

Report on Refrigerating Machinery and Appliances.

17th Nov. 1949
 Date of writing Report 10th Aug. 1949 When handed in at Local Office 22nd Nov. 1949 Port of GREENOCK
 No. in Reg. Book. Survey held at Ardrossan Port Glasgow Date: First Survey 24-6-47 Last Survey 11/11/1949
 09146 "FAIRFREE" (Number of Visits P.S.M. - 12. H.K.T. - 14.)
 on the Refrigerating Machinery and Appliances of the Tons Gross 1241 Net 575
 Vessel built at Toronto, Ontario By whom built Redfern Construction Co., Ltd. Yard No. 54 When built 1944/7
 Owners Fresh Frozen Foods Ltd [Chris Salvesen] Port belonging to LEITH Voyage ① 6/47
 Refrigerating Machinery made by ② L. Sterne & Co. Machine Nos. ② - None. When made ② 6/46
 Insulation fitted by M'Andrew Wormald & Co. When fitted (Ford) 10-47 (Aft) 8-49 System of Refrigeration ② CH₂Cl - Meth. Chlor.
 Method of cooling Cargo Chambers Brine Grids Insulating Material used Onazote
 Number of Cargo Chambers insulated Two Total refrigerated cargo capacity 24,550 cubic feet

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed Tween Deck Compartment at after end of ship

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

Total refrigeration or ice-melting capacity in tons per 24 hours 60.8 Are all the units connected to all the refrigerated chambers Yes

Compressors, driven direct through Vee Belting reduction gearing. Compressors, single or double acting Single If multiple effect compression No

Are relief valves or safety discs fitted Both No. of cylinders to each unit ② - 3 Diameter of cylinders ② 5" ① 8" x 12"

Diameter of piston rod none Length of stroke ② - 4" No. of revolutions per minute ② 450 ① 440

Motive Power supplied from ① W.T. Boiler - steam to Bellin & Morcom Comp. Steam Eng. ② Steam Dynamos - Elec. Motor
 (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 2 Diameter 7" x 16"

Length of stroke 5" Working pressure 180 Diameter of crank shaft journals and pins ② 3" ① 2 1/2" CRANK PIN DIAS. 2 1/2"

Breadth and thickness of crank webs - No. of sections in crank shaft ONE Revolutions of engines per minute 700

Oil Engines, type - 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 - 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 -

Electric Motors, type ② Compound - Drip proof No. of 1 Rated (Cont. Kilowatts 14 B.H.P. Volts

at 1400 revolutions per minute. Diameter of motor shafts at bearings 2.373" 20

Reduction Gearing Vee Belts 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 Yes No. of coils in each Shell & tube Material of coils Steel Can each coil be readily shut off or disconnected -

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

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

valves fitted Yes No. of coils in each casing Shell Material of coils Steel Can each coil be readily shut off or disconnected -

Direct Expansion or Brine Cooled Batteries, No. of none Are there two separate systems, so that one may be in use while the other is being

cleared of snow - No. of coils in each battery - Material of coils - Can each coil be readily shut off or

disconnected - Total cooling surface of battery coils - Is a watertight tray fitted under each battery -

Air Circulating Fans, Total No. of - each of - cubic feet capacity, at - revolutions per minute

Steam or electrically driven - Where spare fans are supplied are these fitted in position ready for coupling up -

Brine Circulating Pumps, No. and size of, including the additional pump ② 450 g.p.m. how worked Electric Motors

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

No. of brine sections in each chamber Ford Hold - 6 circuits, Aft. chamber - 3 circuits, ✓

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

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... ✓
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...
B.C. Rules. — Yes
Is the exhaust steam led to the main and auxiliary condensers... Yes [no main]

HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure	Air Test Pressure.	Stamped.	REMARKS.
Engine Cylinders (if tested) ...						
Gas Compressors ...	21-4-47	220	600	350		
" Crankcase	21-4-47		300	175		SEE BELOW
" Separators						
Intercoolers	21-4-47	220	600	350		HYDRAULIC
" Multiple Effect Receivers						ON STEEL
" Condenser Coils Shell & Tubes	19-9-47		500	—	Blu	
" Evaporator Coils	17-9-47		500	250	Blu	
" Condenser Headers and Connections	19-9-47		500	—	Blu	
" Condenser Casings Water ends	19-9-47		100	—	P.S.M.	
" Evaporator Casings	17-9-47		100	—	P.S.M.	
NH ₃ Condenser, Evaporator and other coils after erection in place	8/7/47		—	(244) 200 lbs/sq. in.	H.K.T.	
CH ₂ Cl ₂ Do.	26/7/47		—	125 lbs/sq. in.	H.K.T.	
Brine Piping after erection in place...	5/8/47		90 lbs/sq. in.	—	H.W.	

