

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office

27 APR 1931 22 JAN 1931

Date of writing Report

15 January 1931

When handed in at Local Office

Port of London

No. in

Reg. Book.

35211

Survey held at

Barrow

Date: First Survey

19th Dec. 1930

Last Survey

13th February 1931

(No. of Visits

9

on the Refrigerating Machinery and Appliances of the

Vessel "Strathaird"

Tons

Gross 225.744

Net 136.21

Vessel built at

Barrow

By whom built

Vickers Armstrongs Ltd

and No.

664

When built

1931

Owners

P.O. Stm. nav Co

Port belonging to

London

Voyage

Australia

Refrigerating Machinery made by

J. E. Hall Ltd.

Machine No.

8421
8422
8423

When made

1931

Insulation fitted by

Vickers-Armstrongs Ltd

When fitted

1932

System of Refrigeration

CO₂ + Brine

Method of cooling Cargo Chambers

Brine Grids

Insulating Material used

Slab & Granulated Cork

Number of Cargo Chambers insulated

8

Total refrigerated cargo capacity

156,000

cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY.

Where placed on tank top fore of Eng. Rm.

Refrigerating Units, No. of

3

Single, double, or triple

Single

Cubic feet of air delivered per hour

Total refrigeration or ice-melting capacity in tons per 24 hours

144

Are all the units connected to all the refrigerated chambers

yes

Compressors, driven direct or through

single
double

reduction gearing.

Compressors, single or double acting

single

No. of cylinders

3 per mach.

Diameter of cylinders

3 5/16"

Diameter of piston rod

1 5/8"

Length of stroke

4"

No. of strokes per minute

345 each

Motive Power supplied from

Electric motors - direct coupled.

Steam Engines, high pressure, compound, or triple expansion, surface condensing.

No. of cylinders

Diameter

Length of stroke

22"

Working pressure

Diameter of crank shaft journals and pins

5"

Breadth and thickness of crank webs

3 1/2" x 3 1/8"

No. of sections in crank shaft

one

Revolutions of engines per minute

CO₂ machine 345

Oil Engines, type

✓

2 or 4 stroke cycle

✓

Single or double acting

✓

B.H.P.

✓

No. of cylinders

✓

Diameter

✓

Length of stroke

✓

Span of bearings as per Rule

✓

Maximum pressure in cylinders

✓

Diameter of crank shaft journals and pins

✓

Breadth and thickness of crank webs

✓

No. of sections in crank shaft

✓

Revolutions of engine per minute

✓

Electric Motors, type

Enclosed drip proof

No. of

1 per mach.

Rated

95 H.P.

Kilowatts

Volts at

220 at 345

revolutions per minute.

Diameter of motor shafts at bearings

Reduction Gearing, maximum shaft horse power at 1st pinion

Revolutions per minute at full power at 1st pinion

2nd pinion

1st reduction wheel

main shaft

Pitch circle diameter, 1st pinion

2nd pinion

1st reduction wheel

Main wheel

Width of face, 1st reduction wheel

Main wheel

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings, 1st pinion

2nd pinion

1st reduction wheel

Main wheel

Flexible pinion shafts, diameter 1st

2nd

Pinion shafts, diameter at bearings, External, 1st

2nd

Internal, 1st

2nd

Diameter at bottom of teeth of pinion, 1st

2nd

Wheel shafts, diameter at bearings, 1st

Main

Diameter at wheel shroud, 1st

Main

Gas Condensers, No. of

1 per mach.

Cast iron or steel casings

cast iron

Cylindrical or rectangular

cylindrical

No. of coils in each

9

Material of coils

S.D. Copper 3/4" x 1 1/2" d

Can each coil be readily shut off or disconnected

yes

Water Circulating Pumps, No. and size of

2 - 4" centri

how worked

electrically

Gas Separators, No. of

6

Gas Evaporators, No. of

1 per mach

Cast iron or steel casings

steel

Pressure or gravity type

pressure

No. of coils in each casing

8

Material of coils

S.D. Steel 1 1/2" x 1 5/8" d

Can each coil be readily shut off or disconnected

yes

Direct Expansion or Brine Cooled Batteries, No. of

Air blown over side grids in tween decks + holds

Are there two separate systems, so that one may be in use while the other is being

cleared of snow

✓

No. of coils in each battery

✓

Material of coils

✓

Can each coil be readily shut off or

disconnected

✓

Total cooling surface of battery coils

35,000

Is a watertight tray fitted under each battery

✓

Air Circulating Fans, Total No. of

2 - 20" do each of

2,100

cubic feet capacity, at

1,600

revolutions per minute

Steam or electrically driven

electrically

Where spare fans are supplied are these fitted in position ready for coupling up

Brine Circulating Pumps, No. and size of, including the additional pump

3 - 4" centrifugal

how worked

electrically

Brine Cooling System, closed or open

open

Are the pipes and tanks galvanised on the inside

no

No. of brine sections in each chamber

N° 2 hold = 11, N° 3 hold = 12, N° 2 Lwr Dk. = 9

N° 3 Lwr Dk. = 6, Special cargo = 2 sections to each of 4 chambers.

