

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office)

Date of writing Report

19

When handed in at Local Office

5/11/42 Port of Glasgow.

No. in

Reg. Book. Survey held at Glasgow.

Date: First Survey 9 June 1942

Last Survey 3 Nov 1942

(No. of Visits)

Gross 7166

Net 4217

on the Refrigerating Machinery and Appliances of the M/V. "EMPIRE HIGHWAY"

Tons

Vessel built at Glasgow

By whom built Barclay Curle & Co. Ltd

Yard No. 690

When built 1942

Owners The Ministry of War Transport

Port belonging to Glasgow

Voyage

Refrigerating Machinery made by J & E Hall

Machine Nos. 10997

When made 1942

Insulation fitted by Donald-Bean & Co

When fitted 1942

10998

System of Refrigeration NH₃ + BRINE

Method of cooling Cargo Chambers Brine Cooled Batteries & Fans.

Insulating Material used STILLITE

Number of Cargo Chambers insulated 5 Hold & 5 Ice Decks.

Total refrigerated cargo capacity 368,000 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY.

Where placed Upper deck amidships

Refrigerating Units, No. of

No. of machines

Is each machine independent

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

Are all the units connected to all the refrigerated chambers

Compressors, driven direct or through

single }
double }

reduction gearing.

Compressors, single or double acting

If multiple effect compression

relief valves or safety discs fitted

No. of cylinders to each unit

Diameter of cylinders

Diameter of piston rod

Length of stroke

No. of revolutions per minute

motive Power supplied from

(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

Width and thickness of crank webs

No. of sections in crank shaft

Revolutions of engines per minute

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

Width and thickness of crank webs

No. of sections in crank shaft

Revolutions of engine per minute

DRY RECEIVERS:—

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

Are 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

No. of

Rated

Kilowatts

Horsepower at

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

Cast iron or steel casings

Cylindrical or rectangular

Are safety valves fitted

No. of casings

No. of coils in each

Material of coils

Can each coil be readily shut off or disconnected

Water Circulating Pumps, No. and size of pumps available

X how worked

Gas Separators, No. of

Gas Evaporators, No. of

Cast iron or steel casings

Pressure or gravity type

If pressure type, are safety

valves fitted

No. of coils in each casing

Material of coils

Can each coil be readily shut off or disconnected

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

how worked

Brine Cooling System, closed or open

Are the pipes and tanks galvanised on the inside

No. of brine sections in each chamber

Can each section be readily shut off or disconnected

Are the control valves situated in an easily accessible position

Are thermometers fitted to the outflow and to each return brine pipe 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 Independent condensing plant.

HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
ENGINE CYLINDERS (IF TESTED)						
GAS COMPRESSORS						
.. SEPARATORS						
.. MULTIPLE EFFECT RECEIVERS... ..						
.. CONDENSER COILS						
.. EVAPORATOR COILS						
.. CONDENSER HEADERS AND CONNECTIONS						
.. CONDENSER CASINGS						
.. EVAPORATOR CASINGS						
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 Yes

Dates of test 1/11/42 Density of Brine 48° by Twissale 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 -5° & -7°

atmosphere 44° cooling water inlet and discharge 50° & 52° gas in condensers 80 and evaporators -9°

the average temperature of the refrigerated chambers 4.6°F and the rise of temperature in these chambers upon the expiration of 12 hours

time after the machinery and cooling appliances have been shut off 8.36°F

SPARE GEAR.

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

Has the spare gear required by the Rules been supplied

Additional Spare Gear Supplied:

See Log. Bkt. H² RMC 1293

The foregoing is a correct description of the Refrigerating Machinery.

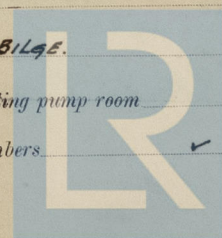


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DESCRIPTION OF INSULATION.

