

$\frac{10}{272}$

No. 2359

THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

Report No. 2348 No. in Register Book 3496

S.S. "Orchy"

Makers of Engines Aulsa & Co., Ltd.

Works No. 150

Makers of Main Boilers J.G. Kincaid & Co., Ltd.

Works No. 196

Makers of Donkey Boiler Cochran & Co., Ltd.

Works No. 11602



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Report No. No. in Register Book

S.S. "Orchy."

Makers of Engines *Ailsa Shipbuilding Co., Ltd.*

Works No. *150*

Makers of Main Boilers *J. G. Kincaid & Co., Ltd.*

Works No. *196*

Makers of Donkey Boiler *Cochran & Co., Ltd.*

Works No. *11602*

MACHINERY.



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No.

THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

Report No. 222 No. in Register Book

Received at Head Office: 1st July 1930

Surveyor's Report on the New Engines, Boilers, and Auxiliary
Machinery of the ~~Single Triple~~ ^{Single Triple} Screw Steamer

"Orchy"

Official No.

Port of Registry

Glasgow

Registered Owners

William Sloan & Co.,
Glasgow.

Engines Built by

Ailsa Shipbuilding Co., Ltd.
Troon.

Main Boilers Built by

John G. Kincaid & Co., Ltd.
Greenock.

Donkey " "

Cochran & Co., Ltd.

at

Annan.

Date of Completion

23/6/30.

First Visit

23/12/29.

Last Visit

23/6/30

Total Visits

27

Add visits to Kincaid's

15

(R.L.G.)

42

Foundation

TURBO-ELECTRIC PROPELLING MACHINERY.

No. of Turbo-Generating Sets Capacity of each

Type of Turbines employed

Description of Generators

No. of Motors driving Propeller Shafting

Are the Propeller Shafts driven direct by the Motors or through Gearing?

Is Single or Double Reduction Gear employed?

Description of Motors

Diam. of 1st Reduction Pinion	}	Width	Pitch of Teeth
" 1st " Wheel			

Estimated Pressure per lineal inch

Diam. of 2nd Reduction Pinion	}	Width	Pitch of Teeth
" 2nd " Wheel			

Estimated Pressure per lineal inch

Revs. per min. of Generators at Full Power

"	"	Motors	"
"	"	1st Reduction Shaft	
"	"	2nd "	
"	"	Propellers at Full Power	

Total Shaft Horse Power

Date of Harbour Trial

" Trial Trip

Trials run at

Speed on Trial Knots. Propeller Revs. per min. S.H.P.

Makers of Turbines

" Generators

" Motors

" Reduction Gear

Turbine Spindles forged by

" Wheels forged or cast by

Reduction Gear Shafts forged by

" Wheels forged or cast by

DESCRIPTION OF INSTALLATION.



SHAFTING.

Are the Crank Shafts Built or Solid?

Built.

No. of Lengths in each

3

Angle of Cranks

120°

Diar. by Rule

9.799"

Actual

10 1/4"

In Way of Webs

10 1/2"

" of Crank Pins

10 1/4"

Length between Webs

1'-0"

Greatest Width of Crank Webs

1'-7 1/2"

Thickness

6 1/4"

Least "Dowels" in Crank Webs

1 1/8"

Length

4"

" Dowels in Crank Pins

1 1/2"

Length

3"

Screwed or Plain

Plain.

No. of Bolts each Coupling

6

Diar. at Mid Length

2 1/4"

Diar. of Pitch Circle

1'-4 1/8"

Greatest Distance from Edge of Main Bearing to Crank Web

3/8"

Type of Thrust Blocks

Michell.

No. " Rings

one.

Diar. of Thrust Shafts at bottom of Collars

10 1/8"

No. of Collars

one.

Forward Coupling

"

At Aft Coupling

10 1/8"

Diar. of Intermediate Shafting by Rule

9.331"

Actual

9 5/8"

No. of Lengths

3

No. of Bolts, each Coupling

6

Diar. at Mid Length

2 1/4"

Diar. of Pitch Circle

1'-4 1/8"

Diar. of Propeller Shafts by Rule

10.414"

Actual

10 3/4"

At Coupling

10 1/4"

Arc Propeller Shafts fitted with Continuous Brass Liners?

Yes. (see p. 38.)

Diar. over Liners

1'-0 1/8"

Length of After Bearings

4'-2"

Of what Material are the After Bearings composed?

