

No. 916

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THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

Report No. 877 No. in Register Book 1432.

S.S. "Sanda"

Makers of Engines Caledon S & E. Co.

Works No. 422

Makers of Main Boilers Caledon S & E. Co.

Works No. 422

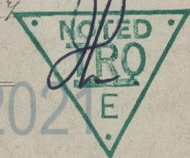
Makers of Donkey Boiler Cochran & Co. Annan Ltd.

Works No. 5454

MACHINERY.



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Foundation

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No.

THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

Report No. _____ No. in Register Book _____

Received at Head Office

28th Dec 1911

Surveyor's Report on the New Engines, Boilers, and Auxiliary
Machinery of the *s. s. "Sanda"*

Port of Registry

Glasgow

Registered Owners

Clyde Shipping Co Ltd

Surveyor's District

Dundee

Date of Completion of Engines

Nov 1911

" "

Main Boilers

Nov 1911

" "

Donkey "

Nov 1911

Trial Run at

Auchmithie

Date

15/11/11

First Visit

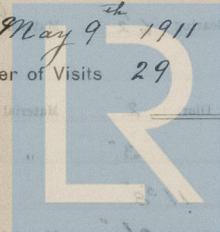
May 9th 1911

Last Visit

9/11/11

Total Number of Visits

29



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ENGINES.

Made by *Caledon S & E. Co.*
 " at *Dundee* Works No. *422*
 Description *Triple Inverted Surface Condensing*
 No. of Cylinders, each Engine *3* Diars. *20.33" x 53"* Stroke *39"*
 Cub. feet in each L.P. Cylr. *49.49* Revols. per Min. *94* I.H.P. *1384*
 Pressure in I.P. Receiver at full Power *68 lbs* 2nd I.P. L.P. *12 lbs*
 Thickness of Metal in H. P. Cylr. *1 1/8"* I.P. *1 1/8"* " *1 1/4"*
 " " " " Liner *1 1/4"* " " " " " " " " " " Valve Chest *1 1/8"* " *1 1/8"* " *1 1/8"*
 Are Spring-loaded Relief Valves fitted to Top and Bottom of each Cylr. *Yes*
 " " " each Receiver? *Yes*
 Number of ^{Bolts} Studs in H.P. Cylr. Cover *20* I.P. *20* 2nd I.P. L.P. *23*
 Eff. Diar. " " " *1.064* " *1.064* " " *1.064*
 Pitch " " " *4 3/4"* " *6 1/2"* " *8 1/2"*
 Type of H.P. Valves (Piston or Slide) *Piston* " *Slide* " *Slide*
 " Valve Gear *Ordinary Link Motion*
 Diameter of Piston Rods (plain part) *5 1/2"* At Bottom of Thread *4"*
 Makers " *D. Colville & Son Motherwell* Material *Steel*
 Diameter of Connecting Rods (smallest part) *5 3/8"* Material *Steel*
 Makers " *W. Beardmore & Co. Glasgow*
 Diar. of Crosshead Gudgeons *5 1/2"* Length of Bearing *6 1/2"* Material *Steel*
 No. of Top End Bolts (each Rod) *4* Effective Diar. *2"* Material *cast Iron*
 " Bot. " " *2* " *3"* " *cast Iron*
 " Main Bearings *6* Lengths *11 5/8"*
 " Bolts in each *2* Effective Diar. *2 1/4"* Material *Steel*

No. of Holding Down Bolts, each Engine *92* No. of Metal Chocks *92*
 Eff. Diar. " " " *1.064* Average Pitch *18" x 10"*
 Are the Engines bolted directly to the Tank Top? *Yes*
 Are the Bolts tapped through the Tank Top and fitted with Nuts inside? *Yes*
 Date of Test of Tank by Water Pressure with Holding Down Bolts in place *14/11/11*

SKETCHES.



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SKETCHES.

SHAFTING.

Are Crank Shafts Built? *Yes* No. of Lengths in each *1* Angle of Cranks *120°*

Diar. of Crank Shafts by Rule Actual *10 $\frac{3}{4}$ "* Diar. in Way of Webs *10 $\frac{3}{8}$ "*

Makers of " *W. Beardmore & Co Glasgow* Material *Steel*

Diar. of Crank Pins *10 $\frac{3}{4}$ " x 1-0 $\frac{3}{8}$ " long* Diar. in Way of Web *10 $\frac{3}{8}$ "*

