

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office 21 SEP 1936)

Date of writing Report

When handed in at Local Office

No. in

Reg. Book. Survey held at

Date: First Survey

Port of London

Last Survey

(No. of Visits

THREE

No. of Visits

NINE

on the Refrigerating Machinery and Appliances of the

S.S. ARABIAN PRINCE

Tons

Gross 1960.
Net 1035.

Vessel built at

Port Glasgow

By whom built

Wm Hamilton & Co. Ltd.
(Lithgows Ltd.)

Yard No.

425

When built

1936

Owners

Prinice Line Ltd.

Port belonging to

London

Voyage

Mediterranean Ports

Refrigerating Machinery made by

J. & E. Hall Ltd.

Machine No.

H.17381.

When made

1936

Insulation fitted by

Murray Insulation Co.

When fitted

1936

System of Refrigeration

CH₂CL

Method of cooling Cargo Chambers

Direct Expansion Grids

Insulating Material used

fibre & slab work

Number of Cargo Chambers insulated

2

Total refrigerated cargo capacity

2140

cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY.

Where placed

lower deck, adjacent to chambers.

Refrigerating Units, No. of

2

No. of machines

2

Cubic feet of air delivered per hour

Total refrigeration or ice-melting capacity in tons per 24 hours

2

Are all the units connected to all the refrigerated chambers

yes

Compressors

belt

driven direct or through

single

reduction gearing

Compressors, single or double acting

Single

No. of cylinders

3 per machine

Diameter of cylinders

2 1/2"

Diameter of piston rod

trunk piston

Length of stroke

2 1/2"

No. of strokes per minute

500 each

Motive Power supplied from

Electric motors thro' "Brammar" Vee belts.

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

1 3/8" journals, 1 1/4" pins

Breadth and thickness of crank webs

4 5/8" x 1 1/4" inner

No. of sections in crank shaft

one

Revolutions of engine per minute

500

Oil Engines, type

2 of 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

Electric Motors, type

Enclosed ventilated

No. of

2

Rated

3 B.H.P.

Kilowatts

Volts at 110 D.C. at 1500 revolutions per minute.

Diameter of motor shafts at bearings

Reduction Gearing, maximum shaft horse power at 1st pinion

Revolutions per minute at full power at 1st pinion

1st pinion

1st reduction wheel

main shaft

Pitch circle diameter, 1st pinion

2nd pinion

2nd 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

3rd 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

Main

Diameter at wheel shroud, 1st

Main

Gas Condensers, No. of

2

Cast iron or steel casings

cast iron

Cylindrical or rectangular

rectangular

No. of coils in each

one

Material of coils

S.D. Copper

Can each coil be readily shut off or disconnected

yes

Water Circulating Pumps, No. and size of

2 - 3/4" centrifugal

how worked

electric direct

Gas Separators, No. of

none

Gas Evaporators, No. of

Direct expansion grids in chamber

Cast iron or steel casings

Pressure or gravity type

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

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

how worked

Brine Cooling System, closed or open

Are the pipes and tanks galvanised on the inside

No. of brine sections in each chamber

one per chamber

Can each section be readily shut off or disconnected

yes

Are the control valves situated in an easily accessible position

yes

Automatic Control
Are thermometers fitted to the outflow and to each return 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 ☒
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	10-8-36	100 lbs □	300 lbs □	✓	DL	oil pressure
" SEPARATORS	none					
" CONDENSER COILS	10-8-36	100 lbs □		300 lbs □	DL	
" EVAPORATOR COILS	DIR EXP GRIDS 10-9-36		350 lbs □	300 lbs □	S.A.	
" CRANKCASE	10-8-36		300 lbs □	✓	DL	oil pressure
" CONDENSER HEADERS AND CONNECTIONS	10-8-36	5 to 10 lbs □	20 lbs □	✓	DL	
" CONDENSER CASINGS	10-8-36	5 to 10 lbs □	20 lbs □	✓	DL	
" EVAPORATOR CASINGS	none					
NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE						
Brine PIPING AFTER ERECTION IN PLACE	9-10-36		✓	220 lbs/sq in		CO ₂ gas used for test

Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory ☒ Yes
Dates of test 12th & 14th Oct. 1936 Density of Brine by 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 - ✓ & ✓, outflow and return brine ✓ & ✓
atmosphere 58°F cooling water inlet and discharge 53°F & 56°F gas in condensers 63°F and evaporators -12°F
the average temperature of the refrigerated chambers 6°F and the rise of temperature in these chambers upon the expiration of 10 1/2 hours
time after the machinery and cooling appliances have been shut off 13 Feb. Degrees.

SPARE GEAR.

Are the machines in accordance with Section 4, Clause 2 of the Rules ☒ Yes

Are the working parts of the machines, pumps and motors respectively, interchangeable ☒ Yes

ARTICLES SUPPLIED AS PER RULE.

2 sets of main ball bearings
1 piston complete with rings
1 conn. rod complete with bolts
1 set gland packing, 2 Dexine rings
1 safety head
1 spring for safety head
1 do. delivery valve
1 impeller and spindle for water pump
1 driving belt for water pump
2 suction valves and 2 delivery valves
3 pipe connections and 6 union nuts
1 bell and bellows for thermostatic units
1 spare bellows for pressure cut out
1 set of gland packing for gland type stop valves
1 set of driving belts
1-3' length of liquid pipe
2 nuts for liquid pipe
1 set of compressed asbestos fibre joint rings
1 do. copper joint ring
3 diaphragms for auto regulator complete with rings
1 insert for combined dryer strainer fitting

ADDITIONAL SPARE GEAR SUPPLIED.

