

No. 1837

Ramage & Ferguson

THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

*H.F.
P.*

Report No. 2203 No. in Register Book 3571

ENDRICK

S.S. "HORSA"
EX

Makers of Engines RAMAGE & FERGUSON. LTD.

Works No. 267

Makers of Main Boilers CALEDON. S & EC: LTD.

Works No. B 10

Makers of Donkey Boiler CALEDON S & EC: LTD.

Works No. B 10

MACHINERY.



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002602-002610-0147

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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

14th October 1928

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

Official No.

Port of Registry LEITH.

Registered Owners LEITH HULL & HAMBURG S.P.C. LTD.

Engines Built by RAMAGE & FERGUSON LTD.

at LEITH.

Main Boilers Built by CALEDON S. & E. CO. LTD.

at DUNDEE

Donkey " " CALEDON S. & E. CO. LTD.

at DUNDEE.

Date of Completion 24th SEPTEMBER 1928

First Visit 9-11-27. Last Visit 23-9-28. Total Visits 52.



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TURBINE ENGINES

Works No. Type of Turbines

No. of H.P. Turbines No. of L.P. No. of L.P. No. of Stern

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

Is Single or Double Reduction Gear employed?

Diar. of 1st Reduction Pinion

" 1st " Wheel

Estimated Pressure per lineal inch

Diar. of 2nd Reduction Pinion

" 2nd " Wheel

Estimated Pressure per lineal inch

Revs. per min. of H.P. Turbines at Full Power

" " I.P. " "

" " L.P. " "

" " 1st Reduction Shaft

" " 2nd " "

" " Propeller Shaft

Total Shaft Horse Power

Date of Harbour Trial

" Trial Trip

Trials run at

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

Turbine Spindles forged by

" Wheels forged or cast by

Reduction Gear Shafts forged by

" Wheels forged or cast by

DESCRIPTION OF INSTALLATION

No. of Turbines employed

Type of Turbines employed

Description of Construction

No. of Motors driving Propeller Shafts

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

Is Single or Double Reduction Gear employed?

Description of Motors

Diar. of 1st Reduction Pinion

" " " "

Diar. of 2nd Reduction Pinion

" " " "

Revs. per min. of H.P. Turbines at Full Power

" " I.P. " "

" " L.P. " "

" " 1st Reduction Shaft

" " 2nd " "

" " Propeller Shaft

Total Shaft Horse Power

Date of Harbour Trial

" Trial Trip

Trials run at

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

Turbine Spindles forged by

" Wheels forged or cast by

Reduction Gear Shafts forged by

" Wheels forged or cast by



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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 Revols. per min. S.H.P.

Makers of Turbines

" Generators

" Motors

" Reduction Gear

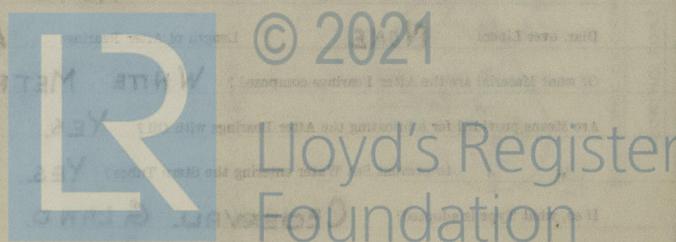
Turbine Spindles forged by

" Wheels forged or cast by

Reduction Gear Shafts forged by

" Wheels forged or cast by

DESCRIPTION OF INSTALLATION.



PUMPS, ETC.

No. of Air Pumps **ONE** Diar. **18"** Stroke **20"**

Worked by Main or Independent Engines? **MAIN ENGINES.**

No. of Circulating Pumps **ONE** Diar. **11½"** Stroke **20"**

Type of " **D.A. BUCKET TYPE.**

Diar. of " Suction from Sea **8½"**

Has each Pump a Bilge Suction with Non-return Valve? **YES** Diar. **6"**

What other Pumps can circulate through Condenser? **BALLAST PUMP.**

No. of Feed Pumps on Main Engine **TWO.** Diar. **3"** Stroke **20"**

Are Spring-loaded Relief Valves fitted to each Pump? **YES.**

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

No. of Independent Feed Pumps **TWO.** Diar. **8½" x 6"** Stroke **13" WEIRS**

What other Pumps can feed the Boilers? **GENERAL SERVICE PUMP 8" x 6" x 8"**

No. of Bilge Pumps on Main Engine **TWO.** Diar. **3"** Stroke **20"**

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

No. of Independent Bilge Pumps **NONE**

What other Pumps can draw from the Bilges? **BALLAST PUMP.**

GENERAL SERVICE PUMP.

