

# REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office)

6 JAN 1944

Date of writing Report 4<sup>th</sup> 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 24<sup>th</sup> MARCH 1943. Last Survey 4<sup>th</sup> 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 Grk. 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 Grk. Dock Co. Ltd. When fitted 1943/1944. System of Refrigeration C.O<sub>2</sub> & Brine  
under hull. C.O<sub>2</sub> & Brine

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

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 <sup>single</sup> } reduction gearing. Compressors, single or double acting \_\_\_\_\_ No. of cylinders \_\_\_\_\_  
<sub>double</sub> }

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.

Im. 5.21.—I.



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Lloyd's Register

Foundation

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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.**

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

Fee *£24.* Travelling Expenses *£* { Fee applied for 19. Received by me 19. }  
*M. L. Sumner & Charles J. Hunter*  
 Surveyors to Lloyd's Register.

Committee's Minute **TUES. 11 JAN 1944**  
 Assigned *+ LLOYD'S R.M.C 1.44*



Certificate to be sent to *Genl office.*

DESCRIPTION OF INSULATION.

	IN LOWER HOLD CHAMBERS.					IN 'TWEEN DECK CHAMBERS.							
	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 (Fore Peak)	A	NONE	NONE	CORK	16"	12"	NONE	NONE	CORK	10"	10"	12"	12"
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 (Boiler Room)	F	✓	✓	✓	✓	✓	NONE	NONE	STILLITE	10 1/2"	-	12"	-
	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
FRAME No. 68 (Engine Room)	A	NONE	NONE	STILLITE	10"	1" T.O.G.	NONE	NONE	STILLITE	10"	-	1/16"	12"
	F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
FRAME No. 67	A	✓	✓	✓	✓	✓	NONE	NONE	CORK	10-6"	-	1/16"	12"
	F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
FRAME No. 52	F	NONE	NONE	CORK	4"	1" T.O.G.	"	"	"	4"	4"	14"	14"
	A	"	"	"	9"	"	"	"	"	7-9"	6-7"	14"	1" T.O.G.
FRAME No. 27	F	"	"	"	10"	"	"	"	"	10"	10"	12"	"
	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
FRAME No. (After Peak)	F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SIDES	...	NONE	NONE	CORK	16-11"	1" T.O.G.	NONE	NONE	CORK	12-11"	11"	14"	14"
OVERHEADING (PARTIAL)	"	"	"	"	13-11"	1" T.O.G.	"	"	"	12-11"	11"	14"	14"
FLOORS OF CHAMBERS	...	"	"	SLAB CORK 2 LAYERS	6"	1" & 1/2" T.O.G.	✓	✓	✓	✓	✓	✓	✓
TRUNK HATCHWAYS	NONE	...	...	...	...	...	...	...	...	...	...	...	...
THRUST RECESS, SIDES AND TOP	...	...	...	...	...	...	...	...	...	...	...	...	...
TUNNEL SIDES AND TOP	...	...	...	...	...	...	...	...	...	...	...	...	...
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.O.G. 8" PLUG. BILGE 1/2" CORK. 1 1/2" T.O.G. SHEET. MANHOLE SIMILAR TO BILGE.

HATCHWAY COAMINGS, MAIN P.P. 18" x 6" / 4" BILGE P.P. 8" x 4" / 2 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 CORRUGATED 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, 2 x 2, 18" APART ON END FLOORS NONE. TO BE SUPPLIED ABOARD. ARE CLEAR OF COOLERS.

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 { N: 2 & 5 U.T.D. 2F. 2C. 2A. N: 2 & 4 " 2F. 2A. N: 2 & 5 L.T.D. 3F. 2C. 3A. } 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 TRAPPED 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" DIA. SCUPPERS water circulating pump room ✓ TRAPPED, LED TO BILGES.

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



