

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office)

Date of writing Report 19 41 When handed in at Local Office 26/3/41 Port of NEWCASTLE-ON-TYNE

No. in Reg. Book. Survey held at Newcastle Date: First Survey 12 Aug 1940 Last Survey 17 March 1941 (No. of Visits 6)

on the Refrigerating Machinery and Appliances of the Steel Liner S/S "ARONDA" Tons { Gross 9031 Net 4463

Vessel built at Newcastle on Tyne By whom built Swan, Hunter & Wigham Richardson Yard No. 1640 When built 1941-3

Owners British India Ste. Nav. Co. Ltd. Port belonging to London Voyage

Refrigerating Machinery made by J. E. Hall, Ltd Machine Nos. 10561 10562 When made 1940

Insulation fitted by Newall's Insulation Co. When fitted 1941 System of Refrigeration CO₂ & Brine

Method of cooling Cargo Chambers Brine grids Insulating Material used slab cork

Number of Cargo Chambers insulated 4 Total refrigerated cargo capacity 4520 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed In Shaft Tunnel abaft Thrust, See also London Rpt No RMC.1215. Recess.

Refrigerating Units, No. of 2 No. of machines 2 Is each machine independent Yes

Total refrigeration or ice-melting capacity in tons per 24 hours 15 Are all the units connected to all the refrigerated chambers Yes

Compressors, driven direct on through ^{single} ~~double~~ reduction gearing. Compressors, single or double acting single acting. If multiple effect compression No

are relief valves or safety discs fitted Safety discs No. of cylinders to each unit 2 Diameter of cylinders 28"

Diameter of piston rod 1" Length of stroke 6" No. of revolutions per minute 400 max

Motive Power supplied from THREE KW. STEAM TURBO-GENERATORS in Main Eng. Rm. (State number of boilers, oil engines or electric generators supplying the motive power.)

CO₂ Compressors 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 3" journals; 3 1/2" cr. pins

Breadth and thickness of crank webs ✓ No. of sections in crank shaft One Revolutions of CO₂ mach engines per minute 400 max.

Oil Engines, type ✓ 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:—Is each receiver, which can be isolated, fitted with a safety valve as per Rule ✓

Can the internal surfaces of the receivers be examined ✓ What means are provided for cleansing their inner surfaces ✓

Is there a drain arrangement fitted at the lowest part of each receiver ✓ If made under survey ✓

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 Enclosed ventilated No. of 2 Rated 25 HP Kilowatts ✓

Volts 220 @ 300/400 revolutions per minute. Diameter of motor shafts at bearings ✓

Reduction Gearing none 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 Cast iron Cylindrical or rectangular Cylindrical Are safety valves fitted ✓

to casings Yes No. of coils in each 7 Material of coils S.D. Copper Can each coil be readily ✓ disconnected Yes

Water Circulating Pumps, No. and size of One 2" Horiz Central how worked all by Electric Motors Gas Separators, No. of 4

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

No. of coils in each 3 Material of coils S.D. Steel 5" Can each coil be readily ✓ disconnected Yes

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 ✓

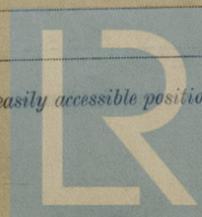
Brine Circulating Pumps, No. and size of, including the additional pump two - 2" horiz central how worked by Elec. motors.

Brine Cooling System, closed or open ✓ Are the pipes and tanks galvanised on the inside ✓

No. of brine sections in each chamber one to each chamber.

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

NOTE.—THE WORDS WHICH DO NOT APPLY SHOULD BE DELETED.



