

## REPORT ON MACHINERY.

Port of *Belfast*Received at London Office **THURS. 22 SEP. 1892**No. in Survey held at *Belfast*  
Reg. Book.Date, first Survey *Oct 24<sup>th</sup> 1891* Last Survey *Sept 14<sup>th</sup> 1892*(Number of Visits *50*)on the *Steel screw steamer "Southern Cross"*Tons  $\left\{ \begin{array}{l} \text{Gross } 5049 \\ \text{Net } 3311 \end{array} \right.$ Master *A. Child* Built at *Belfast* By whom built *Workman Clark & Co. Ltd.* When built *1892*Engines made at *Belfast* By whom made *Workman Clark & Co. Ltd.* when made *1892*Boilers made at *Belfast* By whom made *Workman Clark & Co. Ltd.* when made *1892*Registered Horse Power *600* Owners *Wincott Cooper & Co.* Port belonging to *London*Nom. Horse Power as per Section 28 *504*

**ENGINES, &c.—** Description of Engines *Triple expansive* No. of Cylinders *Three*  
 Diameter of Cylinders *29 : 46 : 75* Length of Stroke *54* Revolutions per minute *68* Diameter of Screw shaft *as per rule 14.12*  
 Diameter of Tunnel shaft *as per rule 13.42* Diameter of Crank shaft journals *15"* Diameter of Crank pin *15"* Size of Crank webs *10 1/4 x 21 shaped*  
 Diameter of screw *19' 3"* Pitch of screw *19' 0"* No. of blades *4* State whether moveable *No* Total surface *85.6 projected 96.2 actual*  
 No. of Feed pumps *2* Diameter of ditto *5 1/4* Stroke *27"* Can one be overhauled while the other is at work *yes*  
 No. of Bilge pumps *2* Diameter of ditto *6 1/4* Stroke *27"* Can one be overhauled while the other is at work *yes*  
 No. of Donkey Engines *Two 12 Centr. Sizes of Pumps (Pearce duplex 4 x 6 x 6)* No. and size of Suctions connected to both Bilge and Donkey pumps  
 In Engine Room *one centre 3 1/2" & two wing 3" (Two 10" pumps for circulating & one for bilge)* No. 1 (foremost) hold, one 3"  
 No 2 hold, two 3" No 3 hold, two 3" No 4 hold, two 3" No 5 hold well 3" & tunnel well 3"  
 No. of bilge injections *one sizes 7"* Connected to condenser, or to circulating pump *at main Is a separate donkey suction fitted in Engine room & size yes 3 1/2"*  
 Are all the bilge suction pipes fitted with roses *except bilge injection* 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 *valves & cocks*  
 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*  
 What pipes are carried through the bunkers *bilge suction pipes* How are they protected *wood casing*  
 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 *21.7.92 before launching* Is the screw shaft tunnel watertight *yes*  
 Is it fitted with a watertight door *yes* worked from *upper deck*

