

# Report on Refrigerating Machinery and Appliances.

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Date of writing Report 30<sup>th</sup> Dec 1954. When handed in at Local Office 19 Port of Rotterdam  
 No. in Reg. Book. Survey held at Rotterdam Date: First Survey 20<sup>th</sup> October 54 Last Survey 22<sup>nd</sup> December 1954.  
 21187 71512 (Number of Visits 9)  
 on the Refrigerating Machinery and Appliances of the m/s "MOORDAM" Tons Gross 10726 Net 6236  
 Vessel built at Rotterdam By whom built H. J. P. Smit & Co. Yard No. When built 1938-9  
 Owners Ned. Inv. Stoom. Nij. Port belonging to Rotterdam Voyage New York  
 Refrigerating Machinery made by Westinghouse Electric Machine Nos. 11279. When made 1954.  
 Insulation fitted by Messrs. Hertel & Co. When fitted 1954. System of Refrigeration Freon 12.  
 Method of cooling Cargo Chambers Direct exp. cooled batteries Insulating Material used Cork slabs.  
 Number of Cargo Chambers insulated 2 Total refrigerated cargo capacity 126.35 cubic feet

**DESCRIPTION OF REFRIGERATING MACHINERY.** Where placed No 4 Hold Tween deck space  
 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 15.4 Are all the units connected to all the refrigerated chambers Yes  
 Compressors, driven direct or through <sup>single</sup> Vee belts <sub>double</sub> reduction gearing. Compressors, single or double acting S.A. If multiple effect compression ✓  
 Are relief valves or safety discs fitted Yes relief valves No. of cylinders to each unit 3 Diameter of cylinders 4 inch  
 Diameter of piston rod Not fitted Length of stroke 4 1/4 inches No. of revolutions per minute 683  
 Motive Power supplied from Existing oil engine generators  
 (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 ✓  
 Breadth and thickness of crank webs ✓ No. of sections in crank shaft ✓ Revolutions of engines per minute ✓  
 Oil Engines, type Existing 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 Existing 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 ✓  
 2 Electric Motors, type Compound / driving compressors No. of 2 Rated 17.5 H.P. Kilowatts 220 Volts  
 at 2000 revolutions per minute. Diameter of motor shafts at bearings 50 mm  
 Reduction Gearing Not fitted 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 No. of coils in each Multitubular Material of coils steel fins Can each coil be readily shut off or disconnected No  
 Water Circulating Pumps, No. and size of pumps available elec driven how worked cap. 104/lh 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 2 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 9.6 Material of coils Copper with fins Can each coil be readily shut off or  
 disconnected No Total cooling surface of battery coils 1615 each Is a watertight tray fitted under each battery Yes  
 Air Circulating Fans, Total No. of 2 each of 5807 cubic feet capacity, at 1000 revolutions per minute  
 Steam or electrically driven Electric driven 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 ✓ 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.



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...  
*Yes*  
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 ...	15-11-54	150 lbs	350 lbs	200 lbs	Lloyd's Test	oil 200/350 lbs. air 150/200 lbs. WB 15-11-54.
„ Separators <i>lig receiver</i> ...	15-11-54	do	do	do		C.P.M. 15-11-54
„ Multiple Effect Receivers ...						
„ Condenser Coils ...	15-11-54	do	do	do		C.P.M. 15-11-54
<i>Direct exp. Batteries.</i> „ Evaporator Coils ...	1-11-54	do	do	do		C.P.M. 1-11-54
„ Condenser Headers and Connections ...						
„ Condenser Casings ...	15-11-54	do	do	do		J.F.V. 15-11-54
„ Evaporator Casings ...						
<i>Free</i> „ Condenser, Evaporator and Air Cooler Coils after erection in place	15-12-50	do	✓	do	✓	✓
Brine Piping after erection in place...	✓	✓	✓	✓	✓	✓

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 21-12-54. 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 - 25°C & -23°C, outflow and return brine ✓ & ✓  
atmosphere 7°C cooling water inlet and discharge 8°C & 10°C gas in condensers 26°C and evaporators -35°C  
the average temperature of the refrigerated chambers -20.5 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 - 14.5°C

