

## REPORT ON MACHINERY.

No. 26835

Received at London Office NOV. 6 1916

Date of writing Report *30<sup>th</sup> Oct 1916* When handed in at Local Office *31<sup>st</sup> Oct 1916* Port of *Sunderland*  
 Date, First Survey *8 Jan. 15* Last Survey *24<sup>th</sup> Oct 1916*  
 Name of Ship *Lightfoot* (Number of Visits)  
 Name of Master *W. H. Metcalfe* Built at *Sunderland* By whom built *J. Crown & Sons Ltd.* Tons { Gross *1875*  
 Engines made at *Sunderland* By whom made *North Eastern Marine Eng. Co. Ltd.* When built *1916*  
 Boilers made at *"* By whom made *"* when made *1916*  
 Registered Horse Power *199* Owners *Witherington & Everett* Port belonging to *Newcastle*  
 Is Refrigerating Machinery fitted for cargo purposes *No* Is Electric Light fitted *Yes*  
 Description of Engines *Triple* No. of Cylinders *3* No. of Cranks *3*  
 Dia. of Cylinders *30 1/2", 33", 54"* Length of Stroke *39"* Revs. per minute *70* Dia. of Screw shaft *11 1/8"* 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  
 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 *4'-0"*  
 Dia. of Tunnel shaft *10.3"* Dia. of Crank shaft journals *10.8"* Dia. of Crank pin *10 7/8"* Size of Crank webs *15 3/4" x 6 3/4"* Dia. of thrust shaft under  
 bars *10 7/8"* Dia. of screw *14'-9"* Pitch of Screw *15'-6"* No. of Blades *4* State whether moveable *No* Total surface *68 sq ft*  
 No. of Feed pumps *2* Diameter of ditto *3"* Stroke *21"* Can one be overhauled while the other is at work *Yes*  
 No. of Bilge pumps *2* Diameter of ditto *3 1/2"* Stroke *21"* Can one be overhauled while the other is at work *Yes*  
 No. of Donkey Engines *2* Sizes of Pumps *7" x 9" x 9" & 5 1/2" x 3 1/2" x 5"* No. and size of Suctions connected to both Bilge and Donkey pumps  
 Engine Room *Two of 2 1/2" & one of 4"* In Holds, &c. *Two of 2 1/2" in fore hold, two*  
*of 2 3/4" in after hold & one of 2 3/4" in tunnel well.*  
 No. of Bilge Injections *1* sizes *4"* Connected to condenser, or to circulating pump *pumps 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 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 *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 *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 *28/8/16* of Stern Tube *5/10/16* Screw shaft and Propeller *5/10/16*  
 Is the Screw Shaft Tunnel watertight *Yes* Is it fitted with a watertight door *Yes* worked from *Top platform*  
 BOILERS, &c.—(Letter for record *15*) Manufacturers of Steel *J. Spencer & Sons*  
 Total Heating Surface of Boilers *3092* Is Forced Draft fitted *No* No. and Description of Boilers *2 Single-ended.*  
 Working Pressure *180 lbs* Tested by hydraulic pressure to *360 lbs* Date of test *28/8/16* No. of Certificate *3349*  
 Can each boiler be worked separately *Yes* Area of fire grate in each boiler *40 sq ft* No. and Description of Safety Valves to  
 each boiler *2 direct spring* Area of each valve *3.97 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 *18"* Mean dia. of boilers *13'-0"* Length *10'-6"* Material of shell plates *Steel*  
 Thickness *6 3/4"* Range of tensile strength *29,780-33,000* Are the shell plates welded or flanged *No* Descrip. of riveting: cir. seams *d. r. lap*  
 Long. seams *d. r. d. b.* Diameter of rivet holes in long. seams *1 3/16"* Pitch of rivets *9 1/4"* Lap of plates or width of butt straps *18 3/4"*  
 Percentages of strength of longitudinal joint *88.5* Working pressure of shell by rules *180 lbs* Size of manhole in shell *16" x 12"*  
 Size of compensating ring *flange* No. and Description of Furnaces in each boiler *2 plain* Material *Steel* Outside diameter *45 1/2"*  
 Length of plain part *6'-1 1/8"* Thickness of plates *5 1/4"* Description of longitudinal joint *welded* No. of strengthening rings *1*  
 Working pressure of furnace by the rules *181 lbs* Combustion chamber plates: Material *Steel* Thickness: Sides *3/4"* Back *25/32"* Top *3/4"* Bottom *15/16"*  
 Pitch of stays to ditto: Sides *11 1/8" x 8 1/2"* Back *10 7/8" x 10 1/4"* Top *11" x 8 1/2"* If stays are fitted with nuts or riveted heads *into* Working pressure by rules *182 lbs* End plates in steam space:  
 Material of stays *Steel* Diameter at smallest part *2.79"* Area supported by each stay *138 sq in* Working pressure by rules *183 lbs* Material of stays *Steel*  
 Material *Steel* Thickness *1 1/4"* Pitch of stays *22" x 18"* How are stays secured *d. n. w.* Working pressure by rules *180 lbs* Material of Front plates at bottom *Steel*  
 Diameter at smallest part *6.78"* Area supported by each stay *396 sq in* Working pressure by rules *180 lbs* Material of Front plates at bottom *Steel*  
 Thickness *3/4"* Material of Lower back plate *Steel* Thickness *1 5/16"* Greatest pitch of stays *14.75"* Working pressure of plate by rules *182 lbs*  
 Diameter of tubes *3 1/4"* Pitch of tubes *4 3/4" x 4 1/4"* Material of tube plates *Steel* Thickness: Front *3/4"* Back *3/4"* Mean pitch of stays *10.6"*  
 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 *9" x 1 1/2"* Length as per rule *30.2"* Distance apart *11"* Number and pitch of stays in each *2 of 8 1/2"*  
 Working pressure by rules *180 lbs* Superheater or Steam chest; how connected to boiler *none* 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  
 holes *Yes* 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*



