

REPORT ON MACHINERY.

Port of West Hartlepool Received at London Office 1893
No. in Survey held at West Hartlepool Date, first Survey 20th March Last Survey 11th Dec^r 1893
Reg. Book. on the Steam Steamer "Greenbrier" (Number of Visits 66)
Master H. Boig Built at Hartlepool By whom built Furness, Withy & Co Tons { Gross 2874.6
Engines made at Hartlepool By whom made J. Richardson & Sons when made 1893
Boilers made at Hartlepool By whom made J. Richardson & Sons when made 1893
Registered Horse Power 412 Owners Chesapeake & Ohio Steam Ship Co. Ltd. Port belonging to West Hartlepool
Nom. Horse Power as per Section 28 412

ENGINES, &c.— Description of Engines Inverted, Triple Expansion, 3 Blanks No. of Cylinders 3
Diameter of Cylinders 28" 44" 72" Length of Stroke 48" Revolutions per minute 68 Diameter of Screw shaft as per rule 13.01
Diameter of Tunnel shaft as fitted 13" Diameter of Crank shaft journals 13 1/2" Diameter of Crank pin 14" Size of Crank webs 21 1/2" x 9"
Diameter of screw 17.6" Pitch of screw 16.6 to 19.6 No. of blades 4 State whether moveable yes Total surface 86.1 sq. ft.
No. of Feed pumps 2 Diameter of ditto 8 1/2" Stroke 26" Can one be overhauled while the other is at work yes
No. of Bilge pumps 2 Diameter of ditto 4" Stroke 26" Can one be overhauled while the other is at work yes
No. of Donkey Engines 3 Sizes of Pumps (10 x 9) (4 1/2 x 10) (2 1/2 x 4) No. and size of Suctions connected to both Bilge and Donkey pumps
In Engine Room Four Two 3 1/2" dia., Two 3" dia. In Holds, &c. Five, One In hold, 3 1/2" dia. One 3 1/2" dia. main hold, One 3 1/2" dia. After hold, One 3 1/2" dia. Aftermost hold, One 3 1/2" dia. After well.
No. of bilge injections one sizes 7 1/2" dia. Connected to condenser, or to circulating pump no Is a separate donkey suction fitted in Engine room of size yes, 3 1/2" dia.
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 no sluices
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
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
When were stern tube, propeller, screw shaft, and all connections examined in dry dock 12.10.93 Is the screw shaft tunnel watertight yes
Is it fitted with a watertight door yes worked from Top platform of Engine Room
Total Heating Surface of Boilers 6981 sq. ft.

BOILERS, &c.— (Letter for record (18))
No. and Description of Boilers Two, Cyl. built, Double Ended Working Pressure 160 lb. Tested by hydraulic pressure to 320 lb.
Date of test 14.9.93 Can each boiler be worked separately yes Area of fire grate in each boiler 93.7 sq. ft. No. and Description of safety valves to
each boiler Two, Spring Area of each valve 12.56 sq. in. Pressure to which they are adjusted 165 lb. Are they fitted
with easing gear yes Smallest distance between boilers or uptakes and bunkers or woodwork 22" Mean diameter of boilers 14.6"
Length 15.6' Material of shell plates Steel Thickness 1 1/2" Description of riveting: circum. seams butt in lap long. seams double butt straps
Diameter of rivet holes in long. seams 1 1/2" Pitch of rivets 1 1/2" 7/8", 2 rows 3/8" Lap of plates or width of butt straps 19 1/2"
Per centages of strength of longitudinal joint 84.1 Working pressure of shell by rules 161 lb. Size of manhole in shell 16 3/4" x 13"
Size of compensating ring 26 x 2.3 x 15 No. and Description of Furnaces in each boiler 6, horizontal Material Steel Outside diameter 3.7 3/4"
Length of plain part top 7" bottom 7" Thickness of plates crown 9/16" bottom 7/16" Description of longitudinal joint welded No. of strengthening rings none
Working pressure of furnace by the rules 160 lb. Combustion chamber plates: Material Steel Thickness: Sides 5/8" Back 5/8" Top 5/8" Bottom 13/16"
Pitch of stays to ditto: Sides 8 1/2" x 8 1/2" Back 8 1/2" x 8 1/2" Top 8 1/2" x 8 1/2" If stays are fitted with nuts or riveted heads nuts Working pressure by rules 176 lb.
Material of stays Steel Diameter at smallest part 1 3/8" Area supported by each stay 74.3 sq. in. Working pressure by rules 159.6 lb. End plates in steam space:
Material Steel Thickness 1 1/16" Pitch of stays 18 x 18 How are stays secured Double nuts Working pressure by rules 165 lb. Material of stays Steel
Diameter at smallest part 2 1/4" Area supported by each stay 324 sq. in. Working pressure by rules 165 lb. Material of Front plates at bottom Steel
Thickness 1 1/16" Material of Lower back plate — Thickness — Greatest pitch of stays — Working pressure of plate by rules —
Diameter of tubes 3 3/4" Pitch of tubes 4 1/2" x 4 3/8" Material of tube plates Steel Thickness: Front 5/16" Back 3/4" Mean pitch of stays 9" x 8 3/4"
Pitch across wide water spaces 14 1/2" Working pressures by rules 160 lb. Girders to Chamber tops: Material Steel Depth and
thickness of girder at centre 10 x 1 1/4" Length as per rule 39' Distance apart 8 3/4" Number and pitch of Stays in each 3, - 8 1/2"
Working pressure by rules 166 lb. Superheater or Steam chest; how connected to boiler none 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 —

