

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office)

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85149. SURVEY HELD AT GLASGOW DATE 1ST SURVEY 24th Nov 1924 LAST SURVEY 25/2/25 (No. of Visits) 14
 No of VISITS 26.
 on the Refrigerating Machinery and Appliances of the T/S Yonagiri Tons { Gross 8729
 Net 5501
 Vessel built at Port Glasgow By whom built Wm Hamilton & Co Yard No. 323 When built 1925
 Owners New Zealand Shipping Co Ltd Port belonging to Plymouth. Voyage Amanath
 Refrigerating Machinery made by J & E Hall Ltd Dartford Machine Nos 5930 When made 1924
 Insulation fitted by Mercery Insulation When fitted 192 System of Refrigeration CO2 & Brine
 Method of cooling Cargo Chambers Brine Cools Insulating Material used Granulated cork & Silbotta
 Number of Cargo Chambers insulated 9 Total refrigerated cargo capacity 134387 1/2 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY.

Where placed In shelter tween deck.
Aft main engine casingRefrigerating Units, No. of Two Single, double, or triple Single Cubic feet of air delivered per hour ✓Total refrigeration or ice-melting capacity in tons per 24 hours 156 Are all the units connected to all the refrigerated chambers yesCompressors, driven direct or through single reduction gearing. Compressors, single or double acting Double Acting No. of cylinders 1 per machineDiameter of cylinders 6 3/4" Diameter of piston rod 3" Length of stroke 21" No. of strokes per minute 140Motive Power supplied from Direct Acting Tandem Compound Steam EngineSteam Engines, high pressure, compound, or triple expansion, surface condensing. No. of cylinders 2 Diameter HP = 14"
L.P. = 26"Length of stroke 21" Working pressure 110 lb. Diameter of crank shaft journals and pins 8" journal, 8 1/4" pinsBreadth and thickness of crank webs 12" x 5 1/2" inner No. of sections in crank shaft 1 Revolutions of engines per minute 70Oil Engines, type 2 or 4 stroke cycle Single or double acting SingleNo. of cylinders 2 Diameter 21" Length of stroke 21" Span of bearings as per Rule 21"Maximum pressure in cylinders 110 lb. Diameter of crank shaft journals and pins 8"Breadth and thickness of crank webs 12" x 5 1/2" inner No. of sections in crank shaft 1 Revolutions of engine per minute 70Electric Motors, type 2 or 4 stroke cycle No. of 2 Rated 110 lb. Kilowatts 110Volts at 21" revolutions per minute. Diameter of motor shafts at bearings 8"Reduction Gearing, maximum shaft horse power at 1st pinion 110 lb. Revolutions per minute at full power at 1st pinion 702nd pinion 1st reduction wheel main shaft Pitch circle diameter, 1st pinion 21" 2nd pinion 21"1st reduction wheel Main wheel Width of face, 1st reduction wheel 21" Main wheel 21"Distance between centres of pinion and wheel faces and the centre of the adjacent bearings, 1st pinion 21" 2nd pinion 21"1st reduction wheel Main wheel Flexible pinion shafts, diameter 1st 21" 2nd 21"Pinion shafts, diameter at bearings, External, 1st 21" 2nd 21" Internal, 1st 21" 2nd 21"Diameter at bottom of teeth of pinion, 1st 21" 2nd 21" Wheel shafts, diameter at bearings, 1st 21"Main 21" Diameter at wheel shroud, 1st 21" Main 21"Gas Condensers, No. of 1 per mach Cast iron cast iron Cylindrical or rectangular RectangularNo. of coils in each 15 Material of coils 3/4" x 1" Copper Can each coil be readily shut off or disconnected yesWater Circulating Pumps, No. and size of 2-8" x 10" x 10" V.D. how worked Direct Acting Steam Gas Separators, No. of 1 per machineGas Evaporators, No. of 1 per mach Cast iron or steel casings Steel circular Pressure or gravity type PressureNo. of coils in each casing 11 Material of coils 1 1/2" S.W. Steel Can each coil be readily shut off or disconnected yesDirect Expansion or Brine Cooled Batteries, No. of 2 Are there two separate systems, so that one may be in use while the other is beingcleared of snow 2 No. of coils in each battery 2 Material of coils 2 Can each coil be readily shut off ordisconnected 2 Total cooling surface of battery coils 2 Is a watertight tray fitted under each battery 2Air Circulating Fans, Total No. of 2 each of 2 cubic feet capacity, at 2 revolutions per minute 2Steam or electrically driven 2 Where spare fans are supplied are these fitted in position ready for coupling up 2Brine Circulating Pumps, No. and size of, including the additional pump 3-8" x 10" x 10" how worked Direct acting-steamBrine Cooling System, closed or open open Are the pipes and tanks galvanised on the inside yes Tanks yesNo. of brine sections in each chamber 8-2°1 Hold, 8-2°1 M.T.D. 10-2°2 Hold, 10-2°2 M.T.D. 10-2°3 Hold9-2°3 M.T.D. 9-2°4 Hold, 9-2°4 M.T.D. 8-2°5 M.T.D.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.

