

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office 12 MAR 1925)

Date of writing Report 12 MAR 1925

When handed in at Local Office 12 MAR 1925

Port of London & Belfast

No. in

Reg. Book. 90331

Survey held at

Dartford

Date: First Survey 10th November 1924

Last Survey 6 February 1925

(No. of Visits)

NINE

on the Refrigerating Machinery and Appliances of the Port-Dunedin

Vessel built at Belfast

By whom built Workman, Clark & Co. Ltd.

Yard No. 477

When built 1925

Owner Commonwealth & Dominion Line

Port belonging to London

Voyage Australia

Refrigerating Machinery made by J. & C. Hall Ltd. Dartford

Machine No. 6019

When made 1925

Insulation fitted by Workman, Clark & Co. Ltd. When fitted 1925

System of Refrigeration C. & P. Brind

Method of cooling Cargo Chambers Brine Grids, Air Blower

Insulating Material used Granulated Cork

Number of Cargo Chambers insulated 8

Total refrigerated cargo capacity 328,000 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY.

Where placed 2nd Flt Aft Main Eng Room

Refrigerating Units, No. of 2

Single, double, or triple

Single

Cubic feet of air delivered per hour 14,400

Total refrigeration or ice-melting capacity in tons per 24 hours 120 tons

Are all the units connected to all the refrigerated chambers yes

Compressors, driven direct or through

reduction gearing

Compressors, single or double acting

Double Acting

No. of cylinders 2 per machine

Diameter of cylinders 4"

Diameter of piston rod 2"

Length of stroke 12

No. of strokes per minute 300

Motive Power supplied from

Three (Diesel) oil engines direct coupled to D.C. generators.

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

No. of cylinders

Diameter

Length of stroke

Working pressure

Diameter of crank shaft journals and pins

Breadth and thickness of crank webs

No. of sections in crank shaft

Revolutions of engine per minute

Oil Engines, type

2 or 4 stroke cycle

Single or double acting

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

Open Type

No. of 1 per machine

Rated 110 B.H.P.

Kilowatts

Volts at 220 Volts 2/50

revolutions per minute

Diameter of motor shafts at bearings

5 1/2"

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 machine

Cast iron or steel casings

Cast Iron

Cylindrical or rectangular

Rectangular

No. of coils in each 15

Material of coils

3" x 1" S.D. Copper

Can each coil be readily shut off or disconnected

Yes

Water Circulating Pumps, No. and size of 1 per machine

how worked

Electric motor

Gas Separators, No. of 1 per machine

Gas Evaporators, No. of 1 per machine

Cast iron or steel casings

Steel Circular

Pressure or gravity type

Pressure

No. of coils in each casing 8

Material of coils

1" x 1 1/2" S.D. Steel

Can each coil be readily shut off or disconnected

Yes

Direct Expansion or Brine Cooled Batteries, No. of

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

Is a watertight tray fitted under each battery

Air Circulating Fans, Total No. of 20

each of 4900

cubic feet capacity, at 550

revolutions per minute

Steam or electrically driven

Electrically Direct Coupled

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

20

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

how worked

D.C. to electric motor

motor driven thru worm gearing

Brine Cooling System, closed or open

Open

Are the pipes and tanks galvanised on the inside

20

No. of brine sections in each chamber

8 = 2° 1 T.D.

9 = 2° 1 Hold

11 = 2° 2 T.D.

11 = 2° 2 Hold

9 = 2° 4 T.D.

11 = 2° 4 Hold

2 = 2° 4 Room Port

2 = 2° 4 Room Starboard

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.

Im 521-T

004881-004886-0065 1/2

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 yes

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.

Electric Motor Driven Plant

HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
ENGINE CYLINDERS (IF TESTED)						
GAS COMPRESSORS	28-1-25	1000 lbs	3000 lbs	1500 lbs		
SEPARATORS	6-2-25	do	do	do		
CONDENSER COILS	10-11-24	do	do	do		
EVAPORATOR COILS	14-11-24	do	do	do		
CONDENSER HEADERS AND CONNECTIONS	18-12-24	do	do	do		
CONDENSER CASINGS	1-1-25	do	do	do		
EVAPORATOR CASINGS	6-1-25	5 to 10 lbs	25 lbs			
NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE	8-1-25	20 to 25 lbs	50 lbs			
BRINE PIPING AFTER ERECTION IN PLACE	April 1st 5 May 1925	18 lbs		90 lbs		also examined fitted

Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory yes

Dates of test May 1st & 5th 1925 Density of Brine 50 by W. A. D. L. 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 -9°F & -5°F

atmosphere 62°F cooling water inlet and discharge 53°F & 54°F gas in condensers 68°F and evaporators -19°F

the average temperature of the refrigerated chambers 65°F and the rise of temperature in these chambers upon the expiration of few hours

time after the machinery and cooling appliances have been shut off 10°F

SPARE GEAR.