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. 161 (Fore Peak)	✓	✓	STILLITE	8"	1" T&G.	✓	✓	STILLITE	8"	1" T&G.	
	FRAME No. 137	F	✓	✓	"	15 1/2"	1" T&G.	✓	✓	"	6"	1" T&G.
		A	RIBBAND 4 FT FROM TANK TOP & SHELL		"	4"	1" T&G.	IN WAY OF COOLERS	COVERED WITH 14 W.G. GALV SHEETS	STILLITE	4"	1" T&G.
	FRAME No. 112	F	✓	✓	"	12 1/2"	1" T&G.	✓	✓	"	6"	1" T&G.
		A	RIBBAND 4 FT FROM TANK TOP & SHELL		"	4"	1" T&G.	IN WAY OF COOLERS	COVERED WITH 14 W.G. GALV SHEETS	STILLITE	4"	1" T&G.
	FRAME No. 98	F	✓	✓	"	9 1/2"	1" T&G.	✓	✓	STILLITE	8"	1" T&G.
		A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	FRAME No. (Boiler Room)	F										
	FRAME No. (Engine Room)	A										
	FRAME No. 61	F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
A		✓	✓	STILLITE	9 1/2"	1" T&G.	N° 62 FRAME	✓	STILLITE	8"	1" T&G.	
FRAME No. 39	F	RIBBAND 4 FT FROM TANK TOP & SHELL		"	4"	1" T&G.	IN WAY OF COOLERS	COVERED WITH 14 W.G. GALV SHEETS	STILLITE	4"	1" T&G.	
	A	✓	✓	"	12 1/2"	1" T&G.	✓	✓	STILLITE	6"	1" T&G.	
FRAME No.	F											
FRAME No.	A											
FRAME No. 12 (After Peak)	F	✓	✓	STILLITE	8"	1" T&G.	N° 18 FRAME	✓	STILLITE	8"	1" T&G.	
	A	N° 1 HOLD		"	18 1/2" & 16 1/2"	1" T&G.	N° 1 HOLD TW DECK	"	"	9" & 10"	1" T&G.	
SIDES		N° 2, 3, 4 & 5 HOLDS		"	8 1/2"	1" T&G.					COVERED WITH 3/16" HARDBOARD IN WAY OF AIR TRUNK	
OVERHEADING		2 ND DECK FRAME 12 TO 19.		"	11"	1" T&G.					3/8" INSUL WOOD	
FLOORS OF CHAMBERS		IN HOLDS		CORK SLABS	6"	1 1/4" T&G.	OVERHEADING		STILLITE	11"	3/16" HARDBOARD	
BOTH LININGS FITTED AT MASTHEAD												
TRUNK HATCHWAYS							✓	✓	✓	✓	✓	
THRUST RECESS, SIDES AND TOP							✓	✓	✓	✓	✓	
TUNNEL SIDES AND TOP							✓	✓	STILLITE	8"	1" T&G.	
TUNNEL RECESS, FRONT AND TOP								FRONT	"	8"	1" T&G.	
CENTRE LINE BHD (HOLDS)		RIBBAND 4' 0" FROM TANK TOP & BHD		10 1/2"	STILLITE ON STEEL SIDE IN FORE HOLDS - 4' STILLITE ON FACE SIDE						1 1/2" T&G.	
FRAMES OR REVERSE FRAMES, FACE						2" STILLITE						
BULKHEAD STIFFENERS, TOP						1/2" HAIR FELT AT FACE OF BRACKETS BOTTOM 1/2" HAIR FELT AT FACE OF BRACKETS AND FACE 1/2" HAIR FELT.						
RIBBAND ON TOP OF DECK						TOP - STILLITE FROM SHIPS SIDE TO 20" INBOARD.						
SIDE STRINGERS, TOP						✓						
WEB FRAMES, SIDES						✓						
BRACKETS, TOP						✓						
INSULATED HATCHES, MAIN						PLUGS WITH 6" STILLITE						
HATCHWAY COAMINGS, MAIN						OREGON PINE						
HOLD PILLARS						3/4" FELT & 2" SISAL ROPE.						
MASTS						6" STILLITE						
VENTILATORS						NONE						
Are insulated plugs fitted to provide easy access to bilge suction roses						YES tank, air, and sounding pipes YES heels of pillars YES.						
and manhole doors of tanks						YES. 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						ONLY TUNNEL TOP. if so, how 1/4" STEEL PLATING.						
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						COFFERDAM FITTED BETWEEN N° 3 HOLD & OIL FUEL BUNKER, AND ALSO BETWEEN N° 4 HOLD & DEEP TANK.						
and for draining the tank top						✓						
Fireproof Insulation. Is the insulation and woodwork fireproof in way of bulkheads or any surfaces exposed to excessive heat						{ SILICATE COTTON & 2 LAYERS OF ASBESTOS SHEETS						
Where Cooling Pipes pass through watertight bulkheads or deck plating, are the fittings and packing of the stuffing boxes both watertight and fireproof						YES.						
Cargo Battens, Dimensions and spacing, sides						2" x 2" SPACED 15" floors TO BE FITTED AT LADING PORT. tunnel top ELM SPACED 12"						
fixed or portable						FIXED Are screens fitted over the brine grids at chamber sides ✓ hinged or permanently fixed ✓						
Thermometer Tubes, No. and position in each chamber						4 - 2 FOR 2 & 2 AFT IN EACH HOLD & TWEEN DECK						
diameter						2 1/2" are they fitted in accordance with Section 3, Clause 8 YES.						
Protection of Pipes. Are all pipes, including air and sounding pipes, which pass through or into insulated chambers, well insulated						YES.						
Draining Arrangements. What provision is made for draining the inside of the chambers						HOLDS - 3" SCUPPER (PRS) } WITH BRINE SEAL & FITTED TWEEN DECK - 2 1/2" " " } WITH NON RETURN CHECK VALVE.						
Where scupper, scupper pipes, and drain pipes are fitted are means provided for blanking them off						No						
What provision is made for draining the refrigerating machinery room						SCUPPERS TO ENGINE ROOM BILGE.						
brine return room						{ 2" SCUPPER WITH BRINE SEAL FITTED WITH N.R. CHECK VALVE } COOLER SPACES. SCUPPERS WITH BRINE SEAL FITTED WITH N.R. CHECK VALVE. 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 *THERMOMETER TUBES USED FOR SOUNDING ABOVE INSULATION.*