Are thermometers fitted to the outflow and to each return brine pipe *yes* Where the tanks are closed are they ventilated as per Rule *Tank open*
Where the tanks are not closed is the compartment in which they are situated efficiently ventilated
Steam Condensing Plant. State what provision is made for condensing steam, in terms of Section 4, Clauses 13 and 14 *Surface Cond'g in machine base, Air & Feed pumps, Feed pump discharge taken to Filter tank in Main Engine Room*

HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
ENGINE CYLINDERS (IF TESTED)	31-7-24		350 lb = 4 P		102	
	31-7-24		250 lb = 4 P		102	
GAS COMPRESSORS	29-7-24	1000 lb	3000 lb	1500 lb	102	
" SEPARATORS	20-8-24	"	"	"	102	
" CONDENSER COILS	22-8-24	"	"	"	102	
" EVAPORATOR COILS	20-8-23	"	"	"	102	
" CONDENSER HEADERS AND CONNECTIONS	28-9-23	"	"	"	102	
" CONDENSER CASINGS	15-10-23	"	"	"	102	
" EVAPORATOR CASINGS	1-8-23	"	"	"	102	
NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE	2-9-24	"	"	"	102	
BRINE PIPING AFTER ERECTION IN PLACE	14-8-24	"	"	"	102	
	24-7-24	5 to 10 lb	25 lb	*	102	
	31-7-24	25 lb	50 lb	*	102	
	8-11-23				102	

Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory *yes*
Dates of test *1920-2-25* Density of Brine *46* by *Twaddle* 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 *-9°* & *-3°*
or, delivery and return air at direct expansion or brine cooled batteries *-9°* & *-3°*
atmosphere *40°* cooling water inlet and discharge *39°* & *46°* gas in condensers *60* and evaporators *17°*
the average temperature of the refrigerated chambers *8.5°* 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 *20°*

SPARE GEAR.

ARTICLES SUPPLIED AS PER RULE.	ADDITIONAL SPARE GEAR SUPPLIED.
1- Crank shaft	4- Compressor suction valves with seats & springs
1- Steam piston rod with nut	4- Comp. delivery valves with seats & springs
1- Piston for H.P. cylinder	10- Additional valve springs
1- Set steam piston rings for each cylinder	1- Guide for grinding in comp. valve
4- Sets of piston rings for each compressor	1- Set steam piston rings for water pump
2- Compressor rods complete	1- Set of valve springs for water pump
1- Bucket & rod for circulating water pump	1- Set of steam piston rings for water pump
1- Piston slide valve for H.P. cylinder	2- Springs for water relief valve
1- Slide valve spindle with nuts for both cylinders	2- Springs for brine relief valve
1- Eccentric shaft strap rod & brasses, each pattern fitted	2- Springs for C.O. safety valve
1- Spare brine pump fitted in Engine Room	2- Springs for feed pump relief valve
2- Bolts & nuts for main bearings	2- Head coupling with bolts for compressor piston rods
2- " " " crank pin bearing	1- Hand pump for lubricator
2- " " " crosshead bearing	2- C.O. pressure gauge
1- Set of valves for air pump	2- Hydrometer
1- " " " water pump	6- Brass cased thermometers
1- " " " brine pump	12- Copper safety valves
1- " " " feed pump	1- C.O. gauge valve 1/8" bore with 3 open pipe
1- " " " leather mounds	1- H.M. box
6- Tubes & 24 gaskets for steam compressor	1- Special screw tested thermometer
3- Lengths of 1/2" pipe each 12 & 14 bore	1- Spare valve for each type of C.O. safety valve fitted
3- 1/2" bolts each 12 & 14	1/2- Rod of H.M. pressure washer
12- Nuts & 12 locknuts each 12 & 14 bore	1/2- Rods for hatch cock connections
2- Pairs of C.O. tube flanges	6- Nuts for same return valve
1- Set hatchcock screwing into screw 1 1/2 & 1 1/4 gas thread	1- Barometer pressure gauge
1- Regulator spindle	1- Length of copper joint pipe
1- Spare brine cock & valve	1- Pair main bearings with bolts & nuts
1- Spare hatchcock	1- Pair crank pin bearings
12- Lubricator piston leathers	2- Springs for cylinder relief valve
12- Lubricator gland leathers	1- Drain for separator with pipe
1- Set of copper joint rings for all joints	1- Set of valve springs for water pump
2- sets of special metal packing rings for each compressor	2- Pairs crosshead brasses