ARTICLES SUPPLIED AS PER RULE.

ADDITIONAL SPARE GEAR SUPPLIED.

- 1- Crank shaft
- 2- Sets of rings for compressor pistons
- 3- Pistons & rods for compressors complete
- 4- Additional brine pumps fitted in Engine Room
- 5- Bolts & nuts for main bearings
- 6- Bolts & nuts for connecting rod big end
- 7- Impeller & spindle for water circulating pump (see spec. for Ballast per circulator)
- 8- Set of valves for V.D. Brine Pump
- 9- Plugger & valve for do do
- 10- Set of 2 leather moulds
- 11- Lengthy each of 1/4" 9 1/2" N.I. Piping
- 12- N.I. bends each 1/4" 9 1/2" bore
- 13- N.I. sockets & backnuts each 1/4" 9 1/2" pipe
- 14- Set of 4 valves, seats & gaskets for compressors
- 15- Set of 4 valves, seats & gaskets for compressors
- 16- Set of 4 valves, seats & gaskets for compressors
- 17- Set of 4 valves, seats & gaskets for compressors
- 18- Set of 4 valves, seats & gaskets for compressors
- 19- Set of 4 valves, seats & gaskets for compressors
- 20- Set of 4 valves, seats & gaskets for compressors
- 21- Set of 4 valves, seats & gaskets for compressors
- 22- Set of 4 valves, seats & gaskets for compressors
- 23- Set of 4 valves, seats & gaskets for compressors
- 24- Additional springs for compressors
- 25- Ends for guiding in temp. valve
- 26- Springs for water relief valve
- 27- " " " " " " " "
- 28- " " " " " " " "
- 29- " " " " " " " "
- 30- " " " " " " " "
- 31- " " " " " " " "
- 32- " " " " " " " "
- 33- " " " " " " " "
- 34- " " " " " " " "
- 35- " " " " " " " "
- 36- " " " " " " " "
- 37- " " " " " " " "
- 38- " " " " " " " "
- 39- " " " " " " " "
- 40- " " " " " " " "
- 41- " " " " " " " "
- 42- " " " " " " " "
- 43- " " " " " " " "
- 44- " " " " " " " "
- 45- " " " " " " " "
- 46- " " " " " " " "
- 47- " " " " " " " "
- 48- " " " " " " " "
- 49- " " " " " " " "
- 50- " " " " " " " "
- 51- " " " " " " " "
- 52- " " " " " " " "
- 53- " " " " " " " "
- 54- " " " " " " " "
- 55- " " " " " " " "
- 56- " " " " " " " "
- 57- " " " " " " " "
- 58- " " " " " " " "
- 59- " " " " " " " "
- 60- " " " " " " " "
- 61- " " " " " " " "
- 62- " " " " " " " "
- 63- " " " " " " " "
- 64- " " " " " " " "
- 65- " " " " " " " "
- 66- " " " " " " " "
- 67- " " " " " " " "
- 68- " " " " " " " "
- 69- " " " " " " " "
- 70- " " " " " " " "
- 71- " " " " " " " "
- 72- " " " " " " " "
- 73- " " " " " " " "
- 74- " " " " " " " "
- 75- " " " " " " " "
- 76- " " " " " " " "
- 77- " " " " " " " "
- 78- " " " " " " " "
- 79- " " " " " " " "
- 80- " " " " " " " "
- 81- " " " " " " " "
- 82- " " " " " " " "
- 83- " " " " " " " "
- 84- " " " " " " " "
- 85- " " " " " " " "
- 86- " " " " " " " "
- 87- " " " " " " " "
- 88- " " " " " " " "
- 89- " " " " " " " "
- 90- " " " " " " " "
- 91- " " " " " " " "
- 92- " " " " " " " "
- 93- " " " " " " " "
- 94- " " " " " " " "
- 95- " " " " " " " "
- 96- " " " " " " " "
- 97- " " " " " " " "
- 98- " " " " " " " "
- 99- " " " " " " " "
- 100- " " " " " " " "

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED	Machine	Motor	Ant. Term. pump	V.D. Brine pump	San. Motor
Armature in time lined case	1	1	1	1	1
Set of field coils	1	1	1	1	1
Brush holder	1	1	1	1	1
Set of brushes	1	1	1	1	1
Set of brushes	1	1	1	1	1
Set of starter spars	1	1	1	1	1

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

The foregoing is a correct description of the Refrigerating Machinery.

