

## REPORT ON MACHINERY.

Mdb. Rpt. No.  
No. 21487Port of *Sunderland*

14th. 8 OCT 1903

Received at London Office

19

No. in Survey held at

*Sunderland*

Date, first Survey

*27 April 03*

Last Survey

*September 29 1903*

Reg. Book.

*118*

on the

*Steel S.S. "Zambezia"*(Number of Visits *30*)

(C 1503)

Gross *1173.74*Net *734.48*When built *1903*Master *C. J. de Faria*Built at *Middlesbro*

By whom built

*Sir R. Dixon & Co (501)*

Engines made at

*Sunderland*

By whom made

*No. Eastern Mar. Eng. Co. Ld.*

when made

*1903*

Boilers made at

*Sunderland*

By whom made

*- Ditto -*

when made

*1903*

Registered Horse Power

Owners

*Empresa Nacional &c.*

Port belonging to

*Lisbon*

Nom. Horse Power as per Section 28

*133*

Is Refrigerating Machinery fitted

*no*

Is Electric Light fitted

*yes*

## ENGINES, &amp;c.—Description of Engines

*Tri Compound*

No. of Cylinders

*3*

No. of Cranks

*3*Dia. of Cylinders *17" 27" 45"*

Length of Stroke

*33"*

Revs. per minute

*91*

Dia. of Screw shaft

*as per rule 9"*

Material of

*Wrot. Iron*

Is 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

in the propeller boss

*Yes*

If the liner is in more than one length are the joints burned

*✓*

If 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

*✓*

If two

liners are fitted, is the shaft lapped or protected between the liners

*✓*

Length of stern bush

*3' 4"*

Dia. of Tunnel shaft

*as per rule 8.59"**as fitted 8.59"*

Dia. of Crank shaft journals

*as per rule 9"**as fitted 9"*

Dia. of Crank pin

*9*

Size of Crank webs

*13 1/2" x 5 1/2"*

Dia. of thrust shaft under

collars

*9*

Dia. of screw

*11-3"*

Pitch of screw

*13-0"*

No. of blades

*4*

State whether moveable

*no*

Total surface

*38 sq ft*

No. of Feed pumps

*2*

Diameter of ditto

*2 1/4"*

Stroke

*1'-6"*

Can one be overhauled while the other is at work

*Yes*

No. of Bilge pumps

*2*

Diameter of ditto

*3"*

Stroke

*1'-6"*

Can one be overhauled while the other is at work

*Yes*

No. of Donkey Engines

*2*

Sizes of Pumps

*6" 7" 9" 5" 3" 4 1/2"*

No. and size of Suctions connected to both Bilge and Donkey pumps

*2 of 2" in fore hold; 2 in aft. hold**2"*

In Engine Room

*1 of 3" & 2 of 2"*

In Holds, &amp;c.

*2 of 2" in fore hold; 2 in aft. hold**2"*

No. of bilge injections

*1*

sizes

*3 1/2"*

Connected to condenser, or to circulating pump

*Yes*

Is a separate donkey suction fitted in Engine room &amp; size

*Yes-2"*

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

*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*

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

*none*

How are they protected

*✓*

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

*New ship*

Is the screw shaft tunnel watertight

*Yes*

Is it fitted with a watertight door

*Yes*

worked from

*main decks*

## BOILERS, &amp;c.—

(Letter for record *S*)

Total Heating Surface of Boilers

*216.5*

Is forced draft fitted

*no*

No. and Description of Boilers

*1 Cylindrical Multitubular*

Working Pressure

*180*

Tested by hydraulic pressure to

*360*

Date of test

*8/7/03*

Can each boiler be worked separately

*✓*

Area of fire grate in each boiler

*62.5*

No. and Description of safety valves to

each boiler

*2 spring direct loaded*

Area of each valve

*2.0684*

Pressure to which they are adjusted

*180*

Are they fitted with easing gear

*Yes*

Smallest distance between boilers or uptakes and bunkers or woodwork

*13 1/2"*

Mean dia. of boilers

*15'-1 1/2"*

Length

*10'-6"*

Material of shell plates

*Stl*

Thickness

*1 1/2"*

Range of tensile strength

*29-32*

Are they welded or flanged

*✓*

Descrip. of riveting: cir. seams

*Dr. lap*

long. seams

*2 x d. 6*

Diameter of rivet holes in long. seams

*1 1/8"*

Pitch of rivets

*9*

Lap of plates or width of butt straps

*1'-7 1/8"*

Per centages of strength of longitudinal joint

*91.31*

Working pressure of shell by rules

*203.8*

Size of manhole in shell

*1.4' x 1'-0"*

Size of compensating ring

*flanged*

No. and Description of Furnaces in each boiler

*3 Deighton's*

Material

*Stl*

Outside diameter

*3'-11 1/2"*

Length of plain part

*top 1'**bottom 1'*

Thickness of plates

*9 1/2"*

Description of longitudinal joint

*✓*

No. of strengthening rings

*✓*

Working pressure of furnace by the rules

*198.77*

Combustion chamber plates: Material

*Stl*

Thickness: Sides

*1 1/16"*

Back

*3 1/32"*

Top

*1 1/16"*

Bottom

*1 1/8"*

Pitch of stays to ditto: Sides

*9 1/2" x 9"*

Back

*9 1/2" x 9"*

Top

*9 1/2" x 9"*

If stays are fitted with nuts or riveted heads

*nuts*

Working pressure by rules

*190.7*

Material of stays

*Stl*

Diameter at smallest part

*1.79*

Area supported by each stay

*89*

Working pressure by rules

*180.9*

End plates in steam space:

