

# REPORT ON BOILERS.

No. 6235.

Received at London Office

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Date of writing Report 19<sup>th</sup> Oct 1937 When handed in at Local Office

19/10/37 Port of **YOKOHAMA**

No. in Survey held at **YOKOHAMA**

Date, First Survey 17<sup>th</sup> April Last Survey 12<sup>th</sup> Oct 1937

(Number of Visits 17) Tons { Gross 8637 Net 6368

on the **Steel Screw M.V. "KAIO MARU"**

Mitsubishi Jukogyo K.K.

Built at **Yokohama** By whom built **Yokohama Dock** Yard No. 279 When built 1937

Engines made at **Yokohama** By whom made **Mitsubishi J. K. K. Yokohama Dock** Engine No. 279 When made 1937

Boilers made at **Yokohama** By whom made **Mitsubishi J. K. K. Yokohama Dock** Boiler No. 279 When made 1937

Indicated Horse Power 1166.8 Owners **Nippon Yusen K. K.** Port belonging to **Yokio**

## MULTITUBULAR BOILERS ~~MAIN, AUXILIARY, OR~~ DONKEY.

Manufacturers of Steel **The Steel Company of Scotland, Ltd.**

(Letter for Record S. ✓)

Total Heating Surface of Boilers 218 M<sup>2</sup> each boiler Is forced draught fitted **Yes**

Coal or Oil fired **Oil Exhaust Gases**

No. and Description of Boilers **Two cylindrical marine with water tubes in dry combustion chamber**

Working Pressure 11.5 kps/cm<sup>2</sup> 163 lb.

Tested by hydraulic pressure to 20.75 kps/cm<sup>2</sup> Date of test 18-8-37 No. of Certificate 63 Can each boiler be worked separately **Yes**

Area of Firegrate in each Boiler 19.5 M<sup>2</sup> No. and Description of safety valves to each boiler **2 - spring loaded.**

Area of each set of valves per boiler { per Rule as fitted 22-940" Pressure to which they are adjusted 11.5 kps/cm<sup>2</sup> Are they fitted with easing gear **Yes**

In case of donkey boilers, state whether steam from main boilers can enter the donkey boiler **✓**

Smallest distance between boilers or uptakes and bunkers or woodwork 950 mm Is oil fuel carried in the double bottom under boilers **✓**

Smallest distance between shell of boiler and tank top plating **On 2nd platform** Is the bottom of the boiler insulated **Yes**

Largest internal dia. of boilers 3800 mm Length 2550 mm Shell plates: Material **Steel** Tensile strength 44-55 kps/cm<sup>2</sup>

Thickness 25 mm Are the shell plates welded or flanged **✓** Description of riveting: circ. seams { end D.R. Lap. inter. ✓

Long. seams **T.R.S.B.S.** Diameter of rivet holes in { circ. seams 29.5 mm long. seams 26.5 mm Pitch of rivets { 90 mm 182 mm

Percentage of strength of circ. end seams { plate 67.2% rivets 45.6% Percentage of strength of circ. intermediate seam { plate 85.4% rivets 93.3% combined

Percentage of strength of longitudinal joint { plate 85.4% rivets 93.3% combined Working pressure of shell by Rules 11.6 kps/cm<sup>2</sup>

Thickness of butt straps { outer 19 mm inner No. and Description of Furnaces in each Boiler **Two Deighton Corrugated Furnaces**

Material **Steel** Tensile strength 41-47 kps/cm<sup>2</sup> Smallest outside diameter 1078 mm 1178

Length of plain part { top bottom ✓ Thickness of plates { crown 14 mm bottom Description of longitudinal joint **Weld.**

Dimensions of stiffening rings on furnace or c.c. bottom ✓ Working pressure of furnace by Rules 12.1 kps/cm<sup>2</sup>

Stays and plates in steam space: Material **Steel** Tensile strength 41-47 kps/cm<sup>2</sup> Thickness 30 mm Pitch of stays 400 mm

Are stays secured **nuts & washers both sides** Working pressure by Rules 18.3 kps/cm<sup>2</sup>

End door plates: Material { front back } **Steel** Tensile strength 41/47 kps/cm<sup>2</sup> Thickness 22 mm

Unpitch of stay tubes in nests 330 x 306 mm Pitch across wide water spaces 330 mm Working pressure { front 12.1 kps/cm<sup>2</sup> back 12.1 kps/cm<sup>2</sup>

Doors to combustion chamber tops: Material **✓** Tensile strength **✓** Depth and thickness of girder

