

REPORT ON BOILERS.

No. 5097

Received at London Office MAY 16 1938

Date of writing Report 30/4/1938 When handed in at Local Office 13/5/1938 Port of Oslo

No. in Reg. Book. Survey held at Fredrikstad Date, First Survey 9th March 1937 Last Survey 3rd May 1938

on the steel screw steamer "VIVA" (Number of Visits 29) Tons {Gross 3798 Net 2194}

Master S. Hoelfeldt Built at Fredrikstad By whom built Hs Fredrikstad Mek. Verhsted Yard No. 287 When built 1938
Engines made at Fredrikstad By whom made Hs Fredrikstad Mek. Verhsted Engine No. 1092 When made 1938
Boilers made at Fredrikstad By whom made Hs Fredrikstad Mek. Verhsted Boiler No. 1345/46 When made 1938
Nominal Horse Power 353 Owners Hs Viva (C. H. Løvensen Sønner) Port belonging to Arendal

MULTITUBULAR BOILERS—MAIN, AUXILIARY, OR DONKEY.

Manufacturers of Steel Vitkovic Mines Steel & Ironworks Corp., Kön. Ung. Staatliche Eisen- & Stahlmasch. fabriken (Letter for Record E. 14/4/37)

Total Heating Surface of Boilers 512 m² (5510 ft.²) Is forced draught fitted Yes Coal or Oil fired Oil, also arranged for coal

No. and Description of Boilers Two cylindrical, multitubular, Scotch type Working Pressure 15.5 kg/cm²

Tested by hydraulic pressure to 380 lb./sq. in. Date of test 25/2 & 4/3/38 Date of Certificate 12/4/38 Can each boiler be worked separately Yes

Area of Firegrate in each Boiler 5.61 m² No. and Description of safety valves to each boiler one double, spring loaded High lift

Area of each set of valves per boiler {per Rule 70.88 mm² 9.460 mm² as fitted 78.53 mm² Pressure to which they are adjusted 15.5 kg/cm² Are they fitted with easing gear Yes

In case of donkey boilers, state whether steam from main boilers can enter the donkey boiler Area for auxiliary 7.5-30 mm²

Smallest distance between boilers or uptakes and bunkers 250 mm. Boilers placed on upper dk. Is oil fuel carried in the double bottom under boilers Yes

Smallest distance between shell of boiler and tank top plating Is the bottom of the boiler insulated Yes

Largest internal dia. of boilers 4650 mm Length 3683 mm Shell plates: Material S.M. steel Tensile strength 49-55 kg./mm²

Thickness 35 mm. Are the shell plates welded or flanged Yes Description of riveting: circ. seams {end D.R. inter. Yes} long. seams 36

Percentage of strength of circ. end seams {plate 64.7 rivets 42} Percentage of strength of circ. intermediate seam {plate 84.7 rivets 85.2} Working pressure of shell by Rules 15.52 kg/cm²

Percentage of strength of longitudinal joint {plate 84.7 rivets 85.2 combined} Thickness of butt straps {outer 27 mm inner 30 mm} No. and Description of Furnaces in each Boiler Three, Morrison, stiffened

Material S.M. steel Tensile strength 41-47 kg./mm² Smallest outside diameter 1135 mm

Length of plain part {top bottom} Thickness of plates {crown 17.5 bottom 17.5} Description of longitudinal joint

Dimensions of stiffening rings on furnace or on bottom 75 x 16 mm. E.N. Working pressure of furnace by Rules 15.9 kg/cm²

End plates in steam space: Material S.M. steel Tensile strength 41-47 kg./mm² Thickness 24.5 Pitch of stays 520 x 480

How are stays secured Double nuts + washers Working pressure by Rules 15.64 kg/cm²

Tube plates: Material {front S.M. steel back S.M. steel} Tensile strength 41-47 kg./mm² Thickness {28 mm 21.5 mm}

Mean pitch of stay tubes in nests 330 x 220 Pitch across wide water spaces 355 mm Working pressure {front 15.86 kg/cm² back 15.52 kg/cm²}

Girders to combustion chamber tops: Material S.M. steel Tensile strength 49-55 kg./mm² Depth and thickness of girder

at centre 265 mm side 245 mm x 19 mm Length as per Rule 775 Distance apart 265 x 270 x 310 No. and pitch of stays

in each 3 @ 200 mm Working pressure by Rules 16.05 kg/cm² Combustion chamber plates: Material S.M. steel

Tensile strength 41-47 kg./mm² Thickness: Sides 21 mm Back 19 mm Top 22 mm Bottom 22 mm

Pitch of stays to ditto: Sides 202 x 178 mm Back 195 x 187 mm Top 310 x 200 mm Are stays fitted with nuts or riveted over Riveted over

Working pressure by Rules 20.2, 16.38 or 17.8 kg/cm² Front plate at bottom: Material S.M. steel Tensile strength 41-47 kg./mm²

Thickness 28 mm Lower back plate: Material S.M. steel Tensile strength 41-47 kg./mm² Thickness 25.5

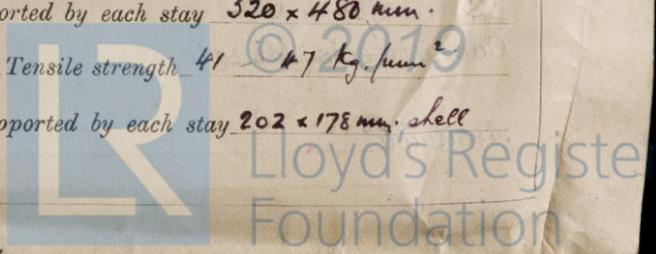
Pitch of stays at wide water space 355 mm 340 x 187 Are stays fitted with nuts or riveted over riveted over