Makers of " *W. Beardmore & Co Glasgow* Material *Steel*

Width across Crank Webs at Centre of Shaft *1' 4 $\frac{1}{2}$ "* Thickness *4"*

" " " " Crank Pins *1' 4 $\frac{1}{2}$ "* " *4"*

" " " " Narrowest part *1' 4 $\frac{1}{2}$ "* " *4"*

Makers of Crank Webs *W. Beardmore & Co Glasgow* Material *Steel*

Diar. or Breadth of Keys in Crank Webs *1 $\frac{3}{4}$ " dia* Length *5"*

" of Dowel Pins in Crank Pins *1"* Length *4"* Screwed or Plain *screwed*

No. of Bolts in each Coupling *6* Diar. at Mid Length *2 $\frac{1}{2}$ "* Diar. of Pitch Circle *1' 4 $\frac{3}{4}$ "*

Material of Coupling Bolts *Steel*

Crank Shafts Finished by *Caledon S & E Co.*

Greatest Distance from edge of Main Bearing to Crank Web *3 $\frac{1}{2}$ "*

Description of Thrust Blocks *Horse Shoe Pattern*

Number " " Rings *5"*

Diar. of Thrust Shafts by Rule Actual (at bot. of Collars) *10 $\frac{3}{4}$ "* Over Collars *1' 8 $\frac{3}{4}$ "*

" " at Forward Coupling *10 $\frac{3}{4}$ "* After Coupling *10 $\frac{3}{4}$ "*

No. of Thrust Collars *5* Thickness *2"* Distance apart *4 $\frac{3}{4}$ "*

Thrust Shafts Forged by *W. Beardmore & Co Glasgow* Material *Steel*

" Finished by *Caledon S & E Co*

Diar. of Intermediate Shafting by Rule Actual *10 $\frac{1}{4}$ "*

No. of Lengths, each Engine *3* No. of Tunnel Bearings *4*

Diar. of Bearings *10' 2"* Length *14"* Distance apart *12' to 15'*

No. of Bolts, each Coupling 4 Diar. at Mid Length 2'-2" Diar. of Pitch Circle 1'-4 3/4"

Intermediate Shafts Forged by *W. Beardmore & Co Glasgow* Material *Steel*

Finished by *Caledon S & E Co.*

Diar. of Propeller Shafts by Rule Actual 11 1/2" At Couplings 11 5/8" Full

Are Propeller Shafts fitted with Continuous Brass Liners? *Yes*

Diar. over Liners *Forward bearing 13" dia* Length of After Bearings 4'-2 1/4"

Of what Material are the After Bearings composed? *Brass Bush with lignum vitae*

Distance from After Bearing in Stern Tube to nearest Tunnel Bearing 13'-6" to centre of tunnel bearing

Are the After Bearings lubricated with Oil or Sea Water? *Sea*

What means are adopted to prevent Sea Water entering the Stern Tubes? *None*

Propeller Shafts Forged by *Messrs Jas Carmichael & Co Ltd* Material *Bar Iron*

Finished by *Caledon S & E Co.*

No. of Propellers 1 Diar. 13'-6" Pitch 14'-6"

Blades, each Propeller 4 Fitted or Solid *Solid*

Material of Blades *Bull's Metal* Boss ☒

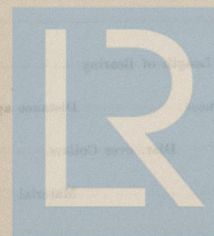
Surface, each Propeller *54.8* *g* Diar. of Propeller Rule Diar. of Crank Shaft = 15.4

Coefficient of Displacement of Vessel at 1/2 Moulded Depth .64

SKETCHES

All shafting marked thus

B.C. TEST
No 422
J.F.
18-9-11



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TURBINE ENGINES.

Type

No. of H.P. Turbines

No. of L.P. Turbines

No. of Astern „

How arranged

Revs. per Min.

Horse Power

Diar. of H.P. Turbine Drums

MATERIAL

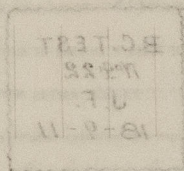
THICKNESS OF METAL

Material of H.P. Turbine Casings

Lengths of Blades in H.P. Turbines

No. of Rows of Blades of each Length

Pitch of „ „ „



Diar. of L.P. Turbine Drums

MATERIAL

THICKNESS OF METAL

Material of L.P. Turbine Casings

Lengths of Blades in L.P. Turbines

No. of Rows of Blades of each Length

Pitch of „ „ „

Diar. of Astern Turbine Drums

MATERIAL

THICKNESS OF METAL

Material of Astern Turbine Casings

Lengths of Blades in Astern Turbines

No. of Rows of Blades of each Length

Pitch of „ „ „

Diar. of Turbine Spindles

Length of Bearing

No. of Thrust Collars on each Spindle

Thickness

Distance apart

Diar. of Spindles at Bottom of Collars

Diar. over Collars

Spindles Forged by

Material

„ Finished by

SKETCHES.



