

# REPORT ON MACHINERY

MON. DEC. 16 1913 No. 25533

Date of writing Report 19 When handed in at Local Office 14/12 1912 Port of Sunderland  
 No. in Survey held at Sunderland Date, First Survey 20 May Last Survey 6 Dec 1912  
 Reg. Book. on the Steel S.S. Ethel Duncan (Number of Visits 40)  
 Master Murphy Built at Alcoa By whom built MacKay Bros. N° 15 Tons } Gross 2510  
 Engines made at Sunderland By whom made North Eastern Marine Eng Co Ltd. (2046) Net 1091 When built 1912  
 Boilers made at Sunderland By whom made North Eastern Marine Eng Co Ltd. when made 1912  
 Registered Horse Power 254 Owners J. J. Duncan & Co. Port belonging to Cardiff  
 Nom. Horse Power as per Section 28 254 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  
 Dia. of Cylinders 22" x 36" x 59" Length of Stroke 39" Revs. per minute 85 Dia. of Screw shaft 12.06" Material of 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 18 1/2"  
 Dia. of Tunnel shaft 10.86" Dia. of Crank shaft journals 11.4" Dia. of Crank pin 11 1/2" Size of Crank webs 1 1/2" x 4" Dia. of thrust shaft under  
 collars 11 1/2" Dia. of screw 1 1/2" 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 x 6" Stroke 18" Can one be overhauled while the other is at work yes  
 No. of Bilge pumps Two Diameter of ditto 3 1/2" 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 1/4" dia. fwd hold.  
2 @ 2 1/4" dia. aft hold fwd. 2 @ 2 1/4" dia. aft hold aft. 1 @ 2 1/4" dia. tunnel well.  
 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 snices 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 14268 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 1/2" Range of tensile strength 28 x 32 tons Are the shell plates welded or flanged no Descrip. of riveting: cir. seams D.R.  
 Long. seams T.R.D.P.S. 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 Two 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 Diameter at smallest part 2.1" 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 1/2" Greatest pitch of stays 11 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 2 1/2" Thickness of shell plates 3/32" Material Steel Description of longitudinal joint Weld Diam. of rivet  
tested by hydraulic pressure to 360 lbs per sq. inch when fitted up in place  
 Pitch of rivets 9 3/16" Working pressure of shell by rules 180 lbs Diameter of flue 10" Material of flue plates Steel Thickness 3/32"  
 See also letter dated 23 Aug 1912 from Manchester Surveyors (enclosed).  
 Stiffened with rings yes Distance between rings 12" Working pressure by rules 180 lbs End plates: Thickness 1 1/4" How stayed Welded by line at water  
 Working pressure of end plates 180 lbs Area of safety valves to superheater one @ 7.04 sq. in. Are they fitted with easing gear yes

Lloyd's Register  
 Foundry 10183

**VERTICAL DONKEY BOILER—** Manufacturers of Steel

No. \_\_\_\_\_ Description \_\_\_\_\_ When made \_\_\_\_\_ Where fixed \_\_\_\_\_  
 Made at \_\_\_\_\_ By whom made \_\_\_\_\_  
 Working pressure \_\_\_\_\_ tested by hydraulic pressure to \_\_\_\_\_ Date of test \_\_\_\_\_ No. of Certificate \_\_\_\_\_ Fire grate area \_\_\_\_\_ Description of \_\_\_\_\_  
 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 \_\_\_\_\_ Rivets \_\_\_\_\_  
 Dia. of rivet holes \_\_\_\_\_ Whether punched or drilled \_\_\_\_\_ Pitch of rivets \_\_\_\_\_ Lap of plating \_\_\_\_\_ Per centage of strength of joint \_\_\_\_\_ 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:— Two each bolts & nuts for top & bottom ends and main bearings. One set coupling bolts. Nuts for all pumps. Assorted bolts nuts & rivets etc. One coil iron propeller.

The foregoing is a correct description,  
 Manufacturer.

Geo D Weir  
 per HC

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 22 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

" " " donkey " " "  yes

**Dates of Examination of principal parts**—Cylinders 2-4-17 Slides 16-4-17 Covers 14-6-17 Pistons 14-6-17 Rods 25-6-17  
 Connecting rods 25-6-17 Crank shaft Copenhagen 5-12 Thrust shaft 9-8-17 Tunnel shafts 9-8-17 Screw shaft 3-10-17 Propeller 29-4-17  
 Stern tube 29-4-17 Steam pipes tested 30-4-17 5-11-17 Engine and boiler seatings 9-10-17 Engines holding down bolts 4-11-17  
 Completion of pumping arrangements 6-12-17 Boilers fixed 4-11-17 Engines tried under steam 3-12-17  
 Main boiler safety valves adjusted 3-12-17 ; 6-12-17 Thickness of adjusting washers 9 3/4 F+A 1/2, 10 F+A 1/2; Superheater 1/2  
 Material of Crank shaft Steel Identification Mark on Do. 2513 AF 6 Material of Thrust shaft Steel Identification Mark on Do. 462  
 Material of Tunnel shafts Steel Identification Marks on Do. 4866-7-8 4969 di 2 A Material of Screw shafts Steel Identification Marks on Do. 340  
 Material of Steam Pipes Lapwelded port iron 4 3/4" bore x 1/4" thick. 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-** in the Register Book.

It is submitted that this vessel is eligible for THE RECORD + L.M.C. 12.12  
 27th JAN. 1913  
 17.12.12

Certificate (if required) to be sent to

The amount of Entry Fee ... £ 32 : 14 : 0  
 Special ... £ 2 : 0 : 0  
 Donkey Boiler Fee ... £ : :  
 Travelling Expenses (if any) £ : :  
 Committee's Minute  
 Assigned

When applied for, 14.12.12  
 When received, 21.12.12

TUE. DEC. 17. 1912

Home 12 12

William Butler  
 Engineer Surveyor to Lloyd's Register of British & Foreign Ships  
 TUE. JAN. 21. 1913  
 © 2020  
 Lloyd's Register Foundation