

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office 18 OCT 1938)

Date of writing Report 18 OCT 1938

19

When handed in at Local Office 18 OCT 1938

Port of London

No. in

Reg. Book.

Survey held at London

Date: First Survey 28th Jan.Last Survey 25th July 1938

(No. of Visits 18)

on the Refrigerating Machinery and Appliances of the S.S. "AMRA"

Tons { Gross 8314
Net 3993

Vessel built at Newcastle.

By whom built Swan Hunter & Wigham

Yard No. 1540

When built 1938.

Owners P. & O. Steam Navigation Co. Ltd. B.I. S.N.C.

Port belonging to

Richardson & Co. Ltd.

Voyage

Refrigerating Machinery made by J. E. Hall & Co.

Machine Nos. 9890
9891
10052
10053

When made 1938.

Insulation fitted by

When fitted

System of Refrigeration CO₂ + Brine

Method of cooling Cargo Chambers

Brine Cycles.

Insulating Material used

Number of Cargo Chambers insulated

3 4

Total refrigerated cargo capacity

4812

cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed on tank top aft of main E.R.

Refrigerating Units, No. of 4

No. of machines 4

Is each machine independent

yes

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

11

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

If multiple effect compression

no

are relief valves or safety discs fitted

yes

No. of cylinders to each unit

one

Diameter of cylinders

1 1/2"

Diameter of piston rod

5/8"

Length of stroke

6"

No. of revolutions per minute

500

Motive Power supplied from

Direct coupled motors

(State number of boilers, oil engines or electric generators supplying the motive power.)

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

3"

Breadth and thickness of crank webs

No. of sections in crank shaft

Revolutions of engines per minute

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

AIR RECEIVERS:—Is each receiver, which can be isolated, fitted with a safety valve as per Rule

Can the internal surfaces of the receivers be examined

What means are provided for cleansing their inner surfaces

Is there a drain arrangement fitted at the lowest part of each receiver

If made under survey

No. of Receivers

Cubic capacity of each

Internal diameter

thickness

Seamless, lap welded or riveted longitudinal joint

Material

Range of tensile strength

Working pressure by Rules

Electric Motors, type

Enclosed ventilated

No. of

4

Rated

10 B.H.P.

Kilowatts

Volts at 220 at 500

revolutions per minute. Diameter of motor shafts at bearings

Reduction Gearing

Pitch circle diameter, pinion

Main wheel

Width of face

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

Main wheel

Pinion shafts, diameter at bearings

Main wheel shaft, diameter at bearings

Gas Condensers, No. of

2

each with 2 gas circuits

Cast iron or steel casings

Cast iron

Cylindrical or rectangular

cylindrical

to casings

yes

No. of coils in each

4

Material of coils

S.D. copper

3/4" x 1"

Can each coil be readily shut off or disconnected

yes

Water Circulating Pumps, No. and size of

2-1 1/2" centrifugal

how worked

electrically

Gas Separators, No. of

8

Gas Evaporators, No. of

2

each with 2 gas circuits

Cast iron or steel casings

steel

Pressure or gravity type

gravity

If pressure type, are safety

valves fitted

yes

No. of coils in each casing

2

Material of coils

S.D. Steel

1 1/2" x 1 1/8"

Can each coil be readily shut off or disconnected

yes

Direct Expansion or Brine Cooled Batteries, No. of

yes

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

cleared of snow

yes

No. of coils in each battery

yes

Material of coils

yes

Can each coil be readily shut off or

disconnected

yes

Total cooling surface of battery coils

yes

Is a watertight tray fitted under each battery

yes

Air Circulating Fans, Total No. of

yes

each of

yes

cubic feet capacity, at

yes

revolutions per minute

yes

Steam or electrically driven

yes

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

yes

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

4-1 1/2" 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

1 to each chamber.

Can each section be readily shut off or disconnected

yes

yes

Are the control valves situated in an easily accessible position

yes

yes

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Foundation

004718-004726-0286 1/2

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
Are the number and capacity of the machines and the number of pumps and sea connections in accordance with Section 2, Clause 1 of the Rules yes
Is the exhaust steam led to the main and auxiliary condensers

HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
ENGINE CYLINDERS (IF TESTED)	11-3-38					
GAS COMPRESSORS	13-4-38	1000 lb. sq. in.	3000 lb. sq. in.	1500 lb. sq. in.	St.	
" SEPARATORS	11-3-38	do.	do.	do.	St.	
" MULTIPLE EFFECT RECEIVERS	28-1-38	do.	do.	do.	St.	
" CONDENSER COILS	13-4-38	do.	do.	do.	St.	
" EVAPORATOR COILS	15-2-38	do.	do.	do.	St.	
" CONDENSER HEADERS AND CONNECTIONS	18-2-38	do.	do.	do.	St.	
" CONDENSER CASINGS	16-3-38	do.	do.	do.	St.	
" EVAPORATOR CASINGS	11-2-38	do.	do.	do.	St.	
NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE	25-4-38	10 to 15 lb. sq. in.	30 lb. sq. in.	do.	St.	
BRINE PIPING AFTER ERECTION IN PLACE	10/10/38	10 to 15 lb. sq. in.	do.	90 lb. per sq. in.	St.	

Have important steel castings and forgings been tested in accordance with the Rules

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)

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 working parts of the machines, pumps and motors respectively, interchangeable yes

Has the spare gear required by the Rules been supplied yes

Additional Spare Gear Supplied:

12 lubr piston leathers, 2 sets of leather moulds, 4 springs for CO₂ safety valves
12 do. gland do. 4 do. water relief valve
4 bolts & nuts for X head, 2 pro. main bearings, brasses with bolts & nuts
2 pro. crankpin brasses with bolts & nuts, 2 hand pumps for lubr, 2 CO₂ gauges
2 hydrometers, 4 brass cased thermometers, 24 safety discs, 4 pro. CO₂ pipe flanges
2 sets coupling bolts for machines, 4 sets leather moulds couplings for machines
2 fitted boxes for compressor parts.
For Pumps. 1 impeller, 1 spindle, 1 bearing assembly for Brine water pumps.

ELECTRICAL SPARES.

2 Armatures
2 sets of bearings
2 field coils
2 Interpole coils
2 lines of brush holders
2 sets of brushes
2 sets of Controller spares

for machine motors
Water & Brine Pumps
(interchangeable)

The foregoing is a correct description of the Refrigerating Machinery.

J. E. HALL LTD

J. Wells Manufacturer.

for 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. (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 DECKS

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 heels of pillars

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

and for draining the tank top

Fireproof Insulation. Is the insulation and woodwork fireproof in way of bunkers or any surfaces exposed to excessive heat

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. 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. Are the arrangements satisfactory and in accordance with the approved plans

Are they permanently fixed or collapsible, or portable

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 Minimum thickness 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 above Refrigerating machinery has been installed and satisfactorily tested See Newcastle Rpt.

A. Watts 26th Oct 1938

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					System of (1) Refrigerating (2) Insulating the Chambers.	Ice melting capacity per 24 hours.	Is Refrigerating Machinery Electrically Driven	INSULATED CARGO CHAMBERS.	
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.				No.	Capacity Cubic ft.
4	4	Carburety	J. & E. Hall Ltd	1938	(1) Brine	11		3	4810

Fee ^{Lon M £22} : : ^{for spec 19/10/38} Fee applied for, 19
Travelling Expenses £ : : Received by me, 19

D. Gemmell.
Surveyor to Lloyd's Register.

Committee's Minute

FRI 18 NOV 1938

Assigned

See RMC 6852)



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