Diameter *2 1/2"* Are all sounding pipes in way of insulated chambers fitted in accordance with Section 3, Clause 11 *YES.*

Are all wood linings tongued and grooved *YES* 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 *CORK SLABS BEDDED ON "CURIP" & JOINTS OF SLABS SEALED WITH BITUMASTIC SOLUTION.*

Air Trunkways in Chambers. Are the arrangements satisfactory and in accordance with the approved plans *YES.*

Are they permanently fixed or collapsible, or portable *DELIVERY TRUNKS FIXED. SUCTION TRUNKS ON TANK TOP IN FOR? HOLDS PORTABLE.*

SUCTION TRUNKS IN AFT HOLDS. AT SIDES OF TUNNEL FIXED.

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 *✓*

BATTERY
Cooling Pipes in Chambers, diameter *1 1/2"* Minimum thickness *7 W.G.* Are they galvanised externally *COATED WITH BITUMIN.*

How are they arranged in the chambers *COOLING BATTERIES IN COOLER SPACE IN EACH INSULATED TWEEN DECK.*

Thawing Off, what provision is made for removing the snow from the cooling pipes in the chambers *BY HOT BRINE.*

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

FOR BARCLAY, CURLE & Co., Ltd.

Howalmbury, Secretary Builders.

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

Is the Refrigerating Machinery and Appliances duplicate of a previous case *No* 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 *Complete.*

General Remarks (State quality of workmanship, opinions as to class, &c.)

*The refrigerating machinery and appliances have been fitted under special survey, tested under working conditions and found satisfactory and, in our opinion, the installation is eligible to be classed with **NEED + LLOYD'S RMC 11, 42***

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					System of (1) Refrigerating (2) Insulating the Chambers.	Ice melting capacity per 24 hours. Tons.	Is Refrigerating Machinery Electrically Driven?	INSULATED CARGO CHAMBERS.	
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.				No.	Capacity. Cubic ft.
<i>3</i>	<i>6</i>	<i>Ammonia</i>	<i>J. L. Hall, Ltd.</i>	<i>1942</i>	<i>Air Drive</i> <i>Electric</i> <i>Direct Drive</i>	<i>2000</i>	<i>No</i>	<i>5 HOLD</i> <i>5 TW DECK</i>	<i>368,000</i>

Fee *£ 30 : 0 : 0*
Travelling Expenses

Fee applied for *in B. 11, 42*
Received by me, *class 11, 42*

P. Dunne

Surveyor to Lloyd's Register.

Committee's Minute

TUE 10 NOV 1942

Assigned

Lloyd's Rmc 11, 42

White & Clark

CERTIFICATE WRITTEN



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