DONKEY BOILER— Description *Cylindrical, multitubular, Single Ended.*
 Made at *Gateshead* By whom made *Clarke Chapman & Co.* When made *28.9.93* Where fixed *In Stevedore*
 Working pressure *80 lb.* tested by hydraulic pressure to *160 lb.* No. of Certificate *4179* Fire grate area *304 sq ft* Description of safety valves *Spring*
 No. of safety valves *One* Area of each *14.4* Pressure to which they are adjusted *85 lb.* If fitted with easing gear *yes* If steam from main boilers can enter the donkey boiler *no* Diameter of donkey boiler *9.0"* Length *9.0"* Material of shell plates *Steel* Thickness *9/16"*
 Description of riveting long. seams *Double in Lap.* Diameter of rivet holes *1"* Whether punched or drilled *drilled* Pitch of rivets *3"*
 Lap of plating *4 7/16"* Per centage of strength of joint *70* Rivets *70* Thickness of shell *End* plates *5 7/8"* Radius of do. — No. of Stays to do. *6*
 Dia. of stays. *1 5/8"* Diameter of furnace *Top 2.6"* Bottom — Length of furnace *6.0"* Thickness of furnace plates *7/16"* Description of joint *Single in Lap.* Thickness of furnace crown plates *3/16"* Stays by *1 5/8"* stays, *8 1/2"* pitch Working pressure of shell by rules *83 lb.*
 Working pressure of furnace by rules *80 lb.* Diameter of uptake *3"* Thickness of uptake plates *5/8"* Thickness of water tubes *10 1/2 lb.*

SPARE GEAR. State the articles supplied:— *Two propellers. Blades, a set of bolts & nuts for a compass rod, main bearing, shaft coupling, a set of valves for the feed & bilge pumps, 3 sets of piston springs, Water, nuts, & iron assorted, 50 Condenser tubes, 6 boiler tubes, One air-pump bucket, head valve & rod, One circulating pump bucket & rod.*

The foregoing is a correct description,
 P. PRO T. RICHARDSON & SONS. *L. Armstrong* Manufacturer. *Of Engines & Marine Boilers.*

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

Main steam pipes tested by hydraulic pressure to 320 lb per square inch and found tight.
*The engines and boilers of this vessel have been constructed under Special Survey and of a good quality of workmanship they have been tried under steam the safety valves adjusted and found to work well and are now in safe and efficient working condition and, in my opinion, eligible to have **L.M.C. 12.93** recorded in the Register of this Society.*
The electric lighting installation has been fitted on board by Messrs. Clarke, Chapman & Co. Ltd and their Report on the same is appended.
The engine and dynamo are placed a little below the lower platform of engine room, on the Port side, and near the after bulkhead.
The photo prints of the main and donkey boilers accompany this Report.

It is submitted that
 this vessel is eligible for
THE RECORD L.M.C. 12.93

14/12/93

MACHINERY CERTIFICATE
 Certificate (if required) to be sent to **WRITTEN:**
 The amount of Entry Fee.. £ *3* : *0* :
 Special £ *40* : *12* :
 Donkey Boiler Fee £ : :
 Travelling Expenses (if any) £ : :
 When applied for, *13.12.93*
 When received, *13.12.93*

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

Committee's Minute

FRI 15 DEC 1893

Assigned

+ L.M.C. 12.93



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 Foundation