Lignum vitae.

Are Means provided for lubricating the After Bearings with Oil?

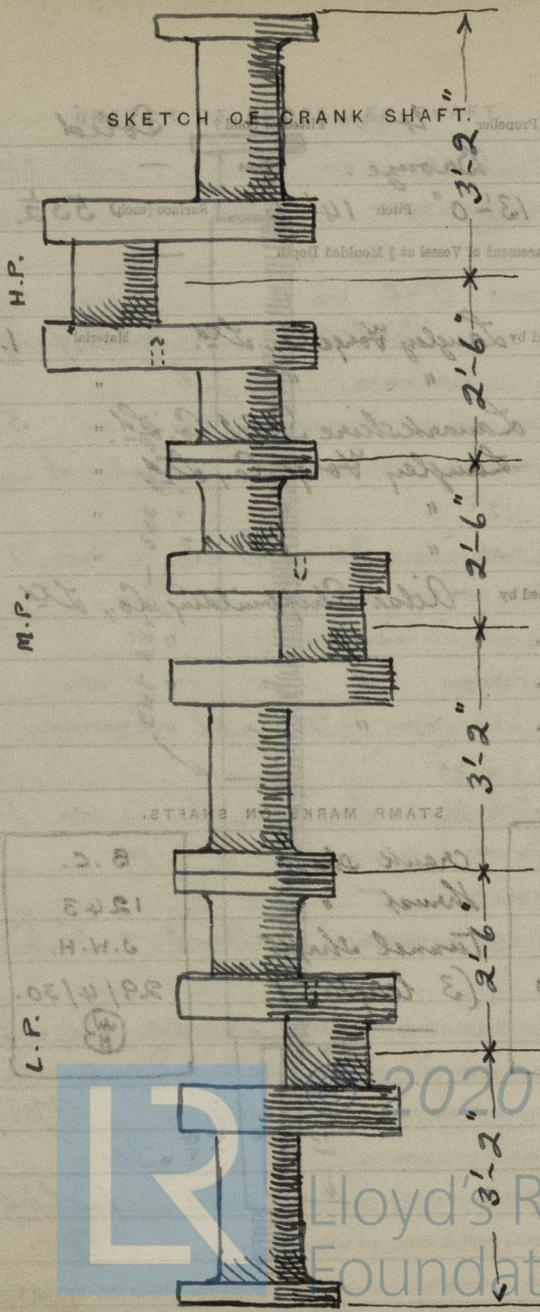
no.

" " to prevent Sea Water entering the Stern Tubes?

"

If so, what Type is adopted?

SKETCH OF CRANK SHAFT.



2.8	18.1
6.421	14.21
H.W.6	9.H.W.6
08/11/20	18/2/20
(H)	(H)

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No. of Blades each Propeller *4* Fitted or Solid? *Solid*
 Material of Blades *Bronze* Boss —
 Dia. of Propellers *13'-0"* Pitch *14'-6"* Surface (each) *53½* S. ft.)
 Coefficient of Displacement of Vessel at $\frac{3}{4}$ Moulded Depth —

Crank Shafts Forged by *Langley Forge Co., Ltd.* Material *I. S.*
 „ Pins „ „ „ „
 „ Webs „ *Launarkshire Steel Co. Ltd.* „ „
 Thrust Shafts „ *Langley Forge Co., Ltd.* „ „ @
 Intermed. „ „ „ „ „
 Propeller „ „ „ „ „
 Crank „ Finished by *Ailsa Shipbuilding Co., Ltd.*
 Thrust „ „ „ „ „
 Intermed. „ „ „ „ „
 Propeller „ „ „ „ „

STAMP MARKS ON SHAFTS.

B.C.
1241
J.W.H.
18/2/30

*Crank shaft
 Thrust
 Tunnel shafts
 (3 lengths.)*

B.C.
1243
J.W.H.
29/4/30.

tail shaft.

SKETCH OF PROPELLER SHAFT.