Can each section be readily shut off or disconnected

yes

Are the control valves situated in an easily accessible position

yes

NOTE.—THE WORDS WHICH DO NOT APPLY SHOULD BE DELETED.

Im12.23.—T.

See
alteration
1938/39

003659-003670-003012

Lloyd's Register
Foundation

Are thermometers fitted to the outflow and to each return brine pipe yes Where the tanks are closed are they ventilated as per Rule Open Tank
Where the tanks are not closed is the compartment in which they are situated efficiently ventilated Yes
Steam Condensing Plant. State what provision is made for condensing steam, in terms of Section 4, Clauses 13 and 14 Electrical

HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
ENGINE CYLINDERS (IF TESTED)	16-1-31					
GAS COMPRESSORS	23-1-31	1000 lb. □	3000 lb. □	1500 lb. □	B4	
" SEPARATORS	13-2-31	do.	do.	do.	B4	
" CONDENSER COILS	20-1-31	do.	do.	do.	B4	
" EVAPORATOR COILS	16-1-31	do.	do.	do.	B4	
" CONDENSER HEADERS AND CONNECTIONS	19-12-31	do.	do.	do.	B4	
" CONDENSER CASINGS	5-2-31	1500 lb. □	30 lb. □	-	B4	
" EVAPORATOR CASINGS	11-2-31	20 to 25 lb. □	50 lb. □	-	B4	
NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE	12/19/10/31					Valid by Hydraulic pressure to 1000 lb. pressure
BRINE PIPING AFTER ERECTION IN PLACE	10/11/31	15 lb. □	90 lb.	-	-	to 1000 lb. pressure

Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory Yes
Dates of test 23rd and 26th November 1931 Density of Brine 48 by Wardle hydrometer
Temperatures (when the cargo chambers are cooled down to the required test temperatures) of air at the snow box and of the return air ✓ & ✓
or, delivery and return air at direct expansion or brine cooled batteries ✓ & ✓, outflow and return brine - 4° F & - 6° F
atmosphere 50° F cooling water inlet and discharge 44° F & 51° F gas in condensers 65° and evaporators - 12° F
the average temperature of the refrigerated chambers 8° F and the rise of temperature in these chambers upon the expiration of 24 hours
time after the machinery and cooling appliances have been shut off 14.6° F

SPARE GEAR.

Are the machines in accordance with Section 4, Clause 2 of the Rules Yes

Are the working parts of the machines, pumps and motors respectively, interchangeable Yes

ARTICLES SUPPLIED AS PER RULE.

1 Crankshaft
3 pistons & rods for compressor
1 set of piston rings for each compressor piston
1 impeller and shaft for water circulating pump
1 do do do
1 additional brine pump in engine room
2 pair bolts & nuts for connecting rod big ends
2 do do do
2 do do do
1 set of 2 leather moulds
12 lengths each $1\frac{1}{2}$ " x $1\frac{1}{2}$ " N.P. piping & 3 bends each size
12 sockets and backnuts each size $1\frac{1}{2}$ " x $1\frac{1}{2}$ "
2 pair CO₂ pipe flanges
1 set of ratchet discs to screw $1\frac{1}{2}$ " x $1\frac{1}{2}$ " pipes & taps
Sundry brine cocks & valves
Assorted bolts & nuts
1 regulator spindle
6 lubricator piston leathers
6 do do do
2 sets copper joint rings throughout
1 extra set do do
1 set special metal rings for each comp. gland

ADDITIONAL SPARE GEAR SUPPLIED.

1 set suction seats, valves & springs
1 set delivery do do
24 addl springs for comp. valves
3 springs for water relief valves
3 do do do
3 do CO₂ safety valves
1 pair crank pin shells and N.M.
1 pair crosshead brasses
1 pump for pressure lubricator
24 safety valve discs
1 leather cutter
2 CO₂ pressure gauges
2 hydrometers
6 brass cased thermometer
1 length copper gauge pipe
2 CO₂ gauge valves with 6 spare pipes
4 gas charging valves
4 valves for separator drain
2 N° 2 Wells oil filter
1 pair rings for brine pipe connection
1 fitted bolt
3 coupling bolts & 3 sets leather washers for machine coupling

ELECTRICAL SPARES.

