

Rpt. 17 (a)

Date of writing Report 18th July, 1958 Received London 53 Port
Survey held at Tamano, Japan No. of visits 53 First date 4th Feb., 1958 Last date 15th July, 1958

REFRIGERATED CARGO INSTALLATION REPORT ON REFRIGERATING MACHINERY

Mitsui Shipbuilding & Eng. Co., Ltd.,
Machinery made by & Kunimori Eng. Works, Kobe Machine Nos. 52, 53, 54, 55, 56 & 57 When made 1958-May
Intended for Yard No. or Ship's Name "MEGURO SAN MARU"
Built or building at Mitsui S.B. & Eng. Co., Ltd., Tamano Wks. By whom Mitsui S.B. & Eng. Co., Ltd. 620
OWNERS Mitsui Steamship Co., Ltd. Primary refrigerant & air
Primary refrigerant CCl₂ F₂ Medium for cooling chambers (brine, primary refrigerant, etc.)

PARTICULARS OF REFRIGERATING MACHINES OF EACH SIZE (Including machines (if any) for cooling liquid refrigerant)

RECIPROCATING TYPES

(1) No. of machines No. of cylinders per machine Single or double acting Single or two-stage
Diameter of cylinders Vertical, horizontal or Vee Diameter of piston rod if double acting
No. of cranks Stroke Speed of machines as fitted: Maximum R.P.M. Minimum R.P.M.
Single speed, set speeds or variable speed Clearance volume as percentage of swept volume
Swept volume of machine(s) at maximum R.P.M. How driven (direct, V belt, gearing, etc.)
Prime Movers (steam engine, oil engine, electric motor, etc.) B.H.P. Maximum R.P.M.

(2) No. of machines No. of cylinders per machine Single or double acting Single or two-stage
Diameter of cylinders Vertical, horizontal or Vee Diameter of piston rod if double acting
No. of cranks Stroke Speed of machines as fitted: Maximum R.P.M. Minimum R.P.M.
Single speed, set speeds or variable speed Clearance volume as percentage of swept volume
Swept volume of machine(s) at maximum R.P.M. How driven (direct, V belt, gearing, etc.)
Prime Movers (steam engine, oil engine, electric motor, etc.) B.H.P. Maximum R.P.M.

Material of compressor ~~cast iron~~ rotary piston forged steel Have they been manufactured and tested in accordance with the Rules and/or Secretary's letters? Yes
Tensile strength 32-36 ton/in² Have other important steel forgings and castings been manufactured and tested in accordance with the Rules? Yes
Are safety devices fitted to compressors in accordance with the Rules? Yes Are compressors arranged for multiple-effect compression? No

OTHER TYPES (e.g., Centrifugal, steam jet, etc.)

(3) Six sets of Rotary type compressor were installed, e.i. 4 sets of RL-80 & 2 sets of RL-20
Speed of Machines: 800 to 640 r.p.m. for RL-80, 1210 to 970 r.p.m. for RL-20 (Variable speed)
Swept volume of machines at max. r.p.m.: 137 M³/h. for RL-80, 41 M³/h for RL-20
How driven; direct driven by electric motor, Diameter of cylinder; 170mm for RL-80, 100mm for RL-20, Diameter of rotary piston; 135mm for RL-80, 80mm for RL-20, Length of cylinder & piston; 340mm for RL-80, 200mm for RL-20, Prime movers; 25HP electric motor for RL-80, 8HP electric motor for RL-20.

Where two machines only are provided, are all the working parts interchangeable? battery rooms are laid parallel and, insulated as a whole
Is provision to be made for liquid refrigerant sub-cooling? Yes If so, state method so that after evaporation may be avoided.

PARTICULARS OF GAS CONDENSERS OF EACH TYPE AND SIZE

No. of shell-and-tube type 6 No. of shells in each 1 No. of tubes per shell 130 & 65 Material and thickness of tubes Almi-brass, 1.24mm
Cooling medium and No. of passes Sea water, 4 pass for RL80, 6 pass for RL-20 No. of tubes each pass 32 & 11 Internal diameter of tubes 13.5mm
Total No. of tubes per condenser 130 & 65 Total external surface of tubes in each condenser 12.7M² & 3.9 M²
No. of coil-in-casing type No. of casings No. of coils each casing Material, external diameter and thickness of coils
External surface of each coil Cooling medium and No. of passes
Total external surface of coils each condenser Can each coil be readily shut off or disconnected?
Other types

PARTICULARS OF EVAPORATORS (BRINE COOLERS) OF EACH TYPE AND SIZE.

No. of shell-and-tube type No. of shells in each No. of tubes per shell Material and thickness of tubes
No. of passes of brine No. of tubes each pass Internal diameter of tubes
Total No. of tubes per evaporator Total external surface of tubes in each evaporator
No. of coil-in-casing type No. of casings No. of coils each casing Material, external diameter and thickness of coils
External surface of each coil Can each coil be readily shut off or disconnected?
Other types

OTHER COMPONENTS, ETC.

No. of oil separators 6 No. of filters 6 No. of liquid receivers Combined with condenser No. of driers 2 No. of brine heaters None
Other pressure vessels, give particulars electric resistance
Particulars of air cooler coils and cooling grids: Plain coils, external diameter 34mm Thickness 3.2mm Material welded steel pipe
Extended surface coils, internal diameter Thickness
Pitch of fins or plates Dimensions of fins or plates Total extended surface per foot of pipe
Air cooler coil assemblies, total No. 6 Length of pipe and No. of coils of each size 174M x 3; 4 sets, 174Mx4; 2 sets.
Can each coil be readily shut off or disconnected?

