

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office)

16 JAN 1944

Date of writing Report 4th Jan 1944 When handed in at Local Office 4/1/44 Port of Greenock
No. in Reg. Book. Survey held at Greenock. Date: First Survey 24th March 1943 Last Survey 4th January 1944
36932. (No. of Visits 44)

on the Refrigerating Machinery and Appliances of the T.S.S. "CLAN URQUHART" Tons { Gross 972.6
Net 560.7

Vessel built at Greenock By whom built The Grt. Dock Co. Ltd. Yard No. 454 When built 1944-1

Owners The Clan Line Steamers Ltd. Port belonging to Glasgow Voyage ✓

Refrigerating Machinery made by J. & E. Hall, Ltd. Machine No. 11211 When made 1943

Insulation fitted by The Grt. Dock Co. Ltd. When fitted 1943/1944 System of Refrigeration C.O.₂ & Brine
Insulated Air

Method of cooling Cargo Chambers air circulation Insulating Material used Hobasite & Stillite

Number of Cargo Chambers insulated Twelve Total refrigerated cargo capacity 388,920 cubic feet.
Net.

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed

Refrigerating Units, No. of _____ Single, double, or triple _____ Cubic feet of air delivered per hour _____

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} reduction gearing. Compressors, single or double acting _____ No. of cylinders _____
_{double}

Diameter of cylinders _____ Diameter of piston rod _____ Length of stroke _____ No. of strokes per minute _____

Motive Power supplied from _____

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 _____

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 _____

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 _____ No. of _____ Rated _____ 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 _____ Cast iron or steel casings _____ Cylindrical or rectangular _____

No. of coils in each _____ Material of coils _____ Can each coil be readily shut off or disconnected _____

Water Circulating Pumps, No. and size of _____ how worked _____ Gas Separators, No. of _____

Gas Evaporators, No. of _____ Cast iron or steel casings _____ Pressure or gravity type _____

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 _____

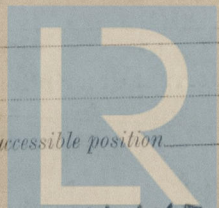
Brine Cooling System, closed or open _____ Are the pipes and tanks galvanised on the inside _____

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 _____

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

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Sounding Pipes, No. and position in each chamber situated below the load water line *1 Port & Starboard in each chamber.*
Diameter *2 1/2 inches.* 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 *Bedded in Duroproof bounded by grounds.*
Air Trunkways in Chambers, inside dimensions, main *Various.* and branch *Various.*
Are they permanently fixed or collapsible, or portable *Permanent.* State position in chambers *Overhead, and*
Ship's sides.
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

THE GREENOCK DOCKYARD CO. LTD.

W. Macdonald
SECRETARY

Builders.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery *✓* and Insulation *yes, & in No.*
(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 efficiently installed in the vessel & tested under full working conditions with satisfactory results. The materials & workmanship are sound & good. This installation is eligible in our opinion to be classed in the Society's Register Book with Record + LLOYD'S R.M.C 1-44 (in Red) as recommended in London R.M.C report N°1318*

It is submitted that this vessel is eligible for THE RECORD + Lloyd's R.M.C 1.44.

CERTIFICATE WRITING

L.Y.
6/1/44.

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					System of (1) Refrigerating (2) Insulating the Chambers.	POWER.		INSULATED CARGO CHAMBERS.	
No. and whether Single or Duplex.	Makers.	Date of Construction.	System.	Type.		Cubic feet of air delivered per hour.	Ice melting capacity per 24 hours. Tons.	No.	Capacity.
<i>2</i>	<i>J. E. Hall & Co.</i>	<i>1943</i>	<i>CO₂</i>		<i>(1) AIR</i>		<i>143</i>	<i>12</i>	<i>388,920</i>
					<i>(2) GRAN. CORN., SLAB CORN. & STILLITE.</i>				<i>NET.</i>

LONDON £12
Fee *GRK* *£24.*

Travelling Expenses £ *—*

Fee applied for *19*
Received by me, *19*

M. L. Swinton & Charles J. Hunter
Surveyors to Lloyd's Register.

Committee's Minute

TUES. 11 JAN 1944

Assigned

+ LLOYD'S R.M.C 1.44



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DESCRIPTION OF INSULATION.