BOILERS

Works No. 196 (John G. Kincaid & Co. Ltd.)
 No. of Boilers 2 Type Cylindrical multitubular.
 Single or Double-ended Single
 No. of Furnaces in each 3
 Type of Furnaces Deighton
 Date when Plan approved 4/11/29.
 Approved Working Pressure 210 lb/□"
 Hydraulic Test Pressure 365 "
 Date of Hydraulic Test 1/4/30
 " when Safety Valves set 17/6/30
 Pressure at which Valves were set 217 lb/□"
 Date of Accumulation Test 17/6/30.
 Maximum Pressure under Accumulation Test 220 lb/□"
 System of Draught Natural. (Coal fired.)
 Can Boilers be worked separately? Yes.
 Makers of Plates Steel Company of Scotland Ltd.
 Stay Bars Scottish Iron & Steel Coy., Ltd.
 Rivets North West Rivet, Bolt, & Nut Factory Ltd.
 Furnaces Deighton Patent Hue & Tube Co., Ltd.
 Greatest Internal Diam. of Boilers 14'-3"
 " " Length " 11'-6"
 Square Feet of Heating Surface each Boiler 1898
 " " Grate " 52½
 No. of Safety Valves each Boiler 2 Rule Diam. 2 19/32" Actual 2 3/4"
 Are the Safety Valves fitted with Easing Gear? Yes.
 No. of Pressure Gauges, each Boiler One No. of Water Gauges One
 " Test Cocks 3 " Salinometer Cocks "

B.C. TEST.
 5291
 365 lb.
 W.P. 210 lb.
 R.L.G.
 1/4/30.

Dorman Long Britannia Wks.



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Thickness of End Plates in Steam Space Approved

$1\frac{9}{32}$ "

Pillars

" " " " in Boilers

"

Pitch of Steam Space Stays

$20\frac{1}{2}$ " hor. x 18" vert.

Diar. " " " Approved

$3\frac{1}{8}$ " Threads per Inch 6

" " " " in Boilers

" " " "

Material of " " "

Steel.

How are Stays Secured?

Nuts with $\frac{1}{4}$ " washers both sides.

Diar. and Thickness of Loose Washers on End Plates

—

" " " Riveted " "

—

Width " " Doubling Strips "

—

Thickness of Middle Back End Plates Approved

$\frac{7}{8}$ "

" " " " in Boilers

"

Thickness of Doublings in Wide Spaces between Fireboxes

—

Pitch of Stays at

$14\frac{1}{2}$ " hor. x $9\frac{3}{4}$ " centre;

Diar. of Stays Approved

$2\frac{1}{8}$ " Threads per Inch 9

" " " in Boilers

" " " "

Material "

Steel.

Are Stays fitted with Nuts outside?

Yes.

Thickness of Back End Plates at Bottom Approved

$\frac{7}{8}$ "

" " " " in Boilers

"

Pitch of Stays at Wide Spaces between Fireboxes

(widening.)

Thickness of Doublings in " "

—

Thickness of Front End Plates at Bottom Approved

1"

" " " " in Boilers

"

No. of Longitudinal Stays in Spaces between Furnaces

3 round each

bottom manhole.

Diag. of Stay Approved
in Boilers
Threads per Inch
1 1/2
2 1/2
3 1/2

Thickness of End Plates Approved

" " " " in Boilers

Pitch of Steam Space Stays

Diar. " " " Approved

" " " " in Boilers

Material of " " "

How are Stays Secured?

Diar. and Thickness of Loose Washers on End Plates

" " " Riveted " "

Width " " Doubling Strips "

Thickness of Middle Back End Plates Approved

" " " " in Boilers

Thickness of Doublings in Wide Spaces between Fireboxes

Pitch of Stays at

Diar. of Stays Approved

" " " in Boilers

Material "

Are Stays fitted with Nuts outside?

Thickness of Back End Plates at Bottom Approved

" " " " in Boilers

Pitch of Stays at Wide Spaces between Fireboxes

Thickness of Doublings in " "

Thickness of Front End Plates at Bottom Approved

" " " " in Boilers

No. of Longitudinal Stays in Spaces between Furnaces

(pitch) hor. $11\frac{1}{2}$ x vert. $9\frac{1}{2}$
 $9\frac{1}{2}$ hor. x $14\frac{1}{2}$ vert.
 $9\frac{1}{2}$ wings, vert.
top corners to rest on
8 W.C. (late)
stay $3\frac{1}{2}$; plain $3\frac{1}{2}$ for $8\frac{1}{2}$
welded wrought iron