Are all Bilge Suctions fitted with Roses? **YES.**

Are the Valves, etc., so arranged as to prevent unintentional connection between Sea and Bilges? **YES.**

Are all Sea Connections made with Valves or Cocks next the Ship's sides? **YES.**

Are they placed so as to be easily accessible? **YES**

Are the Discharge Chests placed above or below the Deep Load Line? **BELOW**

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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MAIN BOILERS.

Works No. B. 10.

No. of Boilers 2 Type CYLINDRICAL, MULTITUBULAR

Single or Double-ended SINGLE

No. of Furnaces in each 3

Type of Furnaces FOX

Date when Plan approved 7-11-27

Approved Working Pressure 180 LBS.

Hydraulic Test Pressure 320 "

Date of Hydraulic Test 25-5-28

„ when Safety Valves set 12-9-28.

Pressure at which Valves were set 180 lbs.

Date of Accumulation Test 14-9-28

Maximum Pressure under Accumulation Test 197 lbs.

System of Draught NATURAL

Can Boilers be worked separately? YES

Makers of Plates D. COLVILLE & SONS, L^{TD}

Do. Furnace W^M BEARDMORE & G. L^{TD}

„ Stay Bars THE SCOTTISH IRON & STEEL C. L^{TD}

„ Rivets THE N.W. RIVET, BOLT & NUT C. L^{TD}

„ Furnaces W^M BEARDMORE & G. L^{TD}

Greatest Internal Diam. of Boilers 14' 3"

„ „ Length „ 10' 9½"

Square Feet of Heating Surface each Boiler 1976

„ „ Grate „ „ 56.35

No. of Safety Valves each Boiler 2 Rule Diam. 2 7/8" Actual 3"

Are the Safety Valves fitted with Easing Gear? YES

No. of Pressure Gauges, each Boiler TWO No. of Water Gauges TWO

„ Test Cocks „ TWO „ Salinometer Cocks ONE

DONKEY BOILER

Works No. B. 10.

No. of Boilers ONE Type CYLINDRICAL, MULTITUBULAR

Single or Double-ended SINGLE

No. of Furnaces in each Boiler 2

Type of Furnaces PLAIN

Date when Plan approved

Approved Working Pressure 100 LBS.

Hydraulic Test Pressure 200 "

Date of Hydraulic Test 25-5-28

„ when Safety Valves set 12-9-28

Pressure at which Valves were set 14-9-28

Date of Accumulation Test 100 lbs

Maximum Pressure under Accumulation Test 102 lbs

System of Draught NATURAL

Can Boilers be worked separately?

Makers of Plates D. COLVILLE & SONS L^{TD}

Do. Furnace ~~JAMES DUNLOP & CO L^{TD}~~ D. COLVILLE & SONS L^{TD}

„ Stay Bars THE SCOTTISH IRON & STEEL C. L^{TD}

„ Rivets THE NORTH WEST RIVET, BOLT & NUT C. L^{TD}

„ Furnaces THE BROOMSIDE BOILER WORKS C. L^{TD}

Greatest Internal Diam. of Boilers 9' 6"

„ „ Length „ 7' 10½"

Square Feet of Heating Surface each Boiler 656

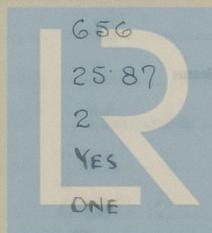
„ „ Grate „ „ 25.87

No. of Safety Valves each Boiler 2 Rule Diam. 2 1/8" Actual 2 1/4"

Are the Safety Valves fitted with Easing Gear? YES

No. of Pressure Gauges, each Boiler ONE

„ Test Cocks „ 3



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MAIN BOILERS

Are the Water Gauges fitted direct to the Boiler Shells or mounted on Pillars? MOUNTED ON PILLARS

Are the Water Gauge Pillars fitted direct to the Boiler Shells or connected by Pipes? PIPES