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PUMPS, ETC

No. of Air Pumps 1 Diar. 18" Stroke 20"

Type of " *Edwards*

Diar. of Air Pump Rod 2 3/4" Material *Muntz Metal*

How are Air Pumps Worked? *Lever from LP engine*

No. of Centrifugal Circulating Pumps

Maker

Wrysdale

" Reciprocating " "

Diar.

Stroke

Diar. of Circulating Pump Rods

Material

How are Circulating Pumps Worked?

Diar. of Circulating Pump Suction from Sea 9"

Has each Circulating Pump a Bilge Suction with Non-return Valve?

Yes

Diar. 6"

No. of Feed Pumps on each Engine 2

Diar. 3"

Stroke 20"

Where do they pump from?

Hotwell & Filter

" " discharge to?

Main Boilers

Are Spring-loaded Relief Valves fitted to each Pump?

Yes

Can one Pump be overhauled while the others are at work?

Yes

No. of Bilge Pumps on each Engine 2

Diar. 3"

Stroke 20"

Where do they pump from?

Bilges

" " discharge to?

Overboard

Can one Pump be overhauled while the others are at work?

Yes

No. of Bilge Injections connected to Condensers

None

Diar.

Are all Bilge Suctions fitted with Roses?

Yes

Are the Valves, Cocks, and Pipes so arranged as to prevent unintentional connection between sea and

Bilges?

Yes

Are all Sea Connections made with Valves or Cocks fitted direct to the Hull Plating?

Yes

Are they placed so as to be easily seen and accessible?

Yes

Are the Discharge Chests placed above the Deep Load Line?

Yes

Are they fitted direct to the Hull Plating and easily accessible?

Yes

Are all Blow-off Cocks or Valves fitted with Spigots through the Hull Plating and Covering Plates or

Flanges on the outside?

Yes



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BOILERS.

Boilers made by *Caledon S & E Co.*
 „ at *Dundee*
 Works No. *422*
 Date when Plan approved
 Boiler Plates, Iron or Steel *Steel*
 Makers of Shell Plates *Rheinische Stahlwerke Duisberg*
 „ Internal Plates *Leeds Forge Co.*
 „ Furnaces *Wroughtons Patent Blue Lany*
 „ Stay Bars *H. Colville & Son Motherwell*
 „ Rivets *R. B. & R. Co. Ltd Glasgow*
 Material tested by (B.C., B.T., etc.)
 No. of Boilers *2*
 Single or Double-ended *Single*
 No. of Furnaces, each Boiler *3*
 Type of Furnaces *Suspension Bull Furnace. Gourlay Stephen type.*
 Approved Working Pressure *180 lbs*
 Hydraulic Test Pressure *360*
 Date of Hydraulic Test *9-10-11*
 „ when Safety Valves set *8-11-11*
 Pressure on Valves *180 lbs*
 Date of Steam Accumulation Test *8-11-11*
 Max. Pressure under Accumulation Test *190*
 System of Draught *Natural*
 Can Boilers be worked separately? *Yes*
 Greatest inside Diam. of Boilers *14'-10"*
 „ „ Length „ *12'-8"*
 Square Feet of Heating Surface, each Boiler *1996*
 „ Grate „ „ *46.2*

Vertical Monkey Boiler
Cochrane & Co Annan Ltd

Annan Scotland

5454

Steel

1

✓

✓

✓

80 lbs

140 lbs

4-8-11

8-11-11

80 lbs

8-11-11

86 lbs

Natural

4'-6"

16'-3" high

430

31.5

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No. of Safety Valves, each Boiler 2

Diam. " " " 3"

Area " " " 7.068 each valve

Are the Valves fitted with Easing Gear? Yes

No. of Pressure Gauges, each Boiler 1

" Water " " 1

" Test Cocks, " 3

" Salinometer Cocks, " 1

Are Water Gauge Pillars attached by Pipes to Steam and Water Spaces? No. Direct on boiler

Are these Pipes connected to Boilers by Cocks or Valves? ✓

Are Blow-off Cocks or Valves fitted on Boiler Shells? Valves

No. of Strakes of Shell Plating in each Boiler 1

" Plates in each Strake 3

Thickness of Shell Plates by Rule

" " Approved 1 3/32"

" " in Boilers 1 3/32"

