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Rpt. 17.

No. 77634

Report on Refrigerating Machinery and Appliances.

Date of writing Report 18.9.51 When handed in at Local Office 18.9.51 Port of Glasgow Received at London Office 20 SEP 1951

No. in Reg. Book. Survey held at Glasgow Date: First Survey 15.5.51 Last Survey 12.8.51 (Number of Visits 14)

on the Refrigerating Machinery and Appliances of the M.V. "Zent" Tons Gross 3242 Net 2186 2144

Vessel built at Landskrona By whom built Gresundsvaret AKT. Yard No. When built 1938

Owners Elders & Yffes Ltd Port belonging to London Voyage

Refrigerating Machinery made by J & F. Hall Ltd Machine Nos. 14548/9 When made 1951.

Insulation fitted by Griguard When fitted Griguard system of Refrigeration F12

Method of cooling Cargo Chambers Brine & Air Insulating Material used Granulated Cork & Glass Wool

Number of Cargo Chambers insulated Eleven Total refrigerated cargo capacity 143,934 cubic feet

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed Separate compartment on starboard side

Refrigerating Units, No. of 2 No. of machines 2 Is each machine independent Yes

Total refrigeration or ice-melting capacity in tons per 24 hours 40 Are all the units connected to all the refrigerated chambers Yes

Compressors, driven direct or through Belts Compressors, single or double acting Single If multiple effect compression No

Are relief valves or safety discs fitted Yes No. of cylinders to each unit 2 Diameter of cylinders 10 1/2"

Diameter of piston rod 1/2" Length of stroke 8" No. of revolutions per minute 350

Motive Power supplied from 3 Diesel Generators 2 @ 333 BHP @ 500 rpm + 1 @ 164 BHP @ 500 rpm

Steam Engines, high pressure, compound, or triple expansion, surface condensing. No. of cylinders 2 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 Petter 3.54 2 or 4 stroke cycle 2 Single or double acting Single B.H.P. 2 @ 333 2 @ 500

No. of cylinders Diameter Length of stroke Span of bearings as per Rule

Maximum pressure in cylinders Diameter of crank shaft journals and pins See Test sheets & reports on

Breadth and thickness of crank webs No. of sections in crank shaft Revolutions of engine per minute 2215/51

Air Receivers: Have they been made under survey No accepted for State No. of Report or Certificate

Is each receiver, which can be isolated, fitted with a safety valve as per Rule. Yes Original installation - see time report now.

Can the internal surfaces of the receivers be examined and cleaned Yes Is a drain fitted at the lowest part of each receiver Yes.

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 2. Campbell & Schenwood 42490, 220V 90AMP. One ME 48997. 220V 454amp. Rated. Cont. Encl. Kilowatts 299amp Volts 220

at 875/1300 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 2 Cast iron or steel casings Steel Cylindrical or rectangular cylindrical Are safety valves fitted

to casings. No. of tubes in each 226 Material of coils Yorkalloy Can each coil be readily shut off or disconnected No

Water Circulating Pumps, No. and size of pumps available 2 Existing how worked Gas Separators, No. of

Gas Evaporators, No. of 2 Cast iron or steel casings Steel Pressure or gravity type pressure If pressure type, are safety

valves fitted. No. of tubes in each casing 356 Material of coils Yorkalloy Can each coil be readily shut off or disconnected No

Direct Expansion or Brine Cooled Batteries, No. of 13 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 496 Material of coils Gal Iron Can each coil be readily shut off or

disconnected. Yes Total cooling surface of battery coils about 16000 sq ft Is a watertight tray fitted under each battery Yes

Air Circulating Fans, Total No. of 4 (new fan fitted ME 2 lower Deck) 381000 cubic feet capacity, at 750/1100 revolutions per minute

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 2 4 1/2" Simpson centrifugal Electric

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

No. of brine sections in each chamber 4 & 6 in each battery

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



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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)		115/15	115/15	115/15		
Gas Compressors	16/2/51	130	350	200	EMS	
Separators	9/2/51	-	200	150	EMS	
Multiple Effect Receivers						
Condenser Coils	22/5/51	15	150	-	EMS	
Evaporator Coils	18/5/51	30	100	-	EMS	
Condenser Headers and Connections	9/5/51					
Condenser Casings	11/5/51	120	350	200	EMS	
Evaporator Casings	11/5/51	120	350	200	EMS	
NH ₃ Condenser, Evaporator and Air Cooler Coils after erection in place						
Brine Piping after erection in place	28/6/51	115/50	100	115		Examined & found good joints.
Have important steel castings and forgings been tested in accordance with the Rules <u>Yes</u> new installation only						
Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory. <u>Yes</u>						
Dates of test. 1st & 2nd Aug 1951 Density of Brine 4.4 by Twaddle 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. Air delivery 30°F Return 31°F (average) & 21°F, outflow and return brine 21°F & 27°F atmosphere 70°F/64°F cooling water inlet and discharge 64°F/52°F & gas in condensers 78/77°F and evaporators 19°F						
the average temperature of the refrigerated chambers 31°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 7.2 average Rise/hr = .6						