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

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

No. of Strakes of Shell Plating in each Boiler 2

Plates in each Strake 1

Thickness of Shell Plates Approved $1\frac{11}{16}$ "

" " in Boilers $1\frac{3}{16}$ " B

Are the Rivets Iron or Steel? STEEL

Are the Longitudinal Seams Butt or Lap Joints? BUTT

Are the Butt Straps Single or Double? DOUBLE

Are the Double Butt Straps of equal width? YES

Thickness of outside Butt Straps $\frac{29}{32}$ "

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

Are Longitudinal Seams Hand or Machine Riveted? MACHINE

Are they Single, Double, or Treble Riveted? TREBLE

No. of Rivets in a Pitch 5

Diar. of Rivet Holes $1\frac{3}{16}$ " Pitch $8\frac{1}{4}$ "

No. of Rows of Rivets in Centre Circumferential Seams ✓

Are these Seams Hand or Machine Riveted? ✓

Diar. of Rivet Holes Pitch ✓

No. of Rows of Rivets in Front End Circumferential Seams 2

Are these Seams Hand or Machine riveted? HAND AND MACHINE

Diar. of Rivet Holes $1\frac{3}{16}$ " Pitch $3\frac{1}{2}$ "

No. of Rows of Rivets in Back End Circumferential Seams 2

Are these Seams Hand or Machine Riveted? MACHINE

Diar. of Rivet Holes $1\frac{3}{16}$ " Pitch $3\frac{1}{2}$ "

Size of Manholes in Shell $16" \times 12"$

Dimensions of Compensating Rings $3'1" \times 2'9" \times 1\frac{11}{16}"$

DONKEY BOILER

MOUNTED ON PILLARS

PIPES

COCKS

VALVE

1

1"

 $1\frac{11}{16}$ " $1\frac{11}{16}$ "

STEEL

LAP

✓

✓

✓

✓

MACHINE

DOUBLE

2

 $1\frac{1}{16}$ "

✓

✓

✓

ONE

HAND

 $1\frac{1}{16}$ "

ONE

MACHINE

 $1\frac{1}{16}$ " $16" \times 12"$ $2'7" \times 2'3" \times 1\frac{1}{16}"$ 

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MAIN BOILERS

Thickness of End Plates in Steam Space Approved $1\frac{1}{4}$ "

" " " " " in Boilers $1\frac{1}{4}$ "

Pitch of Steam Space Stays $1'-8" \times 1'-8"$

Diar. " " " " Approved 3" Threads per Inch 9

" " " " " in Boilers 3" " 9

Material of " " " STEEL

How are Stays Secured? DOUBLE NUTS

Diar. and Thickness of Loose Washers on End Plates OUTSIDE - $6\frac{1}{4} \times \frac{1}{4}$ " INSIDE - $6\frac{1}{2} \times \frac{1}{4}$ "

" " Riveted " " " ✓

Width " " Doubling Strips " ✓

Thickness of Middle Back End Plates Approved $\frac{25}{32}$ "

" " " " " in Boilers $\frac{25}{32}$ "

Thickness of Doublings in Wide Spaces between Fireboxes ✓

Pitch of Stays at " " " " $8" \times 8"$

Diar. of Stays Approved $1\frac{5}{8}$ " Threads per Inch 9

" " in Boilers $1\frac{5}{8}$ " " 9

Material " STEEL

Are Stays fitted with Nuts outside? YES

Thickness of Back End Plates at Bottom Approved $\frac{25}{32}$ "

" " " " " in Boilers $\frac{25}{32}$ "

Pitch of Stays at Wide Spaces between Fireboxes $8" \times 8"$

Thickness of Doublings in " " ✓

Thickness of Front End Plates at Bottom Approved $1\frac{3}{16}$ "

" " " " " in Boilers $1\frac{3}{16}$ "

No. of Longitudinal Stays in Spaces between Furnaces 3

DONKEY BOILER

Thickness of End Plates in Steam Space Approved $1\frac{1}{4}$ "

" " " " " in Boilers $1\frac{1}{4}$ "

Pitch of Steam Space Stays $1'-4" \times 1'-3"$

Diar. " " " " Approved 2" Threads per Inch 9

" " " " " in Boilers 2" " 9

Material of " " " STEEL

How are Stays Secured? DOUBLE NUTS

Diar. and Thickness of Loose Washers on End Plates $8" \times \frac{3}{4}"$

" " Riveted " " " ✓

Width " " Doubling Strips " ✓

Thickness of Middle Back End Plates Approved $\frac{25}{32}$ "

