

# REPORT ON MACHINERY.

No. 4095

No. in Survey held at  
Reg. Book.

Dumbarton

Date, first Survey

Dec. 1884

Last Survey

Sept. 5 1885

(Number of Visits 33)

Tons 1248.4

on the Screw Steamer "Mararoa"

Master J. J. Oddie

Built at Dumbarton

By whom built J. & D. Denny Brothers

When built 1885

Engines made at Dumbarton

By whom made

Denny & Co.

when made 1885

Boilers made at

By whom made

"

"

"

when made 1885

Registered Horse Power 530

Owners Union S. S. Co. of New Zealand Port belonging to

Dunedin

## ENGINES, &c.

Description of Engines

Simple Expansive Direct Acting

Diameter of Cylinders 31" 31" 31" Length of Stroke 34" No. of Rev. per minute 80 Point of Cut off, High Pressure .75 Low Pressure .7

Diameter of Screw shaft 14 3/4" Diam. of Tunnel shaft 13 3/4" Diam. of Crank shaft journals 15 1/2" Diam. of Crank pin 15 1/2" size of Crank web built 21" x 11"

All the shafts turned & finished at Consumers Works

Diameter of screw 13" 6" Pitch of screw 22 1/2" No. of blades 4 state whether moveable Yes total surface 65 ft<sup>2</sup>

No. of Feed pumps 2 diameter of ditto 4 1/4" Stroke 34" Can one be overhauled while the other is at work Yes

No. of Bilge pumps 2 diameter of ditto 4 1/4" Stroke 34" Can one be overhauled while the other is at work Yes

Where do they pump from All Compartments

No. of Donkey Engines Three Size of Pumps double 1/2" 2-5" x 10" Stroke 10" Where do they pump from Hotwell

9 3/4" x 4 3/4" Cyls 8" x 18" Stroke 10" Feedwater

Are all the bilge suction pipes fitted with roses Yes Are the roses always accessible Yes Are the sluices on Engine room bulkheads always accessible Yes

No. of bilge injections One and sizes 8" Are they connected to condenser, or to circulating pump Circulating

How are the pumps worked By Levers

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 Above & 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

What pipes are carried through the bunkers Pipes to Storeholds How are they protected By strong wood casing

Are all pipes, cocks, valves, and pumps in connection with the machinery accessible at all times Yes

Are the pipes, cocks, and valves arranged so as to prevent an unintentional connection between the sea and the bilges Yes

When were stern tube, propeller, screw shaft, and all connections examined in dry dock On Ship previous to launching

Is the screw shaft tunnel watertight Yes and fitted with a sluice door Yes worked from Upper platform

## BOILERS, &c.

Number of Boilers

Two double ended +

Whether Steel or Iron Steel

Working Pressure 160 lbs

Tested by hydraulic pressure to 320 lbs

Date of test 26 June 1883 - 2 - single ended

Description of superheating apparatus or steam chest Round Longitudinal

Can each boiler be worked separately Yes Can the superheater be shut off and the boiler worked separately Yes

No. of square feet of fire grate surface in each boiler 96 ft in large boiler 48 ft in small boiler Description of safety valves Direct Spring No. to each boiler 200 " 2 small

Area of each valve 4" Are they fitted with easing gear Yes No. of safety valves to superheater 2 area of each valve 13 1/2" 13 1/2"

Are they fitted with easing gear Yes Smallest distance between boilers and bunkers or woodwork 12" to 15" Diameter of boilers 13 1/2" 13 1/2"

Length of boilers 41' 6" description of riveting of shell long. seams double riveted circum. seams Double riveted Thickness of shell plates 1 1/2"

Diameter of rivet holes 1 1/4" whether punched or drilled Drilled pitch of rivets 6 1/2" + 3" Lap of plating Straps

Percentage of strength of longitudinal joint 80% working pressure of shell by rules 164 lbs size of manholes in shell 17 1/2" x 13"

Size of compensating rings Doubling plates No. of Furnaces in each boiler Four and Two

Outside diameter 4' 2 1/2" length, top 6' 6" bottom 6' 6" thickness of plates 1 1/16" description of joint Corrugated if rings are fitted Yes

Greatest length between rings 1' working pressure of furnace by the rules 160 lbs combustion chamber plating, thickness, sides 7/16" back 7/16" top 7/16"

Pitch of stays to ditto, sides 6 1/8" x 8" back 7" x 8" top 6 1/8" x 8" If stays are fitted with nuts or riveted heads Nuts working pressure of plating by rules 165 lbs

