-12 Screw shaft and Propeller 11-11-12  
 Is the Screw Shaft Tunnel watertight yes Is it fitted with a watertight door yes worked from top platform.

BOILERS, &c.—(Letter for record 5) Manufacturers of Steel Spencer & Sons Ltd.  
 Total Heating Surface of Boilers 4268 Is Forced Draft fitted no No. and Description of Boilers Two single ended.  
 Working Pressure 180 lbs Tested by hydraulic pressure to 360 lbs Date of test 31-1-12 No. of Certificate 3035  
 Can each boiler be worked separately yes Area of fire grate in each boiler 58 sq. ft. No. and Description of Safety Valves to  
 each boiler Two spring loaded Area of each valve 5.94 sq. in. 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 24" Mean dia. of boilers 15'-0" Length 11'-0" Material of shell plates Steel  
 Thickness 1 3/8" Range of tensile strength 28 3/4 x 32 1/2 Are the shell plates welded or flanged no Descrip. of riveting: cir. seams D.R.  
 Long. seams I.R.D.D.D. Diameter of rivet holes in long. seams 1 1/4" Pitch of rivets 9 3/16" Lap of plates or width of butt straps 18 3/4"  
 Percentages of strength of longitudinal joint rivets 85.9 Working pressure of shell by rules 180 lbs Size of manhole in shell 16" x 12"  
 Size of compensating ring dished No. and Description of Furnaces in each boiler One cor. Material Steel Outside diameter 45 3/8"  
 Length of plain part top 1 1/2" Thickness of plates crown 3/32" Description of longitudinal joint weld No. of strengthening rings 1  
 Working pressure of furnace by the rules 180.3 Combustion chamber plates: Material Steel Thickness: Sides 3/4" Back 3/4" Top 3/4" Bottom 3/4"  
 Pitch of stays to ditto: Sides 11" x 9 1/2" Back 10 1/2" x 10" Top 11" x 9 1/2" If stays are fitted with nuts or riveted heads nuts Working pressure by rules 184 lbs  
 Material of stays Steel Area at smallest part 2.1 sq. in. Area supported by each stay 105 sq. in. Working pressure by rules 180 lbs End plates in steam space:  
 Material Steel Thickness 1 1/4" Pitch of stays 21 3/8" x 19" How are stays secured D.N. Wash. Working pressure by rules 181 lbs Material of stays Steel  
 Diameter at smallest part 1.06" Area supported by each stay 406 sq. in. Working pressure by rules 181 lbs Material of Front plates at bottom Steel  
 Thickness 3/4" Material of Lower back plate Steel Thickness 2 3/8" Greatest pitch of stays 14 1/2" x 10" Working pressure of plate by rules 182 lbs  
 Diameter of tubes 3 1/4" Pitch of tubes 4 1/2" x 4 1/2" Material of tube plates Steel Thickness: Front 3/4" Back 3/4" Mean pitch of stays 10.12"  
 Pitch across wide water spaces 14 1/2" Working pressures by rules 192 lbs Girders to Chamber tops: Material Steel Depth and  
 Thickness of girder at centre 20 1/2" x 15 1/2" Length as per rule 32" Distance apart 11" Number and pitch of stays in each 2 @ 9 1/2"  
 Working pressure by rules 182.5 Superheater or Steam chest; how connected to boiler Bolted to uptake Can the superheater be shut off and the boiler worked  
 separately yes Diameter 12" Length 12" Thickness of shell plates 3/32" Material Steel Description of longitudinal joint Weld Diam. of rivet  
 Pitch of rivets 9 3/16" Working pressure of shell by rules 360 lbs Diameter of flue 2 1/2" Material of flue plates Steel Thickness 3/32"  
 See also letter dated 23 Aug 1912 from Manchester Surveyors (enclaved). End plates: Thickness 1 1/4" How stayed Welded by line at water  
 stiffened with rings Distance between rings Working pressure by rules 192 lbs Area of safety valves to superheater One @ 7.04 sq. in. Are they fitted with easing gear yes

# VERTICAL DONKEY BOILER—

Manufacturers of Steel

No.	Description	When made	Where fixed
Made at	By whom made	No. of Certificate	Fire grate area
Working pressure	tested by hydraulic pressure to	Date of test	Date of adjustment
Valves	No. of Safety Valves	Area of each	Pressure to which they are adjusted
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
Working pressure of shell by rules	Thickness of shell crown plates	Radius of do.	No. of stays to do.
Diameter of furnace Top	Bottom	Length of furnace	Thickness of furnace plates
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 each bolts & nuts for top & bottom ends and main bearings. One set coupling bolts. Nuts for all pumps. Assorted bolts nuts & iron etc One coil iron propeller.

The foregoing is a correct description,

Manufacturer.

Geo D Kerr

Dates of Survey while building	During progress of work in shops --	1912 May 21 31 Jun 4 6 10 14 21 25 28 Jul 3 8 11 23 26 29 30 31
	During erection on board vessel --	Aug 1 9 24 Sept 5 6 Oct 3 8 15 Nov 4 5 7 11 13 15 16 22 26 29 30 Dec 2 3 4 6
Total No. of visits		(40)

Is the approved plan of main boiler forwarded herewith

yes

Dates of Examination of principal parts	Cylinders	2-4-12	Slides	16-4-12	Covers	14-6-12	Pistons	14-6-12	Rods	25-6-12	
Connecting rods	25-6-12	Crank shaft	5-12	Thrust shaft	9-8-12	Tunnel shafts	9-8-12	Screw shaft	3-10-12	Propeller	29-4-12
Stern tube	29-4-12	Steam pipes tested	30-4-12	Engine and boiler seatings	9-10-12	Engines holding down bolts	4-11-12	Engines tried under steam	3-12-12		
Completion of pumping arrangements	6-12-12	Boilers fixed	4-11-12	Thickness of adjusting washers	3-12-12	Superheaters	1-12-12				
Main boiler safety valves adjusted	3-12-12	Identification Mark on Do.	2513 AF	Material of Thrust shaft	Steel	Identification Mark on Do.	4621				
Material of Crank shaft	Steel	Identification Marks on Do.	4866-7-8	Material of Screw shafts	Steel	Identification Marks on Do.	340				
Material of Tunnel shafts	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 material and workmanship are of good quality and the hydraulic tests of the boiler proved satisfactory. The whole of the machinery has been securely fixed on board & tried under steam and is in good & safe working condition and eligible in my opinion to be classed & have record **L.M.C. 12-12** in the Register Book.

It is submitted that this vessel is eligible for THE RECORD.

L.M.C. 12.12

27/8 J.P.D. 17.12.12

The amount of Entry Fee	£ 32 : 14 : 0
Special	£ 2 : 0 : 0
Donkey Boiler Fee	£ :
Travelling Expenses (if any)	£ :

When applied for,

14.12.12

When received,

21.12.12

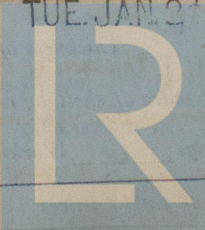
Committee's Minute

Assigned

TUE DEC. 17. 1912

William Butler  
Engineer Surveyor to Lloyd's Register of British & Foreign Ships

TUE JAN 21 1913



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