

Report on Refrigerating Machinery and Appliances.

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No. in Reg. Book. Survey held at Trieste & Genoa Date: First Survey 10.7.1956 Last Survey 1.6 1957
90121 (Number of Visits 15)

on the Refrigerating Machinery and Appliances of the M/V "CAPO FARO" Tons (Gross 1590 Net -)

Vessel built at Trieste By whom built Cantiere Navale Giuliano Yard No. 45 When built 1956

Owners Gestione Esercizio Navi Sicilia Port belonging to Palermo Voyage -
G.E.N.S.

Refrigerating Machinery made by J.E. Hall Machine Nos. H.84509-10-11 When made 1957

Insulation fitted by Cant. Navale Giuliano When fitted 1956 System of Refrigeration Dichloro-difluoro-methane=Direct expansion

Method of cooling Cargo Chambers cooled air Insulating Material used slab wool sheets

Number of Cargo Chambers insulated one Total refrigerated cargo capacity 4838 cubic feet

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed In Eng. Room - Ports. After (For particulars of machinery see London Rpt 17 N° R 8462)

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

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

Compressors, driven direct or through single } reduction gearing. Compressors, single or double acting. If multiple effect compression double }

Are relief valves or safety discs fitted. No. of cylinders to each unit. Diameter of cylinders.

Diameter of piston rod. Length of stroke. No. of revolutions per minute.

Motive Power supplied from 3 @ 240 KW and 1 @ 40 KW electric generator oil engine sets.
(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. 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 DC Prptected, Self Ventilated No. of three Rated 5,94 Kilowatts 220 Volts

at 1750 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 three (for particulars see London Rpt 17 N° R.8462) Cast iron or steel casings. Cylindrical or rectangular. Are safety valves fitted

to casings. No. of coils in each. Material of coils. Can each coil be readily shut off or disconnected.

Water Circulating Pumps, No. and size of pumps available three @ how worked elec. driven Gas Separators, No. of -

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 Batteries, No. of one (For particulars see London Rpt 17 N° R 8462) 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 one each of 4000 cubic feet capacity, at 2000 revolutions per minute

Steam or electrically driven elec. driven Where spare fans are supplied are these fitted in position ready for coupling up In air tight box in store room

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 APPEAR IN SMALL CAPITALS ARE TO BE TAKEN AS IMPLIED

MADE AND PRINTED IN ENGLAND

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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 26 of the Rules~~ 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.	Gas Test Pressure.	Stamped.	REMARKS.
Engine Cylinders (if tested)						
Gas compressor piping in machinery and chambers	-		24.5 Kg cm2	14.- Kg cm2	-	LLOYD'S Test
„ Separators						
„ Multiple Effect Receivers						
„ Condenser Coils						
„ Evaporator Coils						
„ Condenser Headers and Connections						
„ Condenser Casings						
„ Evaporator Casings						
NH ₃ Condenser, Evaporator and Air Cooler Coils after erection in place						
Gas compressor Piping after erection in place...				7 Kg/cm2		

Have important steel castings and forgings been tested in accordance with the Rules **see London Rpt 17 N° R. 8462**
 Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory.....
 Dates of test **from 28.5 to 1.6.57A** 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 & outflow and return brine & atmosphere **av. 73°F** cooling water inlet and discharge **av. 65°F** & **av. 67°F** gas in condensers **av. 93.2°F** and evaporators **av. -18°F**
 the average temperature of the refrigerated chambers **-3.9°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 **8.7° 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: **(see London Rpt 17 N° R. 8462)**

The foregoing is a correct description of the Refrigerating Machinery.



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BOUNDARY.	(A).	EXTERNAL THERM.	(B)	(C)	(D)	ESTIMATED H. LEAKAGE DURING BALANCE. (D) x (A).
	ESTIMATED INSULATION. HEAT LEAKAGE BTU/HR. °F.		EXTERNAL TEMP AVERAGE APPLICABLE DURING BALANCE.	INTERNAL TEMP. AVG. DURING BALANCE.	TEMP. DIFF. DURING BALANCE (B)-(C).	
FWD. BLKHD.	20.1.					
AFT. BLKHD.	18.7.					
SHIP SIDE P.	17.1.					
" " S.	17.1					
DECK OVER.	97.0.					
" UNDER.	52.8.					

ESTIMATED TOTAL.

MEASURED. HEAT LEAKAGE, = .95 x COMPRESSOR OUTPUT (FROM CURVES). - minus. Heat input by Fan and Heater. (3.41 x Volts x Amps).