Distance between stays ✓ Length as per Rule ✓ Distance apart ✓ No. and pitch of stays

Working pressure by Rules ✓ Front plate at bottom: Material **Steel** Tensile strength 41-47 kps/cm<sup>2</sup>

Thickness 22 mm Lower back plate: Material **Steel** Tensile strength 41-47 kps/cm<sup>2</sup> Thickness 22 mm

Are stays fitted with nuts or riveted over **✓**

Working Pressure **✓** Main stays: Material **Steel** Tensile strength 44-55 kps/cm<sup>2</sup>

At body of stay, 63.5 mm No. of threads per inch 6 Area supported by each stay 400 cm<sup>2</sup>

Over threads 70 mm Working pressure by Rules 15.5 kps/cm<sup>2</sup> Screw stays: Material **✓** Tensile strength

At turned off part, **✓** No. of threads per inch **✓** Area supported by each stay **✓**

Over threads **✓**



Working pressure by Rules ☒ Are the stays drilled at the outer ends. ☒ Margin stays: Diameter { At turned off part, or Over threads. ☒ No. of threads per inch ☒ Area supported by each stay ☒ Working pressure by Rules ☒ Tubes: Material Steel External diameter { Plain 3" Stay 3" Thickness { 9 L.S.G. 3/8" x 5/16" No. of threads per inch 9 Pitch of tubes 10.2 x 110 m/m Working pressure by Rules 13.5 kgs/cm<sup>2</sup> Manhole compensation: Size of opening in shell plate 305 x 406 m/m Section of compensating ring ☒ No. of rivets and diameter of rivet holes ☒ Outer row rivet pitch at ends ☒ Depth of flange if manhole flanged ☒ Steam Dome: Material Steel Tensile strength 41-47 kgs/m<sup>2</sup> Thickness of shell 12 m/m Description of longitudinal joint D.R. Lap Diameter of rivet holes 23 m/m Pitch of rivets 60 m/m Percentage of strength of joint { Plate 67.1% Rivets 74% Internal diameter 1200 m/m Working pressure by Rules 12.6 kgs/cm<sup>2</sup> Thickness of crown 22 m/m No. and diameter of stays ☒ Inner radius of crown 1200 m/m Working pressure by Rules 15.3 kgs/cm<sup>2</sup> How connected to shell D.R. joint Size of doubling plate under dome 1635 x 25 m/m Diameter of rivet holes and pitch of rivets in outer row in dome connection to shell 23 @ 125 m/m

Size of Manhole or Handhole ☒ Water Drums: Number in each boiler One Inside Diameter 450 m/m Material of plates Steel Thickness 20 m/m Range of tensile strength 41-47 kgs/m<sup>2</sup> Are drum shell plates welded or flanged No Description of riveting: Cir. seams R long. seams Seamless Diameter of Rivet Holes in long. seams ☒ Pitch of rivets ☒ Lap of plates or width of butt straps ☒ Thickness of straps ☒ Percentage strength of long. joint: Plate ☒ Rivet ☒ Diameter of tube holes in drum 45.5 m/m Pitch of tube holes 73 x 60 m/m Percentage strength of drum shell in way of tubes 37.6% Water Drum Heads or Ends: Material Steel Thickness 55 m/m Radius or how stayed ☒ Size of manhole or handhole Ends bolted on Headers or Sections: Number ☒ Material ☒ Thickness ☒ Tested by Hydraulic Pressure to ☒ Material of Stays ☒ Hydraulic test pressure: tubes forgings and castings and after assembly in place 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,

Z. Adachi Manufacturer.

Dates of Survey { During progress of 17/4, 28/6, 3, 15, 17, 22, 26, 27/7, 2/8, 6/8 Are the approved plans of boiler and superheater forwarded herewith File 4/2/37 work in shops - - 18/8/37 (If not state date of approval.) while building { During erection on 24/8, 10, 17, 27/9, 7/10, 12/10/37 Total No. of visits 17 board vessel - - }

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 built under Special Survey in accordance with the Rules & approved plan. Materials & workmanship good.

These boilers have been securely fitted on board vessel, examined under steam, safety valves adjusted to  $11.5 \text{ kgs/cm}^2$  and accumulation tests carried out with satisfactory results.

These boilers in our opinions are eligible to be classed with the machinery of this vessel and to have the record of 174 LMC 10-37

Survey Fee Charged on Machinery Report. When applied for, 19  
Travelling Expenses (if any) £ When received, 19

J. Nicholas N. Kishigami  
Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute TUE 23 NOV 1937

Assigned

See Yka LC 6235-



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Foundation