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R. M. C. No. No. 36075

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office 21 MAR 1930 7 AUG 1930)

Date of writing Report 21 MAR 1930 When handed in at Local Office 21 MAR 1930 Port of London
No. in Reg. Book. Survey held at Belfast. Date: First Survey 15th November 1929 Last Survey 7th January 1930
86096. 16th June 1930 (No. of Visits 5 + 9)

on the Refrigerating Machinery and Appliances of the MV "TAYBANK" Tons {Gross Net
Vessel built at Belfast By whom built Workman Clark & Co. Yard No. 512 When built 1930
Owners Andrew Weir & Co. Ltd. Port belonging to Belfast. Voyage
Refrigerating Machinery made by J. E. Hall Ltd. Machine No. 8122. When made 1930
Insulation fitted by Gregson & Co. Ltd. When fitted 1930. System of Refrigeration CO₂ + Brine
Method of cooling Cargo Chambers air cooled. Insulating Material used Granulated & slab cork.
Number of Cargo Chambers insulated 2 Total refrigerated cargo capacity 15,450 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed Main deck, aft.

Refrigerating Units, No. of one Single, double, or triple Cubic feet of air delivered per hour
Total refrigeration or ice-melting capacity in tons per 24 hours 12 Are all the units connected to all the refrigerated chambers yes.

Compressors, driven direct or through ^{single} ~~double~~ reduction gearing. Compressors, single or double acting single No. of cylinders two
Diameter of cylinders 2 1/8" Diameter of piston rod 1" Length of stroke 6" No. of strokes per minute 400 each

Motive Power supplied from Electric motor direct coupled.

Steam Engines, high pressure, compound, or triple expansion, surface condensing. No. of cylinders 1 Diameter 10"
Length of stroke 12" Working pressure 120 lbs. Diameter of crank shaft journals and pins 3" journals, 3 1/2" pins
Breadth and thickness of crank webs 10" x 1 3/4" No. of sections in crank shaft one Revolutions of engine per minute 400

Oil Engines, type 4 stroke cycle Single or double acting B.H.P. 220
No. of cylinders 2 Diameter 10" Length of stroke 12" Span of bearings as per Rule
Maximum pressure in cylinders 120 lbs. Diameter of crank shaft journals and pins 3"

Electric Motors, type EVDP Supplied by shipbuilders No. of One Rated 26 1/2 H.P. Kilowatts 220
Volts at 400 revolutions per minute. Diameter of motor shafts at bearings 3 1/4"

Reduction Gearing, maximum shaft horse power at 1st pinion 220 Revolutions per minute at full power at 1st pinion 400
2nd pinion 1st reduction wheel main shaft Pitch circle diameter, 1st pinion 2nd pinion
1st reduction wheel Main wheel Width of face, 1st reduction wheel Main wheel
Distance between centres of pinion and wheel faces and the centre of the adjacent bearings, 1st pinion 2nd pinion
1st reduction wheel Main wheel Flexible pinion shafts, diameter 1st 2nd
Pinion shafts, diameter at bearings, External, 1st 2nd Internal, 1st 2nd
Diameter at bottom of teeth of pinion, 1st 2nd Wheel shafts, diameter at bearings, 1st 2nd
Main Diameter at wheel shroud, 1st Main

Gas Condensers, No. of 1 Cast iron or steel casings cast iron Cylindrical or rectangular cylindrical
No. of coils in each 3 Material of coils S.D. copper 3/4" b. x 10" d. Can each coil be readily shut off or disconnected yes.

Water Circulating Pumps, No. and size of 1 - 1 1/2" centrifugal how worked electrically Gas Separators, No. of 2

Gas Evaporators, No. of 1 Cast iron or steel casings steel Pressure or gravity type gravity
No. of coils in each casing 2 Material of coils S.D. steel 1 1/2" b. x 1 5/8" d. Can each coil be readily shut off or disconnected yes

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 no
No. of coils in each battery 2 Material of coils S.D. steel 1 1/2" b. x 1 5/8" d. Can each coil be readily shut off or disconnected yes
Total cooling surface of battery coils 825 sq. feet Is a watertight tray fitted under each battery yes

Air Circulating Fans, Total No. of 1 - 14 1/2" each of 5500 cubic feet capacity, at 900 revolutions per minute
Steam or electrically driven electrically Where spare fans are supplied are these fitted in position ready for coupling up no