Ratio Measured Heat leakage max. of 1.3.
ESTIMATED H. L.

Note. .95 of compressor output is used as it is estimated 5% of total output will be used up in leads etc. external to the insulated envelope.

If installation is cooled down in 12 HRS. then time to extract initial heat 16 HRS.
 " " " " " " 24 HRS. " " " " " " 12 HRS.
 " " " " " " 48 HRS. " " " " " " 7 HRS.

External Temp. entered in col (B). should be ^{average of} those recorded 3 HRS previously. i.e. Time lag. 3 HRS.

As the speed of compressor and fan is constant, it is considered that the internal temp. could best be kept steady by placing say a 1 KW. or 2 KW. electric heater in the chamber. This being capable of regulation and used to maintain the internal temp steady during balance.

With sea temps. given in letter, 1 compressor, condensing at 70°F. and 1 KW heater in space, chamber temp. expected -5°F.

M/V "CAPO FARO"

Cantiere Navale Giuliano S. Giusto - Yard N°45

Balance test of the Refrigerated Cargo Installation.

Cooling down period : From 9.30 Pm on the 28/5 to 2.00 AM on the 30/5 - Hours 28.30;

Temperature -11.2°F.

Two compressors working - 1100 RPM

Extraction heat period : From 2.00 AM on the 30/5 to 7.00 AM on the 31/5 - Hours 29;

Temperature -5,8°F

One compressor working - 1100 RPM.

BALANCE TEST:

Temperatures in °F

	8 AM	9	10	11	12	1 PM	2 PM
Cargo chamber P.s	-4.9	-4	-3.6	-3.5	-3.3	-3.1	-3.3
" " S.s	-4.7	-4.4	-4	-3.8	-3.5	-3.3	-3.4
Fwd. Bulkhead	+76.1	+77	+77.2	+77.9	+78.6	+78.8	+78.8
Aft. "	+52.7	+52.7	+52.7	+52.7	+53.6	+55.4	+57.2
Ship Side P.	+62.6	+62.6	+62.6	+62.6	+63.5	+64.4	+64.4
" " S.	+62.6	+62.6	+62.6	+62.6	+63.5	+64.4	+64.4
Deck over	+46	+46.4	+47	+48.2	+49.1	+50	+50
Deck under	+60.8	+60.8	+60.8	+61.2	+61.7	+61.7	+61.7
Air delivery	-6.5	-6.2	-6	-5.8	-5.6	-5.3	-5.3
Air suction	-4.7	-4.2	-3.8	-3.6	-3.5	-3.1	-3.1
Gas Condenser	+93.2	+93.2	+93.2	+93.2	+93.2	+93.2	+93.2
Gas Evaporator	-18	-18	-18	-18	-18	-18	-18
Sea W. cool. in	+64.4	+64.4	+64.4	+64.4	+65.3	+65.3	+66.2
Sea W. cool. out	+65.8	+66	+66	+66.4	+68	+68	+68.2
Atm. temperature	+68	+68	+71.6	+73.4	+77	+77	+75.2

One compressor = 1100 RPM - 220 Volts - 27 Amps

One cooling circulating pump = 1750 RPM - 220 Volts - 5 Amps

Air Fan = 2000 RPM - 220 Volts - 6.5 Amps

Atmospheric conditions = Sunny and northely wind.

Air circulating about 4000 Cu. Feet per minute against about 1.5" SWG.

(S. Follo)

Surveyor to Lloyd's Register of Shipping

(See note in the end of the 1st Entry Rpt.)



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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.
	mm.	mm.		mm.	mm.					
Frame No. (Fore Peak) A										
Frame No. (Boiler Room) F										
Frame No. (Engine Room) A										
Frame No. 28 F										
	none	none	SlagWool	200	2x20	T & G				
Frame No. 19 A	none	none	do	300	2x20	T & G				
Frame No. (After Peak) F	none	none	SlagWool	260	2x20	T & G				
Sides ...	none	none	do	220	2x20	T & G				
Overheading ...	50	25	do	160	20x50					
Floors of Chambers ...										
Trunk Hatchways ...										
Thrust Recess, Sides and Top						none	none	SlagWool	200	2x20 T & G
Tunnel Sides and Top						50	25	do	160	25x50
Tunnel Recess, Front and Top										

