

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office)

JUL 1936

Date of writing Report

6 JUL 1936

When handed in at Local Office

6 JUL 1936

Port of London

No. in

Reg. Book.

29677

79883

Survey held at Darford

Date: First Survey

12th May

Last Survey

11th June 1936

(No. of Visits)

SEVEN

on the Refrigerating Machinery and Appliances of the

S.S. "MASULA"

Tons

Gross 7326

Net 4566

Vessel built at

Glasgow

By whom built

Barclay Currier & Co. Ltd.

Yard No.

When built 1919-6

Owners

British India Steam Nav. Co. Ltd.

Port belonging to

Glasgow

Voyage

Refrigerating Machinery made by

J. E. Hall Ltd.

Machine No.

9507

When made

1936

Insulation fitted by

When fitted

System of Refrigeration CO₂ + Brine

Method of cooling Cargo Chambers

Brine Grids and Air Circles

Insulating Material used

Number of Cargo Chambers insulated

5

Total refrigerated cargo capacity

19,170

cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY.

Where placed Main dk - P & S of eng casing

Refrigerating Units, No. of

2

Single, double, or triple

Cubic feet of air delivered per hour

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

21½

Are all the units connected to all the refrigerated chambers

yes

Compressors, driven direct or through

singlereduction gearing

Compressors, single or double acting

double

No. of cylinders

2

Diameter of cylinders

3½"

Diameter of piston rod

1½"

Length of stroke

9"

No. of strokes per minute

240

Motive Power supplied from

Steam engine thro' two throw crankshaft

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

No. of cylinders

2

Diameter

12"

Length of stroke

9"

Working pressure

Diameter of crank shaft journals and pins

5"

Breadth and thickness of crank webs

7" x 3¼"

No. of sections in crank shaft

one

Revolutions of engines per minute

135

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

No. of

Rated

Kilowatts

Volts at

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

2

Cast iron or steel casings

cast iron

Cylindrical or rectangular

rectangular

No. of coils in each

3

Material of coils

S.D. Copper ¾" x 1" o.d.

Can each coil be readily shut off or disconnected

yes

Water Circulating Pumps, No. and size of

one 6" x 4" x 8" V.D.

how worked

steam direct

Gas Separators, No. of

4

Gas Evaporators, No. of

2

Cast iron or steel casings

steel

Pressure or gravity type

pressure

No. of coils in each casing

6

Material of coils

S.D. Steel 1" x 1½" o.d.

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

4 - 14"

each of

1750

cubic feet capacity, at

2500

revolutions per minute

Steam or electrically driven

electrically

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

no

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

2 - 5" x 6" x 6" V.D.

how worked

steam direct

Brine Cooling System, closed or open

open

Are the pipes and tanks galvanised on the inside

no

No. of brine sections in each chamber

2 for centre spaces + 1 each for other 4 spaces

Can each section be readily shut off or disconnected

yes

Are the control valves situated in an easily accessible position

yes

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

| HYDRAULIC AND OTHER TESTS. | | | | | | |
|--|---------------|-------------------|--------------------------|--------------------|----------|----------|
| DESCRIPTION. | Date of Test. | Working Pressure. | Hydraulic Test Pressure. | Air Test Pressure. | Stamped. | REMARKS. |
| ENGINE CYLINDERS (IF TESTED) | 21-5-36 | | 350 lbs | | Bl | |
| GAS COMPRESSORS | 11-6-36 | 1000 lbs | 3000 lbs | 1500 lbs | Bl | |
| " SEPARATORS | 9-6-36 | do. | do. | do. | Bl | |
| " CONDENSER COILS | 15-5-36 | do. | do. | do. | Bl | |
| " EVAPORATOR COILS | 19-5-36 | do. | do. | do. | Bl | |
| " CONDENSER HEADERS AND CONNECTIONS | 12-5-36 | do. | do. | do. | Bl | |
| " CONDENSER CASINGS | 8-6-36 | do. | do. | do. | Bl | |
| " EVAPORATOR CASINGS | 9-6-36 | do. | do. | do. | Bl | |
| NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE | 4-6-36 | 5 to 10 lbs | 20 lbs | | Bl | |
| BRINE PIPING AFTER ERECTION IN PLACE... | 11-6-36 | 20-25 lbs | 50 lbs | | Bl | |

Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory
Dates of test Density of Brine by 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 &
atmosphere cooling water inlet and discharge & gas in condensers and evaporators
the average temperature of the refrigerated chambers and the rise of temperature in these chambers upon the expiration of hours
time after the machinery and cooling appliances have been shut off

SPARE GEAR.
Are the machines in accordance with Section 4, Clause 2 of the Rules
Are the working parts of the machines, pumps and motors respectively, interchangeable

| ARTICLES SUPPLIED AS PER RULE. | ADDITIONAL SPARE GEAR SUPPLIED. |
|---|---|
| 1 piston & rod for each compressor with rings 1 bucket & rod for C.W. pump. 1 set valves & springs for same 1 set steam piston rings for same 1 addl. brine pump fitted in engine room 1 set valves and springs for steam piston rings for brine pump. 2 bolts & nuts for comp. rod big end. 2 do. do. engine crosshead. 2 do. do. comp. do. 2 do. do. main bearings 12 lubricator piston leather 12 do. gland do. 1 set of 2 leather moulds. 3 lengths W.I. piping 1 1/4" & 1 1/2" bore 3 W.I. bends do. 6 sockets & 2 back nuts do. do. 1 set ratchet screwing dies for 1 1/4" & 1 1/2" pipe Sundry brine cocks 1 regulator valve spindle Assorted bolts & nuts 2 pair CO ₂ pipe flanges 2 sets copper joint rings for comp. joints 1 do. do. for other joints 2 sets special metal rings for each comp. gland. | 2 sets each of 4 valves & springs 8 addl. springs for compressor 2 springs for hydro. relief valve 2 do. for brine do. do. 2 springs for CO ₂ safety valve 1 pump for pressure lubricator 1 CO ₂ gauge 1 hydrometer 2 brass cased thermometers 6 safety discs 1 - 1/2" CO ₂ valve 3 - spare pipe for same. 1 fitted box for comp. parts. |