" " " " " in Boilers $\frac{25}{32}$ "

Thickness of Doublings in Wide Spaces between Fireboxes ✓

Pitch of Stays at " " " " $8\frac{3}{4}"$

Diar. of Stays Approved $1\frac{1}{2}$ " Threads per Inch 9

" " in Boilers $1\frac{1}{2}$ " " 9

Material " STEEL

Are Stays fitted with Nuts outside? YES



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MAIN BOILERS

Diar. of Stays Approved	2"	Threads per Inch	9
" " in Boilers	2"		9
Material "			STEEL
Thickness of Front Tube Plates Approved			$\frac{13}{16}$ "
" " " " in Boilers			$\frac{13}{16}$ "
Pitch of Stay Tubes at Spaces between Stacks of Tubes			9"
Thickness of Doublings in " " "			✓
" Stay Tubes at " " "			$\frac{3}{8}$ "
Are Stay Tubes fitted with Nuts at Front End?			No.
Thickness of Back Tube Plates Approved			$\frac{3}{4}$ "
" " " in Boilers			$\frac{3}{4}$ "
Pitch of Stay Tubes in Back Tube Plates			9"
" Plain "			$4\frac{1}{2}$ " x $4\frac{1}{2}$ "
Thickness of Stay Tubes			$\frac{5}{8}$ "
" Plain "			8 B.W.G.
External Diar. of Tubes			$3\frac{1}{4}$ "
Material "			IRON
Thickness of Furnace Plates Approved			$\frac{9}{16}$ "
" " " in Boilers			$\frac{9}{16}$ "
Smallest outside Diar. of Furnaces			3'-6 $\frac{1}{8}$ "
Length between Tube Plates			7'-0"
Width of Combustion Chambers (Front to Back)			2'-9 $\frac{21}{32}$ "
Thickness of " " Tops Approved			$\frac{5}{8}$ "
" " " in Boilers			$\frac{5}{8}$ "
Pitch of Screwed Stays in C.O. Tops			8"

DONKEY BOILER

Diar. of Stays Approved	2"	Threads per Inch	9
" " in Boilers	2"		9
Material "			STEEL
Thickness of Front Tube Plates Approved			$\frac{1}{2}$ "
" " " " in Boilers			$\frac{1}{2}$ "
Pitch of Stay Tubes at Spaces between Stacks of Tubes			8 $\frac{1}{2}$ " & 12 $\frac{3}{4}$ "
Thickness of Doublings in " " "			✓
" Stay Tubes at " " "			$\frac{3}{8}$ "
Are Stay Tubes fitted with Nuts at Front End?			No.
Thickness of Back Tube Plates Approved			$\frac{5}{8}$ "
" " " in Boilers			$\frac{5}{8}$ "
Pitch of Stay Tubes in Back Tube Plates			8 $\frac{1}{2}$ " & 12 $\frac{3}{4}$ "
" Plain "			$4\frac{1}{4}$ " x $4\frac{3}{8}$ "
Thickness of Stay Tubes			28 @ $\frac{3}{8}$ " 8 @ $\frac{7}{16}$ "
" Plain "			9 S.W.G.
External Diar. of Tubes			3"
Material "			IRON
Thickness of Furnace Plates Approved			$\frac{9}{16}$ "
" " " in Boilers			$\frac{9}{16}$ "
Smallest outside Diar. of Furnaces			2'-11 $\frac{5}{8}$ "
Length between Tube Plates			5'-6"
Width of Combustion Chambers (Front to Back)			1'-7 $\frac{7}{8}$ "
Thickness of " " Tops Approved			$\frac{5}{8}$ "
" " " in Boilers			$\frac{5}{8}$ "
Pitch of Screwed Stays in C.O. Tops			6 $\frac{1}{2}$ "