The spare gear has been checked and found to agree with above list *See*

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

The foregoing is a correct description of the Refrigerating Machinery.

FOR J. & E. HALL, LTD

Chicholder

Manufacturer.

for DIRECTOR.

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. 192 (Fore Peak)	1" GAL/IRON	1"	GRAN CORK	10"	-	NONE	1"	GRAN CORK	10"	-	
FRAME No. 162	NONE	1"	"	11 1/2"	-	"	1"	"	5 1/4"	-	
	"	1"	"	4"	-	"	1"	"	4"	-	
FRAME No. 134	"	1"	"	10"	-	"	1"	"	5 1/4"	-	
	"	1"	"	4"	-	"	1"	"	4"	-	
FRAME No. 108	1" GAL/IRON	1"	SIL COTTON	10"	-	1" GAL/IRON	1"	SIL COTTON	10"	-	
FRAME No. 68 (Boiler Room)	NONE	1"	SIL COTTON	12"	-	NONE	1"	SIL COTTON	12"	-	
FRAME No. 42 (Engine Room)	"	1"	GRAN CORK	10 1/2"	-	"	1"	GRAN CORK	5 1/4"	-	
	"	"	NOT INSULATED			"	1"	"	5"	-	
FRAME No. 12 (After Peak)	NONE	1"	GRAN CORK	11"	-	NONE	1"	GRAN CORK	10"	-	
SIDES	"	1"	"	10 1/2"	-	"	1"	"	10"	-	
OVERHEADING	"	1"	"	7"	1"	"	1"	"	10"	-	
FLOORS OF CHAMBERS	"	1 1/2"	"	"	"	"	1 1/2"	"	"	"	
TRUNK HATCHWAYS								NONE			
THRUST RECESS, SIDES AND TOP						NONE	1"	SIL COTTON	12"	-	
TUNNEL SIDES AND TOP						"	1 1/2"	GRAN CORK	10"	1"	
TUNNEL RECESS, FRONT AND TOP								NOT INSULATED			

FRAMES OR REVERSE FRAMES, FACE *1 1/2" WOOD OVER REVERSE FRAMES IN No. 1 HOLD.*
BULKHEAD STIFFENERS, TOP *1/2" BEYOND EDGE OF BRACKETS. BOTTOM 1/2" BEYOND EDGE OF BRACKETS. AND FACE 1/2" BEYOND EDGE OF STIFFENERS.*
RIBBAND ON TOP OF DECKS *FW- END OF No. 4 'TWEEN DECKS IN WAY OF DYNAMO RECESS 4'0" x 2", 8'0" CANT AT SIDES & ACROSS BY 15.*
SIDE STRINGERS, TOP *✓* BOTTOM *✓* AND FACE *✓*
WEB FRAMES, SIDES *✓* AND FACE *✓*
BRACKETS, TOP *✓* BOTTOM *✓* AND FACE *✓*
INSULATED HATCHES, MAIN *6 1/2" G.C. DOUBLE 1" SHEETING TOP & BOTTOM BILGE 4' G.C. WITH DOUBLE LININGS. MANHOLE 5" GRAN CK WITH DOUBLE LININGS.*
HATCHWAY COAMINGS, MAIN *18 1/2" P.P. OVER HAUL. BILGE PITCH PINE COAMING 2" THICK.*
HOLD PILLARS (BUILT) *SIL CN & 1" 2" LINING BOARDS, ROUND IRON STANCHIONS FITTED WITH 1" FELT & 1" LINING.*
MASTS *DO NOT PASS THROUGH INSULATED CHAMBERS* VENTILATORS *6" SILICATE COTTON & 2" LINING.*
Are insulated plugs fitted to provide easy access to bilge suction roses *YES.* tank, air, and sounding pipes *PORTABLE INSULATION.*
and manhole doors of tanks *YES.* Are insulated plugs fitted to ventilators *YES.* cargo ports *NONE* and side lights *NONE.*
Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected *YES.* if so, how *2" ELM DOUBLING FITTED.*
Five Cross Bunker.
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 *PATENT CORRUGATED SHEET IRON WITH CHANNEL AT BOTTOM OPEN INTO BILGES.*