	IN LOWER HOLD CHAMBERS.					IN 'TWEEN DECK CHAMBERS.					L. U.		L. U.	
	Air Space.	Outer Lining.	Non-conducting Material.	Thickness of ditto.	Inner Lining. GAL. STEEL. WIRE GAUGE.	Air Space.	Outer Lining.	Non-conducting Material.	Thickness of ditto.	Inner Lining. GAL. STEEL. WIRE GAUGE.				
BULKHEADS.														
FRAME No. 149 A	NONE	NONE	CORK	16"	12	NONE	NONE	CORK	10	10	12	12		
(Fore Peak)														
FRAME No. 116 F	"	"	"	13	12 & 14	"	"	"	9-7	8-7	14	14		
A	"	"	"	4	14	"	"	"	4	4	14	14		
FRAME No. 100 F	"	"	"	10	1/16 & 12									
A	✓			✓					✓					
FRAME No. 99 F	✓			✓		NONE	NONE	CORK	-	10-6	-	1/16 & 12		
A	✓			✓					✓					
FRAME No. 95 F	✓			✓		NONE	NONE	STILLITE	10/16	-	12	-		
(Boiler Room)														
A	✓			✓					✓					
FRAME No. 68 A	NONE	NONE	STILLITE	10	1" T.G.	NONE	NONE	STILLITE	10	-	1/16 & 12	-		
(Engine Room)														
FRAME No. 67 F	✓			✓					✓					
A	✓			✓		NONE	NONE	CORK	-	10-6	-	1/16 & 12		
FRAME No. 52 F	NONE	NONE	CORK	4	1" T.G.	"	"	"	4	4	14	14		
A	"	"	"	9	"	"	"	"	7-9	6-7	14	1" T.G.		
FRAME No. 27 F	"	"	"	10	"	"	"	"	10	10	12	"		
A	✓			✓	12 & 14 1" 2 & 3 HOLDS				✓					
FRAME No. (After Peak) F	✓			✓					✓					
SIDES ...	NONE	NONE	CORK	16-11	1" T.G. 1" 2 & 3 HOLDS	NONE	NONE	CORK	12-11	11	14	1" 2 & 3 HOLDS		
OVERHEADING (PARTIAL)	"	"	"	13-11	HOLDS	"	"	"	12-11	11	14	1" 2 & 3 HOLDS		
FLOORS OF CHAMBERS ...	"	"	SLAB CORK	6	1" & 1 1/2 T.G.				✓		✓			
TRUNK HATCHWAYS	NONE													
THRUST RECESS, SIDES AND TOP, ...	FLOOR OF N.A. HOLD													
TUNNEL SIDES AND TOP, ...	FLOOR OF N.A. & S. HOLDS													
TUNNEL RECESS, FRONT AND TOP														

FRAMES OR REVERSE FRAMES, FACE UNDER INSULATION.

BULKHEAD STIFFENERS, TOP UNDER INSULATION. BOTTOM UNDER INSULATION. AND FACE UNDER INSULATION.

RIBBAND ON TOP OF DECKS ✓

SIDE STRINGERS, TOP ✓ BOTTOM ✓ AND FACE ✓

WEB FRAMES, SIDES ✓ AND FACE ✓

BRACKETS, TOP ✓ BOTTOM ✓ AND FACE ✓

INSULATED HATCHES, MAIN 6" SLAB CORK 1" T.G. 8" PLUG. BILGE 1/2" CORK. 1" T.G. SHEET. MANHOLE SIMILAR TO BILGE.

HATCHWAY COAMINGS, MAIN P.P. 18" 6" 1/4" BILGE P.P. 8" 4" 1/2"

HOLD PILLARS 2" STILLITE WITH 3/16" GAL. STEEL PLATES, FOR HEIGHT OF 4'-0" FROM FLOOR ONLY.

MASTS 12" GRANULATED CORK. VENTILATORS ✓

Are insulated plugs fitted to provide easy access to bilge suction roses YES. tank, air, and sounding pipes ✓ heels of pillars WELDED.

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 NO. if so, how TIMBER TO BE SUPPLIED ABOARD.

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 DEEP COFFER DAM FITTED BETWEEN OIL FUEL CROSS BUNKER AND

INSULATED CHAMBER.

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, side 2x2, 18" apart on end floors. NONE. TO BE tunnel top SUPPLIED ABOARD.

Are screens fitted over the brine grids at chamber sides ✓ hinged or permanently fixed ✓

Thermometer Tubes, No. and position in each chamber { N: 2 & 5 HOLDS. 2 F. 2 C. 2 A. N: 2 & 4 T.D. 2 F. 2 C. 2 A. N: 3 & 4 " 2 F. 2 A. N: 3 & 5 T.D. 3 F. 2 C. 3 A. N: 2 & 5 U.T.D. 2 F. 2 C. 2 A. N: 3 & 4 " 2 F. 2 A. } ALL 2 1/2" DIA. 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. Where the chambers are situated below the load water line, what provision is made for draining the inside of the chambers

TAPPED SCUPPERS TO BILGES. Where sluices, scupper pipes, and drain pipes are fitted are means provided for blanking them off YES.

What provision is made for draining the refrigerating machinery room 2 1/2" DIA. SCUPPERS TO E.R. BILGE WITH LOADED COCK.

brine return room DITTO. COOLERS. 2 1/2" DIA. SCUPPERS water circulating pump room ✓

Are all air spaces behind insulation arranged to drain to the bilges, bilge wells, or gutterways of the respective chambers. TRAPPED, LED TO BILGES. ✓

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

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. *To independent*
condensers normally also with connections to Main & 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						
„ SEPARATORS						
„ CONDENSER COILS						
„ EVAPORATOR COILS						
„ CONDENSER HEADERS AND CONNECTIONS						
„ CONDENSER CASINGS						
„ EVAPORATOR CASINGS						
NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE	19 Nov 1914					
BRINE PIPING AFTER ERECTION IN PLACE...	6 Dec	30 lbs.		75 lbs.		

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

Dates of test 18th to 21st Dec 1943 Density of Brine 45 by T. W. Adelle 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 44 cooling water inlet and discharge 49 & 51 gas in condensers 63 and evaporators -9.

the average temperature of the refrigerated chambers 5.04 and the rise of temperature in these chambers upon the expiration of 24 hours

time after the machinery and cooling appliances have been shut off 12.03

SPARE GEAR.

ARTICLES SUPPLIED AS PER RULE.	ADDITIONAL SPARE GEAR SUPPLIED.
Spare gear checked & found as stated on London RMC sp' N ^o 1318	

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

The foregoing is a correct description of the Refrigerating Machinery.

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Manufacturer.