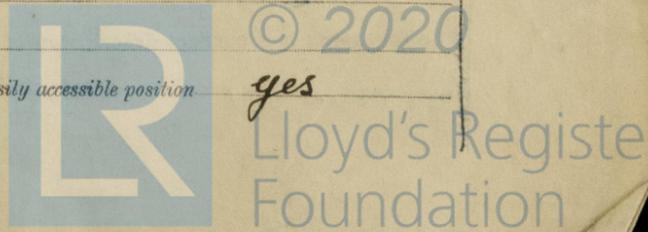
Brine Circulating Pumps, No. and size of, including the additional pump 2 - 2" centrifugal how worked electrically

Brine Cooling System, closed or open open Are the pipes and tanks galvanised on the inside no
No. of brine sections in each chamber air cooled.

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.

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

HYDRAULIC AND OTHER TESTS.

DESCRIPTION	Date of Test	Working Pressure	Hydraulic Test Pressure	Air Test Pressure	Stamped	REMARKS
ENGINE CYLINDERS (IF TESTED)						
GAS COMPRESSORS	6-12-29	1000 lbs	3000 lbs	1500 lbs	OK	
" SEPARATORS	18-11-29	do	do	do	OK	
" CONDENSER COILS	6-12-29	do	do	do	OK	
" EVAPORATOR COILS	10-12-29	do	do	do	OK	
" CONDENSER HEADERS AND CONNECTIONS	11-11-29	do	do	do	OK	
" CONDENSER CASINGS	18-11-29	do	do	do	OK	
" EVAPORATOR CASINGS	4-1-30	10 to 15 lbs	30 lbs	✓	OK	open top
NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE						
BRINE PIPING AFTER ERECTION IN PLACE						

Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory yes.
 Dates of test 5-6 Aug 1930. Density of Brine 49 by Twardella 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 21°F & 16°F, outflow and return brine -2°F & 3°F,
 atmosphere 65°F cooling water inlet and discharge 54°F & 62°F gas in condensers 68°F and evaporators -5°F.
 the average temperature of the refrigerated chambers 21°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 Fore Chamber 11°F Aft Chamber 14°F = .92 & 1.17°F per hour.

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 ✓

ARTICLES SUPPLIED AS PER RULE.

- 1 Crankshaft.
- 1 Compressor piston & rod for each compressor.
- 1 set rings for each compressor piston.
- 1 spindle & impeller for circulating water pump.
- 1 do do for brine pump.
- 1 spare brine pump in engine room.
- 1 pair main bearing shells lined with W. M.
- 1 pair connecting rod brasses lined with W. M.
- 1 pair crosshead brasses.
- 2 bolts & nuts for cone rod big end.
- 2 studs & nuts for crosshead.
- 2 bolts & nuts for main bearing.
- 1 regulator spindle.
- 1 set of two leather moulds.
- 1 set of valves & springs for each compressor.
- 6 lubricator piston leather.
- 6 do gland leather.
- 2 sets of copper joint rings for compressor joints.
- 1 set of do do for other joints.
- 1 set of special metal rings for each compressor gland.
- 3 lengths of each size pipe for brine mains.
- 3 bends do do do.
- 12 sockets & 12 backnuts do do.
- 1 set of gas screwing dies for above.
- 24 assorted bolts & nuts.

ADDITIONAL SPARE GEAR SUPPLIED.

- 8 addl. Springs for Comp^r valve.
- 1 spring for water relief valve.
- 1 do CO₂ safety valve.
- 1 oil pump for pressure lubricator.
- 1 CO₂ pressure gauge.
- 1 hydrometer.
- 2 brass cased thermometers.
- 6 safety discs.
- 1-1/2" CO₂ valve & 3 spare pipe.
- 1 fitted box for comp^r parts.
- 3 bolts & 3 sets leather washers for machine coupling.

Electrical spare gear.

- 1 Armature.
 - 2 Field coils.
 - 2 Inter pole coils.
 - 1. Line brush holder.
 - 1 set brushes.
 - 1 set bearings.
- Electric spares 1 Armature with its shaft & bearing bushes. supplied for fan motor. Main motor. Brine pump together with its electric motor. (See London letter dated 14th & 26th Nov 1929.)

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED.