Material

*Stl*

Thickness

*1 1/2"*

Pitch of stays

*20 1/2" x 18 1/4"*

How are stays secured

*dbl. nuts washers*

Working pressure by rules

*242*

Material of stays

*Stl*

Diameter at smallest part

*8.48*

Area supported by each stay

*384.75*

Working pressure by rules

*221*

Material of Front plates at bottom

*Stl*

Thickness

*2 1/2"*

Material of Lower back plate

*Stl*

Thickness

*2 1/2"*

Greatest pitch of stays

*14 1/4" x 9 5/8"*

Working pressure of plate by rules

*183*

Diameter of tubes

*3 1/4"*

Pitch of tubes

*4 1/2" x 4 1/2"*

Material of tube plates

*Stl*

Thickness: Front

*2 1/32"*

Back

*2 1/32"*

Mean pitch of stays

*9' x 9"*

Pitch across wide water spaces

*14 1/2" x 9"*

Working pressures by rules

*266*

Girders to Chamber tops: Material

*Stl*

Depth and

*2 of 9"*

Thickness of girder at centre

*8 1/2" x 2"*

Length as per rule

*30*

Distance apart

*9"*

Number and pitch of Stays in each

*2 of 9"*



**DONKEY BOILER—** No. *One* Description *Cyl. mult<sup>e</sup> 2 plain furnaces. dry back.*  
 Made at *Stockton* By whom made *J. Sudron & Co. Ltd* When made *4.8.03* Where fixed *on deck.*  
 Working pressure *90 lbs* tested by hydraulic pressure to *180 lbs* No. of Certificate *3045* Fire grate area Description of safety valves *direct spring*  
 No. of safety valves *2* Area of each *3.14* Pressure to which they are adjusted *90 lbs* If fitted with easing gear *yes* If steam from main boilers can enter the donkey boiler *no* Dia. of donkey boiler *8'-0"* Length *6'-0"* Material of shell plates *Steel* Thickness *1/2"* Range of tensile strength *27/32* Descrip. of riveting long. seams *Free riv lap* Dia. of rivet holes *13/16"* Whether punched or drilled *drilled* Pitch of rivets *3 1/2"*  
 Lap of plating *6"* Per centage of strength of joint Rivets *80.2* Thickness of shell crown plates *4/16"* Radius of do. Pitch No. of Stays to do. *16 x 12 1/2*  
 Dia. of stays. *2 1/2"* Diameter of furnace Top *2'-4"* Bottom *✓* Length of furnace *6'-0"* Thickness of furnace plates *1/16"* Description of joint *welded* Thickness of furnace crown plates *✓* Stayed by *✓* Working pressure of shell by rules *92.3*  
 Working pressure of furnace by rules *102 lbs* Diameter of uptake *tubes 3"* Thickness of uptake plates *4/16"* Thickness of stay tubes *5/16"*

**SPARE GEAR.** State the articles supplied:— *2 top end & 2 bot. end bolts & nuts; 2 main bearing*  
*1 set of coupling bolts & nuts; 2 feed pump & 2 bilge pump valves & seats;*  
*1/2 cwt. iron plate; 1/2 cwt. iron bars; 100 assorted bolts & nuts; 1 spare 1/3 crank shft.*  
*1 spare tail shaft; 1 set packg. rings for each cyl; 2 valve spindles; 1 air pump head valve seat*  
*1 guard; 1 eccentric strap liner; 1 spare propeller; 8*  
 The foregoing is a correct description, *other usual spare gear.*

Manufacturer. *W. & A. Smith & Co. Ltd*  
 Dates of Survey: During progress of work in shops— *1903 April 27 May 1 14 June 4 16 17 26 July 6 8 18 28*  
 while board vessel— *August 20 21 25 Mtd. 1903 July 13 24 28 Aug 13 28 Sept 1 4 8 12 15 18 23 25 26 29*  
 building Total No. of visits *30* Is the approved plan of main boiler forwarded herewith *Yes*  
 " " " donkey " " " *Yes*

**General Remarks** (State quality of workmanship, opinions as to class, &c. *The machinery of this vessel*  
*has been built under Special Survey. The material & workmanship*  
*sound and good. Boilers & steam pipes tested by hydraulic pressure to*  
*double the working pressure. The Engines worked well. The safety*  
*valves of the main boiler adjusted as above.*  
*The vessel is eligible in my opinion to have the notation*  
*in the Register Book of + L.M.C. 9,03*

*The electric light report will be forwarded as soon as received back from the shipbuilders.*

It is submitted that this vessel is eligible for THE RECORD. + L.M.C 9.03. ELECTRIC

*B. H.*  
*8.10.03*

*H. S.*  
*8.10.03*

The amount of Entry Fee. . . £ *2* : : : When applied for, *12.9.1903*  
 Special . . . . . £ *19* : *19* : : : When received, *14.9.1903*  
 Donkey Boiler Fee . . . . . £ : : :  
 Travelling Expenses (if any) £ : : : *at 8/6*

Committee's Minute

FRI. 9 OCT 1903

Assigned

+ L.M.C 9.03

MACHINERY CERTIFICATE

*Pat. Salmon R.D. Shilston*  
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.



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