Are the Rivet Holes Punched or Drilled? Drilled

Are Rivets Iron or Steel? Steel

Are the Longitudinal Seams Butt or Lap Joints? Butt

Are the Double Butt Straps of equal width? Yes

Thickness of outside Butt Straps 15 1/16"

" Inside " 15 1/16"

Are Longitudinal Seams Hand or Machine Riveted? Machine

Are they Single, Double, or Treble Riveted? Treble

Diam. of Rivet Holes 1 1/4"

Pitch " 4 7/16"

Width of Overlap ✓

Percentage of Strength in Longitudinal Seams Plate Section 85.8 %

Rivet " 87.2 %

Vertical Donkey Boiler

No. of Rows of Rivets in Centre Circumferential Seams 2

Are these Seams Hand or Machine Riveted? Machine

Diam. of Rivet Holes 1 1/4"

Pitch " 4 7/16"

Width of Overlap ✓

No. of Rows of Rivets in End Circumferential Seams 2

Are these Seams Hand or Machine Riveted? Machine

Diam. of Rivet Holes 1 1/4"

Pitch " 4 7/16"

Width of Overlap ✓

Size of Washholes in Shell 1 1/2"

Dimensions of Compensation Rings 3

Thickness of End Plates in Steam Space by Rule 1

" " " " " 1 3/32"

Lap & bottom strakes 1/2", Middle strakes 1/32"

" " " 1/2" " 1/32"

Ed. Diam. " " " Drilled

" " " Steel

" " " in Boilers Lap

" " " ✓

How are stays secured? ✓

Size and Thickness of Loose Washers on End Plates 1 1/2"

Vertical Seams Machine

Plate Section 68.5 %

Rivet " 65 %

No. of Rows of Rivets in Centre Circumferential Seams ✓

Are these Seams Hand or Machine Riveted? ✓

Diar. of Rivet Holes ✓

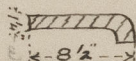
Pitch ✓

Width of Overlap ✓

No. of Rows of Rivets in End Circumferential Seams 2

Are these Seams Hand or Machine Riveted? *Front End, hand. Back End, Machine*Diar. of Rivet Holes $1\frac{1}{2}$ "Pitch $3\frac{5}{8}$ "Width of Overlap $5\frac{3}{4}$ "Size of Manholes in Shell $18" \times 15"$

Dimensions of Compensating Rings



Thickness of End Plates in Steam Space by Rule

" " " " Approved $3\frac{1}{32}$ "" " " " in Boilers $3\frac{1}{32}$ "Pitch of Steam Space Stays $16" \times 15"$

Eff. Diar. " " " by Rule

" " " " Approved $2\frac{7}{8}$ "" " " " in Boilers $2\frac{7}{8}$ "Material of " " " *Iron*How are Stays Secured? *Nuts & Washers on each end*Diar. and Thickness of Loose Washers on End Plates $9" \times \frac{11}{16}"$ " " Riveted " " $12" \times \frac{15}{16}"$

Width " " Doubling Strips " ✓

Thickness of Middle Back End Plate by Rule

" " " " Approved

" " " " in Boilers

Vertical Donkey Boiler

Thickness of Doublings in Wide Spaces between Firms

Pitch of Stays at

Eff. Diar. of Stays by Rule

Approved

in Boilers

Material

Are Stays fitted with Nuts outside?

Thickness of Back End Plates at Bottom by Rule

Approved

 $16" \times 12"$ Pitch of Stays at Wide Spaces between Firms $2' - 4" \text{ dia} \times 1\frac{3}{4}"$

Thickness of Doublings in

Thickness of Front End Plates at Bottom by Rule

Approved

in Boilers

No. of Long Stays in Spaces between Firms

Eff. Diar. of Stays by Rule

Approved

in Boilers

Material of

Thickness of Front End Plates at Bottom by Rule

Approved

in Boilers

No. of Long Stays in Spaces between Firms

Thickness of Doublings in



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Are Stay Tubes fitted with Nuts at Front End?

No

Thickness of Back Tube Plates by Rule

" " " Approved

 $\frac{13}{16}$ "

" " " in Boilers

 $\frac{13}{16}$ "

Pitch of Stay Tubes in Back Tube Plates

 $10\frac{3}{4}$ "

" Plain "

 $5\frac{3}{8}$ "

Thickness of Stay Tubes

Marginal $3\frac{1}{8}$ others $5\frac{1}{4}$

" Plain "

No 7 LSWG

External Diam. of Tubes

 $3\frac{3}{4}$ "

Material " "

Iron

Thickness of Furnace Plates by Rule

" " " Approved

 $9\frac{1}{4}$ "

" " " in Boilers

 $9\frac{1}{4}$ "