### 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:—*No*

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. (Fore Peak)	A									
Frame No. 53	F									
	A					✓	Solution	Cork slabs	8 inch	Cement 1/2 inch
Frame No. 36	F									
	A					✓	Solution	Cork slabs	8 inch	Cement 1/2 inch
Frame No. 32	F					✓	Solution	Cork slabs	8 inch	Cement 1/2 inch
	A									
Long bulkhead	X	Port				✓	Solution	Cork slabs	8 inch	Cement 1/2 inch
Frame No. 2 1/2	X	Starboard				✓	Solution	Cork slabs	8 inch	Cement 1/2 inch
Frame No. (Engine Room)	A									
Frame No.	F									
	A									
Frame No.	F									
	A									
Frame No.	F									
	A									
Frame No. (After Peak)	F									
Sides	Shull					✓	Solution	Cork slabs	12 inch	Cement 1/2 inch
Overheating						✓	Solution	Cork slabs	13 inch	Cement 1/2 inch
Floors of Chambers						✓	Solution	Cork slabs	8 inch	Bitumen 1 inch
Trunk Hatchways						✓	Solution	Cork slabs	8 inch	Cement 1 inch
Thrust Recess, Sides and Top										
Tunnel Sides and Top										
Tunnel Recess, Front and Top										
Frames or Reverse Frames, Face										
Bulkhead Stiffeners, Top	3 inch									
		Bottom	3 inch							
Ribband on Top of Decks										
Side Stringers, Top	✓									
		Bottom	✓							
Web Frames, Sides	✓									
		and Face	✓							
Brackets, Top	✓									
		Bottom	✓							
Insulated Hatches, Main	✓									
		Bilge	✓							
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	✓							
and manhole doors of tanks	✓									
Are insulated plugs fitted to ventilators	✓									
		cargo ports	✓							
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										
		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 Battens, Dimensions and spacing, sides	2 x 2 inch teak									
	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	2 in air trunkways and 2 bulbs of Malone									
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	2 scuppers, forward and aft in each chamber									
	after draining in tunnel (in each chamber)									
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	Through existing tween deck scuppers									
brine return room	✓									
	fan room	✓								
	forward scupper	✓								
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.....Yes  
How is the expanded metal secured in place.....with corrugated galvanized clips  
How are the cork slabs secured to the steel structure of the vessel.....Odourless bituminous solution and rotten pins between layers of cork slabs.  
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 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.....✓ 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.

X N.V. NIEHUIS & VAN DEN BERG'S  
Scheepswaerfmeesters  
Builders.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery.....27-8-54 and Insulation.....16-9-54.  
(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.....

General Remarks (State quality of workmanship, opinions as to class, &c.) This additional refrigerating machinery, appliances and the insulation of the new cargo chambers in No. 5 Hold Tweendeck space of this vessel have been constructed and fitted under special survey and in accordance with the approved plans, Society's Rules and Secretary's letters, found workmanship good throughout. The electrical installation of this additional refrigerating equipment have been installed under special survey and in conformity with the Rules (amended plans attached), materials and workmanship found good, upon completion megger tested as required and found satisfactory. A cooling down and rise of temperature test of the chambers was carried out with the results as stated above.  
In my opinion this refrigerating machinery and appliances is eligible to be submitted for the record of + Lloyd's R.M.C. 12-54. To maintain temperatures of 15°F by a sea temp of 86°F maximum.

butlorodifluoromethane

PARTICULARS TO BE ENTERED IN REGISTER BOOK. of the additional installation.

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.				No.	Capacity. Cubic ft.
2	2	Freon 12	Westinghouse Elec Air Intern. Company	1954	Direct exp. coiled batteries slab cork.	Tons. 15.4	Yes	2	12635

Fee .....£ 340;- (Fee applied for, 7/1 1955)  
Travelling Expenses £ 22;- (Received by me, 19.....)  
Surveyor to Lloyd's Register.

FRIDAY 28 JAN 1955

Committee's Minute.....

Assigned No. 5 Sw. dk plant  
+ Lloyd's R.M.C. 12-54

To maintain temp of 15°F with  
sea temp 86°F max. (See also later minute on ship 53737  
re No. 3 Tween decks plant)

CERTIFICATE WRITTEN

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Foundation