

## REPORT ON MACHINERY.

Port of *Kobe*

Received at London SAT. 18 DEC 1897

No. in Survey held at *Kagasaki*  
Reg. Book.Date, first Survey *6/6/96* Last Survey *27/7* 1897  
(Number of Visits)on the *Engines & boilers of the Japanese Steamer Miyajima Maru* Tons  $\left\{ \begin{array}{l} \text{Gross } 1533 \\ \text{Net } 950 \end{array} \right.$ Built at *Kagasaki* By whom built *Kagasaki Dock & Engine Works* When built *7-97*Engines made at *Greenock* By whom made *Scott & Co.* when made *1890*Boilers made at *Glasgow* By whom made *A. Stephen & Sons* when made *1888*Registered Horse Power *160* Owners *Asaka Shoen Kaisha* Port belonging to *Asaka*Nom. Horse Power as per Section 28 *160*

ENGINES, &c.— Description of Engines *Direct Act. Inver. Tricomp. Surf. Con. Screw* No. of Cylinders *3*

Diameter of Cylinders *18 1/4 - 29 1/2 - 47* Length of Stroke *39"* Revolutions per minute *80* Diameter of Screw shaft *as per rule 2.97*  
*as fitted 10"*

Diameter of Tunnel shaft *as per rule 8.52* Diameter of Crank shaft journals *10"* Diameter of Crank pin *10"* Size of Crank webs *18 1/2 x 8"*  
*as fitted 10"*

Diameter of screw *12 1/10* Pitch of screw *17 1/9* No. of blades *44* State whether moveable *Yes* Total surface *57.5 ft.*

No. of Feed pumps *2* Diameter of ditto *2 1/4"* Stroke *39"* Can one be overhauled while the other is at work *Yes*

No. of Bilge pumps *2* Diameter of ditto *2 3/8"* Stroke *39"* Can one be overhauled while the other is at work *Yes*

No. of Donkey Engines *3*  $\left\{ \begin{array}{l} 1 \text{ main boiler} \\ 1 \text{ donkey} \\ 1 \text{ bellows} \end{array} \right.$  Sizes of Pumps  $\left\{ \begin{array}{l} 3 1/2 \times 7 \text{ double act.} \\ 2 1/2 \times 5 \text{ single} \\ 5 1/4 \times 9 \text{ double} \end{array} \right.$  No. and size of Suctions connected to both Bilge and Donkey pumps

In Engine Room *4 to donkey pump & 2 in* In Holds, &c. *2 to bilge pumps in fore hold*  
*4 - bilge - " - "* *2 - " - " - "* *after*

No. of bilge injections *1* sizes *4"* Connected to *condenser, or to circulating pump* Is a separate donkey suction fitted in Engine room & size *Yes*

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 *All valves excepting blow off.*

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 *2 bilge pipes to fore hold* How are they protected *Wooden casings*

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 *now* Is the screw shaft tunnel watertight *Yes*

Is it fitted with a watertight door *Yes* worked from *Spur deck*

OILERS, &c.— (Letter for record) Total Heating Surface of Boilers *1429.25 x 2 = 2858.5 sq. ft.*

No. and Description of Boilers *2. Cylindrical return tube* Working Pressure *160* Tested by hydraulic pressure to *240*

Date of test *12/6/97* Can each boiler be worked separately *Yes* Area of fire grate in each boiler *38 sq. ft.* No. and Description of safety valves to each boiler *2. Spring loaded* Area of each valve *9"* Pressure to which they are adjusted *160* Are they fitted with easing gear *Yes*

Smallest distance between boilers or uptakes and bunkers or woodwork *7 1/2"* Mean diameter of boilers *12 1/2"*

Length *11 1/2'* Material of shell plates *Steel* Thickness *1 1/16"* Description of riveting: circum. seams *lap. double* long. seams *double butt riveted*

Diameter of rivet holes in long. seams *1 1/16"* Pitch of rivets *7 1/4"* Lap of plates or width of butt straps *1 1/10 1/2"*

Per centages of strength of longitudinal joint  $\left\{ \begin{array}{l} \text{rivets } 76.54 \\ \text{plate } 83.6 \end{array} \right.$  Working pressure of shell by rules *180* Size of manhole in shell *17 x 13*

Size of compensating ring *1 1/2 x 2 1/2 x 1 1/2* No. and Description of Furnaces in each boiler *2. Box plat.* Material *Steel* Outside diameter *3 1/8"*

Length of plain part  $\left\{ \begin{array}{l} \text{top } 6 1/2' \\ \text{bottom } " \end{array} \right.$  Thickness of plates  $\left\{ \begin{array}{l} \text{crown } 3/8" \\ \text{bottom } 3/8" \end{array} \right.$  Description of longitudinal joint *Weld* No. of strengthening rings *1*

Working pressure of furnace by the rules *200.29* Combustion chamber plates: Material *Steel* Thickness: Sides *5/8"* Back *5/8"* Top *5/8"* Bottom *3/4"*

Pitch of stays to ditto: Sides *Top 6 1/2 x 7 1/2* Back *7 1/2 x 7 1/2* Top *8 x 6 1/2* If stays are fitted with nuts or riveted heads *nuts* Working pressure by rules *211.8*