Cooling grid sections, total No. and length of pipe of each size 62.24/2.41, 49.75/2.11, 37.61/1.83, 31.62/1.65, 25.27/1.65,
Primary refrigerant piping, internal diameter and thickness of each size 22.10/1.65, 18.93/1.65, 13.30/1.25, 10.21/1.25, 7.03/1.25,
Material Copper 3.85/1.25mm How manufactured Cold drawing

Have all components of the refrigerating plant been constructed strictly in accordance with the Rules and approved plans? Yes
Has the spare gear required by the Rules been supplied? Yes Where additional spare gear has been supplied a list is to be attached to the Report.
The foregoing is a correct description of the refrigerating machinery.

MITSUI SHIPBUILDING & ENGINEERING CO., LTD., TAMANO WORKS.

T. Okumura Machinery Manufacturers.
Senior Managing Director.

PRESSURE TESTS AT WORKS						
DESCRIPTION	Working Pressure	Hydraulic Pressure	Date of Test	Air Test Pressure	Date of Test	Stamped
casing						
Compressor XXXXX	7 kg/cm2	24.5kg/cm2	27,28,30-1-58	14 kg/cm2	22,28,30-1-58	RS LR
Compressor XXXXX bearing cover	"	"	21,24,28-4-58	"	21,24,28-4-58	RS LR
Oil separators, oil rectifiers	"	"	5,30-5-58	"	5,30-5-58	RS LR
Filters	"	"	13-1-58	"	13-1-58	RS LR
Driers	"	"	6-3-58	"	6-3-58	SM LR
Strainers	"	"	17-3-58	"	17-3-58	RS LR
Stop valves and connections	"	"	6,11,14-4-58	"	6,11,14-4-58	RS LR
Liquid receivers	"	"	3,5,6-3-58	"	26-2-58	SM,KT LR
Condenser shells XXXXX	"	"	"	"	"	"
Evaporator (brine cooler) shells or coils	-	-	-	-	-	-
Condenser headers and connections	7 kg/cm2	24.5kg/cm2	23,5,6-3-58	14 kg/cm2	26-2-58	SM,KT LR
Condenser XXXXX water ends	1 kg/cm2	4kg/cm2	6-3-58	-	6-3-58	SM LR
Evaporator headers and connections	-	-	-	-	-	-
Evaporator coil casings or brine ends	-	-	-	-	-	-
Air cooler coil assemblies	7 kg/cm2	24.5kg/cm2	1,3-3-58	14 kg/cm2	4,5,7-3-58	YK,SM,KT,YK LR
Chamber grid sections	-	-	-	-	-	-
Float regulators	-	-	-	-	-	-
Brine heaters	-	-	-	-	-	-
Primary refrigerant piping	7 kg/cm2	24.5kg/cm2	20,14-6-58	14 kg/cm2	20,14-6-56	SH& JN LR
Other pressure parts						

PLANS: Drawing No. and date of approval of each plan concerned

Rotary piston RL80 RL20 Date Oct.7-57
 Compressors, crankshaft 1P-2222 2P-4729 Oct.7-57
 Filters 1P-2229 2P-4849 "Bearing cover: 1P-2219 2P-4708
 Evaporators - Separators 1P-2231, 1P-2059 Date Oct.7-57
 Condensers RD143A, RD143B, May 2-58 Strainers 1P-2238 2P-4817 -
 Air coolers PC143A, PC143B " Driers -
 Other pressure parts Oil cooler: 1P2232 for RL-80, 2P4808 for RL-20
 Casing 1P-2218 1P-2034 Oct.7-57
 Liquid receivers RD143A - May 2 1958
 Float regulators -
 Brine heaters -

General remarks (state quality of workmanship, opinions as to class, etc.) The Refrigerated Cargo Installation of this vessel has been built and installed under Special Survey in accordance with the Rules, Approved Plans and Secretary's letters. The materials and workmanship are sound and good..

The installation has been examined under full working conditions and found satisfactory.

In our opinion this Refrigerated Cargo Installation is worthy of the record of LLOYD'S RMC 7,58.

PARTICULARS OF MACHINERY FOR REGISTER BOOK			
No. of units	6	Prime Movers	Electric motors
Total B.H.P. of all compressor prime movers	116	Refrigerant	CCl ₂ F ₂
Makers	Mitsui S.B.& Eng.Co.,Ltd.& Kunimori Eng.,Wks.	Date of construction	
MACHINERY PARTICULARS:	Type & No. of machine	Rotasco RL80x4 sets	Rotasco RL20 x 2 sets
	Diameter of cylinder	170mm	100mm
	Diameter of rotary piston	135mm	80mm
	Length of cylinder and piston	340mm	200mm
	Revolutions per minute	800/640	1210/970
	Ice melting capacity	10.22 ton/day	2.9 ton/day

SURVEY FEE (Based on measured cubic capacity on completion of installation.)

Construction & Inst. £146,450.-

Travelling expenses £See Rpt.1 :

Fee applied for, 19

Received by me, 19

Date of Committee
Minute

TUESDAY 2nd OCT 1958

See Rpt. 17 (R)

R.D. Sutherland
 Surveyor to Lloyd's Register
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 Foundation