Are thermometers fitted to the outflow and to each return brine pipe *Common* **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 **Yes**
 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)	✓					
GAS COMPRESSORS	12-6-40 25-6-40	1000 lbs	3000 lbs	1500 lbs	D.G.	
SEPARATORS	12-6-40	do	do	do	D.G.	
MULTIPLE EFFECT RECEIVERS	none	—	—	—	—	
CONDENSER COILS	5-1-40 12-1-40	do	do	do	D.G.	
EVAPORATOR COILS	28-5-40 4-6-40	do	do	do	D.G.	
CONDENSER HEADERS AND CONNECTIONS	12-6-40 10-7-40	do	do	do	D.G.	
CONDENSER CASINGS	12-6-40	10-15 lbs	30 lbs	✓	D.G.	
EVAPORATOR CASINGS	open top.					
NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE	✓					
BRINE PIPING AFTER ERECTION IN PLACE	11/10/40 10/3/41	10-15 lbs	30 lbs brine 10/2/41	90 lbs 11/10/40	Ad. Newcastle/Syre	

Have important steel castings and forgings been tested in accordance with the Rules **Yes**
Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory **Yes**.
 Dates of test *7th Mar. 1941.* Density of Brine *49°* by *Swaddell* hydrometer
Temperatures (when the cargo chambers are cooled down to the required test temperatures)
 or, delivery and return air at direct expansion or brine cooled batteries ✓ & ✓, outflow and return brine *-5°7* & *-4°5*
 atmosphere *50°7* cooling water inlet and discharge *40°7* & *42°7* gas in condensers *52°7* and evaporators *-7°7*
 the average temperature of the refrigerated chambers *5°7* and the rise of temperature in these chambers upon the expiration of *twelve* hours
 time after the machinery and cooling appliances have been shut off *12°7*.
Ad. Watt Newcastle on Tyne 11/3/41

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:-

- 12 lubricator piston leathers
- 12 " gland "
- 1 set of 2 leather moulds
- 12 addl valve springs for Comp^r.
- 2 sets Copper joint rings for " joints
- 2 brass cased thermometers.
- 2 pairs CO₂ pipe flanges
- 1 impeller for Circ. water pump,
- 1 spindle for ditto.
- 1 bearing assembly for ditto.
- 2 springs for CO₂ Safety Valves, 2 Springs for Water relief Valves
- 2 bolts & nuts for Crosshead, 1 CO₂ gauge, 1 hydrometer,
- 1 pair Main bearing brasses with bolts & nuts
- 1 pair big end " " " "
- 1 set for other joints, 1 CO₂ gauge & 3 spare pipes
- 12 safety discs, 1 set screwing dies for 1 1/4" & 1 1/2" pipes
- Fitted box for Comp^r pistons, valves, etc.,
- 1 impeller for brine pump, 1 hand pump for pressure lubricator
- 1 spindle for ditto
- 1 bearing assembly for ditto,

Electrical Spares:-

- one Armature
 - one set of bearings
 - one field coil
 - one interpole coil
 - one line of brush holders
 - one set of brushes
 - one set of Controller spares
- } for machine motors,
pump motors, each size

The foregoing is a correct description of the Refrigerating Machinery.

Signed by *F. WELLS*
 J. & E. HALL, LTD.
 P. DIRECTOR.



DESCRIPTION OF INSULATION.

TWEEN DECKS IN LOWER HOLD CHAMBERS. (3 chambers)					UPPER IN 'TWEEN DECK CHAMBERS. (1 chamber)						
	Air Space.	Outer Lining.	Non-conducting Material.	Thickness of ditto.	Inner Lining.	Air Space.	Outer Lining.	Non-conducting Material.	Thickness of ditto.	Inner Lining.	
BULKHEADS.	FRAME No. (Fore Peak)	A									
	FRAME No.	F									
		A									
	FRAME No.	F									
		A									
	FRAME No.	F									
		A									
	FRAME No. (Boiler Room)	F									
		A									
	FRAME No. (Engine Room)	A									
F		Frame 56	3/16" asbestos cement sheet	slab cork	12"	✓	Frame 55	3/16" asbestos cement sheet	slab cork	6"	3/16" asbestos cement sheet
FRAME No.	A	" 49	"	"	12"	✓	" 51	"	"	12"	"
	F	Stand. side	"	"	12"	✓	Sides Outboard	"	"	12"	"
FRAME No.	A	Port side shell	"	"	12"	✓	Sides Inboard	"	"	6"	"
	F	Intermediate	"	"	6"	3/16" asbestos cement sheet					
FRAME No.	A	F & A division									
	F										
SIDES			3/16" asbestos cement sheet	slab cork	10"	✓	3/16" asbestos cement sheet	slab cork	10"	✓	
OVERHEADING											
FLOORS OF CHAMBERS			1/2" Durastic	"	8"	✓	1/2" Durastic	"	4"	✓	
TRUNK HATCHWAYS											
THRUST RECESS, SIDES AND TOP											
TUNNEL SIDES AND TOP											
TUNNEL RECESS, FRONT AND TOP											