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Top $2\frac{1}{2}$ "
 Diar. of Stays Approved $2\frac{1}{4}$ " Threads per Inch 6
 " " in Boilers " "
 Material " Steel. 18 "
 Thickness of Front Tube Plates Approved 1"
 " " " " in Boilers Steel "
 Pitch of Stay Tubes at Spaces between Stacks of Tubes $14\frac{1}{2}$ " hor. x $9\frac{1}{4}$ " vert.
 Thickness of Doublings in " " "
 " Stay Tubes at " " "
 Are Stay Tubes fitted with Nuts at Front End No.
 Thickness of Back Tube Plates Approved $\frac{27}{32}$ "
 " " " in Boilers "
 Pitch of Stay Tubes in Back Tube Plates $9\frac{1}{2}$ " hor. x $11\frac{9}{16}$ " vert. (wings)
 " Plain " $4\frac{3}{4}$ " x $4\frac{5}{8}$ "
 Thickness of Stay Tubes $\frac{9}{32}$ "; top corners $\frac{7}{16}$ " next wide
 " Plain " 8 W.G. (Zaito's patent tapered.)
 External Diar. of Tubes Stay $3\frac{1}{2}$ "; plain $3\frac{1}{2}$ " back to $2\frac{5}{8}$ " front.
 Material " Welded wrought iron.
 Thickness of Furnace Plates Approved $5\frac{7}{8}$ "
 " " " in Boilers "
 Smallest outside Diar. of Furnaces $3'-7\frac{1}{4}"$
 Length between Tube Plates $7'-7"$
 Width of Combustion Chambers (Front to Back) $3'-0"$ at top (ent.)
 Thickness of " " Tops Approved $\frac{23}{32}$ "
 " " " in Boilers "
 Pitch of Screwed Stays in C.C. Tops $8\frac{7}{16}"$ x $9\frac{3}{8}"$ athwart (wings)

spaces.
 tapered.)
 front.



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22
 202
 Diar. of Screwed Stays Approved $1\frac{7}{8}$ " Threads per Inch 9
 " " " in Boilers " "
 Material " " Steel.
 Thickness of Combustion Chamber Sides Approved $\frac{23}{32}$ "
 " " " " in Boilers "
 Pitch of Screwed Stays in C.C. Sides $8\frac{7}{16}$ " hor. x $9\frac{3}{8}$ " vert.
 Diar. " " Approved $1\frac{7}{8}$ " Threads per Inch 9
 " " " in Boilers " "
 Material " " Steel.
 Thickness of Combustion Chamber Backs Approved $\frac{23}{32}$ "
 " " " " in Boilers "
 Pitch of Screwed Stays in C.C. Backs $8\frac{1}{4}$ " x 9" wings; 8 " x $9\frac{3}{4}$ " etc
 Diar. " " Approved $1\frac{7}{8}$ " Threads per Inch 9
 " " " in Boilers " "
 Material " " Steel.
 Are all Screwed Stays fitted with Nuts inside C.O.? Yes.
 Thickness of Combustion Chamber Bottoms $\frac{7}{8}$ "
 No. of Girders over each Wing Chamber 4
 " " " Centre " 3
 Depth and Thickness of Girders 10 " x $\frac{3}{4}$ " each plate.
 Material of Girders Steel plates.
 No. of Stays in each 3
 No. of Tubes, each Boiler 230
 Size of Lower Manholes 16 " x 12 "

11002
 VERTICAL DONKEY BOILERS
 One vertical boiler
 Height 7'-0"
 Diameter of boiler 16" x 12"
 Thickness of boiler plates 3/4"
 Pitch of stays 8 1/4" x 9"
 Diar. of stays 1 7/8"
 Threads per inch 9
 Material Steel
 Thickness of combustion chamber sides 23/32"
 Thickness of combustion chamber backs 23/32"
 Thickness of combustion chamber bottoms 7/8"
 No. of girders over each wing chamber 4
 No. of girders over centre 3
 Depth and thickness of girders 10" x 3/4" each plate
 Material of girders Steel plates
 No. of stays in each 3
 No. of tubes, each boiler 230
 Size of lower manholes 16" x 12"

SUPERHEATERS

(over)



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VERTICAL DONKEY BOILERS.

