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pt. 4.

REPORT ON MACHINERY.

Received at London Office JUN 1911

14-6-11 When handed in at Local Office 15. 6. 1911 Port of MIDDLESBROUGH
Survey held at Stockton-on-Tees Date, First Survey 7th Nov. 1910 Last Survey 9th June 1911
Reg. Book. on the Steel Screw Steamer "TENPAISAN MARU" (S.S. No 481) Tons Gross 4985
Master Isuji Built at Sunderland By whom built J. L. Thompson & Sons When built 1911
Machines made at Stockton By whom made Messrs Blair & Co (No 1703) when made 1911
Engines made at Stockton By whom made Messrs Blair & Co Ltd. when made 1911
Registered Horse Power Owners Mitsui Bussan Kaisha Ltd. Port belonging to Mitsui

Horse Power as per Section 28 417 Is Refrigerating Machinery fitted for cargo purposes no Is Electric Light fitted yes
Description of Engines Tri-compound No. of Cylinders 3 No. of Cranks 3
of Cylinders 26-42-70 Length of Stroke 48 Revs. per minute 65 Dia. of Screw shaft as per rule 14.48 Material of screw shaft as fitted 15.74 screw shaft 2 1/2" Steel
The screw shaft fitted with a continuous liner the whole length of the stern tube yes Is the after end of the liner made water tight
The propeller boss yes If the liner is in more than one length are the joints burned one length 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 tight fit If two
are fitted, is the shaft lapped or protected between the liners Length of stern bush 5'-4"

of Tunnel shaft as per rule 12.98 Dia. of Crank shaft journals as per rule 13.63 Dia. of Crank pin 14 3/4 Size of Crank web 28 1/2 x 9 1/2 Dia. of thrust shaft under
as fitted 13 3/4 as fitted 14 1/4
ars 14 3/4 Dia. of screw 17'-6" Pitch of Screw 18'-0" No. of Blades 4 State whether moveable no Total surface 96 sq ft
of Feed pumps 2 Diameter of ditto 3 1/2" Stroke 34" Can one be overhauled while the other is at work yes
of Bilge pumps 2 Diameter of ditto 5" Stroke 34" Can one be overhauled while the other is at work yes
of Donkey Engines 2 Sizes of Pumps Ballast - 11 x 10 2 1/2" Fuel - 4 1/2 x 8 No. and size of Suctions connected to both Bilge and Donkey pumps
Engine Room 3 @ 3 1/2" x one 3 1/2" in dry tank In Holds, &c. 2 @ 3 1/2" in each hold; tunnel
Will one @ 2 1/2"

of Bilge Injections 1 sizes 6 3/4 Connected to condenser or to circulating pump yes Is a separate Donkey Suction fitted in Engine room & size yes - 4"
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 below
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
How are they protected wood ceiling
That pipes are carried through the bunkers Fore holds

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
Dates of examination of completion of fitting of Sea Connections 8-5-11 of Stern Tube 8-5-11 Screw shaft and Propeller 27-5-11
The Screw Shaft Tunnel watertight yes Is it fitted with a watertight door yes worked from top platform
MILERS, &c. (Letter for record (S)) Manufacturers of Steel Messrs John Spencer & Sons Ltd.

Total Heating Surface of Boilers 7114 Is Forced Draft fitted no No. and Description of Boilers 3 single ended
Working Pressure 180 Tested by hydraulic pressure to 260 Date of test 27-4-11 No. of Certificate 4633
Can each boiler be worked separately yes Area of fire grate in each boiler 63 1/2 sq ft No. and Description of Safety Valves to
each boiler 2 direct spring Area of each valve 8.29 Pressure to which they are adjusted 185 Are they fitted with easing gear yes
Smallest distance between boiler or uptakes and bunkers on woodwork 2 ft External Mean dia. of boilers 15'-3" Length 11'-0" Material of shell plates steel
Thickness 1 1/2 Range of tensile strength 28-32 Are the shell plates welded or flanged no Descrip. of riveting: cir. seams 2 Riv lap
Long. seams 2 B-3 Riv Diameter of rivet holes in long. seams 1 1/4 Pitch of rivets 8 1/16 Lap of plates or width of butt straps 18 5/8 x 1 3/8
5 Rivets per pitch rivets 8 1/16 Working pressure of shell by rules 182 Size of manhole in shell 16" x 12"

Percentages of strength of longitudinal joint plate 85.6 No. and Description of Furnaces in each boiler 3 Morrison Material steel Outside diameter 45 3/8
Size of compensating ring 7 1/2 x 1 3/2 Length of plain part top 7 1/2 bottom 7 1/2 Thickness of plates crown 7/16 Description of longitudinal joint welded No. of strengthening rings
Working pressure of furnace by the rules 192 Combustion chamber plates: Material steel Thickness: Sides 1/2 Back 1/2 Top 1/2 Bottom 1/2
Pitch of stays to ditto: Sides 8 1/2 x 10 Back 9 5/8 x 9 1/4 Top 9 x 9 1/2 If stays are fitted with nuts or riveted heads nuts Working pressure by rules 184
Material of stays steel Diameter at smallest part 1.59 Area supported by each stay 89 Working pressure by rules 202 End plates in steam space:
Material steel Thickness 1 3/8 Pitch of stays 18 3/4 x 18 1/2 How are stays secured nuts & washers Working pressure by rules 184 Material of stays steel
Diameter at smallest part 2.79 Area supported by each stay 340 Working pressure by rules 186 Material of Front plates at bottom steel
Thickness 1 1/2 Material of Lower back plate steel Thickness 1" Greatest pitch of stays 14 1/4 x 9 1/4 Working pressure of plate by rules 189
Diameter of tubes 3 1/4 Pitch of tubes 4 1/2 x 4 3/8 Material of tube plates steel Thickness: Front 1 1/2 Back 1 1/2 Mean pitch of stays 10 1/2