Have important steel castings and forgings been tested in accordance with the Rules... Crankschaft Report 20601
Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory... Yes
Dates of test 24-10-47 11-11-47 Density of Brine 48° 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... ✓ & ✓, outflow and return brine... -27°F. & -23°F.
atmosphere 44°F. cooling water inlet and discharge 50°F. & 55°F. gas in condensers 74°F. and evaporators -30°F.
the average temperature of the refrigerated chambers... FORO. -7°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... FORO. +13°F. Aft +10½°F.

SPARE GEAR.

Are the working parts of the machines, pumps and motors respectively, interchangeable... No.
Has the spare gear required by the Rules been supplied... Yes
Additional Spare Gear REQUIRED FOR LARGE UNIT.
1. ONE CRANKSHAFT COMPLETE FOR STEAM ENGINE AND COMPRESSOR.
2. ONE PISTON & ROD OF EACH TYPE FOR STEAM AND COMPRESSOR CYLINDERS.
3. ONE VALVE AND ROD OF EACH TYPE COMPLETE WITH NUTS.
4. ONE ECCENTRIC STRAP AND ROD OF EACH TYPE.
5. ONE CYLINDER COVER OF EACH TYPE FOR STEAM CYLINDERS.
6. ONE SPARE BOTTOM END BEARING AND MAIN BEARING OF EACH TYPE.

STERNE UNIT - HYDRAULIC TESTS.

ITEM.	HYDRAULIC TEST PRESSURE	DATE.
COMPRESSOR CRANKCASE	275 lbs/sq. in.	4/4/46
" CYLINDER	"	"
CONDENSER (SHELL & TUBES)	300 lbs/sq. in.	7/5/46
EVAPORATOR (" ")	"	"

The foregoing is a correct description of the Refrigerating Machinery.

J. & E. HALL LTD.
36 Byron Street
Glasgow, W.1

Manufacturer.
Works Manager.

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		Onazote	6"	T+G. 7/8"					
Frame No. 20	F	3"	3/8" T. & G. O.P.							
Frame No. 49	F		Onazote	6"	T+G. 7/8"					
Frame No.	F									
Frame No. (Boiler Room)	A									
Frame No. (Engine Room)	A									
Frame No.	F									
Frame No. 85	F						1/8" T. & G. CEDAR	Onazote	6"	
Frame No. 100	F						1/8" T. & G. CEDAR	"	"	
Frame No. (After Peak)	F		3/8" T. & G. O.P.	6"	T+G. 7/8"		3/8" T. & G. CEDAR	Onazote	6"	
Sides			2" CEMENT ON EXPANDED METAL.	"	2" cement		2" CEMENT ON EXPANDED METAL.	"	"	
Overheading										
Floors of Chambers										
Trunk Hatchways	FORO. HOLD :- 6" ONAZOTE WITH 3/8" T. & G. O.P.									
Thrust Recess, Sides and Top										
Tunnel Sides and Top										
Tunnel Recess, Front and Top										

Frames or Reverse Frames, Face... 2" INSULATION WITH 3/8" T. & G. OUTER LINING.
Bulkhead Stiffeners, Top... Bottom and Face
Ribband on Top of Decks... 2" INSULATION WITH 3/8" T. & G. OUTER LINING.
Side Stringer's, Top... Bottom and Face
Web Frames, Sides... and Face
Brackets, Top... Bottom and Face
Insulated Hatches, Main... 9" THICK, FRAMED AND INSULATED WITH ONAZOTE. Bilge... 2" INSULATION WITH 3/8" T. & G. OUTER LINING.
Hatchway Coamings, Main... Bilge
Hold Pillars... 2" INSULATION WITH 3/8" T. & G. OUTER LINING.
Masts... Ventilators
Are insulated plugs fitted to provide easy access to bilge suction roses... Yes tank, air, and sounding pipes... Yes heels of pillars...
and manhole doors of tanks... Yes Are insulated plugs fitted to ventilators... Yes cargo ports... Yes and side lights...
Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected... No if so, how... Loading door at bottom of hatch
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... Ventilators to Deck
and for draining the tank top... Gutterways to Bilges
Fireproof Insulation. Is the insulation and woodwork fireproof in way of bunkers or any surfaces exposed to excessive heat... No 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... 3"x1" @ 12" FORO. floors... 3"x1" @ 12" hatch top... 2"x2" @ 9"
fixed or portable... Portable Are screens fitted over the brine grids at chamber sides... Yes hinged or permanently fixed... Permanent.
Thermometer Tubes, No. and position in each chamber... No. 1 Hold - 3 tubes 1 Foro, 2 Aft; Aft chamber - 2.
diameter... 3" are they fitted in accordance with Section 3, Clause 8 B.C. Rules - Yes
Protection of Pipes. Are all pipes, including air and sounding pipes, which pass through or into insulated chambers, well insulated... Yes
Draining Arrangements. What provision is made for draining the inside of the chambers... Trapped Scuppers
Where sluices, scupper pipes, and drain pipes are fitted are means provided for blanking them off... (FORO.) No. (Aft) Yes
What provision is made for draining the refrigerating machinery room... Scuppers to Tunnel Bilge.
brine return room... Scupper to Bilge Scupper to Tunnel
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. **B.C. Rules** Yes

