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Liv.

Rpt. 17.

No. 31119

# Report on Refrigerating Machinery and Appliances.

Received at London Office 10 APR 1956

Date of writing Report 19... When handed in at Local Office 19... Port of ANTWERP

No. in Reg. Book. Survey held at ANTWERP Date: First Survey 4-1-56 Last Survey 3-4-1956 (Number of Visits 7)

on the Refrigerating Machinery and Appliances of the s/s "HILARY" Tons Gross 7420 Net 4268

Vessel built at Birkbeek By whom built Cammell Laird & Co. Ltd. Yard No. When built 1951

Owners Borth & Co. Ltd. Port belonging to Liverpool Voyage

Refrigerating Machinery made by J. E. Hall Ltd. Machine Nos 1672/4 and 16990 When made 1956

Insulation fitted by Messrs Guthrie Murdoch When fitted 1956 System of Refrigeration F12

Method of cooling Cargo Chambers... Insulating Material used Mineral wool, Sphéronite and slab cork

Number of Cargo Chambers insulated two Total refrigerated cargo capacity 17245 cubic feet

## DESCRIPTION OF REFRIGERATING MACHINERY. Where placed Foredeck port side main engine room.

Refrigerating Units, No. of 3 No. of machines 3 Is each machine independent Yes

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 or double reduction gearing. Compressors, single or double acting... If multiple effect compression.

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 or 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.

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.

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.

MADE AND PRINTED IN ENGLAND.



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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.   
 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.   
 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						
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	30-1-56	150 lb./sq. in.	250 lb./sq. in.	160 lb./sq. in.	G.V.	

*Over board. P. 15. 17. Nos R 7528 & R 7556*

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.   
 Has the spare gear required by the Rules been supplied.

Additional Spare Gear Supplied: \_\_\_\_\_

The foregoing is a correct description of the Refrigerating Machinery.  
 \_\_\_\_\_  
 Manufacturer.

**DESCRIPTION OF INSULATION.**

	IN LOWER HOLD CHAMBERS.					LOWER IN 'TWEEN DECK CHAMBERS. Nos 4 & 5				
	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									
Frame No. 4	F							mineral wool	6"	plywood
Frame No. 5	F							do.	4"	do.
Frame No. 17	F							do.	6"	do.
Frame No. (Boiler Room)	F							do.	4 1/2"	do.
Frame No. (Engine Room)	F									
Frame No.	F									
Frame No.	F									
Frame No.	F									
Frame No.	F									
Frame No. (After Peak)	F							mineral wool	8"	plywood
Sides								do.	9"	do.
Overheading								slab oak	2 1/2"	2" face boards
Floors of Chambers										
Trunk Hatchways										
Thrust Recess, Sides and Top										
Tunnel Sides and Top										
Tunnel Recess, Front and Top										

Frames or Reverse Frames, Face 1" thick slab oak bulk of frame and lining  
 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 <sup>blubs</sup> ~~holes~~ Main deck } 2" thick slab oak Bilge \_\_\_\_\_ Manhole \_\_\_\_\_  
 Hatchway Coamings, Main \_\_\_\_\_ Bilge \_\_\_\_\_  
 Hold Pillars 2" thick mineral wool and plywood lining  
 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 \_\_\_\_\_ none \_\_\_\_\_  
 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 5" x 7/8" = 5" floors 3/4" x 2 1/2" = 2" tunnel top \_\_\_\_\_  
 fixed or portable \_\_\_\_\_ Are screens fitted over the brine grids at chamber sides \_\_\_\_\_ 7/8" x 1/2" = 7" hinged or permanently fixed \_\_\_\_\_  
 Thermometer Tubes, No. and position in each chamber. See plan 10-2-56 Electric distance thermometer \_\_\_\_\_  
 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. Two scuppers to bilges one on each side and one in the middle of the side plates \_\_\_\_\_  
 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. one scupper to bilge \_\_\_\_\_  
 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. *Plank* Are cement facings reinforced with expanded steel lattice.

How is the expanded metal secured in place. *Sides plywood*

How are the cork slabs secured to the steel structure of the vessel. *Insulation secured as per approved plans.*

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

Are they permanently fixed or collapsible, or portable. *permanently*

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 *none* 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. *none*

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

CHAS. GUNTER & CO. S.A.  
SHIPBUILDERS & ENGINEERS  
2, ABchurch Lane, LIVERPOOL

Builders.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery and Insulation.

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. *To complete the*

survey of the installation of the refrigerating machinery and appliances the plant is to be examined under working conditions, the cooling down test to be carried out, spare fan to be verified and the accuracy of the electric thermometers and fan outputs, pressures etc. to be tested by the contractor and statements of the results to be supplied. The Contract Superintendent stated that this will be done on vessel's arrival at Liverpool on the 10<sup>th</sup> April 1956.

General Remarks (State quality of workmanship, opinions as to class, &c.) The refrigerating machinery and appliances of this vessel have been constructed and installed under the special survey of the Society's surveyors in accordance with the Rules, the approved plans and the secretary's letters. The material and workmanship are good. The refrigerating machinery and appliances will be eligible, in my opinion, for the record of LLOYDS R.M.C. with date etc. when the survey has been completed as described above.

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					System of Refrigerating (1) Refrigerating (2) Insulating the Chambers.	Ice melting capacity per 24 hours.	Is Refrigerating Machinery Electrically Driven?	INSULATED CARGO CHAMBERS.	
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.				No.	Capacity. Cubic ft.
2	9	Rehloffen	J & E Hall	1956	air	17.25	no	2	1724.5
					Minimal work and slab cork				

Certificate to be sent to

Fee ..... £ will be charged with 5.5 fee. (Fee applied for, 19) Received by me, 19

*J. G. Rankin*  
Surveyor to Lloyd's Register.

Committee's Minute  
Assigned. *See Liverpool 144421*