IS A DONKEY BOILER FITTED? *Yes*

If so, is a report now forwarded?

*Ch. Rpt. 3623*

SPARE GEAR. State the articles supplied:—

*Two top end & 2 bottom end bolts, 2 main bearing  
1 set of coupling bolts, 1 set of feed & bidge pumps  
valves, a quantity of assorted bolts nuts & iron, a  
propeller & minor details!*

The foregoing is a correct description,  
FOR THE NORTH EASTERN MARINE ENGINEERING CO. LD

*Geo. D. Green*

Manufacturer.

Manager.

Dates of Survey while building { During progress of work in shops - - - *1915 Jan 8. 11 Mar. 19. Jul 5. 1916 Feb 7. 24 Mar 7. 14. 23 Apr. 14. 18. 26 May 2. 4. 12. 15. 18. 20. Jun 5. 6. 7. 10. 13. 16. 19. 22. 25. 28. 31. Aug 1. 4. 8. 9. 17. 22. 24. 25. 28. 31. Sep 7. 11. 18. Oct 5. 9. 10. 16. 21. 23. 24.*  
During erection on board vessel - - - *16. 21. 30 Jul 14. 18. 26. 27. 28. Aug 1. 2. 4. 8. 9. 17. 22. 24. 25. 28. 31. Sep 7. 11. 18. Oct 5. 9. 10. 16. 21. 23. 24.*  
Total No. of visits *(52)*

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

" " " donkey " " " "

Dates of Examination of principal parts—Cylinders *25/8/16* Slides *18/7/16* Covers *26/7/16* Pistons *1/8/16* Rods *30/5/16*

Connecting rods *28/8/16* Crank shaft *16/6/16* Thrust shaft *30/6/16* Tunnel shafts *24/8/16* Screw shaft *8/8/16* Propeller *17/8/16*

Stern tube *5/6/16* Steam pipes tested *9/10/16* Engine and boiler seatings *28/8/16* Engines holding down bolts *5/10/16*

Completion of pumping arrangements *21/10/16* Boilers fixed *5/10/16* Engines tried under steam *21/10/16*

Main boiler safety valves adjusted *21/10/16* Thickness of adjusting washers *P. F. 9/16" A 3/8" P. F. 3/8" A 3/8"*

Material of Crank shaft *Steel* Identification Mark on Do. *30/6/16* Material of Thrust shaft *Steel* Identification Mark on Do. *26/7/16*

Material of Tunnel shafts *Steel* Identification Marks on Do. *24/8/16* Material of Screw shafts *Steel* Identification Marks on Do. *9/8/16*

Material of Steam Pipes *Lap welded steel* Test pressure *540 lbs.*

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 duplicate of a previous case *Yes* If so, state name of vessel *P.S. "Estat Manor"*

*Estat Manor.*

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

*The machinery of this vessel has been built under special survey, the materials used are good, and the workmanship is satisfactory, it has been properly fitted on board and secured, and the engines have been tried under full power. In my opinion this vessel is eligible for the record of L.M.C. 10, 16.*

*It is submitted that  
this vessel is eligible for  
THE RECORD + L.M.C. 10. 16.*

*JWD.  
6/11/16.*

*J.R.K.*

The amount of Entry Fee ... £ *2* : : When applied for, *- 4. NOV 1916*  
Special ... £ *29* : *17* : :  
Donkey Boiler Fee ... £ : : :  
Travelling Expenses (if any) £ : : : *27/11. 1916 28/9/16*

Engineer Surveyor to Lloyd's Register of British & Foreign Shipping

*Charles Cooper*

Committee's Minute *TUE. 7 - NOV. 1916*

Assigned *+ L.M.C. 10. 16*

MACHINERY CERTIFICATE  
WRITTEN.



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Foundation