Smallest outside Diam. of Furnaces

 $3'-8\frac{3}{8}"$

Length between Tube Plates

 $4'-9"$

Width of Combustion Chambers (Front to Back)

 $3'-10"$

Thickness of " " " Tops, by Rule,

" " " " Approved

 $19\frac{3}{4}$ "

" " " " in Boilers

 $19\frac{3}{4}$ "

Pitch of Screwed Stays in C.C. Tops

 $4'-8" \times 5\frac{1}{8}"$

Eff. Diam. " " by Rule

" " " Approved

1.604

" " " in Boilers

1.604

Material " "

Iron

Thickness of Combustion Chamber Sides by Rule

Vertical Donkey Boiler

No

 $\frac{11}{16}$ " $\frac{11}{16}$ " $\frac{11}{16}$ " $8"$ $4" \times 3\frac{3}{4}"$ $5\frac{1}{4}"$

No 11 LSG

 $2\frac{1}{2}"$

Iron



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Thickness of Combustion Chamber Sides Approved

19 3/32"

" " " " in Boilers

19 3/32"

Pitch of Screwed Stays in C.C. Sides

6 1/2" x 4 3/8" ruled

Eff. Diar. " " by Rule

1.604

" " " Approved

" " " in Boilers

1.604

Material " "

Iron

Thickness of Combustion Chamber Backs by Rule

" " " Approved

5 3/8"

" " " in Boilers

5 3/8"

Pitch of Screwed Stays in C.C. Backs

Rings 8" x 8 1/2". Centre 4" x 8 1/2"

Eff. Diar. " " by Rule

" " " Approved

1.604

Marginal 1.854

" " " in Boilers

1.604

1.854

Material " "

Iron

Are all Screwed Stays fitted with Nuts inside C.C.

Yes
1 1/16"

Thickness of Combustion Chamber Bottoms

No. of Girders over each Wing Chamber

5

" " " Centre "

4

Depth and Thickness of Girders

10 3/4" x 3/8" each plate

Material of Girders

Steel

No. of Stays in each

4

No. of Stay Tubes, each Boiler

79

" " Plain " "

125

Size of lower Manholes

16" x 12"

VERTICAL BUNKER BOILERS

If the Bunker Boilers are Vertical the following particulars should be stated in addition to those on

previous pages applicable to such Boilers.

Type of Boiler

Height of Boiler Crown above Fire Grate

Are Boiler Crowns Flat or Dished?

Internal Radius of Dished Ends

Description of Stays in Boiler Crown

Pitch of River Holes

Height of Firebox Crown above Fire Grate

Are Firebox Crowns Flat or Dished?

External Radius of Dished Crowns

No. of Crown Stays

Internal Dia. of Firebox at Top

No. of Water Tubes

Material of Water Tubes

No. of Screwed Stays in Firebox Side

Are they fitted with Nuts inside?

SUPERHEATERS

Description of Superheaters

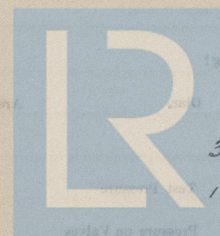
Where situated

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No. of Safety Valves on Superheaters

Date of Expiration of License

Pressure on Valve

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VERTICAL DONKEY BOILERS.

If the Donkey Boilers are Vertical the following particulars should be stated in addition to those on previous Pages applicable to such Boilers:—

Type of Boilers *Bochran Patent Multitubular*

Height of Boiler Crown above Fire Grate *14'-1 1/2"*

Are Boiler Crowns Flat or Dished? *Dished*

Internal Radius of Dished Ends *3'-9"* Thickness of Plates *crown 1/8" other plates 15/32"*

Description of Seams in Boiler Crowns *Single rivetted*

Diar. of Rivet Holes Pitch *2'8"* Width of Overlap *2'2"*

Height of Firebox Crowns above Fire Grate *3'-1 3/4"*

Are Firebox Crowns Flat or Dished? *Dished*

External Radius of Dished Crowns *3'-3"* Thickness of Plates *2'1/32"*

No. of Crown Stays *None* Effective Diar. ☒ Material ☒

External Diar. of Firebox at Top *6'-6"* Bottom *6'-6"* Thickness of Plates *2'1/32"*

No. of Water Tubes ☒ Int. Diar. ☒ " " ☒

Material of Water Tubes ☒

No. of Screwed Stays in Firebox Sides ☒ Eff. Diar. ☒ Material ☒

Are they fitted with Nuts inside? ☒ Outside? ☒

SUPERHEATERS.

Description of Superheaters

Where situated

Which Boilers are connected to Superheaters?

