

Report on Refrigerating Machinery and Appliances.

Received at London Office **27 JUL 1955**

Date of writing Report **23.4.55** 19**55** When handed in at Local Office **28.4.55** 19**55** Port of **London**
No. in Reg. Book. Survey held at **London** Date: First Survey **22 March** Last Survey **27 April** 19**55**
(Number of Visits **9**)

on the Refrigerating Machinery and Appliances of the **S.S. PAVARE** Tons {Gross... Net...
Vessel built at... By whom built... Yard No... When built...
Owners **Elders & Fyffe Ltd.** Port belonging to... Voyage...
Refrigerating Machinery made by **J. E. Hall Ltd** Machine No. **81352** When made **1955**
Insulation fitted by... When fitted... System of Refrigeration **FIR**
Method of cooling Cargo Chambers... Insulating Material used...
Number of Cargo Chambers insulated... Total refrigerated cargo capacity... cubic feet

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed

Refrigerating Units, No. of **1** No. of machines **1** Is each machine independent
Total refrigeration or ice-melting capacity in tons per 24 hours **1.65** Are all the units connected to all the refrigerated chambers
Compressors, driven ~~directly~~ through ^{simple} **Lehriges** ~~double~~ ^{reduction} gearing. Compressors, single or double acting **single** If multiple effect compression **no**
Are relief valves or safety discs fitted **Pressure cut out** No. of cylinders to each unit **4** Diameter of cylinders **2 1/2"**
Diameter of piston rod **trunk pistons** Length of stroke **2 1/2** No. of revolutions per minute **500**
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 **1.57", 1.75"**
Breadth and thickness of crank webs **4 5/8 dia x 1 1/4** No. of sections in crank shaft **one** Revolutions of engines per minute **500**

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 **1** Cast iron or steel casings **steel** Cylindrical or rectangular **Cylindrical** Are safety valves fitted
to casings **no** No. of ^{tubes} coils in each **35** Material of ^{tubes of} coils **foralbro** Can each ^{tube} coil be readily shut off or disconnected **no**

Water Circulating Pumps, No. and size of pumps available how worked Gas Separators, No. of **1**
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 **17** Are there two separate systems, so that one may be in use while the other is being
cleared of snow **no** No. of ^{Circuits} coils in each battery **2 in each space** Material of ^{grids} coils **steel** Can each ^{grid} coil be readily shut off or
disconnected **no** Total cooling surface of battery coils **260 sq ft** Is a watertight tray fitted under each battery **no**

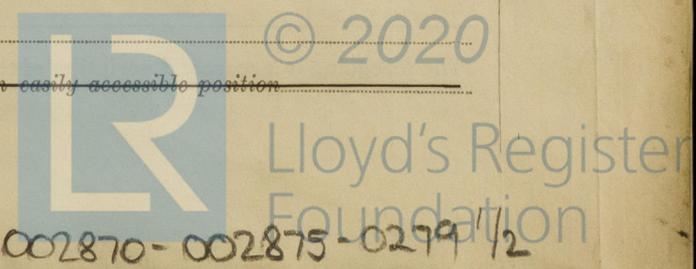
Air Circulating Fans, Total No. of... each of... cubic feet capacity, at... revolutions per minute
Steam or electrically driven... Where spare fans are supplied are these fitted in position ready for coupling up...

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.

5c.8.50. (MADE AND PRINTED IN ENGLAND.)



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) ...		120	350	200	EMS	
Gas Compressors ...	25.3.55	120	350	200	EMS	
Separators ...	25.3.55	120	350	200	EMS	
crankcase Multiple Effect Receivers ...	25.3.55	—	200	150	EMS	
Condenser Coils and covers ...	29.3.55	15	100	—	EMS	
D.E. GRIDS	5.4.55					
Evaporator Coils ...	22.4.55	120	350	200	EMS	
Suction vessel	22.3.55					
Condenser Headers and Connections	25.3.55	120	350	200	EMS	
Condenser Casings 7 tubes ...	22.3.55	120	350	200	EMS	
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...
 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... *Yes*
 Additional Spare Gear Supplied:
 1 Crankshaft
 8 piston rings
 1 Connecting rod complete with bearings
 1 evap & 1 cond gauge
 2 stop valves
 6 condenser tubes
 1 regulator
 2 sets thermostat spares
 1 list lamp
 2 - 30 lbs flasks FIR (stones)

The foregoing is a correct description of the Refrigerating Machinery.
 J. & L. E. *J. & L. E. Manufacturer.*

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.
Frame No. (Fore Peak) ...	A									
Frame No. ...	F									
Frame No. ...	A									
Frame No. ...	F									
Frame No. ...	A									
Frame No. (Boiler Room) ...	F									
Frame No. (Engine Room) ...	A									
Frame No. ...	F									
Frame No. ...	A									
Frame No. ...	F									
Frame No. ...	A									
Frame No. ...	F									
Frame No. (After Peak) ...	F									
Sides ...										
Overheading ...										
Floors of Chambers ...										
Trunk Hatchways ...										
Thrust Recess, Sides and Top ...										
Tunnel Sides and Top ...										
Tunnel Recess, Front and Top ...										
Frames or Reverse Frames, Face ...										
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 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... floors... tunnel top... 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... 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... 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... 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..... 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.....

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

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

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..... 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.....

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

Builders.

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

(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.....

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

The refrigerating machine and its appliances of this vessel has been constructed under special survey in conformity with the Society's Rules, Regulations and the Secretary's letter. The scantlings and arrangements are in accordance with those shown on the approved plans. The materials and workmanship are good.

In my opinion the refrigerating machine and its appliances of this vessel will be eligible for the notation ^{RA} LLOYDS RMC (with date) when the installation and testing have been satisfactorily carried out and the spare gear verified.

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.
1	4	Dichlorodiff hydro methane	J. E. Hall	1955		1.65	Yes		

Fee £ 20 : 1 : 6 (Fee applied for, 19.....) 28 APR 1955
Travelling Expenses £ : : (Received by me, 19.....) P. M. Selley
Surveyor to Lloyd's Register.

Committee's Minute..... 26 III 1955

Assigned..... See Liverpool Reports 142498

Certificate to be sent to