Diameter of stays at smallest part 1 1/16" working pressure of ditto by rules 180 lbs and plates in steam space, thickness 1 1/16"

Pitch of stays to ditto 16" x 15" + 16" x 12" how stays are secured riveted washers working pressure by rules 180 lbs diameter of stays at smallest part 2 3/4" + 2 3/8" Steel working pressure by rules 191 lbs

Greatest pitch of stays 16" x 8" working pressure by rules 160 lbs Diameter of tubes 3 1/2" pitch of tubes 4 3/4" x 4 3/4" thickness of tube plates, front 1 1/16" back 1 1/16"

how stayed by tube pitch of stays 9 1/2" x 13 1/4" width of water spaces 4 1/2"

Diameter of Superheater Steam chest 3' 0 1/2" length 6' 9 1/2" thickness of plates 7/16" description of longitudinal joint Double Straps diam. of rivet holes 1 1/8"

Pitch of rivets 3" working pressure of shell by rules 240 lbs diameter of flue 1 1/2" thickness of plates 1 1/16" If stiffened with rings Yes

Distance between rings 1' working pressure by rules 160 lbs end plates of superheater or steam chest; thickness 1 1/16" how stayed Riveted

chest; how connected to boiler By four neck 18" dia x 1/8" thick



**DONKEY BOILER—**

Description *Horizontal Longitudinal*

Made at *Lumbarton* by whom made *Denny & Co* when made *1885* where fixed *On Upper Deck*  
 Working pressure *160 lbs* tested by hydraulic pressure to *320 lbs* No. of Certificate *1554* fire grate area *162 sq ft* description of safety  
 valves *Direct Spring* No. of safety valves *One* area of each *4"* if fitted with easing gear *Yes* if steam from main boilers can  
 enter the donkey boiler *No* diameter of donkey boiler *8 ft* length *8 ft 3 in* description of riveting *Double butt straps*  
 Thickness of shell plates *3/16"* diameter of rivet holes *1 1/8"* whether punched or drilled *Drilled* pitch of rivets *4 1/2 x 2 1/2* lay of plating *13 1/2 x 11 1/2*  
 per centage of strength of joint *75%* thickness of *End* plates *1 1/16"* stayed by *2 1/2" Stays* *14" x 14" pitch*  
 Diameter of furnace, top *5' 3"* bottom *4'* length of furnace *5' 9 1/2"* thickness of plates *9/16"* description of joint *Corrugated*  
 Thickness of *Combustion Chamber* plates *9/16"* stayed by *Screw Stays* *4 1/2" x 7" x 7 1/4" x 4 1/4"* working pressure of shell by rules *165 lbs*  
 Working pressure of furnace by rules *17 1/4 lbs* diameter of uptake *4'* thickness of *Side* plates *13/16"* thickness of water tubes *1 1/16"*

**SPARE GEAR.** State the articles supplied: *Five Connecting rod top & bottom end bolts & nuts, one Crank pin, one*  
*has main bearing bolts & nuts, 3 valve spindles & complete set of bushes for one engine, one valve*  
*rod bolts, set of packing rings for piston valves, set of packing rings for each piston two feed & two*  
*large pump valve & seats, four steel propeller blades & 12 studs & nuts, one Crank shaft also one propeller*  
 The foregoing is a correct description, *Shaft & the coupling bolts & springs for safety valves*  
*Denny & Co.* Manufacturer. *large assortment of bolts, nuts, studs, iron &c*

**General Remarks** (State quality of workmanship, opinions as to class, &c. *These Engines & Boilers are*  
*the best materials & workmanship and are now in good order*  
*& safe working condition and eligible in my opinion to be noted*  
*in the Register Book* Lloyd's M.C 9/85

*Appended hereto are the reports on Steel Lark also the approved*  
*drawings of main boilers.*

*This submitted that this*  
*vessel is eligible to have*  
*the notification & L.M.C*  
*9/85 recorded.*

The amount of Entry Fee *£ 3* received by me, *(initials)*  
 Special *£ 46: 10*  
 Donkey Boiler Fee *£*  
 Certificate (if required) *£* *4/9/1885*  
 (To be sent as per margin.)  
 (Travelling Expenses, if any, £ )  
 Committee's Minute *TUESDAY 8 SEPT 1885*

*James Hollison*  
 Engineer Surveyor to Lloyd's Register of British & Foreign Ships  
*Glyde District*