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Diam. of Screwed Stays Approved	$\frac{1}{8}$ "	Threads per Inch	9
" " " in Boilers	$\frac{1}{8}$ "		9
Material " "			STEEL
Thickness of Combustion Chamber Sides Approved			$\frac{1}{8}$ "
" " " " in Boilers			$\frac{1}{8}$ "
Pitch of Screwed Stays in C.C. Sides			8" x 8"
Diam. " " Approved	$\frac{1}{8}$ "	Threads per Inch	9
" " " in Boilers	$\frac{1}{8}$ "		9
Material " "			STEEL
Thickness of Combustion Chamber Backs Approved			$\frac{1}{8}$ "
" " " " in Boilers			$\frac{1}{8}$ "
Pitch of Screwed Stays in C.C. Backs			8" x 8"
Diam. " " Approved	$\frac{3}{4}$ "	Threads per Inch	9
" " " in Boilers	$\frac{3}{4}$ "		9
Material " "			STEEL
Are all Screwed Stays fitted with Nuts inside C.C.?			YES
Thickness of Combustion Chamber Bottoms			$\frac{1}{8}$ "
No. of Girders over each Wing Chamber			4
" " " Centre "			4
Depth and Thickness of Girders			8 $\frac{1}{2}$ " x 2- $\frac{7}{8}$ " STEEL
Material of Girders			STEEL
No. of Stays in each			3
No. of Tubes, each Boiler			169 PLAIN. 100 STAY. 269 TOTAL
Size of Lower Manholes			15" x 11"

VERTICAL DONKEY BOILERS	$\frac{1}{8}$ "	9
No. of Boilers	9	
Material		STEEL
Thickness of Combustion Chamber Sides Approved		$\frac{1}{8}$ "
" " " " in Boilers		$\frac{1}{8}$ "
Pitch of Screwed Stays in C.C. Sides		9 $\frac{1}{2}$ "
Diam. " " Approved	$\frac{1}{2}$ "	9
" " " in Boilers	$\frac{1}{2}$ "	9
Material " "		STEEL
Thickness of Combustion Chamber Backs Approved		$\frac{1}{2}$ "
" " " " in Boilers		$\frac{1}{2}$ "
Pitch of Screwed Stays in C.C. Backs		8" x 7 $\frac{3}{4}$ "
Diam. " " Approved	$\frac{1}{2}$ " & $\frac{1}{8}$ "	9
" " " in Boilers	$\frac{1}{2}$ " & $\frac{1}{8}$ "	9
Material " "		STEEL
Are all Screwed Stays fitted with Nuts inside C.C.?		YES
Thickness of Combustion Chamber Bottoms		$\frac{5}{8}$ "
No. of Girders over each Wing Chamber		4
" " " Centre "		✓
Depth and Thickness of Girders		5" x $\frac{1}{2}$ "
Material of Girders		STEEL
No. of Stays in each		3
No. of Tubes, each Boiler		118 PLAIN. 36 STAY. 154 TOTAL
Size of Lower Manholes		15" x 11"



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VERTICAL DONKEY BOILERS.

No. of Boilers — Type SEE PAGES 15-23.

Greatest Int. Diar. — Height —

Height of Boiler Crown above Fire Grate —

Are Boiler Crowns Flat or Dished? —

Internal Radius of Dished Ends — Thickness of Plates —

Description of Seams in Boiler Crowns —

Diar. of Rivet Holes — Pitch — Width of Overlap —

Height of Firebox Crowns above Fire Grate —

Are Firebox Crowns Flat or Dished? —

External Radius of Dished Crowns — Thickness of Plates —

No. of Crown Stays — Diar. — Material —

External Diar. of Firebox at Top — Bottom — Thickness of Plates —

No. of Water Tubes — Ext. Diar. — Thickness —

Material of Water Tubes —

Size of Manhole in Shell —

Dimensions of Compensating Ring —

Heating Surface, each Boiler — Grate Surface —

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 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

No. of Pipes ONE

Material COPPER

Internal, Width or Diameter SEAMLESS

Internal Diar. 4 1/2

Thickness 1/4

How are Joints secured? BRAZED

Date of Hydraulic Test 4.9.18

Test Pressure 30 lbs

No. of Pipes ONE

Material COPPER

Internal, Width or Diameter SEAMLESS

Internal Diar. 4 1/2

Thickness 1/4

How are Joints secured? BRAZED

Date of Hydraulic Test 4.9.18

Test Pressure 30 lbs



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MAIN STEAM PIPES.