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:-

- | | |
|--------------------------------|-----------------------------------|
| 1 set compressor piston rings | 1 - F12 gauge |
| 1 " bottom end brasses & balls | 1 - Brine gauge |
| 1 " top end bushes | 12 - Safety discs |
| 1 set main bearing brasses | 4 - sight glasses |
| 3 " driving belts | 1 - B.C. Thermos |
| 3 " gland packing | 1 - Box spare gear. |
| Brine Pump | Electrical |
| 1 Impeller & shaft complete | 1 armature packed for stowage |
| 1 impeller for fan | 1 line of brush holders & springs |
| | 1 set carbon brushes |
| | 1 set bearings |
| | 1 starter spare gear |

The foregoing is a correct description of the Refrigerating Machinery.

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. 134 (Fore Peak)	A	—	TAG	Gran Cork	6"					
Frame No. 105	F		"	"	4 1/2"					
	A		"	"	4"					
Frame No. 105	F									
Frame No. 105	A									
Frame No. 43 (Boiler Room)	F	—	TAG	Gran Cork	4 1/2"					
Frame No. 55 (Engine Room)	A	—	Sheet Iron	Sheet Glass	8 1/2"					
Frame No. 31	F		"	"	4"					
	A		"	"	4"					
Frame No. 10	F	—	TAG	Gran Cork	6 1/2"					
Sides			TAG	G. Cork	9"					
Overheading			"	G. Cork	9"					
Floors of Chambers				Sheet Glass	6"					
Trunk Hatchways										
Thrust Recess, Sides and Top										
Tunnel Sides and Top										
Tunnel Recess, Front and Top										
Frames or Reverse Frames, Face										
Bulkhead, Stiffeners, Top										
Ribband on Top of Decks										
Side Stringers, Top										
Web Frames, Sides										
Brackets, Top										
Insulated Hatches, Main										
Hatchway Coamings, Main										
Hold Pillars										
Masts										
Are insulated plugs fitted to provide easy access to bilge suction roses.										
and manhole doors of tanks.										
Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected.										
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.										
Cooling Pipes pass through watertight bulkheads or deck plating, are the fittings and packing of the stuffing boxes both watertight and fireproof.										
Cargo Batts, Dimensions and spacing, sides.										
fixed or portable.										
Thermometer Tubes, No. and position in each chamber.										
diameter.										
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.										
Are all air spaces behind insulation arranged to drain to the bilges, bilge wells, or gutterways of the respective chambers.										

Note:-

Fore Hold & Gran Cork
Aft Hold Sheet Glass
Iron Wool

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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. *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. Are the arrangements satisfactory and in accordance with the approved plans.

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 1/2" Bone* Minimum thickness. Are they galvanised externally. *Yes*

How are they arranged in the chambers. *Batteries*

Thawing Off, what provision is made for removing the snow from the cooling pipes in the chambers. *Electric brine heater*

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

Builders.

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

Yes

and Insulation. *Previously approved when accepted for class.*

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 constructed under Special Survey in conformity with the Society's Rules & Regulations & the Secretary's letters has been installed on this vessel satisfactorily. The original insulation of the various chambers & the Appliances are as previously approved when the vessel was accepted into Class and the new insulation of the brine chamber & piping & the existing insulation & appliances were surveyed & found satisfactory and on completion satisfactory running tests were witnessed. All requirements of S.R.M. were done. In my opinion the Refrigerating machinery & appliances of this vessel are in good condition and are eligible in my opinion to remain as classed WITH RECORD LLOYD SRMC 8/51, SRMC 8/51 to maintain temp. 31° F.A.H., with sea temp. 85° F. max. ±

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	Green 12	J. E. Hall	1951	Brine & Air	40	Yes	11	143,934

Fee £60:- Fee applied for 19 SEP 1951

Travelling Expenses £ Received by me, 19 SEP 1951

Committee's Minute.

Assigned.

Lloyds RMC 8.51

SRMC 8.51

To maintain temp. 31° F with sea temp 85° F max.

CERTIFICATE WRITTEN
(RMC & SRMC)
25.9.51

James G. Murray
Surveyor to Lloyd's Register.



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