

Report on Refrigerating Machinery and Appliances.

Received at London Office

Date of writing Report 20th Sept. 1944 When handed in at Local Office 20th Sept. 1944 Port of Vancouver, B. C.No. in Reg. Book. Survey held at Vancouver, B.C. Date: First Survey 10th Aug., 1944 Last Survey 18th Sept., 1944(Number of Visits 19)on the Refrigerating Machinery and Appliances of the Steel Single Screw Steamer "FORT EDMONTON" Tons { Gross 7201.82
(Refrigerated Victualling Ship) Net 4007.16Vessel built at North Vancouver, B.C. By whom built Burrard Dry Dock Co. Ltd. Yard No. 212 When built 1944Owners Minister of Munitions & Supply of Canada. Port belonging to -- Voyage FirstRefrigerating Machinery made by Carrier Corporation, Syracuse, U.S.A. Compressors 1231/2/3 Nos. 1234/5/6 When made 1944Insulation fitted by Burrard Dry Dock Co. Ltd. When fitted 1944 System of Refrigeration Dichlorodifluoromethane. (Freon 12)Method of cooling Cargo Chambers Direct Expansion Batteries Insulating Material used Slab Cork and Palco Wool.Number of Cargo Chambers insulated 25 and One Ice Making and One Ice Storage Chamber. Total refrigerated cargo capacity 111,480 cubic feet

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed Refrigerating Engine Room constructed
 Refrigerating Units, No. of Six (6) Single, double or triple in No. 3 Hold.
independent. Quadruple Is each machine independent Cu. Ft. of air delivered per hr. - 5,933,400

Total refrigeration or ice-melting capacity in tons per 24 hours 45 Are all the units connected to all the refrigerated chambers YesCompressors, driven direct or through reduction gearing. Compressors, single or double acting Single Acting. multiple effect compression NoAre relief valves or safety discs fitted Yes No. of cylinders to each unit 4 Diameter of cylinders 4-1/4"Diameter of piston rod Trunk Piston Length of stroke 3" No. of revolutions per minute 600Motive Power supplied from either Port or Starboard Main Boiler.
(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 1 Diameter 8"Length of stroke 4" Working pressure 100 - 125 lbs. per sq. inch Diameter of crank shaft journals and pins 3-3/16"Breadth and thickness of crank webs 6 1/2" x 2 3/8" No. of sections in crank shaft One Revolutions of engines per minute 600Oil 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 -- No. of -- Rated -- Kilowatts -- Volts --at -- 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 6 Cast iron or steel casings Steel Cylindrical or rectangular Cylindrical Are safety valves fittedto casings Yes No. of coils in each Type - 48 tubes Material of tubes - Metal. Can each be readily shut off or disconnected YesWater Circulating Pumps, No. and size of pumps available 2 - 90GPM how worked Each 2HP Electric Motor Receivers, No. of 6Gas Evaporators, No. of -- Cast iron or steel casings -- Pressure or gravity type -- If pressure type, are safetyvalves 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 25 Are there two separate systems, so that one may be in use while the other is beingcleared of snow No No. of coils in each battery One Material of coils Seamless Can each be readily shut off ordisconnected Yes Total cooling surface of battery coils 7080 Sq. Ft. Is a watertight tray fitted under each battery YesAir Circulating Fans, Total No. of 9 - 1.5H.P. each of 5050 cubic feet capacity, at 1430 revolutions per minuteSteam or electrically driven Electrically Where spare fans are supplied are these fitted in position ready for coupling up NoBrine 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.

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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. **Yes**

HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
Engine Cylinders (if tested)		100 to 125 lbs.	330 lbs.	-	Lloyd's	Covered by Toronto
Gas Compressors		93 lbs. per sq. inch @ 86° F.		150 lbs.	Not Stamped.	Certificates attached.
Liquid Receivers		" " "		400 lbs.	Lloyd's Test J.S.H. 12-4-44	
Multiple Effect Receivers						
Condenser Coils	4-9-44			200 lbs.	Not Stamped	
Evaporator Coils						
Condenser Headers and Connections	14-8-44			400 lbs.	Lloyd's Test	
Condenser Casings	4-9-44	" " "		200 " CO.	400 lbs. Lloyd's Test J.S.H. 14-8-44	
Evaporator Casings	" " "	" " "		200 " CO.	Not Stamped	
Condenser, Evaporator and Air Cooler Coils after erection in place	" " "	" " "		200 " CO.	Not Stamped	
Brine Piping after erection in place.					with Freon Tracer	

Have important steel castings and forgings been tested in accordance with the Rules. -

Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory. **Yes**

Dates of test. **7th - 10th Sept., 1944** 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 on brine cooled
15° F. - Cold Rooms, 25 & 40° F. Chill Rooms,
60 - 70° F. Air Conditioned Rooms. & outflow and return brine &

atmosphere. **62.7° F.** cooling water inlet and discharge. **58° F.** & **74° F.** gas in condensers. **98° F.** max. and evaporators. -

the average temperature of the refrigerated chambers & the rise of temperature in these chambers upon the expiration of. **24** hours

time after the machinery and cooling appliances have been shut off. **15° Rooms - 26° F; 25° Rooms - 20° F; 40° Rooms - 14° F; 60° - 70° Rooms - 7° F;**

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:-

Full List of Spare Gear attached to Vancouver Report No. 6216

The foregoing is a correct description of the Refrigerating Machinery.

Burrard Dry Dock Company, Limited

Shipbuilder.

P.W. = Palco Wool

DESCRIPTION OF INSULATION.

S.L. = Shiplap.

IN LOWER HOLD CHAMBERS. Tank Top (60° - 70° F. Air Conditioned)						4th IN TWEEN DECK CHAMBERS. (15° - 18° Cold 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. 135	F	2 x 3/8" Not Insulated					2 x 3/8" Not Insulated				
	A	S.L. Palco Wool 6"			2 x 3/8"	-	S.L. Palco Wool 10"		2 x 3/8"		
Frame No. 128	F	do do	3-11/16"		S.L.	-	do do	5-11/16"	2 x 3/8"	S.L.	
to " " 118	A										
Frame No. 106	F	do do	12 1/2"		-	-	do do	14"		-	
	A	do do	2 3/4"		-	-	do do	6 1/4"		-	
Frame No. 86 (Boiler Room)	F	Not Insulated				2 1/2"	do do	14"		-	
	A	do do					Not Insulated				
Frame No. (Engine Room)	A	2 x 3/8" S.L.	Palco Wool 3-11/16"		2 x 3/8" S.L.						
Frame No. 99	F	2 x 3/8" S.L.	Palco Wool 7"		-						
	A	2 x 3/8" S.L.	Palco Wool 7"		-						
Frame No. 95 (Refrig. Eng. Room.)	A	Not Insulated					2 x 3/8" S.L.	Palco Wool 5-11/16"	2 x 3/8" S.L.		
Frame No. 99	F					-	2 x 3/8" S.L.	Palco Wool 5-11/16"	2 x 3/8" S.L.		
to " " 92	A										
Frame No. (After Peak)	F	2 x 3/8" S.L.	Palco Wool 12"		-	-	2 x 3/8" S.L.	do	13"	-	
Sides		2 x 3/8" S.L.	do	9"	2 x 3/8" S.L.	-	do do	9"		-	
Overheading		2 x 3/8" S.L.	do	1"	2 x 3/8" S.L.	-	1 x 7/8" S.L.	Cork Board 3"		-	
Floors of Chambers		2" S.L.	Cork Board	1"	2 x 3/8" S.L.	-	20 BWG Galv. Iron	6" for Rooms F3, 4.			
Trunk Hatchways	See bulkheads. Frames 95 to 99. & 128 to 118										
Thrust Recess, Sides and Top											
Tunnel Sides and Top											
Tunnel Recess, Front and Top											
Frames on Reverse Frames, Face	(Covered with 1" Palco Wool; Covered by 2 layers of 7/8" Shiplap in 60°-70° spaces)										
Bulkhead Stiffeners, Top		do	Bottom	do	and Face	do					
Ribband on Top of Decks	None										
Side Stringers, Top	No Stringers					Bottom	-	and Face	-		
Web Frames, Sides	No Web Frames					and Face	-				
Brackets, Top	Covered with 1" Palco Wool					Bottom	Covered with 1" Palco Wool.	and Face	Covered with 1" Palco Wool.		
Insulated Hatches, Main	None					Bilge	2 layers 7/8" S.L.	Manhole	2 layers 7/8" S.L.		
Hatchway Coamings, Main	9" P.W. @ 2 layers of 7/8" Shiplap on sides.					4" P.W. - 2 layers 7/8" S.L.	4" P.W. - 2 layers 7/8" S.L.				
Hold Pillars	1 1/2" P.W. minimum @ 2 layers of 7/8" Shiplap.										
Masts	No					Ventilators	No				
Are insulated plugs fitted to provide easy access to bilge suction roses	Yes					tank, air, and sounding pipes	Yes	heels of pillars	Yes		
and manhole doors of tanks	Yes					Are insulated plugs fitted to ventilators	None	cargo ports	None		
Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected	Not Insulated					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 and the bulkhead plating	At No. 85 Frame, a 2" Dia. vent pipe is led from 2 1/2" air space to upper deck on Port and Starboard sides. Suitable holes cut in frames to permit of drainage to bilges and for draining the tank top. 2" clearance left between tank top and insulation with wood grounds placed athwartships.										
Fireproof Insulation. Is the insulation and woodwork fireproof in way of bunkers or any surfaces exposed to excessive heat	-- 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 3" dressed floors.					2" x 3" dressed tunnel top.	None				
Sides - fixed, floors - portable sections.	Are screens fitted over the brine grids at chamber sides.					-	hinged or permanently fixed	-			
Thermometer Tubes, No. and position in each chamber	Distant Reading Thermometers installed from each chamber.										
diameter	4-1/2" Dia.					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	Yes										
Draining Arrangements. What provision is made for draining the inside of the chambers	Trapped drains to Bilge.										
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	Bilge Pump Suctions.										
brine return room	-					fan room	Drain to Bilge	water circulating pump room	Bilge Pump Suction.		
Are all air spaces behind insulation arranged to drain to the bilges, bilge wells, or gutterways of the respective chambers	Yes										