No. of Lengths	ONE	ONE
Material	COPPER	COPPER
Brazed, Welded or Seamless	SEAMLESS	SEAMLESS
Internal Diar.	4 1/2'	4 1/2'
Thickness	4WG	4WG
How are Flanges secured?	BRAZED	BRAZED.
Date of Hydraulic Test	4-9-28	4-9-28
Test Pressure	360/lbs	360/lbs.
No. of Lengths		
Material		
Brazed, Welded or Seamless		
Internal Diar.		
Thickness		
How are Flanges secured?		
Date of Hydraulic Test		
Test Pressure		
No. of Lengths		
Material		
Brazed, Welded or Seamless		
Internal Diar.		
Thickness		
How are Flanges secured?		
Date of Hydraulic Test		
Test Pressure		



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EVAPORATORS.

No. — Type — Tons per Day —
 Makers —
 Working Pressure — Test Pressure — Date of Test —
 Date of Test of Safety Valves under Steam —

FEED WATER HEATERS.

No. — Type —
 Makers —
 Working Pressure — Test Pressure — Date of Test —

FEED WATER FILTERS.

No. ONE Type GRAVITATION. Size 9014 SQ. INS.
 Makers CARUTHERS & CO LTD. No 309
 Working Pressure ATMOS. Test Pressure — Date of Test 14-9-28

LIST OF DONKEY PUMPS.

DESCRIPTION SIZE & MAKERS No

BALLAST PUMP 7" x 8" x 12" RAMAGE & FERGUSON. 22

SUCTIONS:- SPECIAL BILGE, BILGEMAIN, SEA, TANKS

DISCHARGES:- AUX. CONDENSER, MAIN CONDENSER, OVERBOARD, TANKS, REFRIG. N^o 23 TANKS

WATER FEED PUMP G. & J. WEIR LTD. 87753

SUCTIONS:- FLOAT TANK, FRESH WATER TANK, SEA

DISCHARGE:- MAIN CHECKS, AUX CHECKS.

GENERAL SERVICE PUMP 8" x 6" x 8" T. LAMONT 14548

SUCTIONS:- SEA, MAIN BILGE, TANKS, BOILERS.

DISCHARGE:- AUX. CONDENSER, OVERBOARD, DECK HOSE, BOILERS, D. BOILER, SANITARY.

DONKEY BOILER PUMP 4" x 2 1/4" x 5" T. LAMONT 14349

SUCTIONS:- FLOAT TANK, FRESH WATER TANK, SEA

DISCHARGE:- DONKEY BOILER

STEERING ENGINE



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LIST OF SPARE GEAR

No. of Top End Bolts.	2	No. of Bot. End Bolts.	2	No. of Cylinder Cover Studs	6
" Coupling Bolts	6	" Main Bearing Bolts	2	" Valve Chest "	6
" Junk Ring Bolts	6	" Feed Pump Valves	1 SET.	" Bilge Pump Valves	1 SET.
" H.P. Piston Rings	-	" I.P. Piston Rings	-	" L.P. Piston Rings	-
" " Springs	-	" " Springs	-	" " Springs	-
" Safety Valve "	1	" Fire Bars	1/2 SET.	" Feed Check Valves	1 MAIN 1 AUX.
" Piston Rods	-	" Connecting Rods	-	" Valve Spindles	ONE
" Air Pump Rods	-	" Air Pump Buckets	-	" Air Pump Valves	1 SET.
" Cir. "	-	" Cir. "	-	" Cir. "	1 SET.
" Crank Shafts	-	" Crank Pin Bushes	1 PAIR.	" Crosshead Bushes	-
" Propeller Shafts	-	" Propellers	ONE	" Propeller Blades	-
" Boiler Tubes	6	" Condenser Tubes	20	" Condenser Ferrules	50

OTHER ARTICLES OF SPARE GEAR:-

- 1 D. BOILER SAFETY VALVE SPRING.
- 1 " " FEED CHECK VALVE.
- 2 AIR PUMP HEAD VALVE GUARDS.
- 2 ECC. STRAP BOLTS & NUTS.
- 2 FEED PUMP VALVE SEATS.
- 2 BILGE " " "
- 9 ESCAPE VALVE SPRINGS.
- BAR & PLATE IRON. ASSORTED
- 100 ASSORTED BOLTS & NUTS.

REFRIGERATORS

No. of Machines

Quantity of each

Description

Remarks

With Drive

Without Drive

No. of Steam Cylinders and Pistons



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REFRIGERATORS.

