

# REPORT ON MACHINERY.

Port of *Hamburg*

MUN. 7 MAR 1904

No. in Survey held at *Kiel* Date, first Survey *28.7.03* Last Survey *28.7.03* 1904

Reg. Book *14* on the *Steel S.S. "Östergötland"* (Number of Visits *16*)

Master *C. Anderson* Built at *Kiel* By whom built *Howaldtswerke* Tons *Gross 1096 Net 673* When built *1904*

Engines made at *Kiel* By whom made *Howaldtswerke* when made *1904*

Boilers made at *Kiel* By whom made *Howaldtswerke* when made *1904*

Registered Horse Power *117* Owners *Rederi Aktie. Östergötland (Erikson & Hornsöhl)* Port belonging to *Norrköping*

Nom. Horse Power as per Section 28 *117* Is Refrigerating Machinery fitted *No* Is Electric Light fitted *No*

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

Dia. of Cylinders *16 1/2" 21 1/2" 43 1/2"* Length of Stroke *24 1/2"* Revs. per minute *115* Dia. of Screw shaft *8 1/2"* as per rule *8 1/2"* as fitted *8 1/2"* Lgth. of stern bush *35 1/2"*

Dia. of Tunnel shaft *7 1/2"* as per rule *7 1/2"* as fitted *7 1/2"* Dia. of Crank shaft journals *8 1/2"* as per rule *8 1/2"* as fitted *8 1/2"* Dia. of Crank pin *8 1/2"* Size of Crank webs *22 x 1 1/2"* Dia. of thrust shaft under collars *8 1/2"* Dia. of screw *1 1/2"* Pitch of screw *11 1/2"* No. of blades *4* State whether moveable *solid* Total surface *29.6 sq. ft.*

No. of Feed pumps *2* Diameter of ditto *3"* Stroke *14 1/2"* Can one be overhauled while the other is at work *yes*

No. of Bilge pumps *2* Diameter of ditto *3"* Stroke *14 1/2"* Can one be overhauled while the other is at work *yes*

No. of Donkey Engines *2 duplex* Sizes of Pumps *6 x 7 1/2 x 6" — 5 1/2 x 3 1/2 x 5 1/2"* No. and size of Suctions connected to both Bilge and Donkey pumps

In Engine Room *4 — 3 off 2 1/4" — 1 off 3" — 1 in Tunnel 2 1/4"* In Holds, &c. *4 off 2 1/4" — 1 after peak 2 1/4" — 2 off Boiler — Tank 1 1/2" — 12 from Tanks 3 1/2", 2 1/4", 2 3/4"*

No. of bilge injections *1* sizes *5"* Connected to *condenser* circulating pump *yes* 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 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 *yes*

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 *2 suction from fore hold* How are they protected *in wooden boxes*

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 *on Hook* Is the screw shaft tunnel watertight *yes*

Is it fitted with a watertight door *yes* worked from *byld. platform.*

BOILERS, &c.— (Letter for record *S*) Total Heating Surface of Boilers *1785 sq. ft.* Is forced draft fitted *No*

No. and Description of Boilers *2 single end cyl. multitubular* Working Pressure *178 lbs* Tested by hydraulic pressure to *356 lbs*

Date of test *23.12.03* Can each boiler be worked separately *yes* Area of fire grate in each boiler *32 sq. ft.* No. and Description of safety valves to each boiler *2 spring loaded* Area of each valve *8 sq. in.* Pressure to which they are adjusted *183 lbs* Are they fitted with easing gear *yes*

Smallest distance between boilers or uptakes and bunkers or woodwork *10"* Mean dia. of boilers *9 1/2"* Length *9 1/4"* Material of shell plates *Steel*

Thickness *9"* Range of tensile strength *28-28.6 tons* Are they welded or flanged *flang* Descrip. of riveting: cir. seams *lap. dbl riv. long. seams dbl. Bpt. trip. riv.*

Diameter of rivet holes in long. seams *9 3/4"* Pitch of rivets *6 1/2"* Lap of plates or width of butt straps *9 1/2 x 16 1/2 x 7"*

Percentages of strength of longitudinal joint rivets *93.7%* Working pressure of shell by rules *190.9 lbs* Size of manhole in shell *15 1/2" x 11 1/2"*

Size of compensating ring *8 1/2" x 9"* No. and Description of Furnaces in each boiler *2 Morisons* Material *Steel* Outside diameter *35 1/2"*

Length of plain part top *8"* bottom *9 1/2"* Thickness of plates crown *5"* bottom *5"* Description of longitudinal joint *welded* No. of strengthening rings *none*

Working pressure of furnace by the rules *2128 lbs* Combustion chamber plates: Material *Steel* Thickness: Sides *62"* Back *58"* Top *62"* Bottom *62"*

Ch of stays to ditto: Sides *7 1/2 x 7 1/2* Back *7 3/4 x 7 3/4* Top *7 1/4 x 7 1/4* If stays are fitted with nuts or riveted heads *nuts* Working pressure by rules *231 lbs*

Material of stays *Steel* Diameter at smallest part *1 1/2"* Area supported by each stay *53 sq. in.* Working pressure by rules *185.6 lbs* End plates in steam space:

Material *Steel* Thickness *8 1/2"* Pitch of stays *13 1/4 x 13 1/4* How are stays secured *wash. dbl. riv.* Working pressure by rules *183.7 lbs* Material of stays *Steel*

Diameter at smallest part *2 3/4"* Area supported by each stay *185 sq. in.* Working pressure by rules *227 lbs* Material of Front plates at bottom *Steel*

Thickness *8 1/2"* Material of Lower back plate *Steel* Thickness *8 1/2"* Greatest pitch of stays *170 sq. in.* Working pressure of plate by rules *185.3 lbs*