FRAMES OR REVERSE FRAMES, FACE

BULKHEAD STIFFENERS, TOP BOTTOM AND FACE

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

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 ✓

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 ✓

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 *Surfaces* floors *over beams* tunnel top ✓

fixed or portable *portable* Are screens fitted over the brine grids at chamber sides *yes* hinged or permanently fixed *portable*

Thermometer Tubes, No. and position in each chamber *upper tween dks -- one fitted in door leading to insulated stove passage. lower " " -- one fitted central in each chamber.*

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*

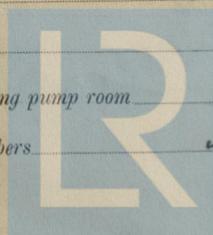
Draining Arrangements. What provision is made for draining the inside of the chambers *Scuppers*

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 *Fitted in tunnel.*

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 ✓ 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

Air Trunkways in Chambers. Are the arrangements satisfactory and in accordance with the approved plans ✓
 Are they permanently fixed or collapsible, or portable ✓

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 ✓ Where are the doors worked from ✓

Cooling Pipes in Chambers, diameter $1\frac{3}{8}$ " o/d Minimum thickness $\frac{3}{16}$ " Are they galvanised externally ✓
 How are they arranged in the chambers on Sides and Roof

Thawing Off, what provision is made for removing the snow from the cooling pipes in the chambers. hot brine.

The foregoing is a correct description of the Insulation and Appliances. FOR SWAN, HUNTER & WIGHAM RICHARDSON, LTD.

W. Morrison
 Builders.
 DIRECTOR

Plans. Are approved Plans & Specifications forwarded herewith for the Refrigerating Machinery ✓ as for ASKA and Insulation ✓ as for ASKA.
 (If not, state date of approval)

Is the Refrigerating Machinery and Appliances duplicate of a previous case Yes If so, state name of vessel AMARA good to 1570, 98896
 ASKA. " " 1596, 97699.

If the survey is not complete, state what arrangements have been made for its completion and what remains to be done
 ✓ AMRA 1570

General Remarks (State quality of workmanship, opinions as to class, &c.)
 The Refrigerating machinery ^{and insulated cargo chambers.} were constructed and installed under special survey, and the materials and workmanship are good.
 The installation was tested satisfactorily under working conditions and is eligible, in our opinion, for the notation + LLOYD'S R.M.C. 3.41.
 The plan & specification approved for ASKA, SHIPYARD 1596 are returned herewith.

It is submitted that this vessel is eligible for THE RECORD. + Lloyd's R.M.C. 3.41
W. Morrison
 31/3/41

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.
2.	4	Carb. Anhyd.	J. & E. Hall, Ld	1941	(1) Brine (2) Slab-cork	Tons. 15.	Yes.	A	4520

Fee £ 6: 0: 0 { Fee applied for, 27 MAR 1941
 Travelling Expenses £ : : { Received by me, 19
 A. Watt E.H. Dean.
 Surveyors to Lloyd's Register.

Committee's Minute
 Assigned + Lloyd's R.M.C. 3.41

Certificate to be sent to



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