Pitch across wide water spaces 14 1/4 Working pressures by rules 188 Girders to Chamber tops: Material steel Depth and
thickness of girder at centre 7 1/2 x 1 5/8 Length as per rule 29 Distance apart 9 Number and pitch of stays in each 2 @ 9 1/2
Working pressure by rules 191 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
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

82
107
101
150
14 16
29 30
4.4.11

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~~VERTICAL~~ DONKEY BOILER—

~~Manufacturers of Steel~~ See Indt Report No 6637

No.	Description		By whom made		When made	Where fixed		
Made at		By whom made		When made	Where fixed			
Working pressure		tested by hydraulic pressure to		Date of test	No. of Certificate	Fire grate area	Description of	
Valves		No. of Safety Valves	Area of each	Pressure to which they are adjusted		Date of adjustment		
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	Plates
Working pressure of shell by rules		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		
Working pressure of furnace by rules		Thickness of furnace crown plates		Radius of do.	Stayed by			
Diameter of uptake		Thickness of uptake plates		Thickness of water tubes	Dates of survey			

SPARE GEAR. State the articles supplied:— Propeller & shaft. 2 each both & nuts for top & bottom ends & main bearing. Set of coupling both true & false. Set of piston rings, valves for all pumps, both sets & iron assorted etc.

The foregoing is a correct description,

Geo Nettleship Manufacturer.

SECRETARY

Dates of Survey while building	{	During progress of work in shops - -	{ 1910 Nov 7, 8, 10, 15, 17, 21, 28, 30, Dec 1, 12, 19, 21, 23, 1911 Jan 4, 7, 10, 11, 16, 20, 23, 25, 30, Feb 1, 2, 3, 6, 8, 10, 13, 15, 17, 20, 21, 22,
		During erection on board vessel - -	{ Mar 1, 2, 3, 6, 8, 9, 12, 14, 15, 16, 17, 20, 22, 24, 27, 28, 29, 31, Apr 3, 4, 5, 7, 11, 26, 29, May 1, 16, 29, 31, June 1, 2, 7, 8, 9, June 16, 30,
		Total No. of visits	Mar - 71. & 3

Is the appended schedule correct?

Is the approved plan of main boiler forwarded herewith yes

Dates of Examination of principal parts—Cylinders ¹⁵⁻²⁻¹¹ 21.3.11 Slides ^{" "} 28.2.11 Covers ^{" "} 20.3.11 Pistons ^{" "} 13.3.11 Rods ^{" "} 27.3.11
Connecting rods 27.3.11 Crank shaft 15.3.11 Thrust shaft 15.2.11 Tunnel shafts ^{11.1.11} 20.1.11 Screw shaft ¹¹ 3.5.11 Propeller 16.5.11
Stern tube 28.3.11 Steam pipes tested 2.6.11 Engine and boiler seatings 8.5.11 Engines holding down bolts 31.5.11
Completion of pumping arrangements 9.6.11 Boilers fixed 9.6.11 Engines tried under steam 9.6.11
Main boiler safety valves adjusted 9.6.11 Thickness of adjusting washers Port Bk center Bk star Bk
Material of Crank shaft *Iry Steel* Identification Mark on Do. 6693 PV $\frac{13}{32}$, SV $\frac{1}{4}$ B; PV $\frac{11}{32}$, SV $\frac{3}{8}$; PV $\frac{1}{2}$ B, S of
Material of Tunnel shafts *Iry Steel* Identification Marks on Do. 7666 N Material of Thrust shaft *Iry Steel* Identification Mark on Do. 7666 N
Material of Steam Pipes *Solid drawn copper* 4½ x 2.5 I.S.G Test pressure 400 lbs ✓

General Remarks (State quality of workmanship, opinions as to class, &c. To complete the survey the following repairs to be done. It is stated that the survey will be completed at Sunderland. The surveyors have been advised: - Donkey boiler to secure in place, mountings to fit and safety valves to adjust. Engine spare gear to examine and crank shaft gauge to adjust: Watertight doors to fit at tunnel & in stokehold: Suction pipes in tunnel and for topside tanks to connect & secure in place, and topside tank valves in machinery space to be made accessible. It is stated that Electric Light will be installed at Sunderland.

The machinery of this vessel has been built under special survey. The materials and workmanship are sound and good and renders the vessel eligible in my opinion to have the notation of \times L.M.C. with a date when the survey has been completed.

The above has now been completed which renders the vessel in our opinion eligible for record of + H.M.C. 7-11

It is submitted that
this vessel is eligible for
THE RECORD, + **LMC 7. 11.**

N.H.P. = 417		
The amount of Entry Fee	.. £ 3 - 0 - 0	When applied for, .. 19...
Special £ 40 - 17 - 0	.. 19...
Donkey Boiler Fee ✓ :	When received, .. 19...
Travelling Expenses (if any) ✓ :	157 .. 19...

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

Committee's Minute

TUE JUL 18 1911

Assigned

+ Lm 6. 7 11



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