6 driving belts
2 inserts for strainer dryer
Set of bolts + nuts + studs
1 thermostatic regulator
1-2 lb tin of calcium for dryer
1 set tools + spanners
1 spare gear box.

ELECTRICAL SPARES.

2 sets of contacts for each Thermostatic unit.

Starter Spares.

2 sets contactor springs + brushes
2 sets main copper contacts
2 sets main contact arcing strips
2 of each type solenoid coils fitted
1 spare starting resistance

1 Armature for Machine motor
1 set bearings do. do.
2 brush holders do. do.
1 set brushes do. do.
2 brush springs do. do.
1 set brushes for Water Pump motor
2 brush springs do. do. do.

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

The foregoing is a correct description of the Refrigerating Machinery.

Chicopee
LLOYD'S REGISTER
FOUNDATION

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Manufacturer.

Lloyd's Register
Foundation

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										
FRAME No.	F										
FRAME No.	A										
FRAME No.	F										
FRAME No.	A										
FRAME No. (Boiler Room)	F										
FRAME No.	A										
FRAME No. (Engine Room)	F										
FRAME No.	A										
FRAME No.	F										
FRAME No.	A										
FRAME No.	F										
FRAME No.	A										
FRAME No. (After Peak)	T										
SIDES	...						NONE	NONE	GRAN. CORK	10"	3/4" T.O.G. DOUBLE.
OVERHEADING	...						"	"	SLAB CORK	10	"
FLOORS OF CHAMBERS	...						"	"	"	8	GRANULITIC 1 1/2" THICK.
TRUNK HATCHWAYS	...						Domestic Bulkhead				
THRUST RECESS, SIDES AND TOP	...						NONE	✓	GRAN. CORK	8	3/4" T.O.G. DOUBLE.
TUNNEL SIDES AND TOP	...										
TUNNEL RECESS, FRONT AND TOP	...										

FRAMES OR REVERSE FRAMES, FACE	✓		
BULKHEAD STIFFENERS, TOP	UNDER INSULATION.	BOTTOM	UNDER INSULATION AND FACE UNDER INSULATION.
RIBBAND ON TOP OF DECKS	✓		
SIDE STRINGERS, TOP	✓	BOTTOM	✓ AND FACE ✓
WEB FRAMES, SIDES	✓	AND FACE	✓
BRACKETS, TOP	✓	BOTTOM	✓ AND FACE ✓
INSULATED HATCHES, MAIN	✓	BILGE	✓ MANHOLE ✓
HATCHWAY COAMINGS, MAIN	✓	BILGE	✓
HOLD PILLARS	✓		
MASTS	✓	VENTILATORS	AT FOR P. CORNER. 10" GRAN. CORK. 3/4" T.O.G. DOUBLE.
Are insulated plugs fitted to provide easy access to bilge suction roses	✓	tank, air, and sounding pipes	✓ heels of pillars ✓
and manhole doors of tanks	✓	Are insulated plugs fitted to ventilators	YES. cargo ports ✓ and side lights ✓
Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected	✓	if 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			
✓			
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	✓	floors	GRATINGS. tunnel top ✓
fixed or portable	PORTABLE.	Are screens fitted over the brine grids at chamber sides	YES. hinged or permanently fixed HINGED.
Thermometer Tubes, No. and position in each chamber	1 AT CENTRE.		
diameter	2 1/2"	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		
2 TRAPPED SCUPPER 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	2 TRAPPED SCUPPER TO BILGE.		
brine return room	✓	fan room	✓ water circulating pump room ✓
Are all air spaces behind insulation arranged to drain to the bilges, bilge wells, or gutterways of the respective chambers			
✓			

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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. ✓

How is the expanded metal secured in place. ✓

How are the cork slabs secured to the steel structure of the vessel. *BY AUTOMATIC.*

Air Trunkways in Chambers, inside dimensions, main ✓ 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. ✓ Are the door frames efficiently insulated. ✓

Are insulated plugs supplied for the doorways. *6'0" x 4'0"* Where are the doors worked from. *SHELTER TWEEN DECK'S.*

Cooling Pipes in Chambers, diameter. *1 1/4"* 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 *Gone.*

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

Builders.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery (If not, state date of approval) and Insulation *Yes (1-9/11)*

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 refrigerating machinery has been constructed under special survey and the materials and workmanship are good and it will be eligible for the notation + Lloyds R.M.C. (with date) when the installation and testing have been satisfactorily completed.*

The Installation has been properly fitted on board, tried under working condition + found satisfactory. results of insulation test are embodied in this report.

The Refrigerating Appliances of this vessel are eligible in our opinion, to be classed in the Register Book with record + Lloyds RMC - 10.36

It is submitted that this vessel is eligible for THE RECORD. + Lloyds RMC 10.36

DA 16/10/36

CERTIFICATE WRITTEN. 16/10/36

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					System of (1) Refrigerating (2) Insulating the Chambers.	POWER.		INSULATED CARGO CHAMBERS.	
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.		Cubic feet of air delivered per hour.	Ice melting capacity per 24 hours. Tons.	No.	Capacity. Cubic ft.
2	6	Methyl Chloride	Jr E. Hall Ltd.	1936	Direct Expansion		2	2	2140

Long 2.0.0
 Fee *£ 6 : 0 : 0*
 Travelling Expenses £ : :
 Fee applied for, 16th Oct. 1936
 Received by me 28.12 1936
 Committee's Minute TUE. 20 OCT 1936
 Assigned + Lloyds Rmb 10.36
 FRI. 30 OCT 1936
 FRI. 18 DEC 1936

D. Cummell.
 Surveyor to Lloyd's Register.
H. J. Ferguson.
J. Boyle

Price Line Office, London.
Committee to be sent to Cassen Street.
13/10/36
15/10/36