MACHINE MOTORS

1 Armature packed for storage
1 set brushes for each motor
1 set brush holders
1 complete interior for controller

BRINE & WATER PUMP MOTORS

1 Armature packed for storage
1 set brushes for each motor
1 set brush holders
1 complete interior of controller

FAN MOTORS EACH SIZE.

1 spare armature packed
1 set brushes for each motor
1 set brush holders
1 complete interior of controller

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

The foregoing is a correct description of the Refrigerating Machinery.

FOR J. & E. HALL LTD

Manufacturer.

Chicheston

DESCRIPTION OF INSULATION.

IN LOWER HOLD CHAMBERS.

IN 'TWEEN DECK CHAMBERS.

BULKHEADS.

		Air Space.	Outer Lining.	Non-conducting Material.	Thickness of ditto.	Inner Lining.		Air Space.	Outer Lining.	Non-conducting Material.	Thickness of ditto.	Inner Lining.
FRAME No. _____	A											
(Fore Peak)	F											
FRAME No. 201	A	✓	✓	Gran Cork	13"	1 1/4" 44 lb. 4P	✓	✓	Gran Cork	8"	1 1/4" 44 lb. 4P	
FRAME No. 144	F	✓	✓	"	13"	"	✓	✓	"	4"	"	
	A	✓	✓	"	4"	"	✓	✓	"	4"	"	
FRAME No. 164	F						✓	✓	"	5"	"	
	A						✓	✓	"	4"	"	
FRAME No. 156	F	✓	✓	Gran Cork	10"	1 1/4" 44 lb. 4P	✓	✓	"	8"	"	
(Better Room)	A			Gran Cork	10" 44 lb. 4P							
FRAME No. _____	A											
(Engine Room)	F											
FRAME No. _____	A											
FRAME No. _____	F											
	A											
FRAME No. _____	F											
	A											
FRAME No. _____	F											
	A											
FRAME No. _____	F											
(After Peak)	F											
SIDES				Gran Cork	11"	1 1/4" 44 lb. 4P	✓	✓	Gran Cork	11"	1 1/4" 44 lb. 4P	
OVERHEADING				"	9"	"			"	9"	"	
FLOORS OF CHAMBERS		1 1/2"	1 1/4" 44 lb. 4P	"	8"	2 1/2" 4P			2 1/2" Oregon Pine Deck Plating			
TRUNK HATCHWAYS												
THRUST RECESS, SIDES AND TOP												
TUNNEL SIDES AND TOP												
TUNNEL RECESS, FRONT AND TOP												

FRAMES OR REVERSE FRAMES, FACE 1" Cork and 1 1/4" 4P
BULKHEAD STIFFENERS, TOP ✓ BOTTOM ✓ AND FACE 1" Cork and 1 1/4" 4P
RIBBAND ON TOP OF DECKS 2 1/2" Oregon Pine
SIDE STRINGERS, TOP ✓ BOTTOM ✓ AND FACE ✓
WEB FRAMES, SIDES ✓ AND FACE ✓
BRACKETS, TOP 6" Gran Cork and 5" 4P BOTTOM ✓ AND FACE ✓
INSULATED HATCHES, MAIN 6" Gran Cork & Pitch Pine BILGE 6" Gran Cork & Pitch Pine MANHOLE 6" Gran Cork & Pitch Pine
HATCHWAY COAMINGS, MAIN Pitch Pine faced with Galv. Iron BILGE Pitch Pine & Sheet Zinc
HOLD PILLARS 1" Galv. Cork and 1 1/4" 4P Also 1" Velt and 2 1/2" Manila rope
MASTS ✓ VENTILATORS 8" Gran Cork and 1 1/4" 4P
Are insulated plugs fitted to provide easy access to bilge suction roses Yes tank, air, and sounding pipes Yes heels of pillars Yes
and manhole doors of tanks Yes Are insulated plugs fitted to ventilators Yes cargo ports None and side lights None
Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected Yes if so, how 2" Elm doubling

Oil Storage Tanks, where adjacent to the insulated chambers, state what provision has been made for ventilating the air space between the insulation and the bulkhead plating None adjacent to Chambers

Coal Bunker Bulkheads, and Brine Outflow and Return Pipes passing through coal bunkers. Is the insulation, so far as practicable, fireproof None

Where Cooling Pipes pass through watertight bulkheads or deck plating, are the fittings and packing of the stuffing boxes both watertight and fireproof Yes

