

REPORT ON MACHINERY.

Date of writing Report 15th October 1921 When handed in at Local Office 15th October 1921 Port of Malmö Received at London Office WED. 30 NOV. 1921

No. in Survey held at Limhamn Date, First Survey 22nd February Last Survey 8th October 1921
Reg. Book. 99944 on the Steel S.S. "WATERWAY" (Number of Visits 14)

Master ✓ Built at Limhamn By whom built Limhamns Skeppvarv AB When built 1921
Engines made at Sunderland By whom made H. E. Marine Eng. Co. Ltd. when made 1920

Boilers made at Sunderland By whom made H. E. Marine Eng. Co. Ltd. when made 1920

Registered Horse Power ✓ Owners Cory + Blundell Port belonging to Cardiff

Nom. Horse Power as per Section 28 119 Is Refrigerating Machinery fitted for cargo purposes no Is Electric Light fitted yes

ENGINES, &c.—Description of Engines Triple expansion No. of Cylinders 3 No. of Cranks 3

Dia. of Cylinders 16" 26" 43" Length of Stroke 30" Revs. per minute 94 Dia. of Screw shaft as fitted 240^{mm} Material of screw shaft Steel

Is the screw shaft fitted with a continuous liner the whole length of the stern tube No liners fitted Is the after end of the liner made water tight in the propeller boss ✓ If the liner is in more than one length are the joints burned ✓ 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 ✓ If two liners are fitted, is the shaft lapped or protected between the liners Orderwall's patent protecting box fitted Length of stern bush 980^{mm}

Dia. of Tunnel shaft as per rule 204 Dia. of Crank shaft journals as fitted 216^{mm} Dia. of Crank pin 216^{mm} Size of Crank webs 30^{mm} Dia. of thrust shaft under collars 216^{mm} Dia. of screw 3070^{mm} Pitch of Screw 4300^{mm} No. of Blades 4 State whether moveable no Total surface 3 square meter

No. of Feed pumps 2 Diameter of ditto 70^{mm} Stroke 280^{mm} Can one be overhauled while the other is at work yes

No. of Bilge pumps 2 Diameter of ditto 76^{mm} Stroke 380^{mm} Can one be overhauled while the other is at work yes

No. of Donkey Engines 3 Sizes of Pumps 5 1/2 x 3 1/2 x 5 No. and size of Suctions connected to both Bilge and Donkey pumps 8 x 4 x 18
In Engine Room Four, 2" diam. In Holds, &c. Two, 2 1/2 diam.

No. of Bilge Injections one size 3 1/2" Connected no to circulating pump yes Is a separate Donkey Suction fitted in Engine room & size yes - 2 1/2"

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 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 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

Is the Screw Shaft Tunnel watertight ✓ Is it fitted with a watertight door ✓ worked from ✓

BOILERS, &c.—(Letter for record S) Manufacturers of Steel John Spencer & Sons Ltd, Newburn Steel Works, Newcastle-on-Tyne

Total Heating Surface of Boilers 1958 square Is Forced Draft fitted no No. and Description of Boilers 1 Single ended multitubular

Working Pressure 180 lbs per square Tested by hydraulic pressure to 360 lbs per square (B.U.) Date of test 1920 No. of Certificate 19574 (B.U.)

Can each boiler be worked separately ✓ Area of fire grate in each boiler 48 square No. and Description of Safety Valves to each boiler 2 spring loaded Area of each valve 10 square Pressure to which they are adjusted 185 lbs per square Are they fitted with easing gear yes

Smallest distance between boilers or uptakes and bunkers or woodwork 6" Mean dia. of boiler 14' 6" Length 10' 6" Material of shell plates Steel

Thickness 1 1/16" Range of tensile strength 29-33 tons Are the shell plates welded or flanged no Descrip. of riveting: cir. seams dbl. riv. laps

long. seams dbl. butt straps Diameter of rivet holes in long. seams 1 1/4" Pitch of rivets 9.17" Lap of plates or width of butt straps 18 3/4"

Per centages of strength of longitudinal joint rivets 86% Working pressure of shell by rules 185 lbs per square Size of manhole in shell 12" x 16"

Size of compensating ring ✓ No. and Description of Furnaces in each boiler 3 Dightons Material Steel Outside diameter 41.5"-38.4"

Length of plain part top 1/2" Thickness of plates bottom 1/2" Description of longitudinal joint welded No. of strengthening rings ✓

Working pressure of furnace by the rules 187 lbs Combustion chamber plates: Material Steel Thickness: Sides 3/4" Back 3/4" Top 3/4" Bottom 3/4"

Pitch of stays to ditto: Sides 9' x 11.22" Back 10' 4 3/4" x 9.45" Top 10.63' x 9" If stays are fitted with nuts or riveted heads both Working pressure by rules 180 lbs

Material of stays Steel Area at smallest part 3.09 square Area supported by each stay 137.75 square Working pressure by rules 206 lbs End plates in steam space:

Material Steel Thickness 1.22" Pitch of stays 18.9' x 21" How are stays secured dbl. nuts Working pressure by rules 180 lbs Material of stays Steel

Area at smallest part 7.10 square Area supported by each stay 399 square Working pressure by rules 190 lbs Material of Front plates at bottom Steel

Thickness 26.5/32" Material of Lower back plate Steel Thickness 29.3/32" Greatest pitch of stays d = 19" Working pressure of plate by rules 185 lbs

Diameter of tubes 3 1/4" Pitch of tubes 4.75' x 4.75' Material of tube plates Steel Thickness: Front 26.5/32" Back 24/32" Mean pitch of stays 9.5"

Pitch across wide water spaces 14.5" Working pressures by rules as per plan Girders to Chamber tops: Material Steel Depth and thickness of girder at centre 8" x 1" Length as per rule 30.6" Distance apart 10.63" Number and pitch of stays in each Two - 9"

Working pressure by rules 216 lbs Steam dome: description of joint to shell ✓ % of strength of joint ✓

Diameter ✓ Thickness of shell plates ✓ Material ✓ Description of longitudinal joint ✓ Diam. of rivet holes ✓

Pitch of rivets ✓ Working pressure of shell by rules ✓ Crown plates ✓ Thickness ✓ How stayed ✓

SUPERHEATER. Type ✓ Date of Approval of Plan ✓ Tested by Hydraulic Pressure to ✓

Date of Test ✓ Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler ✓

Diameter of Safety Valve ✓ Pressure to which each is adjusted ✓ Is Easing Gear fitted ✓

IS A DONKEY BOILER FITTED? *yes*

If so, is a report now forwarded? *yes*

SPARE GEAR. State the articles supplied:— 2 connecting rod or piston rod top-end bolts and nuts, 2 connecting rod bottom end bolts and nuts, 2 main bearing bolts, 1 set of coupling bolts, 1 set of feed and bilge pump valves, 1 set of piston springs. A quantity of assorted bolts and nuts. Iron of various sizes. 9 boiler tubes, 5 stay tubes, 14 condenser tubes. 1 set of safety valve springs.

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

C. T. Adams Manufacturer.

Dates of Survey while building { During progress of work in shops -- 22/2, 15/4, 28/6, 30/6, During erection on board vessel --- 6/4, 24/5, 2/7, 11/8, 1/9, 27/9, 6/10, 7/10, 8/10 1921. Total No. of visits 14

Is the approved plan of main boiler forwarded herewith *Retained in London*

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

Dates of Examination of principal parts—Cylinders 15/4/21 Slides 15/4/21 Covers 15/4/21 Pistons 15/4/21 Rods 15/4/21 Connecting rods 15/4/21 Crank shaft 21/7/21 Thrust shaft 21/7/21 Tunnel shafts ✓ Screw shaft 21/7/21 Propeller 15/4/21 Stern tube 22/2/21 Steam pipes tested 28/6, 30/6/21 Engine and boiler seatings 11/8/21 Engines holding down bolts 27/9/21 Completion of pumping arrangements 27/9, 8/10/21 Boilers fixed 27/9/21 Engines tried under steam 8/10/21 Completion of fitting sea connections 6/4/21 Stern tube 6/4/21 Screw shaft and propeller 6/4/21 Main boiler safety valves adjusted 8/10/21 Thickness of adjusting washers Nuts secured by stoppers in caps.

Material of Crank shaft *Steel* Identification Mark on Do. *no. 254-55-56* Material of Thrust shaft *Steel* Identification Mark on Do. *no. 257* Material of Tunnel shafts ✓ Identification Marks on Do. ✓ Material of Screw shafts *Steel* Identification Marks on Do. *no. 258* Material of Steam Pipes *Steel* Test pressure 570 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 *no* If so, state name of vessel ✓

General Remarks (State quality of workmanship, opinions as to class, &c. The machinery and boilers of this vessel have been built under the supervision of the Surveyors to the Bureau Veritas. The working parts of these engines have been opened out and carefully examined by the undersigned and the scantlings of the main and donkey boilers compared with the approved plans. Forgings and castings examined. Workmanship—good as far as can be seen.

This machinery has been tried under steam and found working satisfactorily and is eligible in my opinion to be classed in the Society's Register Book with notation of LMC 10, 21. Working pressure 180 lbs.

Please see Secretary's letters:— E 5/8, 10/8, 30/9 1920 20/9 1921.

The amount of Entry Fee ... £k : 54.60. When applied for, Special ... £k : 546.00 15/10 1921 Donkey Boiler Fee ... £ : : When received, Travelling Expenses (if any) £k : 40.00 27/10 1921 Exam. of forgings

Committee's Minute

Assigned

FRI. NOV. 18 1921

L. B. 1021

MACHINERY CERT. WRITTEN

W. J. Jensen Engineer Surveyor to Lloyd's Register of Shipping.

FRI. 2 DEC. 1921

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Lloyd's Register Foundation

Certificate (if required) to be sent to Surveyors Office, Malacca.

The Surveyors are requested not to write on or below the space for Committee's Minute.

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