Can Superheaters be shut off while Boilers are working?

No. of Safety Valves on Superheaters Diar. Area

Are " " fitted with Easing Gear?

Date of Hydraulic Test Test Pressure

Date when Safety Valves set Pressure on Valves

MAIN STEAM PIPES
SKETCHES.

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MAIN STEAM PIPES.

No. of Lengths

2

Material

Copper

Brazed, Welded, or Seamless

Seamless

Internal Diam.

1 1/2"

Thickness

17" L. M.G.

How are Flanges Secured?

Brazed

Date of Hydraulic Test

6-11-11

Test Pressure

340 lbs

REFRIGERATORS.

No. of Machines

Makers

Description

When any part of the Vessel is to be used for the Carriage of Refrigerated Cargo the following particulars should be stated:—

Total Cubic Capacity of Refrigerated Spaces

Nature, Construction, Thickness, &c., of Insulation

Are all Pipes, Air Trunks, &c., well secured and protected from risk of damage?

Are all Bilge Suction, Sounding, and Air Pipes in Insulated Spaces properly insulated?

Are Thermometer Tubes so arranged that Water cannot enter and freeze in the Tubes?

Are Sluice Valves fitted on any of the Bulkheads of Insulated Spaces?

Are these fitted with Brass Non-return Valves?

Are they always accessible?

Are the Bilges and Bilge Rose Boxes always accessible?

Are the Steam Suctions to Bilges fitted with Non-return Valves?

Is the Machine Room effectively separated from Insulated Spaces?

" " properly Ventilated and Drained?

No. of Steam Cylinders, each Machine

Diars.

" Compressors, " "

Diam. of Crank Shafts

No. of Cranks

Give particulars of Pumps in connection with Refrigerating Plant, and state whether worked by

Refrigerating Machines or independently

Are Brine and other Regulating Valves placed so as to be accessible without entering the Insulated Spaces?

Date of Test under Working Conditions

Fall of Temperature in Insulated Spaces

Time required to obtain this Result

Articles of Spare Gear for Refrigerating Plant carried on board



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SKETCHES.

ELECTRIC LIGHTING.

Installation Fitted by *Selford Griers & Machay Ltd. 14 Barrick St. Glasgow*
 No. and Description of Dynamos *989. Multipolar Protected type. compound wound*
 Makers of Dynamos *H. Y. Boothroyd Ltd. Bootle Lancashire*
 Capacity „ *132* Amperes, at *100* Volts, *265* Revols. per Min.
 Current Alternating or Continuous *Continuous*
 Position of Dynamos *Engine Room*
 „ Main Switch Board *Engine Room*
 No. of Circuits to which Switches are provided on Main Switch Board *14*

Particulars of these Circuits:—

No. of Circuit.	Name of Circuit.	Number of Lights.	Candle Power.	Current Required. Amps.	Size of Conductor.	Current Density.	Conductivity of Conductor.	Insulation Resistance per Mile.
<i>Eng 1</i>	<i>Engine Room</i>	<i>26</i>	<i>16</i>	<i>16</i>	<i>7/14</i>	<i>1000 a</i>	<i>100%</i>	<i>2500 meg</i>
<i>2</i>	<i>Main Deck after Hold</i>	<i>23</i>	<i>16</i>	<i>14</i>	<i>7/14</i>	<i>"</i>	<i>"</i>	<i>"</i>
<i>3</i>	<i>Port after Hold</i>	<i>6</i>	<i>16</i>	<i>4</i>	<i>7/14</i>	<i>"</i>	<i>"</i>	<i>"</i>
<i>4</i>	<i>Starboard</i>	<i>6</i>	<i>16</i>	<i>4</i>	<i>7/14</i>	<i>"</i>	<i>"</i>	<i>"</i>
<i>5</i>	<i>After Blast</i>	<i>12</i>	<i>32</i>	<i>14</i>	<i>7/14</i>	<i>"</i>	<i>"</i>	<i>"</i>
<i>6</i>	<i>Midships</i>	<i>12</i>	<i>32</i>	<i>14</i>	<i>7/14</i>	<i>"</i>	<i>"</i>	<i>"</i>
<i>7</i>	<i>Forward</i>	<i>12</i>	<i>32</i>	<i>14</i>	<i>7/14</i>	<i>"</i>	<i>"</i>	<i>"</i>
<i>8</i>	<i>Main Hold</i>	<i>5</i>	<i>16</i>	<i>3</i>	<i>1/16</i>	<i>"</i>	<i>"</i>	<i>"</i>
<i>9</i>	<i>Port</i>	<i>5</i>	<i>16</i>	<i>3</i>	<i>1/16</i>	<i>"</i>	<i>"</i>	<i>"</i>
<i>10</i>	<i>Starboard</i>	<i>5</i>	<i>16</i>	<i>3</i>	<i>1/16</i>	<i>"</i>	<i>"</i>	<i>"</i>
<i>11</i>	<i>Fore Hold</i>	<i>5</i>	<i>16</i>	<i>3</i>	<i>1/16</i>	<i>"</i>	<i>"</i>	<i>"</i>
<i>12</i>	<i>Captain</i>	<i>5</i>	<i>16</i>	<i>3</i>	<i>1/16</i>	<i>"</i>	<i>"</i>	<i>"</i>
<i>13</i>	<i>Officers</i>	<i>16</i>	<i>16</i>	<i>10</i>	<i>7/18</i>	<i>"</i>	<i>"</i>	<i>"</i>
<i>14</i>	<i>Navigation</i>	<i>8</i>	<i>3-16</i>	<i>8</i>	<i>7/18</i>	<i>"</i>	<i>"</i>	<i>"</i>
<i>15</i>	<i>Crew forward</i>	<i>9</i>	<i>16</i>	<i>5</i>	<i>1/14</i>	<i>"</i>	<i>"</i>	<i>"</i>