Working Pressure 15.86 kg/cm² Main stays: Material S.M. steel Tensile strength 44-50 kg./mm²

Diameter {At body of stay, or Over threads} 3 1/2" and 3 3/8" No. of threads per inch 6 Area supported by each stay 520 x 480 mm

Working pressure by Rules 15.97 kg/cm² Screw stays: Material S.M. steel Tensile strength 41-47 kg./mm²

Diameter {At turned off part, or Over threads} 1 1/2" No. of threads per inch 9 Area supported by each stay 202 x 178 mm shell



Working pressure by Rules 15.8 kg/cm^2 Are the stays drilled at the outer ends Margin stays: Diameter $\left\{ \begin{array}{l} \text{At turned off part,} \\ \text{or} \\ \text{Over threads.} \end{array} \right. 1\frac{3}{4}''$

No. of threads per inch 9 Area supported by each stay $187 \times 267.5 \text{ mm}$ Working pressure by Rules 16.4 kg/cm^2

Tubes: Material *Samless S.M. steel* External diameter $\left\{ \begin{array}{l} \text{Plain} \\ \text{Stay} \end{array} \right. 3\frac{1}{4}''$ Thickness $\left\{ \begin{array}{l} 4 \text{ mm} \\ 8 \text{ mm} \end{array} \right.$ No. of threads per inch 9

Pitch of tubes $110 \times 110 \text{ mm}$ Working pressure by Rules 15.6 kg/cm^2 Manhole compensation: Size of opening in shell plate $400 \times 300 \text{ mm}$ Section of compensating ring $775 \times 33.5 \text{ mm}$ No. of rivets and diameter of rivet holes $42 \times 36 \text{ mm}$

Outer row rivet pitch at ends 240 mm Depth of flange if manhole flanged Steam Dome: Material _____

Tensile strength _____ Thickness of shell _____ Description of longitudinal joint _____

Diameter of rivet holes _____ Pitch of rivets _____ Percentage of strength of joint $\left\{ \begin{array}{l} \text{Plate} \\ \text{Rivets} \end{array} \right.$

Internal diameter _____ Working pressure by Rules _____ Thickness of crown _____ No. and diameter of stays _____ Inner radius of crown _____ Working pressure by Rules _____

How connected to shell _____ Size of doubling plate under dome _____ Diameter of rivet holes and pitch of rivets in outer row in dome connection to shell _____

Type of Superheater *Fredrikstad Mek. Verhsted* Manufacturers of _____

Number of elements 60 Material of tubes *Cold drawn steel tubes* Internal diameter and thickness of tubes $20 \text{ mm} - 2\frac{1}{2} \text{ mm}$

Material of headers *cast steel* Tensile strength 47.5 kg/cm^2 Thickness $20 \text{ a } 25 \text{ mm}$ Can the superheater be shut off and the boiler be worked separately Is a safety valve fitted to every part of the superheater which can be shut off from the boiler

Area of each safety valve 1256 mm^2 Are the safety valves fitted with easing gear Working pressure as per Rules 15.5 kg/cm^2 Pressure to which the safety valves are adjusted 15.5 kg/cm^2 Hydraulic test pressure: tubes 150 kgs/cm^2 forgings and castings 46.5 kg/cm^2 and after assembly in place *see letter E. 14/4/38* Are drain cocks or valves fitted to free the superheater from water where necessary

Have all the requirements of Sections 14 to 22 inclusive for boilers been complied with

The foregoing is a correct description,

Fredrikstad Mek. Verhsted Manufacturer.

Dates of Survey $\left\{ \begin{array}{l} \text{During progress of} \\ \text{work in shops} \end{array} \right. 1937: 9/3-21/5-28/5-2/6-9/6-16/6-3/8-18/8-6/9-20/9-24/9-11/10-14/10$ Are the approved plans of boiler and superheater forwarded herewith 14/4/37
 while building $\left\{ \begin{array}{l} \text{During erection on} \\ \text{board vessel} \end{array} \right. 1938: 4/1-13/1-26/1-11/2-25/2-4/3$ (If not state date of approval.)
 Total No. of visits 29

Is this Boiler a duplicate of a previous case If so, state Vessel's name and Report No.

GENERAL REMARKS (State quality of workmanship, opinions as to class, &c.)

These boilers have been constructed in accordance with the approved plan and as amended and in conformity with the Secretary's letters concerning these boilers. The materials were tested by Det Norske Veritas surveyors, but were accepted by the Committee in this case, as per Secretary's letter E. 11/3-14/4/37. - The workmanship is of the best description throughout.

The electric welding has been carried out to our satisfaction by recognized welders using approved electrodes; special attention being paid to the welding of the combustion chambers on completion of the welding of same these were annealed, being inserted in a proper furnace under strict control of temperature.

On completion the boilers were tested by hydraulic pressure to 380 lbs. per sq. inch, and the safety valves of the boilers and superheaters were subsequently adjusted under steam to 15.5 kg/cm^2 (220 lbs./in^2).

Survey Fee ... *see mech. rpt.* } When applied for, 13/5/1938
 Travelling Expenses (if any) *see* : } When received, 19

Pride Perbjorn Solb.
 Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute

FRI. 24 JUN 1938

Assigned

See Osl. J.E. 5097



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