11602

No. of Boilers *One* Type *Vertical, coal-fired.*
 Greatest Int. Diar. *7'-0"* Height *15'-0"*
 Makers *Cochran & Co. (Aunan) Ltd.*
 Height of Boiler Crown above Fire Grate *Dished; (hemispherical.)*
 Is Boiler Crown Flat or Dished? *Top 1" side $\frac{17}{32}$ "*
 Internal Radius of Dished End *3'-6"* Thickness of Plates
 Description of Seams in Boiler Crowns *Single-riveted lap.*
 Diar. of Rivet Holes *$\frac{31}{32}$ "* Pitch *2 $\frac{1}{4}$ "* Width of Overlap *3"*
 W.P. and End *120 lb/0; natural.*
 Height of Firebox Crown above Fire Grate *draught:*
 Are Firebox Crowns Flat or Dished? *Dished; (hemispherical.)*
 External Radius of Dished Crowns *3'-0"* Thickness of Plates *$\frac{21}{32}$ "*
 Shell sides; *top middle bottom*
 Tube plates *$\frac{19}{32}$ thick $\frac{23}{32}$ front bottom $\frac{19}{32}$ back 1"*
 Internal Diar. of Firebox at Top *17 $\frac{1}{2}$ " thick $\frac{1}{32}$ "*
 No. of Water Tubes *32* Ext. Diar. *2 $\frac{1}{2}$ "* Thickness *$\frac{1}{32}$ "*
 plain *141* 9 L.S.G.
 Material of Water Tubes *Shell $\frac{15}{16}$ " rivets, $\frac{31}{32}$ " holes.*
 Size of Manhole in Shell *16" x 12"*
 Dimensions of Compensating Ring *2'-4" dia. $\frac{7}{8}$ " thick.*
 Heating Surface, each Boiler *600 \oint .* Grate Surface *26.75 \oint .*

SUPERHEATERS.

Description of Superheaters

(none.)

Where situated?

Which Boilers are connected to Superheaters?

Can Superheaters be shut off while Boilers are working?

No. of Safety Valves on each Superheater

Diar.

Are " " fitted with Easing Gear?

Date of Hydraulic Test

Test Pressure

Date when Safety Valves set

Pressure on Valves

MAIN STEAM PIPES

B.C. TEST.

5290

230 LB.

W.P. 120 LB.

J.W.H.

27/3/30.

JW
HS

one on 10/1/30; one on 10/1/30

" 0/1/024



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REGULATORS

Engine by Caldwell & Co., Ltd. 3210

$$\frac{82 \times 110}{1000} = 9.02 \text{ KW.}$$

ELECTRIC LIGHTING.

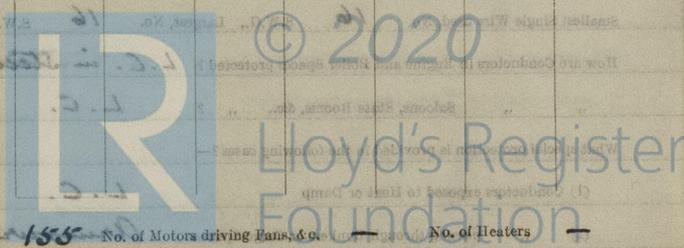
Installation Fitted by Telford, Grier & Mackay Ltd. 82062
 No. and Description of Dynamos One 9 K.W. D.C. comp. wound.
 Makers of Dynamos Lancashire Dynamo & Motor Co., Ltd.
 Capacity „ 82 Amperes, at 110 Volts, 300 Revols. per Min.
 Current Alternating or Continuous Continuous rating.
 Single or Double Wire System Double
 Position of Dynamos Starboard side E.R. bottom platform.
 „ Main Switch Board on bulk head beside dynamo.
 No. of Circuits to which Switches are provided on Main Switch Board 8.

Particulars of these Circuits:—

Circuit.	Number of Lights.	Candle Power.	Current Required. Amps.	Size of Conductor.	Current Density.	Conductivity of Conductor.	Insulation Resistance per Mile.
Navigation.	13	various	4	.007	571	100%	2500
Accommodation.	23	40 w.	8.5	"	1214	"	"
Bridge.	17	"	6	"	857	"	"
Main Deck.	19	various	11	"	1571	"	"
Holds.	36	40 w.	13	"	1857	"	"
Aft.	21	various	7	"	1000	"	"
Engine Room.	26	40 w.	9.5	"	1357	"	"
Spare.							