Total No. of Lights *150* No. of Motors driving Fans, &c. *None* No. of Heaters *None*

Current required for Motors and Heaters

Positions of Auxiliary Switch Boards, with No. of Switches on each *none*

Are Cut-outs fitted as follows?—

On Main Switch Board, to Cables of Main Circuits *Yes*

On Aux. " " each Auxiliary Circuit *Yes*

Wherever a Cable is reduced in size *Yes*

To each Lamp Circuit *Yes*

To both Flow and Return Wires of all Circuits when the Double-Wire System is adopted *Yes*

Are the Fuses of Standard Sizes? *Yes*

Are all Switches and Cut-outs constructed of Non-inflammable Material? *Yes*

Are they placed so as to be always and easily accessible? *Yes*

Smallest Single Wire used. No. *18* S.W.G., Largest, No. *14* S.W.G.

How are Conductors in Engine and Boiler Spaces protected? *Armoured & Braided*

" " Saloons, State Rooms, &c., " *Lead covered, Armoured & Braided where exposed to injury*

What special protection is provided in the following cases?—

(1) Conductors exposed to Heat or Damp *Armoured & Braided*

(2) " " passing through Bunkers or Cargo Spaces *Armoured & Braided*

(3) " " Deck Beams or Bulkheads *Wooden bushes at deck beams
Water tight brass glands at bulkheads*

Are all Joints in Cables properly soldered and thoroughly Insulated so that the efficiency of the Cables is unimpaired? *None*

Are all Joints in accessible positions, none being made in Bunkers or Cargo Spaces? *None*

Are all Hull Connections for Single-Wire Systems made with Screws of large Surface? *None*

Are the Dynamos, Motors, Main and Branch Cables, so placed that the Compasses are not injuriously affected by them? *Yes*

Have Tests been made to prove that this condition has been satisfactorily fulfilled? *Yes*

Has the Insulation Resistance over the whole system been tested? *Yes*

What does the Resistance amount to? *100,000 ohms* Ohms.

Is the Installation supplied with a Voltmeter? *Yes*

" " " an Ampere Meter? *Yes*

Date of Trial of complete Installation *18-11-11* Duration of Trial *6 hours*



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EVAPORATORS.

No. Type *None* Tons per Day *None*
 Makers *None*
 Working Pressure Test Pressure Date of Test
 Date of Test of Safety Valves under Steam

FEED WATER HEATERS.

No. Type *Weirs Contact Heater 19"*
 Makers *Messrs G & J Weir*
 Working Pressure Test Pressure Date of Test

DONKEY

No. of Donkeys	<i>General Service</i>	<i>Weirs feed pumps</i>
Type	<i>Vertical</i>	<i>Vertical</i>
Makers	<i>Cameron</i>	<i>G & J Weir</i>
Single or Duplex	<i>Single</i>	<i>Duplex</i>
" Double-Acting	<i>Double</i>	<i>Double</i>
Diar. of Steam Cylinders	<i>7 1/2"</i>	<i>9 1/2"</i>
" Pumps	<i>5</i>	<i>4"</i>
Stroke of "	<i>4"</i>	<i>18"</i>
Where do they pump from	<i>Sea. Bilges. Tanks</i> <i>Hotwell & Special Bilge</i>	<i>Condenser. Heater</i> <i>Hotwell & Tanks</i>
Where do they discharge to	<i>Main & Donkey</i> <i>Boilers. Tanks. Condenser</i> <i>Overboard. Sanitary tank & Deck</i>	<i>Main Boilers</i>
Capacity, Tons per Hour of Ballast Donkey		Diar. of Pipe required by Rule for

FEED WATER FILTERS.