No. of Machines *ONE* Capacity of each *15530 C.F.*Makers *J & E HALL LTD*Description *8A SINGLE VERTICAL STEAM DRIVEN CO₂.
WITH BRINE CIRCULATION.*No. of Steam Cylinders, each Machine *ONE* No. of Compressors *ONE* No. of Cranks *ONE*Particulars of Pumps in connection with Refrigerating Plant and whether worked by Refrigerating Machines
or Independently*PUMPS WORKED BY MACHINE**BALLAST PUMP TO CIRCULATE WATER IF REQUIRED.*System of Refrigeration *GRANULATED, CORK RETAINED BY WOOD LINING.*,, Insulation *IN HOLDS.*

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

Spaces? *YES*Are all Pipes, Air Trunks, &c., well secured and protected from risk of damage? *YES*Are all Bilge, Sounding, and Air Pipes in Insulated Spaces properly insulated? *YES*Are Thermometer Tubes so arranged that Water cannot enter and freeze in them? *YES.*Date of Test under Working Conditions *13-9-28.*

RESULTS OF TRIALS.

COMPARTMENT.	Temp. at beginning of Trial.	Temp. at end of Trial.	Time required to obtain this Result.	Rise of Temp. after - hours.
<i>N^o1 HOLD 'TWEEN DECK</i>	<i>58°</i>	<i>40½° F.</i>	<i>4¾ hrs.</i>	<i>NOT TAKEN</i>
<i>N^o1 " LOWER.</i>	<i>"</i>	<i>40° F.</i>	<i>"</i>	<i>" "</i>
<i>N^o4 " TWEEN DECK</i>	<i>"</i>	<i>41° F.</i>	<i>"</i>	<i>" "</i>
<i>N^o4 " LOWER.</i>	<i>"</i>	<i>42° F.</i>	<i>"</i>	<i>" "</i>

Articles of Spare Gear for Refrigerating Plant carried on board:—



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ELECTRIC LIGHTING.

Installation Fitted by TELFORD GRIER & MACKAY LTD.

No. and Description of Dynamos ONE.

Makers of Dynamos ELECTRIC CONSTRUCTION CO LTD.

Capacity " 10KW 91 Amperes, at 110 Volts, 565/650 Revols. per Min.

Current Alternating or Continuous CONTINUOUS CURRENT.

Single or Double Wire System DOUBLE WIRE SYSTEM.

Position of Dynamos STAR, SIDE LOWER PLATFORM.

" Main Switch Board " " " "

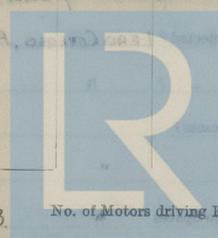
No. of Circuits to which Switches are provided on Main Switch Board SEVEN.

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.
1 NAVIGATION.	10.	VARIOUS.	4.5	7/029	1000	100%	600MEGS.
2 SALOON.	67.	30W.	18	7/036	2571	"	"
3 MIDSHIPS.	35.	30W.	10	7/029	2222	"	"
4 WIRELESS.	-	-	-	7/036	-	"	"
5 AFT.	26	30W.	7	7/029	1560	"	"
6 CARGO.	36	30W.	10	"	2222	"	"
7 ENGINE ROOM.	29	30W.	8.	"	1778.	"	"

Total No. of Lights 203. No. of Motors driving Fans, &c. No. of Heaters

Current required for Motors and Heaters



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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.**

If not, give details of the points of difference, and state when these 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.

"HORSA"

as ascertained by ^{me}me from personal examination

Robert Greig
 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.C.	Cub. ft.	:	:
--------	----------	---	---

£	:	:
---	---	---

Testing, &c.	:	:
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£	:	:
---	---	---

Expenses	:	:
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Total ... £	:	:
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It is submitted that this Report be approved,

Robert Greig
 Chief Surveyor.

Approved by the Committee for the Class of M.B.S.* on the 14th October 1928

Fees advised

Fees paid



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 Secretary.

GENERAL STATEMENT

U.S.	10.00		
U.S.	20.00		
U.S.	10.00		
Total		40.00	

It is requested that this Report be approved

[Handwritten signature]

Approved by the Committee for the Ethics of M.B.E. on the 17th day of 1952

[Large handwritten signature]



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