

# REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office

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NEWCASTLE-ON-TYNE

Date of writing Report

19

When handed in at Local Office

1/2/39

Port of

No. in

Reg. Book. Survey held at

87760

Wallsend on Tyne

Date: First Survey

14 June 1938

Last Survey

21<sup>st</sup> Jan. 1939

(No. of Visits

32

on the Refrigerating Machinery and Appliances of the **Q.S.M.V. Dominion Monarch** Tons (Gross 27155 Net 15813)

Vessel built at **Wallsend on Tyne** By whom built **Swan Hunter & Wigham Richardson Ltd.** Yard No. **1547** When built **1939**

Owners **Shaw Savill & Albion Co. Ltd.** Port belonging to **Southampton** Voyage

Refrigerating Machinery made by **J.E. Hall Ltd.** Machine Nos. **9975-8** When made **1939**

Insulation fitted by **Mersey Insulation Co. Ltd.** When fitted **1939** System of Refrigeration **CO<sub>2</sub> Brine**

Method of cooling Cargo Chambers **Brine Grids & Air** Insulating Material used **Cumulated Slab Cork**

Number of Cargo Chambers insulated **24** Total refrigerated cargo capacity **511960** cubic feet.

## DESCRIPTION OF REFRIGERATING MACHINERY. Where placed **on H Deck amidships**

Refrigerating Units, No. of **4** No. of machines **4** Is each machine independent **Yes**

Total refrigeration or ice-melting capacity in tons per 24 hours **224 tons** Are all the units connected to all the refrigerated chambers **Yes**

Compressors, driven direct ~~or through~~ <sup>single</sup> ~~double~~ reduction gearing. Compressors, single or double acting **Single acting** If multiple effect compression **No.**

are relief valves or safety discs fitted **Yes** No. of cylinders to each unit **2** Diameter of cylinders **5"**

Diameter of piston rod **2 1/4"** Length of stroke **10"** No. of revolutions per minute **300/200**

Motive Power supplied from **Electric motors** Power supplied by **Five 600KW. Oil Engine Dynamos etc.**

**CO<sub>2</sub> machines** Steam Engines, high pressure, compound, or triple expansion, surface condensing. No. of cylinders **4** Diameter **6 1/2"**

Length of stroke **9" x 4 1/2"** Working pressure **300 max.** Diameter of crank shaft journals and pins **Journals 6 1/2", pins 4" dia**

Breadth and thickness of crank webs **9" x 4 1/2"** No. of sections in crank shaft **One** Revolutions of engines per minute **300 max.**

Oil Engines, type **2 or 4 stroke cycle** Single or double acting **B.H.P.**

No. of cylinders **2** Diameter **6"** Length of stroke **10"** Span of bearings as per Rule **Yes**

Maximum pressure in cylinders **300 max.** Diameter of crank shaft journals and pins **6 1/2"**

Breadth and thickness of crank webs **9" x 4 1/2"** No. of sections in crank shaft **One** Revolutions of engine per minute **300 max.**

## AIR RECEIVERS:—Is each receiver, which can be isolated, fitted with a safety valve as per Rule

Can the internal surfaces of the receivers be examined **Yes** What means are provided for cleansing their inner surfaces **See separate list attached to London Report**

Is there a drain arrangement fitted at the lowest part of each receiver **Yes** If made under survey **Yes**

No. of Receivers **4** Cubic capacity of each **110** Internal diameter **18"** thickness **1/2"**

Seamless, lap welded or riveted longitudinal joint **Seamless** Material **SD Steel** Range of tensile strength **45,000** Working pressure by Rules **150**

Electric Motors, type **Open type** No. of **4** Rated **160 HP.** Kilowatts **117.6**

Volts at **300/200** revolutions per minute. Diameter of motor shafts at bearings **1 1/2"**

Reduction Gearing **Yes** Pitch circle diameter, pinion **10 1/2"** Main wheel **10 1/2"** Width of face **1 1/2"**

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings, pinion **10 1/2"** Main wheel **10 1/2"**

Pinion shafts, diameter at bearings **1 1/2"** Main wheel shaft, diameter at bearings **1 1/2"**

