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 R. M. C. No. 48027

Rpt. 17.

No. 9514

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office)

Date of writing Report 29th Sept 1933 When handed in at Local Office 29th Sept 33 Port of Gothenburg
 No. in Reg. Book. Survey held at Gothenburg Date: First Survey 31st August Last Survey 24th Sept 1933
 (No. of Visits 20)

on the Refrigerating Machinery and Appliances of the U.S.M.S. "Washington Express" Tons { Gross 3643 Net 2165
 Vessel built at Gothenburg By whom built A.B. Lykaverken Yard No. 476 When built 1933-9
 Owners Shibs A/S, Seattle Port belonging to Bols Voyage -
 Refrigerating Machinery made by A/S Brammens Jernstoberi Machine No. og Hek. Vorksted When made 1933
 Insulation fitted by A.B. Lykaverken When fitted whilst building System of Refrigeration CO₂
 Method of cooling Cargo Chambers cold air Insulating Material used Expanded granulated cork
 Number of Cargo Chambers insulated 5 Total refrigerated cargo capacity 175,207 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed on port side in the engine room

Refrigerating Units, No. of 2 Single, double, or triple 6 Cubic feet of air delivered per hour
 Total refrigeration or ice-melting capacity in tons per 24 hours 220 Are all the units connected to all the refrigerated chambers yes

Compressors, driven direct or through single reduction gearing. Compressors, single or double acting single acting No. of cylinders each 2 cyls
 Diameter of cylinders 130 mm Diameter of piston rod 40 mm Length of stroke 100 mm No. of strokes per minute 110

Motive Power supplied from two electric motors direct coupled

Steam Engines, high pressure, compound, or triple expansion, surface condensing. No. of cylinders 2 Diameter 150 mm
 Length of stroke 150 mm Working pressure 10 kg/cm² Diameter of crank shaft journals and pins 50 mm
 Breadth and thickness of crank webs 30 mm No. of sections in crank shaft 2 Revolutions of engines per minute 110

Oil Engines, type 2 or 4 stroke cycle Single or double acting single acting B.H.P. 220
 No. of cylinders 2 Diameter 150 mm Length of stroke 150 mm Span of bearings as per Rule 150 mm
 Maximum pressure in cylinders 10 kg/cm² Diameter of crank shaft journals and pins 50 mm

Breadth and thickness of crank webs 30 mm No. of sections in crank shaft 2 Revolutions of engine per minute 110
 Electric Motors, type enclosed ventilated No. of 2 Rated each 110 Kilowatts 220
 Volts at 375 revolutions per minute. Diameter of motor shafts at bearings 130 mm

Reduction Gearing, maximum shaft horse power at 1st pinion 220 Revolutions per minute at full power at 1st pinion 110
 2nd pinion 1st reduction wheel main shaft Pinion circle diameter, 1st pinion 150 mm 2nd pinion 150 mm
 1st reduction wheel Main wheel Width of face, 1st reduction wheel 150 mm Main wheel 150 mm
 Distance between centres of pinion and wheel faces and the centre of the adjacent bearings, 1st pinion 150 mm 2nd pinion 150 mm
 1st reduction wheel Main wheel Flexible pinion shafts, diameter 1st 50 mm 2nd 50 mm
 Pinion shafts, diameter at bearings, External, 1st 50 mm 2nd 50 mm Internal, 1st 50 mm 2nd 50 mm
 Diameter at bottom of teeth of pinion, 1st 50 mm 2nd 50 mm Wheel shafts, diameter at bearings, 1st 50 mm
 Main 50 mm Diameter at wheel shroud, 1st 50 mm Main 50 mm

Gas Condensers, No. of 4 Cast iron or steel casings cast iron Cylindrical or rectangular cylindrical
 No. of coils in each 9 Material of coils copper Can each coil be readily shut off or disconnected yes

Water Circulating Pumps, No. and size of 2 - 135 tons per hour each how worked electrically Gas Separators, No. of 0
 Gas Evaporators, No. of 2 Cast iron or steel casings steel Pressure or gravity type pressure
 No. of coils in each casing 8 Material of coils steel Can each coil be readily shut off or disconnected yes

Direct Expansion or Brine Cooled Batteries, No. of 5 Are there two separate systems, so that one may be in use while the other is being cleared of snow yes
 No. of coils in each battery 2 with 16 Material of coils steel Can each coil be readily shut off or disconnected yes
 Total cooling surface of battery coils 900 m² Is a watertight tray fitted under each battery yes

Air Circulating Fans, Total No. of 5 each of 700 cubic feet capacity, at 900/1120 revolutions per minute
 Steam or electrically driven electrically Where spare fans are supplied are these fitted in position ready for coupling up yes

Brine Circulating Pumps, No. and size of, including the additional pump 2 - 70 tons per hour each how worked electrically
 Brine Cooling System, closed or open open Are the pipes and tanks galvanised on the inside no

No. of brine sections in each chamber 16 in No. 1 hold, No. 2 hold & twin dk and 24 in after hold and twin dk.
 Can each section be readily shut off or disconnected yes Are the control valves situated in an easily accessible position yes

NOTE - THE DUKINS WHICH DO NOT APPLY SHOULD BE DELETED.



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*

Steam Condensing Plant. State what provision is made for condensing steam, in terms of Section 4, Clauses 13 and 14

HYDRAULIC AND OTHER TESTS.