**BOILERS, &c.—** (Letter for record *S*) Total Heating Surface of Boilers *8936.5*  
 No. and Description of Boilers *Three double ended* Working Pressure *170* Tested by hydraulic pressure to *340*  
 Date of test *10.8.92* Can each boiler be worked separately *yes* Area of fire grate in each boiler *96* No. and Description of safety valves to  
 each boiler *Two Cockburn's* Area of each valve *9.62* Pressure to which they are adjusted *175 lbs* Are they fitted  
 with easing gear *yes* Smallest distance between boilers or uptakes and bunkers or woodwork *15"* Mean diameter of boilers *13' 6"*  
 Length *17' 0"* Material of shell plates *Steel* Thickness *1 1/4"* Description of riveting: circum. seams *ends doub riv* long. seams *doubt straps*  
 Diameter of rivet holes in long. seams *1 1/4"* Pitch of rivets *8' 1/4 9 4' 1/8* Lap of plates or width of butt straps *18' 1/8 x 1" thick*  
 Per centages of strength of longitudinal joint *88.8* Working pressure of shell by rules *188* Size of manhole in shell *12 x 16*  
 Size of compensating ring *24 x 28 x 1"* No. and Description of Furnaces in each boiler *Four ribbed* Material *Steel* Outside diameter *49 3/16*  
 Length of plain part *top 19 bottom 32* Description of longitudinal joint *welded* No. of strengthening rings *8 ribs*  
 Working pressure of furnace by the rules *176* Combustion chamber plates: Material *Steel* Thickness: Sides *9/16* Back *7/16* Top *9/16* Bottom *11/16*  
 Pitch of stays to ditto: Sides *7 5/8* Back *7 5/8* Top *7 5/8* If stays are fitted with nuts or riveted heads *nuts* Working pressure by rules *188*  
 Material of stays *Steel* Diameter at smallest part *1 3/8* Area supported by each stay *58.2* Working pressure by rules *203* End plates in steam space:  
 Material *Steel* Thickness *7/8* Pitch of stays *15 3/4* How are stays secured *doubt. nuts & doubling straps 10 1/2 x 7/8* Working pressure by rules *173* Material of stays *Steel*  
 Diameter at smallest part *2 1/2* Area supported by each stay *248* Working pressure by rules *182* Material of Front plates at bottom *Steel*  
 Thickness *3/4* Material of Lower back plate *Steel* Thickness *1 1/4* Greatest pitch of stays *as approx* Working pressure of plate by rules *170*  
 Diameter of tubes *3 1/2* Pitch of tubes *4 3/4* Material of tube plates *Steel* Thickness: Front *15/16* Back *1 1/16* Mean pitch of stays *9 1/2*  
 Pitch across wide water spaces *15 1/2* Working pressures by rules *170 +* Girders to Chamber tops: Material *Steel* Depth and  
 thickness of girder at centre *10 1/2 x 3 3/4 (x 2)* Length as per rule *39 7/8* Distance apart *7 5/8* Number and pitch of Stays in each *four at 7 5/8*  
 Working pressure by rules *170* Superheater or Steam chest; how connected to boiler *Can the superheater be shut off and the boiler worked*  
 separately *no* Diameter *no* Length *no* Thickness of shell plates *no* Material *no* Description of longitudinal joint *no* Diam. of rivet  
 holes *no* Pitch of rivets *no* Working pressure of shell by rules *no* Diameter of flue *no* Material of flue plates *no* Thickness *no*  
 If stiffened with rings *no* Distance between rings *no* Working pressure by rules *no* End plates: Thickness *no* How stayed *no*  
 Working pressure of end plates *no* Area of safety valves to superheater *no* Are they fitted with easing gear *no*



DONKEY BOILER— Description No donkey boiler

Made at By whom made When made Where fixed  
 Working pressure tested by hydraulic pressure to No. of Certificate Fire grate area Description of safety valves  
 No. of safety valves Area of each Pressure to which they are adjusted If fitted with easing gear If steam from main boilers can enter the donkey boiler  
 Diameter of donkey boiler Length Material of shell plates Thickness  
 Description of riveting long seams Diameter of rivet holes Whether punched or drilled Pitch of rivets  
 Lap of plating Per centage of strength of joint Rivets 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  
 Thickness of furnace crown plates Stayed by Working pressure of shell by rules  
 Working pressure of furnace by rules Diameter of uptake Thickness of uptake plates Thickness of water tubes

SPARE GEAR. State the articles supplied:— Interchangeable length of crank shaft. Propeller. Set escape valves & springs. Set coupling bolts & nuts: 2 top end & 2 bot. end con. rod bolts: 2 main bearing bolts: Spare holding down—punch ring & cylinder cover bolts: Set packing rings & springs for each cyl: Air pump bucket, rod, guards & head valve & seat: 50 condenser tubes: The foregoing is a correct description, 12 boiler tubes. Belge & feed pump valves: safety valve & springs  
 Chas. D. Allaw DIRECTOR. Manufacturer. Fine bars. Assorted iron & bolt & nuts. White metal.

General Remarks (State quality of workmanship, opinions as to class, &c.)

The Engines & boilers have been made & fitted on board under special survey & the workmanship throughout is good.

The boilers are made in accordance with the approved drawing & have been tested to double the working pressure.

The engines were worked under full steam for several hours in the Belfast Lough with good results. The safety valves are adjusted to blow off at 175 lbs per sq in.

The vessel is fitted with an electric light installation by Messrs J. M. Holmes & Co. A report of the particulars will be forwarded shortly.

In my opinion the machinery renders the vessel eligible for the record of + LMC 9.92 in the Register Book.

The plan of boilers, & three plans showing the pumping arrangements are returned herewith.

It is submitted that this vessel is eligible for THE RECORD. + LMC 9.92

W. A.  
22-9-92

Certificate (if required) to be sent to

The amount of Entry Fee. £ 3 : 0 : 0 When applied for.  
 Special . . . . . £ 45 : 4 : 0 17<sup>th</sup> Sep 18.92  
 Donkey Boiler Fee . . . . . £ : : : When received.  
 Travelling Expenses (if any) £ : 8 : 6 21<sup>st</sup> Sep 18.92

Committee's Minute

FPI 23 SEP 1892

Assigned

+ LMC 9.92

A. L. Jones

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



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