Gas Condensers, No. of **4** Cast iron or steel casings **3 of Cast Iron 1 of Copper** Cylindrical or rectangular **Cylindrical** Are safety valves fitted **Yes**

to casings **Yes** No. of coils in each **3 with 14** Material of coils **SD Copper 3/4" x 1 1/4"** Can each coil be readily shut off or disconnected **Yes**

Water Circulating Pumps, No. and size of **2 - 225 tons/hour** how worked **Electrically** Gas Separators, No. of **8**

Gas Evaporators, No. of **4** Cast iron or steel casings **Steel** Pressure or gravity type **pressure** If pressure type, are safety valves fitted **Yes**

vent pipes fitted **Yes** No. of coils in each casing **13** Material of coils **SD Steel 1" x 1 5/16"** Can each coil be readily shut off or disconnected **Yes**

Direct Expansion or Brine Cooled Batteries, No. of **25** Are there two separate systems, so that one may be in use while the other is being cleared of snow **No**

No. of coils in each battery **4** Material of coils **SD Steel 1 1/2" bore** Can each coil be readily shut off or disconnected **Yes**

disconnected **Yes** Total cooling surface of battery coils **25,600 sq. ft.** Is a watertight tray fitted under each battery **Yes**

Air Circulating Fans, Total No. of **30** each of **See separate list attached to London Report** cubic feet capacity, at **See separate list attached to London Report** revolutions per minute **See separate list attached to London Report**

Steam or electrically driven **Electrically** Where spare fans are supplied are these fitted in position ready for coupling up **No**

Brine Circulating Pumps, No. and size of, including the additional pump **7-6" vertical centrifugal 1-2" horizontal** how worked **Electrically**

Brine Cooling System, closed or open **Closed** Are the pipes and tanks galvanised on the inside **No.**

No. of brine sections in each chamber **See separate list attached to London Report**

**totals = 59 for grids, 95 for coolers**

Can each section be readily shut off or disconnected **Yes** Are the control valves situated in an easily accessible position **Yes**

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

Im. 1.3.6.—T.



Common  
 Are thermometers fitted to the outdoor 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 ✓  
 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 ✓ Electrically driven.

HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
ENGINE CYLINDERS (IF TESTED)	✓					
GAS COMPRESSORS	24-5-38	1000 lbs	3000 lbs	1500 lbs	DG.	
SEPARATORS	26-5-38	do	do	do	DG.	
MULTIPLE EFFECT RECEIVERS	None					
CONDENSER COILS	21-5-38, 19-4-38, 3-5-38, 17-5-38	1000 lbs	3000 lbs	1500 lbs	DG.	
EVAPORATOR COILS	19-4-38, 4-5-38, 13-5-38, 14-5-38	do	do	do	DG.	
CONDENSER HEADERS AND CONNECTIONS	13-5-38	do	do	do	DG.	
CONDENSER CASINGS	13-5-38	10-15 lbs	30 lbs	✓	DG.	
EVAPORATOR CASINGS	9-4-38, 17-5-38	do	do	✓	DG.	
CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE	6/10/38, 10/11/38	do	do	90 lbs	✓	
BRINE PIPING AFTER ERECTION IN PLACE	5/8/38, 6/12/38	do	do	90 lbs	✓	

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 19th & 20th January 1939 Density of Brine 47° by L. Waddell hydrometer  
 Temperatures (when the cargo chambers are cooled down to the required test temperatures)  
 or, delivery and return air at 57° & 87° brine cooled batteries, outflow and return brine -67° & -37°  
 atmosphere 457° cooling water inlet and discharge 447° & 507° gas in condensers 697° and evaporators -97°.  
 the average temperature of the refrigerated chambers 8.97° and the rise of temperature in these chambers upon the expiration of twelve hours  
 time after the machinery and cooling appliances have been shut off 6.47° Admittance weather type 23/1/39.