Diameter of tubes *3 1/2"* Pitch of tubes *4 1/2 x 4 1/2"* Material of tube plates *Steel* Thickness: Front *8 1/2"* Back *8"* Mean pitch of stays *9 1/2 x 9"*

Ch across wide water spaces *9"* Working pressures by rules *338.7 lbs* Girders to Chamber tops: Material *Steel* Depth and

Thickness of girder at centre *6 1/2 x 6 1/2"* Length as per rule *21 1/2"* Distance apart *7 1/2"* Number and pitch of Stays in each *2 — 7 1/2 x 6 1/2"*

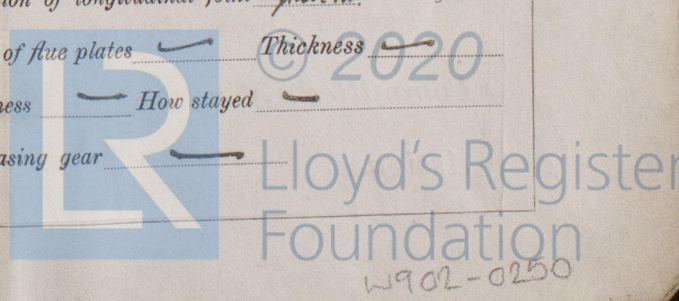
Working pressure by rules *180 lbs* Superheater *Dome* how connected to boiler *lap. dbl. riv.* Can the superheater be shut off and the boiler worked

separately *no* Diameter *35 1/2"* Length *39"* Thickness of shell plates *5"* Material *Steel* Description of longitudinal joint *lap. dbl. riv.* Diam. of rivet

*8 1/2"* Pitch of rivets *2 1/2"* Working pressure of shell by rules *217.5 lbs* Diameter of flue *—* Material of flue plates *—* Thickness *—*

Are they fitted 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 *—*



W902-0250



**DONKEY BOILER—** No. \_\_\_\_\_ Description \_\_\_\_\_

Made at \_\_\_\_\_ By whom made \_\_\_\_\_ When made \_\_\_\_\_ Where fixed \_\_\_\_\_

Working pressure \_\_\_\_\_ tested by hydraulic pressure to \_\_\_\_\_ No. of Certificate \_\_\_\_\_ Fire grate area \_\_\_\_\_ Description of safety valves \_\_\_\_\_

No. of safety valves \_\_\_\_\_ Area of each \_\_\_\_\_ Pressure to which they are adjusted \_\_\_\_\_ If fitted with easing 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 \_\_\_\_\_ Per centage of strength of joint \_\_\_\_\_ Rivets \_\_\_\_\_ 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 \_\_\_\_\_

Thickness of furnace crown plates \_\_\_\_\_ Stayed by \_\_\_\_\_ Working pressure of shell by rules \_\_\_\_\_

Working pressure of furnace by rules \_\_\_\_\_ Diameter of uptake \_\_\_\_\_ Thickness of uptake plates \_\_\_\_\_ Thickness of water tubes \_\_\_\_\_

**SPARE GEAR.** State the articles supplied:— 1 propeller, 1 set connecting rod & crank bolts & nuts, 1 set connecting rod bottom end bolts & nuts, 1 set bolts & nuts for main bearings, 1 set coupling bolts & nuts, 1 set valves for feed and bilge pumps, 1 piston spring (Connobottom), 1 slide valve rod, 1 expansion strap, 1 air pump rod, 1 circulating pump rod, 1 spring for safety valves of boilers, 1 set valves for air pump, 1 set valves for circulating pump, 2 link brasses, 1 link block, 40 tubes for condenser with nuts, 10 tubes for Boilers, a quantity of assorted bolts and nuts, Iron of various sizes.

The foregoing is a correct description,

**HOWALDTSWERKE.**

Manufacturer.

Dates { During progress of work in shops - - 28/4, 20/8, 5/9, 11/9, 11/10, 15/10, 25/11, 11/12, 23/12, 30/12-03, 4/1, 21/1.04  
of Survey { During erection on board vessel - - 1/2, 23/2, 27/2, 2/3.04.  
while building { Total No. of visits 16

Is the approved plan of main boiler forwarded herewith yes

" " " donkey " " "

**General Remarks** (State quality of workmanship, opinions as to class, &c. Material and workmanship of these Engines and Boilers are of very good description, the outfit is ample, the whole has been constructed under Special Survey.

Material of screw shaft Steel Is the screw shaft fitted with a continuous liner the whole length of the stern tube no liner 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 —

On the 2<sup>nd</sup> March I adjusted the Safety valves of the Main Boilers to 183 lbs. and subsequently attended a satisfactory trial trip.

The copies of the invoices of the Steel Boiler Materials, signed by the leading officers, are in my hands. Fitting Certificates of the Shafting will be found attached.

The approved plan of the Main Boilers and of bilge pipes sections will be found forwarded herewith.

The Machinery of this vessel being in my opinion in efficient condition and eligible for a vessel entered in the Society's Register Book, I beg to recommend, that she be classed and that **L.M.C. 3.04** be recorded.

It is submitted that this vessel is eligible for  
**THE RECORD L.M.C. 3.04**

The amount of Entry Fee. . . £ 2: 0: 0: When applied for,  
Special . . . . . £ 17: 11: 0: 2/3 1904  
Donkey Boiler Fee . . . . £ : : : When received,  
Travelling Expenses (if any) £ 9: 7: 0: 2/3 1904

Committee's Minute **TUES. 15 MAR 1904**

Assigned **+ L.M.C. 3.04**

Engineer Surveyor to Lloyd's Register of British & Foreign Shipping  
**J. Kohler**  
**L.M.C. 3.04**

**Lloyd's Register Foundation**

MACHINERY CERTIFICATE  
WRITTEN.