

# Report on Refrigerating Machinery and Appliances.

Received at London Office 22 MAY 1947

Date of writing Report 17 MAY 1947. When handed in at Local Office 21. 5. 1947 Port of GLASGOW.  
 No. in Reg. Book. Surveys held at GLASGOW Date: First Survey 14-1-47 Last Survey 2 5. 1947  
 (Number of Visits 8)  
 on the Refrigerating Machinery and Appliances of the M/V "SANGOLA" Tons {Gross 8646  
 Net 5053  
 Vessel built at GLASGOW By whom built BARCLAY CURLE & CO L<sup>D</sup> Yard No. 707 When built 1947  
 Owners BRITISH INDIA STEAM NAVIGATION CO L<sup>D</sup> Port belonging to LONDON Voyage -  
 Refrigerating Machinery made by J & E HALL L<sup>D</sup> Machine Nos. - When made -  
 Insulation fitted by J. D. INSULATING CO L<sup>D</sup> When fitted 1947 System of Refrigeration -  
 Method of cooling Cargo Chambers BRINE & AIR Insulating Material used SLAB CORK  
 Number of Cargo Chambers insulated 2 Total refrigerated cargo capacity 5730 cubic feet

## DESCRIPTION OF REFRIGERATING MACHINERY. Where placed

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 <sup>single</sup> } reduction gearing. Compressors, single or double acting - If multiple effect compression -  
 double }  
 Are 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 -  
 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 - 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:—Have they been made under survey - State No. of Report or Certificate -  
 Is each receiver, which can be isolated, fitted with a safety valve as per Rule -  
 Can the internal surfaces of the receivers be examined and cleaned - Is a drain fitted at the lowest part of each receiver -  
 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 - Volts -  
 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 -  
 to 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 - 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 -

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

101.11.42. (MADE AND PRINTED IN ENGLAND.)

004698-004702-02891/2

© 2021

Lloyd's Register  
Foundation



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... Yes...

### 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 <sub>3</sub> Condenser, Evaporator and Air Cooler Coils after erection in place						
Brine Piping after erection in place..	<u>24.4.47</u>	<u>20 lbs.</u>	<u>90 lbs.</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>

Have important steel castings and forgings been tested in accordance with the Rules... Yes...  
Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory... Yes...  
Dates of test 1-2.5.47 Density of Brine 48° by Twaddell 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 -12° & -10°F  
atmosphere 45°F cooling water inlet and discharge 46° & 51°F gas in condensers 58°F and evaporators -22°F  
the average temperature of the refrigerated chambers 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 12°F.

### 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:— See London R.M.C. Report No 1671

The foregoing is a correct description of the Refrigerating Machinery.



© 2021

Lloyd's Register  
Foundation



DESCRIPTION OF INSULATION.

IN LOWER HOLD CHAMBERS.						REFRIGERATED CARGOES IN 'TWEEN DECK CHAMBERS. MAIN TO UPPER DECK FRAMES 54 TO 63 ST <sup>d</sup> SIDE.				
	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					BULKHEAD	N <sup>o</sup> 54	SLAB GRK	10"	FACED WITH
Frame No.	F	UPPER DE				"	N <sup>o</sup> 63	" "	10"	1/2" CEMENT
Frame No.	A		REFRIGERATED			F & A BHD <sup>s</sup>	A & B	" "	10"	REINFORCED
Frame No.	F		CARGO			SHIP'S SIDE		" "	11"	WITH GALV <sup>d</sup> .
Frame No.	A	MAIN DE				OVERHEADING		" "	12"	EXPANDED METAL.
Frame No.	F	54 FR	ELEVATION.		63 FR	FLOOR OF CHAMBERS		" "	8"	FACED WITH 1/2" ASPHALTE.
Frame No.	A									
Frame No. (Boiler Room)	F		SHIP'S SIDE							
Frame No. (Engine Room)	A		SHIP'S STORES.							
Frame No.	F		INSULATED							
Frame No.	A									
Frame No.	F									
Frame No.	A									
Frame No.	F		REFRIGERATED CARGO							
Frame No.	A									
Frame No. (After Peak)	F		REFRIGERATED CARGO							
Sides ...										
Overheading ...										
Floors of Chambers ...		FR 54	SHIP'S SIDE		FR 63					
Trunk Hatchways ...										
Thrust Recess, Sides and Top ...										
Tunnel Sides and Top ...										
Tunnel Recess, Front and Top ...										

Frames or Reverse Frames, Face 2 1/2"

Bulkhead Stiffeners, Top ☒ Bottom ☒ and Face ☒

Riband 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 2" x 2" SPACED 12" floors (PORTABLE) SPACED WOOD GRATINGS tunnel top ☒

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 2 IN EACH CHAMBER

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 BY SCUPPERS

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 BY SCUPPER

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 ☒

© 2021

Lloyd's Register  
Foundation

02892/2



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..... YES  
How is the expanded metal secured in place.....  
How are the cork slabs secured to the steel structure of the vessel..... BEDDED IN BITUMINOUS 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..... 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..... ✓  
Cooling Pipes in Chambers, diameter..... 1 7/8" Minimum thickness..... 7 W.G. Are they galvanised externally..... YES  
How are they arranged in the chambers..... Side & Long girders

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.  
Technical Manager. Builders.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery..... and Insulation APPROVED PLAN.  
(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..... Complete.

General Remarks (State quality of workmanship, opinions as to class, &c.)  
The Refrigerating Machinery and Appliances have been fitted under Special Survey.  
The materials & workmanship are good.  
The Machinery has been tested under working conditions and cooling tests have been satisfactorily carried out.  
The installation is eligible in our opinion for Classification with Record of 7 LLOYDS R.M.C. 5.47.

It is submitted that this vessel is eligible for THE RECORD. + Lloyd's R.M.C. 5.47.

CERTIFICATE WRITTEN. 22/5/47.

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.
2	4	CORR RASH.	T. E. HALL LTD.	1947.	(1) BRINE & AIR (2) SLAB CORR.	9	NO.	2	5730

Fee ..... £ : : (Fee applied for, ..... 19..... Robert Lumsden & A. H. Lumsden  
Travelling Expenses £ : : (Received by me, ..... 19..... Surveyors to Lloyd's Register.

Committee's Minute.....  
Assigned..... Transmit to London + Lloyd's R.M.C. 5.47  
Lloyd's Register Foundation