No. Type *Surface Filter* Size *4'-0" x 2'-0" x 2'-0"*
 Makers *Caledon S & E Co*
 Working Pressure Test Pressure Date of Test

FORCED DRAUGHT FANS.

No. of Fans *None* Diam. Revols. per min.
 How are Fans driven?

PUMPS.

Donkey Boiler pump
Vertical
Cameron
Duplex
Single
5"
3"
5"
Sea. Tanks & Exhaust Tank
Donkey Boiler & Sanitary Tank

largest Ballast Tank *3 1/2"*

Velocity of Water in Pipe

SPARE GEAR.

No. of Top End Bolts	2	No. of Bot. End Bolts	2
" Main Bearing Bolts	2	" Coupling Bolts	12
" Cylr. Cover Bolts Studs		" Valve Chest Cover Bolts Studs	
" Feed Pump Valves	2 + seats	" Bilge Pump Valves	2
" Safety Valve Springs	2	" Fire Bars	1 ton + 12 wing bars
" Piston Rings	1 set for HP + IP.	" Junk Ring Bolts Studs	12
" Piston Rods	✓	" Connecting Rods	✓
" Valve Spindles	✓	" Air Pump	✓
" Air Pump Valves		" " " Buckets	✓
" Crank Pin Bushes	✓	" Crosshead Bushes	✓
" Crank Shafts	✓	" Propeller Shafts	✓
" Propellers	1 Boss C.I.	" " Blades	4. Steel
" Boiler Tubes		" Condenser Tubes	24 + 50 ferrules

OTHER ARTICLES OF SPARE GEAR:—

- 2 Studs + nuts for Propeller blades
- 2 Pos. Gauge Glasses
- 2 Feed check valves
- 2 " delivery valves with guards, studs + nuts.
- 2 Spiral springs for relief valves
- 2 Feed valves + seats for Oilers Pump
- 1 wt. Bolts. Nuts. Studs + Washers assorted
- 4 ft. Sheet Iron. each $\frac{1}{4}$, $\frac{1}{8}$ + $\frac{3}{32}$
- 2 Lubr. Stoppers

GENERAL CONSTRUCTION.

Have all the Requirements under Sections 31 and 32 of the Rules been complied with? *Yes*
 If not, give details of the points of difference, and state when these were sanctioned by the Chief

Surveyor

Are the Steam Pumping Arrangements in accordance with the approved Plan? *Yes*

If not, state in what respects they differ and when such differences were sanctioned by the Chief

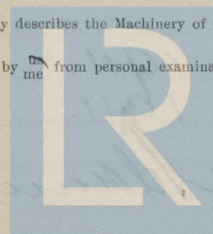
Surveyor

Are the Materials used in the Construction of Engines and Boilers, so far as could be seen, sound and trustworthy? *Yes*

Is the Workmanship throughout thoroughly satisfactory? *Yes*

The above correctly describes the Machinery of the S.S. "Sanda"

as ascertained by me from personal examination.



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 Engineer Surveyor to the British Corporation for the
 Survey and Registry of Shipping.

Fees—

MAIN BOILERS.

	Sq. ft.	£	s.	d.
H.S.		39	10	0
G.S.		16	10	0

DONKEY BOILERS.

	Sq. ft.	£	s.	d.
H.S.				
G.S.				

£ s. d.

ENGINES.

	Cub. ft.	£	s.	d.
L.P.C.		14	0	0

£ s. d.

Testing, &c. £ s. d.

£ s. d.

Expenses £ s. d.

Total ... £ 30 : 10 : 0

It is submitted that this Report be approved,

Oliver King
Chief Surveyor.

Approved by the Committee, for the Class of M.B.S. on
the 10th January 1912.

Fees applied for

18th Nov. 1911.

Fees paid

25th Nov. 1911.

Volker Manning
Secretary.



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Page

CLASS BOLLERS

B.S.

U.S.

BOLLERS BOLLERS

B.S.

U.S.

LAWSON

B.S.

Totals

Expenses

Total

It is submitted that this Report be approved.

Wm. H. King
 Chief Justice

Adopted by the Court for the Class of 1912-13 on
 the 10th January 1912

Noted by the

Noted by

18th Nov 1911

25th Nov 1911

Wm. H. King
 Chief Justice



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