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No.3 Hold - one Port, one Stard. side & one either side of Centre Line Bulkhead aft.
No.2 Hold - one Port, one Stard. side and three Centre Line Bulkhead aft.

Sounding Pipes, No. and position in each chamber situated below the load water line. **2-1/2"** 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. **Shiplap** 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. **Asphalt Cement**
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.**
State position in chambers. **- Top, sides and ends.**
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 **Fan Rooms** diameter **7/8"** Minimum thickness. **-** Are they galvanised externally. **Tinned Copper.**
How are they arranged in the chambers. **Batteries in Fan Rooms.**
Thawing Off, what provision is made for removing the snow from the cooling pipes in the chambers. **Hot salt water sprays.**

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

Burrard Dry Dock Company, Limited **Ship Builders.**

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery and Insulation. **Attached to Vcr. Report No. 6271**
(If not, state date of approval)
Is the Refrigerating Machinery and Appliances duplicate of a previous case. **Yes** If so, state name of vessel **S.S. "FORT PROVIDENCE" (Vcr. Report No. 6271)**
If the survey is not complete, state what arrangements have been made for its completion and what remains to be done. **Complete**

GENERAL REMARKS: The refrigerating machinery of this ship has been constructed partly under Special Survey. The compressors, liquid receivers, condensers and direct expansion batteries are covered by New York Report No. 45366 dated 15th August, 1944, copy attached. The steam engines driving compressors are covered by Toronto Certificates Nos. 506, 507, 510, 511, 513, & 514, copies attached. The fan motors and the two 50 K.W. Diesel driven generator sets and engines installed to deal with the additional refrigerating electrical load were not built under Survey; please see Vancouver electrical reports 4c & 13 (No. 6331) forwarded herewith.

The refrigerating machinery and appliances were installed on board under Special Survey in accordance with the approved plans, New York letters and otherwise in conformity with the Rules. The materials and workmanship are good and the tests required by the Rules have been satisfactorily carried out.

On completion the whole installation was tested under working conditions during a satisfactory cooling down test and the rises of temperatures noted for each chamber 24 hours after shutting down found satisfactory as per attached trial report sheets. In our opinion the refrigerating installation of this ship is eligible to be classed in the Register Book with Notation of Lloyd's R.M.C. 9, 44.

Compressors Serial Nos. 1237/8/41 mentioned on New York Report No. 45366 for Burrard Dry Dock Hull No. 212 have been fitted on board Hull 211. Whilst Compressors Serial Nos. 1231/2/3 mentioned on New York Report No. 45140 for Hull No. 211 have been fitted on Hull No. 212.

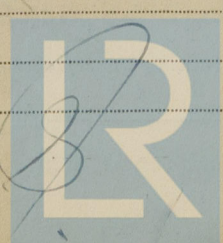
PARTICULARS TO BE ENTERED IN REGISTER BOOK.

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.
6	6	Freon-12	Carrier Corporation	1944	(1) Direct Expansion. (2) Palco Wool & Cork Board	45	Fans only	25	111,480

Fee (Ver.) \$140.00 (Fee applied for 14th Sept 1944)
" (New Yk.) \$100.00
Travelling Expenses \$48.00 (N.Y.) Received by me, 19th

Surveyor **S. Lloyd's Register.**

Committee's Minute
Assigned **Lloyds R.M.C. 9, 44 for temperatures:-**
2nd deck & tank top chamber 60° - 70° F
3rd " B1 & 3 chamber 40° F
B2 & 4 " 25° - 30° F
E3 " 28° F
E1, 2 & 4 & 4th deck chamber 15° - 18° F



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