

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

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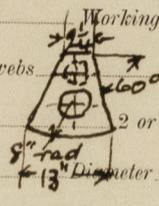
Date of writing Report 18 OCT 1938 19 When handed in at Local Office 18 OCT 1938 Port of London
 No. in Reg. Book. Survey held at London Date: First Survey 28th Jan. Last Survey 25th July 1938
 (No. of Visits 18)

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. B.I.S.N.C. Port belonging to Richardson & Co. 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 Grids. Insulating Material used
 Number of Cargo Chambers insulated 3 4 Total refrigerated cargo capacity 4810 4500 cubic feet.

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

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 ~~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 4/8" 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 ✓ 8" rad 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 Are safety valves fitted
 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 ✓ No. of coils in each casing 2 Material of coils S.D. Steel 1 1/2" x 5/8" 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 ✓ each of ✓ cubic feet capacity, at ✓ revolutions per minute ✓
 Steam or electrically driven ✓ Where spare fans are supplied are these fitted in position ready for coupling up ✓

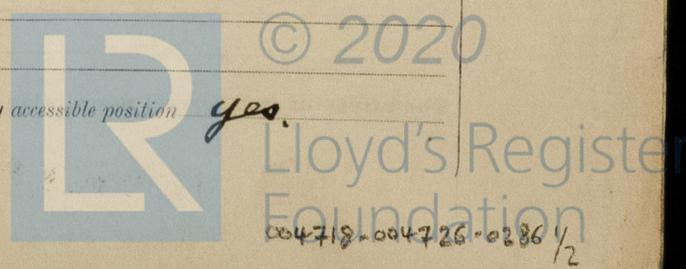
Brine Circulating Pumps, No. and size of, including the additional pump 4-1 1/2" centrifugal how worked electrically

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. Are the control valves situated in an easily accessible position yes.

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



Are thermometers fitted to the outflow and to each return brine pipe *Common* 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.
 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 yes.

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	1000lb. □	3000lb. □	1500lb. □	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	16-2-38	do.	do.	do.	St.	
CONDENSER CASINGS	25-4-38	do.	do.	do.	St.	
EVAPORATOR CASINGS	11-3-38	open top.				
NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE	25-4-38	10 to 15 lb. □	30 lb. □		St.	
BRINE PIPING AFTER ERECTION IN PLACE	10/10/38	10 to 15 lb.		90 lb. per sq. in.		

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

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

Dates of test 10/10/38 Density of Brine 10 to 15 lb. 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 hours

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 valves
 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 Ammeters
 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. (Boiler Room)	F									
FRAME No. (Engine Room)	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