Coal Bunker Bulkheads; and Brine Outflow and Return Pipes passing through coal bunkers. Is the insulation, so far as practicable, fireproof *YES.*
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, sides *2 x 2"* floors *3 x 3"* tunnel top *3 x 3"*
fixed or portable *FIXED AT SIDES* Are screens fitted over the brine grids at chamber sides *1/6* hinged or permanently fixed *-*
Thermometer Tubes, No. and position in each chamber *6, 2 FW, 2 MIDDLE, 2 AFT.*
diameter *2 1/2" INTERNAL DIA.* 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.*
Draining Arrangements. Where the chambers are situated below the load water line, what provision is made for draining the inside of the chambers *INTO BILGES* 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 *SCUPPERS.*
brine return room *SCUPPERS.* fan room *NONE.* water circulating pump room *SCUPPERS.*
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 *ONE EACH SIDE AFTER END OF EACH HOLD.*

Diameter *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 *NONE*

How are the cork slabs secured to the steel structure of the vessel *NONE*

Air Trunkways in Chambers, inside dimensions, main *NONE* and branch *✓*

Are they permanently fixed or collapsible, or portable *✓* State position in chambers *✓*

Where air trunkways pass through watertight bulkheads, are they fitted with watertight doors *NONE* 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* Are they galvanised externally *NO - PAINTED.*

How are they arranged in the chambers *PIPES LED ALONG SIDES, ACROSS BULKHEADS & ALONG OVERHEADING.*

Thawing Off, what provision is made for removing the snow from the cooling pipes in the chambers *HOT BRINE.*

The foregoing is a correct description of the Insulation and Appliances. *For THE MERSEY INSULATION CO. LTD.*

James F. Breen
Managing Director.

INSULATORS,
Builders.

Plans. Are approved ~~Plans~~ Specifications forwarded herewith for the Refrigerating Machinery and Insulation *YES.*

Is the Refrigerating Machinery and Appliances duplicate of a previous case *YES.* Is so, state name of vessel *S.S. "TURAKINA"*

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.) *These Refrigerating machines have been built under special survey. The workmanship and materials are good.*

GLASGOW The brine pipes have been tested, in place, to 90 lbs air pressure and found good. The Refrigerating machinery and insulation have been satisfactorily fitted, tested under full working conditions and found good. and the machinery and appliances are in our opinion eligible for Classification and the Record + LLOYD'S R.M.C. 2,25.

It is submitted that
this vessel is eligible for
THE RECORD + Lloyd's RMC 2.25.

CERTIFICATE WRITTEN
5/3/25

AWD
4/3/25

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 Duplex.	Makers.	Date of Construction.	System.	Type.		Cubic feet of air delivered per hour.	Ice melting capacity per 24 hours.	No.	Capacity.
<i>2 Single 9+6</i>	<i>Hall & Co</i>	<i>1924</i> <i>1925.</i>	<i>Carb Amby</i>	<i>Hell</i>	<i>Brine</i> <i>Exhaust of Cork</i> <i>& Silicate Cotton</i>	<i>✓</i>	<i>156</i> <i>Top</i>	<i>9</i>	<i>343871.</i>

Lon 1/2 £10
Fee 5/6 £20

£30 : 0 : 0 Fee applied for, - 4 MAR 1925

Travelling Expenses £ 1 : 13 : 11 Received by me, *✓*

Committee's Minute *GLASGOW 3-MAR 1925*

Assigned *+ Lloyd's RMC 2.25*

John S Gordon

Surveyor to Lloyd's Register.

W. J. Pyle

S. Davis



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Foundation