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Rpt. 17.

R. M. C. No. 41992

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office 4 JUN 1931)

Date of writing Report 19 When handed in at Local Office 4 JUN 1931 Port of London.

No. in Reg. Book. Survey held at 39703. Date: First Survey 16th January Last Survey 30th April 1931. (No. of Visits 7)

on the Refrigerating Machinery and Appliances of the S.S. "CHEFOO" Tons {Gross 1430.4 Net 781.0}

Vessel built at Glasgow By whom built Alex. Stephen & Sons Ltd No. 535 When built 1931.

Owners P & O. Steam Navigation Co. Ltd Port belonging to Voyage

Refrigerating Machinery made by J. E. Hall Ltd Machine No. 8481/8482 When made 1931.

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 6 Total refrigerated cargo capacity 39,400 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed Tank top aft of main Eng Rm.

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 42 Are all the units connected to all the refrigerated chambers Yes.

Compressors, driven direct or through single reduction gearing Compressors, single or double acting Single No. of cylinders 2 per mach.

Diameter of cylinders 3 1/2" Diameter of piston rod 1 5/8" Length of stroke 4" No. of strokes per minute 400

Motive Power supplied from Electric motor direct coupled.

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 4 1/4" journals 4 1/2" pins

Breadth and thickness of crank webs X 2 1/2" No. of sections in crank shaft one Revolutions of engines per minute 400

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 ventilated No. of 1 per mach Rated 85 B.H.P. 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 1 per mach Cast iron or steel casings cast iron Cylindrical or rectangular cylindrical

No. of coils in each 8 Material of coils S.D. Copper 3/4" x 1" o.d. Can each coil be readily shut off or disconnected yes.

Water Circulating Pumps, No. and size of 1 - 5' centrifugal how worked electrically Gas Separators, No. of 4

Gas Evaporators, No. of 1 - per mach Cast iron or steel casings steel Pressure or gravity type pressure.

No. of coils in each casing 5 Material of coils S.D. Steel 1 1/2" x 1 5/8" o.d. Can each coil be readily shut off or disconnected yes.

Direct Expansion or Brine Cooled Batteries, No. of Air blown over side grids 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 2 32 1/2" Aero each of 12,000 c.ft. cubic feet capacity, at 1300 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 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 Ford cargo space 6", Aft port 3, aft starboard 3

Ford Port 3, Ford Starboard 3, Centre 3 Can each section be readily shut off or disconnected yes. Are the control valves situated in an easily accessible position yes.

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)						
GAS COMPRESSORS	12-3-31	1000lb. □	3000lb. □	1500lb. □	OK	
" SEPARATORS	20-3-31	do.	do.	do.	OK	
" CONDENSER COILS	23-4-31	do.	do.	do.	OK	
" EVAPORATOR COILS	14-4-31	do.	do.	do.	OK	
" CONDENSER HEADERS AND CONNECTIONS	23-4-31	do.	do.	do.	OK	
" CONDENSER CASINGS	19-12-30	do.	do.	do.	OK	
" EVAPORATOR CASINGS	23-2-31	do.	do.	do.	OK	
" CONDENSER CASINGS	23-2-31	10lb. □	30lb. □	-	OK	
" EVAPORATOR CASINGS	26-2-31	20lb. 25lb. □	50lb. □	-	OK	
NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE						
BRINE PIPING AFTER ERECTION IN PLACE...						

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 crankshaft
3 pistons + rods for compressors
1 set piston rings for each compressor piston
1 impeller + shaft for circulating water pump.
1 do. do. for main brine pump.
2 pair bolts + nuts for main bearings
2 pair do. do. for connecting rod big ends.
2 pair do. do. for connecting rod big ends.
1 set of 2 leather mounts.
3 lengths each of 1 1/4" x 1 1/2" N.I. piping + 3 bends each size
12 sockets + back nuts each size 1 1/4" x 1 1/2"
2 pair CO₂ pipe flanges.
1 setatchet screwing dies + taps 1 1/4" x 1 1/2" pipe flanges.
Sundry brine hatch cocks
Assorted bolts + nuts.
1 regulator valve spindle.
6 lubricator piston leather, 6 lubricator gland leather.
2 sets copper pint rings throughout.
1 additional set of pint rings for each compressor
1 set special metal rings for each compressor gland

1 set Suct. valves, seats + springs for each Compt.
1 set delv. do. do.
24 addl. springs for comp. valves
1 hand pump for lubricator
3 springs for water relief valves.
3 do. brine delv. do.
3 do. CO₂ safety valves
1 pair crank pin shells lined W.M.
1 pair crosshead brasses.
24 safety valve drocs.
1 leather cutter.
2 CO₂ pressure gauges.
2 hydrometers.
6 glass cased thermometer.
1 length copper gauge pipe.
3 CO₂ gauge valves + 6 spare pipes
4 gas charging valves.
4 valves for separator drain
2 N° 2 Wells oil fillers
1 pair long for pipe unions, 2 spanners
3 coupling with rod sets, leather washers
1 set taps + dies 1/2" + 3/4" gas.
1 half coupling for spare armature
1 fitted box.

ELECTRICAL SPARES.

1 Armature - packed for storage } Machine Motors
1 set brushes for each motor } Water pump motor
1 line brush holders. } Brine pump motor
1 complete interior for controller } Fan motor - each type

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

The foregoing is a correct description of the Refrigerating Machinery.

FOR J. & E. HALL, LTD. Manufacturer.

Cloughes
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

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

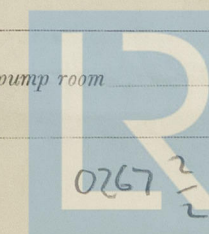
Draining Arrangements. Where the chambers are situated below the load water line, what provision is made for draining the inside of the chambers

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



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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.

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	4	Carl. Anby J. & E. Hall Ltd.		1931.	1) brine		42	6	32,700

Fee ~~£ 6.0.0~~ Letter to 40s. 4th June, 1931
See the Report. Fee applied for, 2.12.1931
Travelling Expenses £ : : Received by me, 8.12.1931

D. Gemmell.
Surveyor to Lloyd's Register.

Committee's Minute

Assigned See 46 R.N. No. 51979.



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