ELECTRICAL SPARES.
1 Motor complete
1 Set of brushes
1 Set brush holder
1 Set starter spares
For each size fan motor.

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED
The foregoing is a correct description of the Refrigerating Machinery.

J. & E. HALL, LTD.
Chichester.
DIRECTOR
Manufacturer.

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. (Fore Peak) | A | | | | | | | | | |
| FRAME No. | F | | | | | | | | | |
| FRAME No. | A | | | | | | | | | |
| FRAME No. | F | | | | | | | | | |
| FRAME No. | A | | | | | | | | | |
| FRAME No. | F | | | | | | | | | |
| FRAME No. (Boiler Room) | A | | | | | | | | | |
| FRAME No. (Engine Room) | A | | | | | | | | | |
| FRAME No. | F | | | | | | | | | |
| FRAME No. | A | | | | | | | | | |
| FRAME No. | F | | | | | | | | | |
| FRAME No. | A | | | | | | | | | |
| FRAME No. | F | | | | | | | | | |
| FRAME No. | A | | | | | | | | | |
| FRAME No. (After Peak) | F | | | | | | | | | |
| SIDES | | | | | | | | | | |
| OVERHEADING | | | | | | | | | | |
| FLOORS OF CHAMBERS | | | | | | | | | | |
| TRUNK HATCHWAYS | | | | | | | | | | |
| THRUST RECESS, SIDES AND TOP | | | | | | | | | | |
| TUNNEL SIDES AND TOP | | | | | | | | | | |
| TUNNEL RECESS, FRONT AND TOP | | | | | | | | | | |

FRAMES OR REVERSE FRAMES, FACE
BULKHEAD STIFFENERS, TOP BOTTOM AND FACE
RIBBAND ON TOP OF DECK
SIDE STRINGERS, TOP BOTTOM AND FACE
WEB FRAMES, SIDES AND FACE
BRACKETS, TOP BOTTOM AND FACE
INSULATED HATCHES, MAIN BILGE MANHOLE
HATCHWAY COAMINGS, MAIN BILGE
HOLD PILLARS
MASTS VENTILATORS
Are insulated plugs fitted to provide easy access to bilge suction roses tank, air, and sounding pipes
and manhole doors of tanks Are insulated plugs fitted to ventilators cargo ports and side lights
Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected if so, how

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

Coal Bunker Bulkheads, and Brine Outflow and Return Pipes passing through coal bunkers. Is the insulation, so far as practicable, fireproof
Where Cooling Pipes pass through watertight bulkheads or deck plating, are the fittings and packing of the stuffing boxes both watertight and fireproof

Cargo Battens, Dimensions and spacing, sides floors tunnel top
fixed or portable Are screens fitted over the brine grids at chamber sides hinged or permanently fixed

Thermometer Tubes, No. and position in each chamber
diameter are they fitted in accordance with Section 3, Clause 8

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

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

What provision is made for draining the refrigerating machinery room

brine return room fan room water circulating pump room

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

Sounding Pipes, No. and position in each chamber situated below the load water line

Diameter Are all sounding pipes in way of insulated chambers fitted in accordance with Section 3, Clause 11

Are all wood linings tongued and grooved Are cement facings reinforced with expanded steel lattice

How is the expanded metal secured in place

How are the cork slabs secured to the steel structure of the vessel

Air Trunkways in Chambers, inside dimensions, main and branch

Are they permanently fixed or collapsible, or portable State position in chambers

Where air trunkways pass through watertight bulkheads, are they fitted with watertight doors Are the door frames efficiently insulated

Are insulated plugs supplied for the doorways Where are the doors worked from

Cooling Pipes in Chambers, diameter Are they galvanised externally

How are they arranged in the chambers

Thawing Off, what provision is made for removing the snow from the cooling pipes in the chambers

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

Builders.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery and Insulation (If not, state date of approval)

Is the Refrigerating Machinery and Appliances duplicate of a previous case If so, state name of vessel

If the survey is not complete, state what arrangements have been made for its completion and what remains to be done

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 and it will be eligible for the notation + Lloyds R.M.C (with date) when the installation and testing have been satisfactorily completed.

The machinery has been despatched to Calcutta for installation, where the chambers will be insulated and equipped.

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. |
| 2 | 2 | Carl G. & E. Hall Ltd | | 1936. | Brine Fills | | 2 1/2 | 5 | 10,170 |

Fee (1/3 rd) £ 2 : 0 : 0 { Fee applied for, 17 JUL 1936
Travelling Expenses £ : : { Received by me, 20 8 19 36

D. Gemmell.
Surveyor to Lloyd's Register.

Committee's Minute Fri. 6 NOV 1936

Assigned See RmC 59710



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Foundation