Frames on Bulkheads, Face 90 mm

Stiffeners on bulkhead N°28 are fitted outside the refrigerated hold

Bulkhead Stiffeners, Top ~~none~~ Face 100 mm, at frame N°19

Ribband on Top of Decks none

Long Side Stringers ~~none~~ Face 70 mm

Web Frames, ~~none~~ none

Brackets Top Brackets face 50 mm. Bottom Brackets face 235 mm

Insulated Hatches, Main 280 Bilge 310 mm Manhole none

Hatchway Coamings, Main 150 mm Bilge -

Hold Pillars none

Masts none Ventilators none

Are insulated plugs fitted to provide easy access to bilge suction roses yes ~~no~~ and sounding pipes yes heels of pillars none

and manhole doors of tanks none Are insulated plugs fitted to ventilators none 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 hard wood sheathing

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 no adjacent storage tanks

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 Not applicable Where applicable

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 none floors 100x50mm spaced 60mm tunnel top 100x50 spaced 60 mm

fixed or portable fixed Are screens fitted over the brine grids at chamber sides no grids hinged or permanently fixed -

Thermometer Tubes, No. and position in each chamber Two: 1 port centre - 1 starboard Centre

diameter 65 mm 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. What provision is made for draining the inside of the chambers liquid sealed N.R. bilge traps

Where sluices, scupper pipes, and drain pipes are fitted are means provided for blanking them off Not applicable

What provision is made for draining the refrigerating machinery room bilge suction as for E.R.

brine return room - fan room fan in chamber water circulating pump room as per E.R.

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 **2 - One port & 1 Stbd**
 Diameter **65 mm** 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 **no facing**
 How is the expanded metal secured in place **-**
 How are the cork slabs secured to the steel structure of the vessel **no cork**
 Air Trunkways in Chambers. Are the arrangements satisfactory and in accordance with the approved plans **yes**
 Are they permanently fixed or collapsible, or portable **permanent**
 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 **none** 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 **not applicable**
 The foregoing is a correct description of the Insulation and Appliances. **Cantiere Navale Giuliano S.Giusto**
Soc. a.r.l.
l'Amministratore Unico Builder
GANDUS GIORGIO

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery **5.2.57** and Insulation **5.4.57**
 (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 **Complete.**

General Remarks (State quality of workmanship, opinions as to class, &c.) **The refrigerated Cargo Installation and Appliances, (for machinery see London Rpt. 17 N°R8462) of this vessel, have been constructed under special survey and in accordance with the Society Rules Requirements and Secretary letters. The scantlings and the arrangements are in accordance with those shown on the approved plans. The materials and workmanship are good. On completion the whole installation has been examined and tested under working conditions as required by the Rules and found satisfactory.**

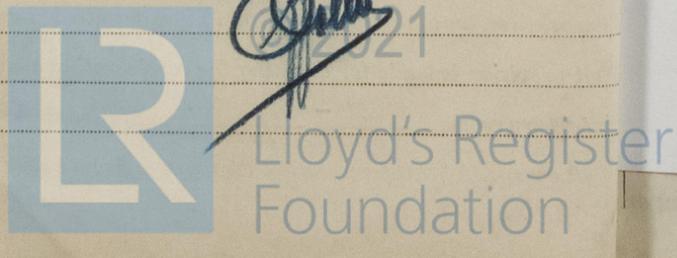
In my opinion the refrigerated cargo installation of this vessel is eligible for the notation in the Society's R.B. : **+ LLOYD'S RMC 6.57** to maintain temp. minus 0.5°F with sea temp. 90°F max.

Note :- Owing to the short stay of the vessel at this Port, the refrigeration test has been carried out during the discharging and loading operations of the general cargo, and therefore the speed of the compressor could not be maintained steady. The speed of the compressor as above quoted is the average of the readings taken.

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

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.
3	18	Dichloro- difluoro- methane	J.E. Hall	1957	Direct expansion and air Slab wool	-	yes	1	4838

Fee at 7.250 per 1000 Lbs. **60563** Fee applied for, **17/6** 19**57** For **S. Verdarelli, R.M. Skinner & F.B. Gray**
 Travelling Expenses £ **9273** Received by me, **19**
 HALLOWAY FEE **2000**
 REV. TAX **2367**
 Committee's Minute **TUESDAY 16 JUL 1957**
 Assigned **+ Lloyd's R.M.C. 6.57**
 "to maintain temp. 0°F with sea temp. 90°F maximum."
 (S. FOLLO)
 Surveyor to Lloyd's Register.



CERTIFICATE WRITTEN