Rpt. 17.

No. 1262

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

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on the Refrigerating Machinery and Appliances of the M/V "GLOUCESTER" Tons { Gross / Net

Vessel built at Glasgow. By whom built Alex. Stephen & Sons Ltd Yard No. 545 When built 1941

Owners Federal Steam Nav. Co. Ltd. Port belonging to Voyage

Refrigerating Machinery made by J. E. Hall Ltd. Machine Nos. 10,544 10,548 When made 1941.

Insulation fitted by When fitted System of Refrigeration CO_2 + Brine

Method of cooling Cargo Chambers Brine + Air Insulating Material used

Number of Cargo Chambers insulated 16 Total refrigerated cargo capacity 304,500 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY.

Where placed 2nd Dk. fwd of eng. rm.

Refrigerating Units, No. of 2 No. of machines 2 Is each machine independent yes

Total refrigeration or ice-melting capacity in tons per 24 hours 111 tons 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 2 Diameter of cylinders 5"

Diameter of piston rod 2 1/4" Length of stroke 10" No. of revolutions per minute 300 max.

Motive Power supplied from Direct coupled electric 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 CO_2 machine 6 1/2" jls, 4" pins.

Breadth and thickness of crank webs 9" x 1 1/2" No. of sections in crank shaft one Revolutions of engines per minute 300 max.

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 open type, with canopy No. of 2 Rated 160 BHP Kilowatts

Volts 220 @ 200/300 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 12 casings ~~Cast iron or steel casings~~ Copper Cylindrical or ~~rectangular~~ Cylindrical Are safety valves fitted to casings No. of coils in each casing - one Material of coils S.D. Copper Can each coil be readily ~~shut off or~~ disconnected yes. water headers at ends of casing

Water Circulating Pumps, No. and size of pumps available 2 - 6" vert. centn. how worked electrically / direct **Gas Separators,** No. of 4

Gas Evaporators, No. of 2 Cast iron or steel casings Steel Pressure or gravity type pressure If pressure type, are safety valves fitted vent pipes No. of coils in each casing 12 Material of coils S.D. Steel 1" x 1 5/16" Can each coil be readily ~~shut off or~~ disconnected yes

~~**Direct Expansion or**~~ **Brine Cooled Batteries,** No. of 18 See list attached Are there two separate systems, so that one may be in use while the other is being cleared of snow no No. of coils in each battery See list attached Material of coils S.D. Steel 1" + 1 1/2" bores Can each coil be readily ~~shut off or~~ disconnected yes Total cooling surface of battery coils 15610 sq. ft. Is a watertight tray fitted under each battery yes

Air Circulating Fans, Total No. of 18 See list attached each of cubic feet capacity, at 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 4 - 4 1/2" vert. centri. - - - - - - electrically direct
1 - 2" " - - - - - - - how worked
1 - 4" x 4 1/2" V.D. ram - - - - - - - electrically worm drive

Brine Cooling System, closed or open closed Are the pipes and tanks galvanised on the inside

No. of brine sections in each chamber See list attached

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.

1m.11.37.—T. (MADE IN ENGLAND.)

004653-004661-0251/2

Are thermometers fitted to the common *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)						
GAS COMPRESSORS	4-1-41	1000 lb. □"	3000 lb. □"	1500 lb. □"	DG.	
„ SEPARATORS	11-3-41	do.	do.	do.	DG.	
„ MULTIPLE EFFECT RECEIVERS	none.					
„ CONDENSER COILS	21-11-40 / 26-11-40 to 24-1-41 / 30-1-41	do.	do.	do.	DG.	
„ EVAPORATOR COILS	3-2-41 / 10-2-41	do.	do.	do.	DG.	
„ CONDENSER HEADERS AND CONNECTIONS	8-4-41	do.	do.	do.	DG.	
„ CONDENSER CASINGS	10-4-41	10 to 15 lb. □"	30 lb. □"		DG.	
„ EVAPORATOR CASINGS	13-2-41	do.	do.		DG.	
NH_3 CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE						
BRINE PIPING AFTER ERECTION IN PLACE						

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) of 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, 24 addl. Compr. valve springs, 2 springs for CO_2 safety valves.
12 " gland " 2 springs for water relief valve, 2 prs. main bearing shells lined W.M., bolts & nuts
1 set of 2 leather moulds, 1 Crankshaft for Compr., 1 pr. Crankpin shells lined W.M., bolts & nuts
1 bucket complete with valves & springs for plunger brine pump, 1 pump for press. lubricator
2 prs. Crosshead brasses, bolts & nuts, ~~1 pump press. lubr.~~, 2 CO_2 gauges, 2 CO_2 gauge valves & 6 spare pipes.
2 hydrometers, 24 Safety discs, 6 therms, 1 Spl. Kew tested therm, 1 Sepr. drain fitting, 1 length copper pipe
1 brine gauge, ½ Brtt hydraulic leather. 1 fitted box for Compr. parts, 2 Springs for brine relief valve.
1- Spindle & impeller for water pumps, 1 set brushes for water pumps
1 " " " brine " 1 " " " brine "

ELECTRICAL SPARES.

		Sets of brushes.
1 Armature in zinc lined case	Compr. motors	2 for Compr. motors
1 Set of field Coils	motors for water pumps,	2 for water pump motors
1 Set of interpole coils	brine pumps (centr.)	4 for large centri. brine pumps motors
1 Set of brush holders	brine pump (plunger)	1 " small " " " "
1 Set of bearings		1 for plunger brine pump motor
1 Set of Controller spares		

FAN SPARES.

One spare motor for all sizes of fans
One Set starter spares do. do.
One spare rotor for all fans except 12½" Sirocco
Sets of spare brushes for all fans.

The foregoing is a correct description of the Refrigerating Machinery.

J. Hall & Sons *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.
BULKHEADS. Frame No. ..... A (Fore Peak)										
Frame No. ..... F / A										
Frame No. ..... F / A										
Frame No. ..... F / A										
Frame No. ..... F / A (Boiler Room)										
Frame No. ..... A (Engine Room)										
Frame No. ..... F / A										
Frame No. ..... F / A										
Frame No. ..... F / A										
Frame No. ..... F (After Peak)										
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 was 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.

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.								INSULATED CARGO CHAMBERS.	
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.	System of (1) Refrigerating (2) Insulating the Chambers.	Ice melting capacity per 24 hours. Tons.	Is Refrigerating Machinery Electrically Driven?	No.	Capacity. Cubic ft.
2	4	Carb. Anhy	Jr E. Hall Ltd.	1941	(1) brine + air	111		VR	309,500

Fee ..... Lon A/c £9 / Gls A/c £18 £27 : 0 : 0 — Fee applied for, L Gls 13/5/41 19 .

Travelling Expenses £ : : — Received by me, 19 .

D. Gemmell.
Surveyor to Lloyd's Register.

Committee's Minute GLASGOW 29 JUL 1941

Assigned See Glasgow Report No 64110A

Certificate to be sent to