FOR J. & E. HALL LTD Manufacturer.

Chiefton
DIRECTOR

DESCRIPTION OF INSULATION.

		IN LOWER HOLD CHAMBERS.					IN TWEEN DECK CHAMBERS.				
		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. 168 (Fore Peak)	A	✓	✓	Granulated Cork	11"	1 1/4"	✓	✓	Granulated Cork	11"	1 1/4"
FRAME No. 134	F	✓	✓	do	12 1/2"	1 1/4"	✓	✓	do	6"	1 1/4"
	A	✓	✓	do	4"	1 1/4"	✓	✓	do	6"	1 1/4"
FRAME No. 106	F	✓	✓	do	11 1/2"	1 1/4"	✓	✓	do	11"	1 1/4"
	A	none									
FRAME No. (Boiler Room)	F	✓									
	A	✓									
FRAME No. 161 (Engine Room)	A	✓	✓	do	11"	1 1/4"	✓	✓	Cork slabs Cement	11"	Cement
	F	✓	✓	do	12 1/2"-11"	1 1/4"	✓	✓	Granulated Cork	11"	1 1/4"
FRAME No. 31	A	none									
FRAME No.	F	✓									
	A	✓									
FRAME No.	F	✓									
	A	✓									
FRAME No. (After Peak)	F	✓	✓	do	11 1/2" x 10 1/2"	1 1/4"	✓	✓	Granulated Cork	10 1/2"	1 1/4"
SIDES		✓	✓	do	10 1/2"	3/4" x 1"	✓	✓	do	10"	3/4" x 1"
OVERHEADING		none	✓	do	7"	2 1/2"	✓	✓	do	✓	✓
FLOORS OF CHAMBERS		2"	1 1/2" x 1/2"	do	5 1/2"	2 1/2"	✓	✓	do	✓	✓
TRUNK HATCHWAYS							none				
THRUST RECESS, SIDES AND TOP							✓	✓	do	10"	3" P.P.
TUNNEL SIDES AND TOP							✓	✓	do	10"	3" P.P.
TUNNEL RECESS, FRONT AND TOP							none				

FRAMES OR REVERSE FRAMES, FACE

BULKHEAD STIFFENERS, TOP insulated by insulation BOTTOM do AND FACE do

RIBBAND ON TOP OF DECKS 3" P.P. 3'-8" 4'-3'-0"

SIDE STRINGERS, TOP 3" Gran. Cork BOTTOM 3" Gran. Cork AND FACE 2" Gran. Cork

WEB FRAMES, SIDES none AND FACE

BRACKETS, TOP insulated by insulation BOTTOM do AND FACE do

INSULATED HATCHES, MAIN 6" Cork slabs BILGE 4 1/2" slab cork MANHOLE 4" in NE 1 x 2, 6" in NE 4.

HATCHWAY COAMINGS, MAIN P. Pine & steel BILGE Pitch pine

HOLD PILLARS Yellow 2" P. Pine

MASTS none in chambers VENTILATORS none in chambers, spars below.

Are insulated plugs fitted to provide easy access to bilge suction roses yes tank, air, and sounding pipes yes heels of pillars hills spaced 40.

and manhole doors of tanks yes Are insulated plugs fitted to ventilators yes cargo ports yes 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 1 1/2" Elm in holds. 3" P.P. tunnel.

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 not adjacent

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 1/2" x 2 1/2" x 12" space floors 3" x 3" x 12" space tunnel top 3" x 3" x 15" space

fixed or portable fixed bottom portable Are screens fitted over the brine grids at chamber sides tunnel only hinged or permanently fixed fixed

Thermometer Tubes, No. and position in each chamber Nº 1 hold. 1 tube 8' 4" high. Nº 2 hold. 1 tube 8' 4" high. Nº 3 hold. 1 tube 8' 4" high. Nº 4 hold. 1 tube 8' 4" high.

diameter 2 1/2" inside 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

syphon suckers to bilge 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 bulkhead suckers

brine return room bulkhead suckers fan room ✓ water circulating pump room bulkhead suckers

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

Lloyd's Register
Foundation