Table with columns: DESCRIPTION, Date of Test, Working Pressure, Hydraulic Test Pressure, Air Test Pressure, Stamped, REMARKS. Rows include ENGINE CYLINDERS, GAS COMPRESSORS, SEPARATORS, CONDENSER COILS, EVAPORATOR COILS, etc.

Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory *yes*. Dates of test *23rd Sept. 1923*. Density of Brine *300* by *baumé* hydrometer. Temperatures (when the cargo chambers are cooled down to the required test temperatures) of air at the snow box and of the return air *✓* & *✓* or, delivery and return air at direct expansion or brine cooled batteries & outflow and return brine *-11°C* & *-9.5°C* atmosphere *+11°C* cooling water inlet and discharge *+15°C* & *+16°C* gas in condensers *+23 1/2°C* and evaporators *-14°C* the average temperature of the refrigerated chambers *-6.2°C* 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 *5.1°C*

SPARE GEAR.

Are the machines in accordance with Section 4, Clause 2 of the Rules

Are the working parts of the machines, pumps and motors respectively, interchangeable

Table with columns: ARTICLES SUPPLIED AS PER RULE, ADDITIONAL SPARE GEAR SUPPLIED. Includes items like piston rods, valves, bearings, pumps, etc.

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

The foregoing is a correct description of the Refrigerating Machinery.

Manufacturer.

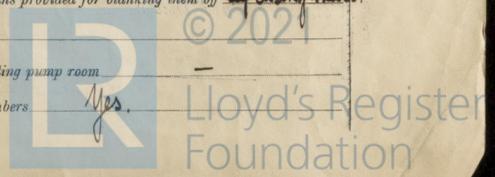
DESCRIPTION OF INSULATION.

All thicknesses of wood linings are the finished thicknesses when planed.

Table with columns: IN LOWER HOLD CHAMBERS, IN TWEEN DECK CHAMBERS. Rows include FRAME NO. 129, 133, 110, 83, 77, 89, 61, 9, SIDES, OVERHEADING, FLOORS OF CHAMBERS, TRUNK HATCHWAY, etc.

Table with columns: FRAMES OR REVERSE FRAMES, FACE, BULKHEAD STIFFENERS, TOP, BOTTOM, AND FACE, RIBBAND ON TOP OF DECKS, SIDE SPRINGERS, TOP, BOTTOM, AND FACE, WEB FRAMES, SIDES, AND FACE, BRACKETS, TOP, BOTTOM, AND FACE, INSULATED HATCHES, MAIN, HATCHWAY COAMINGS, MAIN, HOLD PILLARS, MASTS, VENTILATORS, etc.

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 Baffles, Dimensions and spacing, sides *3x2 @ 14" centers* floors *will be supplied by batten, 3x2 horizontal @ 15" centers*. Thermometer Tubes, No. and position in each chamber *As per approved plan*. Protection of Pipes. Are all pipes, including air and sounding pipes, which pass through or into insulated chambers, well insulated. Draining Arrangements. Where the chambers are situated below the load water line, what provision is made for draining the inside of the chambers. What provision is made for draining the refrigerating machinery room *2" scuppers*. brine rooms *2" scuppers* fan room *none* water circulating pump room *none*. Are all air spaces behind insulation arranged to drain to the bilges, bilge wells, or gutterways of the respective chambers *Yes*.



Sounding Pipes, No. and position in each chamber situated below the load water line *As per approved plan.*

Diameter *4"* 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 *-*

Air Trunkways in Chambers, inside dimensions, main *As per approved plan* and branch *-*

Are they permanently fixed or collapsible or portable *Yes.* State position in chambers *At 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. **AKTIEBOLAGET GÖTAVERKEN**
L. S. Neeluis Builders.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery *16226/6 1933* 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 Refrigerating machinery has been installed and the insulation fitted under an inspection and to our satisfaction. The insulation is good and in accordance with approved plans and Secretary's letter E 24.3.1933. A plan of the insulation as fitted is forwarded. The electric current for the refrigerating plant is supplied by four auxiliary diesel oil engine driven generators of 110 kw each. The spare gear has been checked on board.

The Refrigerating installation of this vessel is eligible in our opinion to be classed in the Register Book and to have record of + LLOYDS RMC 9.33 for a temperature of 33°F subject to the refrigerating machinery having been satisfactorily reported on by the Oslo surveyors during construction.

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					System of (1) Refrigerating (2) Insulating the Chambers.	POWER.		INSULATED CARGO CHAMBERS.	
No. and whether Single or otherwise.	Makers.	Date of Construction.	System.	Type.		Cubic feet of air delivered per hour.	Ice melting capacity per 24 hours. Tons.	No.	Capacity.
								5	175.207 c.f.

Fee *273:00* { Fee applied for, *29/9 1933*
 LATE FEE
 Travelling Expenses *25:00* { Received by me, *16.10 1933*

S. Townshend & Bernelius
 Surveyor to Lloyd's Register.

Committee's Minute *FRI. 6 OCT 1933*

Assigned *+ Lloyd's RMC. 9.33*
For Temp. 33°F

FRI. 17 NOV 1933
FRI. 26 JAN 1934

certificates to be sent to

copy fee
not paid

certIFICATE WRITTEN