Total No. of Lights 155 No. of Motors driving Fans, &c. — No. of Heaters —

Current required for Motors and Heaters —



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

Installation fitted by
No. and Description of Batteries
Makers of Dynamos
Capacity
Current Alternating or Continuous
Single or Double Wire System
Location of Dynamos
Main Switch Board
No. of Circuits to which switches are provided on Main Switch Board

Number of Circuits	Capacity	Current	Location	System
13	110	800	State Room E.R. Water Platform	Double

Are Out-outs fitted as follows? *700*

On Main Switch Board, to Cables of Main Circuits *82* *yes*

On Aux. " " each Auxiliary Circuit *17* *yes*

Wherever a Cable is reduced in size *11* *yes*

To each Lamp Circuit *1827* *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 Out-outs constructed of Non-Inflammable Material? *yes*

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

Smallest Single Wire used, No. *16* S.W.G., Largest, No. *16* S.W.G.

How are Conductors in Engine and Boiler Spaces protected? *L.C. in steel tube or with steel plate.*

" " Saloons, State Rooms, &c., " ? *L.C.*

What special protection is provided in the following cases?—

(1) Conductors exposed to Heat or Damp *L.C.*

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

(3) " " Deck Beams or Bulkheads *Deck Tubes thro' decks; packed W.T. glands thro' W.T. bulkheads.*

Are all Joints in Cables properly soldered and thoroughly Insulated so that the efficiency of the Cables is unimpaired? *no joints.*

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

Are all Hull Connections for Single-Wire Systems made with Screws of large Surface? *yes*

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? *18 meg Ohms*

Is the Installation supplied with a Voltmeter? *yes*

" " " an Ampere Meter *yes*

Date of Trial of complete Installation *17/6/30.* Duration of Trial *6 hours.*

Have all the requirements of Section 42 been satisfactorily carried out? *yes.*

Original lines

the fact a cut & was turned before

receiving. the new length was found

to be right.

As the resistance was in the connection of Engines and Boilers so far as could be seen sound and

in the connection of Engines and Boilers so far as could be seen sound and

yes

yes



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GENERAL CONSTRUCTION.

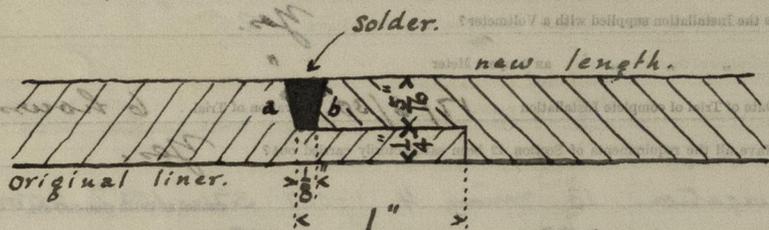
Have the Machinery and Boilers been constructed in accordance with the requirements of the Rules and the

Approved Plans? *Yes, except as detailed below.*

If not, give details of the points of difference, and state when these were sanctioned by the Chief

Surveyor.

The tail shaft liner was found to be slack near after end. A length of 5 feet was cut off, and a new piece shrunk on, the joint being made as shown below.



The faces a and b were turned before soldering. The new length was found to be tight.

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. "*Orchys*"

as ascertained by ⁴⁸⁹me from personal examination

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

Fees—

MAIN BOILERS.		£	s.	d.
H.S.	Sq. ft.	:	:	
G.S.	"	:	:	
DONKEY BOILERS.				
H.S.	Sq. ft.	:	:	
G.S.	"	:	:	
		£	:	:
ENGINES.				
L.P.O.	Cub. ft.	:	:	
		£	:	:
Testing, &c. ...		:	:	
		£	:	:
Expenses ...		:	:	
Total ...		£	:	:

It is submitted that this Report be approved,

W. Green King
 Chief Surveyor.

Approved by the Committee for the Class of M.B.S.* on the 3rd September 1930.

Fees advised

Fees paid



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 Secretary.

23/12/29

14/1/30

29 "

30 " ← (Cochran)

7/2/30

14 "

18 "

25 "

3/3/30

11 "

25 "

27 "

1/4/30.

8 "

15 "

22 "

29 "

6/5/30.

13 "

20 "

27 "

3/6/30

10 "

13 "

17 "

19 "

23 "

(Kincaid)

3/2/30

7 "

11 "

14 "

19 "

21 "

25 "

5/2/30

11 "

14 "

19 "

21 "

24 "

27 "

1/4/30

15 visits

RLC



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