Diameter $1\frac{1}{2}$ " Are all sounding pipes in way of insulated chambers fitted in accordance with Section 3, Clause 11. Yes [on floors]

Are all wood linings tongued and grooved. Yes Are cement facings reinforced with expanded steel lattice. Yes

How is the expanded metal secured in place. Embedded in Granolithic Cement

How are the ~~metal~~ ^{ONAZORE} slabs secured to the steel structure of the vessel. By MEANS OF RICH.

Air Trunkways in Chambers. Are the arrangements satisfactory and in accordance with the approved plans. Yes

Are they permanently fixed or collapsible, or portable. Yes

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

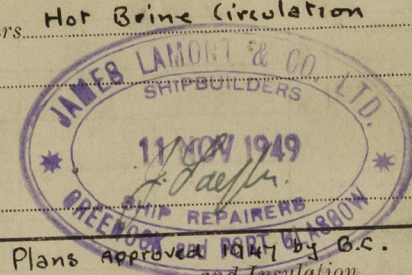
Are insulated plugs supplied for the doorways. Yes Where are the doors worked from. 9 W.G. 7/32"

Cooling Pipes in Chambers, diameter $2\frac{1}{4}$ " old $1\frac{1}{16}$ " o/d Minimum thickness. Are they galvanised externally. Yes

How are they arranged in the chambers. Roof & Side Grids

Thawing Off, what provision is made for removing the snow from the cooling pipes in the chambers. Hot Brine Circulation

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



Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery. (If not, state date of approval) No If so, state name of vessel. COMPLETE

Is the Refrigerating Machinery and Appliances duplicate of a previous case. No

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.)

The N.H.3. Plant built under B.C. Survey to Rules. Cargo chambers insulated under Survey. The NH₃ Plant capacity enough to maintain chambers at minus 5° Fah, & supply Brine @ minus 30° Fah to Burney Quick Freezer in Tween Deck. The CH₂Cl plant only capable of holding previously cooled chambers at minus 5° Fah in Temperate Waters. The Machinery & installation have been examined during erection & satisfactory cooling down & sea trials witnessed. The N.H.3 Condenser & Evaporator constructed by Mess^{rs} Mechans Ltd to Mess^{rs} J.E. Hall's approved Plans & examined & tested in accordance with B.C. Rules for class 2 Fusion Welded Pressure vessels (with Heat treatment) Report 19949/50 Compressor Report 20607, Brine Pump 19648, Circulating Pump 19946.

This ship is to be engaged in the carriage of "Quick Frozen Fish" between the Newfoundland Banks or Bear Island & Scottish ports. Voyages of 4/5 weeks duration & is eligible in my opinion to be classed with this Society with the Notation R.M.C. [with date] For Frozen Congoes at minus 5° Fah. with sea temperatures not exceeding 70° Fah, subject to the spare gear being placed in order.

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	5	① N.H.3 ② CH ₂ Cl	J.E. Hall Ltd L. Sterne & Co.	7-47 6-46	Brine Grids ONAZORE	60.8	① No ② Yes	1 Hold Aft cham	19350 5,200

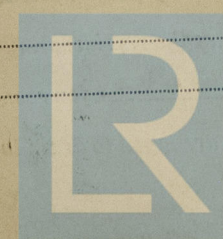
Fee CONSTRUCTION £24:0:0 Fee applied for, 28th Nov 1949.
(CREDIT GLS. £12)
Travelling Expenses £: : Received by me, 19.

P.S. Moore.

H.K. Taylor.
Surveyor to Lloyd's Register.

Committee's Minute GLASGOW - 7 DEC 1949

Assigned. See Rpt. 18.



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Foundation

Certificate to be sent to CHR. SALVESSEN & CO. LITH.

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