Material of stays *Steel* Diameter at smallest part *1 1/23* Area supported by each stay  $\left\{ \begin{array}{l} \text{Sides (crown) } 48.12 \\ \text{Back } 52.00 \\ \text{Top } 58.25 \end{array} \right.$  Working pressure by rules  $\left\{ \begin{array}{l} 197.78 \\ 222.21 \\ 205.32 \end{array} \right.$  End plates in steam space:

Material *Steel* Thickness *1"* Pitch of stays *16 x 16* How are stays secured *double nuts & washers* Working pressure by rules *185* Material of stays *Steel*

Diameter at smallest part *2.6* Area supported by each stay *256* Working pressure by rules *185.2* Material of Front plates at bottom *Steel*

Thickness *7/8"* Material of Lower back plate *Steel* Thickness *1 1/16"* Greatest pitch of stays *12"* Working pressure of plate by rules *290*

Diameter of tubes *3 1/2"* Pitch of tubes *4 5/8" & 4 3/4"* Material of tube plates *Steel* Thickness: Front *1"* Back *3/4"* Mean pitch of stays *10 1/16"*

Pitch across wide water spaces *1 1/2 1/2* Working pressures by rules *170.5* Girders to Chamber tops: Material *Steel* Depth and thickness of girder at centre *7 1/4" x 2 1/2"* Length as per rule *2 1/2 5/8* Distance apart *8"* Number and pitch of Stays in each *3 - 6 1/2"*

Working pressure by rules *246.8* 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

Boles 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 *Cochran's patent Cert. mult.*

Made at *Birkenhead* By whom made *Cochran*

When made — Where fixed *on deck over main*

Working pressure *20* tested by hydraulic pressure to *160* No. of Certificate — Fire grate area *10.5* Description of safety valves *Spring loaded*

No. of safety valves *2* Area of each *3.15* Pressure to which they are adjusted *20* If fitted with easing gear *Yes* If steam from main boilers can enter the donkey boiler *No*

Diameter of donkey boiler *4.5 1/2* Length *9.10* Material of shell plates *Iron Steel* Thickness *1/2*

Description of riveting long. seams *Lap, double rivetted* Diameter of rivet holes *13/16* Whether punched or drilled — Pitch of rivets *2 1/2*

Lap of plating *4 1/2* Per centage of strength of joint *70.5* Thickness of shell crown plates *1/2* Radius of do. *9.9* No. of Stays to do. *3*

Dia. of stays. *2 5/8* Diameter of furnace *Spherical Bottom* *3.9* Length of furnace — Thickness of furnace plates *1/2* Description of joint *Lap* Thickness of furnace crown plates *1/2* Stayed by —

Working pressure of furnace by rules — Diameter of uptake — Thickness of uptake plates — Working pressure of shell by rules *140.4* Thickness of water tubes —

SPARE GEAR. State the articles supplied:— *Spare piston packing rings, all pistons; 1 set each top & bottom end braces; 1 pair main bearing boxes; 1 pair crank pin boxes; 1 set thrust dies; 1 length crank shaft; 3 each top and bottom end bolts & nuts; 3 main bearing bolts; 1 1/2 set coupling bolts; 1 propeller and shaft; feed, helge & boiler*

The foregoing is a correct description, *check valves; Safety & relief valve springs; boiler & condenser tubes; bolts, studs & nuts for engines; black*

General Remarks (State quality of workmanship, opinions as to class, &c. *Correspondence: from 4/12/96*

*22/4 and 24/9/97. Mine 13/10/96, 5/11/96, 4/3/97 and 14/8/97.*

*The engines were completely overhauled as already stated and were in every respect equal to new when placed on board the vessel. The boilers had seen little service, were in first class order and were tested to 240 lbs. with water before being placed on board. The safety valves being subsequently set under steam to 160 lbs. agreeably with your letter of 22/4/97.*

*With regard to the donkey boiler I have been unable to trace anything further, but I am assured by the Shewan, Roebuck and Co. Nagasaki Dock people, and am satisfied, that it was the donkey boiler on board the S.S. Hamkiang, when purchased and overhauled by them in 1894-5 (and subsequently lost, the engines and boilers being shortly afterwards recovered). Anyhow, there is no doubt about its being made by Cochran, of Birkenhead, and equal to new, having been very little used. There was no record of test stamped on it, so far as could be seen, but after a very careful examination by the Japanese surveyors, the European Foreman boiler maker at the works and myself, we agreed that it must have been made for at least 20 lbs. working pressure, and was in every way fit for it. It was therefore tested to 160 lbs. in our presence with satisfactory results, and I stamped it. The valves were afterwards set to 20 lbs. under steam.*

Certificate (if required) to be sent to *here*. I recommend that the entry of *+ L.M.C. 7.97* be made in the Register.

The amount of Entry Fee... £ *2 : 0 : 0* When applied for, Special ... £ *250.00* : Donkey Boiler Fee ... £ *25.00* : Travelling Expenses (if any) £ : : When received, ...

Committee's Minute

FRI. 31 DEC 1897

Assigned

*2 May 97  
N 290-2 fitted 97  
+ N 88-10 " 97  
N 57 93 " 97*

LLOYDS TEST  
160 lbs. per sq. in.  
12/6/97 J.E.

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

It is submitted that this vessel is eligible for THE RECORD.

*L.M.C. 7.97  
N.B. 1890-2 fitted 1897  
+ N.B. 1898-10 " 1897  
N.B. 1893 " 1897  
W.P. N.B. = 160 lbs. N.B. 20 lbs.*

*29/12/97*