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:-

- 48 lub. piston leathers, 48 additional springs for compressor valves.
- 48 " gland " 1 spindle & impeller for brine pumps each size
- 1 set of 2 leather moulds. 1 set bushes for " " "
- 1 pump bucket complete for V.D. ram brine pump, 1 crankshaft for CO2 machine.
- 2 springs for water relief valves, 1 pair main bearing shells lined WM, bolts & nuts.
- 2 " " brine " " 1 " crankpin " " " "
- 2 " " CO2 " " 1 pump for press. lubr., 3 CO2 gauges & 1 hydrometer.
- 12 thermometers, 1 separator drain plug, 48 safety valve discs,
- 4 - 1/2" CO2 valves & 12 spare pipes for same. 1 fitted box for compressor parts.

ELECTRICAL SPARES.

	Machine Motor	Brine Pump Motors each size	Fan Motors each size	Fans each size
Armature - packed.	1.	1	1 motor	1 motor
Shunt coils	6.	} 4	-	-
Series & interpole coils	6		-	-
Bearings	2	8	-	-
Carbon brushes	19	48	} covering all pumps.	1 set
Brush holders	1	3		1
Controller Spares	1 set	various	1 set for each of 3 or less of each size fitted	
Fan for Armatures	-	1		

The foregoing is a correct description of the Refrigerating Machinery.

J. & E. HALL, LTD.

Signed by F. WELLS Manufacturer.  
 FOR DIRECTOR.

DESCRIPTION OF INSULATION.

BULKHEADS.	IN LOWER HOLD CHAMBERS.					IN 'TWEEN DECK CHAMBERS.				
	Air Space.	Outer Lining next steel	Non-conducting Material.	Thickness of ditto.	Inner Lining.	Air Space.	Outer Lining.	Non-conducting Material.	Thickness of ditto.	Inner Lining.
FRAME No. 236 (Fore Peak)	A	none	Gran Cork	12"	1" T&G	0. L. M. U. 2135218	none	Gran Cork	12"	1" T&G
FRAME No. 208	F	"	"	8 1/2"	"	O. L. M. U. 2135218	none	"	10 1/2"	"
FRAME No. 180	A	"	"	8 1/2"	"	L. M. U. 2135218	"	"	4 1/2"	"
FRAME No. 156	F	"	"	9 1/2"	"	L. M. U. 2135218	"	"	10 1/2"	"
FRAME No. 84 (Main Room)	A	Insulation kept clear of sewage & drainage main.	"	12"	1" T&G	M. U. 2135218	Gran Cork	7" Gran & 2" @ 1/2"	4" Slab Cork	Rebuilt Shell
FRAME No. 59	F	"	"	7 1/2"	"	M. U. 2135218	none	Gran Cork	12"	1" T&G
FRAME No. 36	F	"	"	8 1/2"	"	M. U. 2135218	"	"	7 1/2"	"
FRAME No. 4 (M)	F	"	"	12"	"	"	"	"	6"	"
SIDES		none	Gran Cork	12" & 14"	1" T&G	none	none	Gran Cork	12"	1" T&G
OVERHEADING		"	"	8 1/2 - 9 1/2"	1" Slabbed hatching	"	"	"	8 1/2 - 9"	1" Slabbed hatching
FLOORS OF CHAMBERS		1/2" bituminous cement	"	8 - 9 1/2"	1 1/2" T&G	Chilled metal spaces & steel	anti-corrosive soln. & 2" slab cork & truck asphalt			
TRUNK HATCHWAYS										
THRUST RECESS, SIDES AND TOP						1/2" bituminous cement	Gran Cork	9 1/2"	1 1/2" T&G	
TUNNEL SIDES AND TOP						none	"	"	10"	"
TUNNEL RECESS, FRONT AND TOP						Escapes	"	"	"	"
FRAMES OR REVERSE FRAMES, FACE						Grounds 3x2 on tarred felt	1" T&G lining			
BULKHEAD STIFFENERS, TOP AND FACE						Hair felt & 3x1 1/2 Grounds	Bottom	MANHOLE	Insulation as for side beam.	
RIBBAND ON TOP OF DECK						3-9" wide at nos (1) 5 & 6 (4) tweendecks				
SIDE STRINGERS, TOP AND FACE						Fore Hold only, face plates covered with 1/2" hair felt	Insulation as for side beam.			
WEB FRAMES, SIDES AND FACE										
BRACKETS, TOP AND FACE										
INSULATED HATCHES, MAIN BILGE						Sides 2 p.p. top lining 3/4" & 1 1/4" Tank top straight	MANHOLE	Top lining 3/4" & 1 1/4"		
HATCHWAY COAMINGS, MAIN BILGE						Insured p.p. & 3/4" plate		Bottom 5" cow hair		
HOLD PILLARS						Insulated with 3/4" dry hair felt & covered with 2" manilla rope.				
MASTS										
Are insulated plugs fitted to provide easy access to bilge suction roses						Yes	Are insulated plugs fitted to ventilators	✓	✓	✓
and manhole doors of tanks						Yes	Are insulated plugs fitted to ventilators	✓	✓	✓
Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected						Yes	if so, how	2" elm doublings		
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						no air spaces				
and for draining the tank top						3 1/2" scuppers & drain wells fitted with Combined Valve & trap				
Fireproof Insulation. Is the insulation and woodwork fireproof in way of bunkers or any surfaces exposed to excessive heat						oil bunkers only				
Where Cooling Pipes pass through watertight bulkheads or deck plating, are the fittings and packing of the stuffing boxes both watertight and fireproof						Yes				
Cargo Battens, Dimensions and spacing, with 2 x 1 3/4" - 18" centres						fixed	Are screens fitted over the brine grids at chamber sides	✓	hinged or permanently fixed	
fixed or portable						fixed				
Thermometer Tubes, No. and position in each chamber						Generally 4 per compartment, 2 at each end				
diameter						2 1/2" internal	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				
Drainage Arrangements. What provision is made for draining the inside of the chambers						Scuppers & main drain wells fitted with ball valve & trap				
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" scupper	draining into Cofferdam below			
brine return room						2 @ 2 1/2" scuppers	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						none				