The foregoing is a correct description of the Refrigerating Machinery.

FOR J. & E. HALL, LTD. Manufacturer.
 Chichester

DESCRIPTION OF INSULATION.

FRAME No.	Location	IN LOWER HOLD CHAMBERS.			IN 'TWEEN DECK CHAMBERS.				
		Air Space	Outer Lining	Non-conducting Material	Thickness of ditto	Air Space	Outer Lining	Non-conducting Material	Thickness of ditto
FRAME No. A (Fore Peak)	Forward Chamber (Fruit)			End Bld. Fr 77	✓	✓	Green cork	9"	2 3/4" T.R.G.
FRAME No. F				102	✓	✓	-do-	9"	-do-
FRAME No. A				Sides	✓	✓	-do-	9"	-do-
FRAME No. F	After Chamber (Egg + milk)			Overheading	✓	✓	-do-	10"	-do-
FRAME No. A				Floor	✓	✓	Slate cork	8" in three layers	1 1/2" requisite on ext. metal.
FRAME No. F	Boiler Room			End Bld. Fr 78	✓	✓	Green cork	9"	2 3/4" T.R.G.
FRAME No. A				71+2	✓	✓	-do-	11" + 12"	-do-
FRAME No. A	Engine Room			Sides	✓	✓	Green cork	9"	-do-
FRAME No. F				Overheading	✓	✓	-do-	11"	-do-
FRAME No. A	After Peak			Floor	✓	✓	Slate cork	9" in three layers	1 1/2" requisite on ext. metal.
FRAME No. 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									
RIBBAND ON TOP OF DECKS									
SIDE STRINGERS, TOP									
WEB FRAMES, SIDES									
BRACKETS, TOP									
INSULATED HATCHES, MAIN									
HATCHWAY COAMINGS, MAIN									
MASTS									
Are insulated plugs fitted to provide easy access to bilge suction roses									
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									
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 Battens, Dimensions and spacing, sides & ends 2x2 approx. floors									
Thermometer Tubes, No. and position in each chamber									
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									
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 Yes Are cement facings reinforced with expanded steel lattice None

How is the expanded metal secured in place By 3 staples

How are the cork slabs secured to the steel structure of the vessel on floor laid in bituminous enamel.

Air Trunkways in Chambers, inside dimensions, main 5' 4" wide and branch.

Are they permanently fixed or collapsible, or portable permanently fixed State position in chambers sides and

Where air trunkways pass through watertight bulkheads, are they fitted with watertight doors Are the door frames efficiently insulated Yes

Are insulated plugs supplied for the doorways Yes Where are the doors worked from Both sides.

Cooling Pipes in Chambers, diameter 1/2" bore in air coolers Are they galvanised externally Yes.

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.

WORKMAN CLARK (1928) LIMITED.

F. Cunningham

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 Yes. If so, state name of vessel LOSSIEBANK.

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, etc.) The refrigerating machinery has been constructed under special survey and the materials and workmanship are good.

The machinery has been satisfactorily installed & fastened in the machinery space the insulated spaces have been cooled down by the engine working for 13 1/2 hours from 60°F to 21°F.

In my opinion the vessel is now eligible for record + Lloyd's R.M.C. 8,30 for a temperature of 20°F.

John K. Williams.
Belfast 6/8/30.

+ Lloyd's R.M.C. 8,30.
For temp 20°F.

D.M. 7/8/30

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					POWER.		INSULATED CARGO CHAMBERS.		
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.	System of (1) Refrigerating (2) Insulating the Chambers.	Cubic feet of air delivered per hour.	Ice melting capacity per 24 hours. Tons.	No.	Capacity. Cubic ft.
one	2	Carb. Amalg.	J. E. Hall & Co.	1930	(1) Air & Brine (2) Lye. carb. etc. etc.		12	2	13,900

Un% 42:0:0 }
Fee Bel. 14:0:0 } £ 6:0:0
Special Attendance 1:1:0 }
Travelling Expenses £ 4:7:0 }
LON 10 }
Expenses of Committee's Minute 15:0:0 }
FRI. 8 AUG 1930

D. Gemmell.
Surveyor to Lloyd's Register.
L. R. [Signature]

Assigned + Lloyd's R.M.C. 8,30
For temp. 20°F.

CERTIFICATE WRITTEN.