Cargo Battens, Dimensions and spacing, sides 2" x 3" x about 11" floors 3" x 3" x about 11" tunnel top ✓
fixed or portable Both Are screens fitted over the brine grids at chamber sides Yes hinged or permanently fixed Portable

Thermometer Tubes, No. and position in each chamber 4 in each compartment supplemented by Electrical thermometer
diameter 2 1/2" Galvanised are they fitted in accordance with Section 3, Clause 8 Yes

Protection of Pipes. Are all pipes, including air and sounding pipes, which pass through or into insulated chambers, well insulated Yes

Draining Arrangements. Where the chambers are situated below the load water line, what provision is made for draining the inside of the chambers Brine traps & Scuppers Where sluices, scupper pipes, and drain pipes are fitted are means provided for blanking them off Yes

What provision is made for draining the refrigerating machinery room Into pump direct and main suction

brine return room Scuppers fan room Scuppers water circulating pump room ✓

Are all air spaces behind insulation arranged to drain to the bilges, bilge wells, or gutterways of the respective chambers ✓

© 2020

Lloyd's Register Foundation

Sounding Pipes, No. and position in each chamber situated below the load water line *Three in lower hold at Aft end: two on deck by the main cabin*
Diameter *2 1/2"* Are all sounding pipes in way of insulated chambers fitted in accordance with Section 3, Clause 11 *Yes*
Are all wood linings tongued and grooved *Yes or 1/2 checked* Are cement facings reinforced with expanded steel lattice *Yes*
How is the expanded metal secured in place *Staples*
How are the cork slabs secured to the steel structure of the vessel *Jambled and Stapled to Grounds and adjacent Slabs*
Air Trunkways in Chambers, inside dimensions, main *Screen over line ends* and branch *✓*
Are they permanently fixed or collapsible, or portable *Portable* State position in chambers *Sides & Ends*
Where air trunkways pass through watertight bulkheads, are they fitted with watertight doors *None* Are the door frames efficiently insulated *✓*
Are insulated plugs supplied for the doorways *✓* Where are the doors worked from *✓*
Cooling Pipes in Chambers, diameter *1 3/4"* Are they galvanised externally *No*
How are they arranged in the chambers *Overhead, Sides and Ends*
Thawing Off, what provision is made for removing the snow from the cooling pipes in the chambers *Warm Brine*

The foregoing is a correct description of the Insulation and Appliances.

J. Callander Builders.
DIRECTOR.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery *No* and Insulation *Yes*
(If not, state date of approval)
Is the Refrigerating Machinery and Appliances duplicate of a previous case *Yes* If so, state name of vessel *"Shetland"*
If the survey is not complete, state what arrangements have been made for its completion and what remains to be done *Complete*
Barrow Survey Dates: ~ 1931 ~ March 12, April 13, 29, June 2, 26, July 15, 31, August 24, Sept 25, Oct 12, 19,
Nov 5, 25, 26, Dec 8, Jan. 4, 6, 12, 14, (17 visits)

General Remarks (State quality of workmanship, opinions as to class, &c.) *The refrigerating machinery has been constructed under special survey and the materials and workmanship are good.*

*The machinery and Insulation has been efficiently fitted on board. The tests have been carried out in accordance with the Rules and proved satisfactory. In our opinion the vessel is eligible to have the notation of *Lloyd's R.M.C. 1.32* made in the Register Book.*

It is submitted that this vessel is eligible for THE RECORD.

+ Lloyd's R.M.C. 1.32.

My

22/1/32

22/1/32

CERTIFICATE WRITTEN 22.1.32

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					System of (1) Refrigerating (2) Insulating the Chambers.	POWER.		INSULATED CARGO CHAMBERS.	
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.		Cubic feet of air delivered per hour.	Ice melting capacity per 24 hours. Tons.	No.	Capacity. Cubic ft.
<i>3</i>	<i>9</i>	<i>Carbide</i>	<i>J. E. Hall Ltd.</i>	<i>1931</i>	<i>(1) Brine (2) Cork</i>	<i>✓</i>	<i>14.4</i>	<i>8</i>	<i>156,000</i>

LON. A/c 16-0-0
BRW. A/c 13-0-0
Fee *£ 18* : : : *{ Fee applied for 21st Jan 1932*
LETTER BRW 27/4/31
Travelling Expenses *£* : : : *{ Received by me, 22-1-1932*

D. Gemmell, & Co. Ltd.
Surveyor to Lloyd's Register.

Committee's Minute *TUE. 26 JAN 1932.*

Assigned *+ Lloyd's R.M.C. 1.32*



© 2020

Lloyd's Register
Foundation