O Orlon  
 L Lowest  
 M main  
 U Upper

**Sounding Pipes, No. and position in each chamber situated below the load water line** *Usual double bottom sounding pipes & one in each hold to top of hatch on tank top.*

Diameter *2 & 2 1/2* 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 *none*

How is the expanded metal secured in place *✓*

How are the cork slabs secured to the steel structure of the vessel *patent Cement*

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

Are they permanently fixed or collapsible, or portable *wood trunking portable, permanent where metal at ship's sides & in overhead insulation.*

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 1/2 bore* Minimum thickness *Nº 7. WG* Are they galvanised externally *Yes*

How are they arranged in the chambers *Roof grids*

**Thawing Off,** what provision is made for removing the snow from the cooling pipes in the chambers *Steam heated brine*

The foregoing is a correct description of the Insulation and Appliances. *R Walsh*  
*for Messrs Insulation Co. Ltd. Builders.*

**Plans.** Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery *✓* and Insulation *Yes*  
(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 materials and workmanship are good.  
 The Requirements of the Society's Rules have been carried out  
 & the vessel is, in our opinion, eligible to have the  
 notation + Lloyd's RMC 1.39 recorded in the Register  
 Book.*

*Note The report has been signed by the Insulation  
 Contractors who are responsible to the Owners for  
 the carrying out of the work.*

*It is submitted that  
 this vessel is eligible for  
 THE RECORD. + Lloyd's RMC 1.39*

**PARTICULARS TO BE ENTERED IN REGISTER BOOK.**

REFRIGERATING MACHINES.					System of (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.				Tons.	No.
<i>4</i>	<i>8</i>	<i>Carb. Anhyd.</i>	<i>J. &amp; E. Hall, Ltd</i>	<i>1938</i>	<i>(1) Brine &amp; Air (2) Steam &amp; Oil Coch</i>	<i>22 1/4</i>	<i>YES.</i>	<i>24</i>	<i>Rule 511960 Capacity 280</i>

Fee *Nov. £32  
London 16... } £48* : : Fee applied for, *4 FEB 1939*  
 Travelling Expenses £ : : Received by me, *11.7.19 39/14/2*

*H. J. Akerstedt & A. Watt.*  
 Surveyors to Lloyd's Register.

Committee's Minute *TUE. 7 FEB 1939*

Assigned *+ Lloyd's RMC 1.39*

CERTIFICATE WRITTEN



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 Foundation

Certificate to be sent to  
 Newcastle-on-Tyne