

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office)

Date of writing Report 1st October 1939 When handed in at Local Office

No. in

Reg. Book. Survey held at Shinore Date: First Survey 3rd March Last Survey 1st October 1939

(No. of Visits 59)

on the Refrigerating Machinery and Appliances of the INDIAN REEFER Tons { Gross 2814.86 Net 1557.72Vessel built at Shinore By whom built of Helsingør Jensen & Søn Yard No. 259 When built 1939Owners J. Lauritzen Port belonging to Esbjerg Voyage 1871-1872-1873Refrigerating Machinery made by of Atlas Copenhagen Machine No. E22: 1874 When made 1939Insulation fitted by of Helsingør Jensen & Søn When fitted 1939 System of Refrigeration direct expansionMethod of cooling Cargo Chambers air Insulating Material used Expanded granulated cork

Number of Cargo Chambers insulated 10 Total refrigerated cargo capacity 185.000 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY.

Refrigerating Units, No. of 4 Single, double, or triple 3 1/2 type E42 1 1/2 type E22 Where placed in a separate compartment in starboard side of motor room Cubic feet of air delivered per hour 12700000Total refrigeration or ice-melting capacity in tons per 24 hours 150 Tons Are all the units connected to all the refrigerated chambers yesCompressors, driven direct or through single reduction gearing. Compressors, single or double acting single acting No. of cylinders 2 x 4 = 8Diameter of cylinders 240 1/4 170 1/4 Diameter of CRANK- E42 135 1/4 95 1/2 Length of stroke 220 1/4 140 1/4 No. of REVOLUTIONS E42: 350 E22: 450Motive Power supplied from 3 1/2 240 H.P. D.C. generators each driven by a 6 cyl 450 S.A. heavy oil engineSteam 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 heavy oil trunk piston 4 stroke cycle 4 Single or double acting single B.H.P. 360No. of cylinders 6 Diameter 245 1/4 Length of stroke 400 1/4 Span of bearings as per Rule 303 1/4Maximum pressure in cylinders 49 lb/cm² Diameter of crank shaft journals and pins 155 1/4Breadth and thickness of crank webs 435 1/4 x 78 1/4 No. of sections in crank shaft 1 Revolutions of engine per minute 500Electric Motors, type D.C. drip proof ventilated No. of E42: 3 E22: 1 Rated 37/48 HP. 220Volts at 300 / 450 revolutions per minute. Diameter of motor shafts at bearings E42: 122 1/4 - E22: 90 1/4Reduction Gearing, maximum shaft horse power at 1st pinion ✓ Revolutions per minute at full power at 1st pinion ✓2nd pinion ✓ 1st reduction wheel ✓ main shaft ✓ Pitch circle diameter, 1st pinion ✓ 2nd pinion ✓1st 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 ✓1st 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 4 Cast iron or steel casings steel Cylindrical or rectangular cylindricalNo. of coils in each 48 1/2 2" Material of coils steel Can each coil be readily shut off or disconnected yesWater Circulating Pumps, No. and size of 3 1/2 centrifugal, 120 tons/hour how worked electrically Gas Separators, No. of 4LIQUID RECEIVERS 2 Cast iron or steel casings steel Pressure or gravity type ✓OIL SEPARATORS: 042: 3 1/2 022: 1 1/2 Material of coils steel Can each coil be readily shut off or disconnected ✓Direct Expansion or Brine Cooled Batteries, No. of 6 Are there two separate systems, so that one may be in use while the other is beingcleared of snow yes No. of coils in each battery 2 (see below) Material of coils steel Can each coil be readily shut off ordisconnected yes Total cooling surface of battery coils 1260 4 2 Is a watertight tray fitted under each battery yesAir Circulating Fans, Total No. of 6 each of 1/2 48.500 cubic feet capacity, at 1050-1400 revolutions per minuteSteam or electrically driven electrically Where spare fans are supplied are these fitted in position ready for coupling up yesBrine Circulating Pumps, No. and size of, including the additional pump ✓ how worked ✓Brine Cooling System, closed or open closed Are the pipes and tanks galvanised on the inside NoNo. of COOLER I: (working on TW. DH. I.) 2 sections à 240 1/4 = 480 1/4. COOLER II: (HOLD I) 2 sect à 420 1/4 = 840 1/4.COOLER III: (TW. DH. II + HOLD II) 2 sect à 570 1/4 = 1140 1/4 + 2 sect à 570 1/4 = 1140 1/4. TOTAL 2280 1/4. COOLER IV: (TW. DH. III + HOLD III) 2 sect à 740 1/4 = 1480 1/4 + 2 sect à 740 1/4 = 1480 1/4. TOTAL 2960 1/4. COOLER V: (TW. DH. IV + HOLD IV) 2 sect à 435 1/4 = 870 1/4 + 2 sect à 435 1/4 = 870 1/4. TOTAL 1740 1/4. COOLER VI: (TW. DH. V + HOLD V) 2 sect à 650 1/4 = 1300 1/4.Can each section be readily shut off or disconnected yes Are the control valves situated in an easily accessible position yes

Sounding Pipes, No. and position in each chamber situated below the load water line due to bilges at after end of room.

Diameter 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 yes! Are cement facings reinforced with expanded steel lattice

How is the expanded metal secured in place

How are the cork stabs secured to the steel structure of the vessel

Air Trunkways in Chambers, inside dimensions, main 18" wide x full height and branch none

Are they permanently fixed or collapsible, or portable portable State position in chambers along sides

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 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 hot NH3 gas

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

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery and Insulation

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

General Remarks (State quality of workmanship, opinions as to class, etc.) The refrigerating machinery with appliances has been constructed and fitted under Special Survey and in accordance with the Society's Rules, the approved plans and the specification, and the requirements contained in the Secretary's letter E dated 2/3-5/4-13/5-2/6-15/6-6/7-20/7-1939. The material has been tested and found in accordance with the Rules and the workmanship is good. On completion of the installation the machinery was tested under working conditions and found satisfactory and the insulation tested as per Rule with the results stated on page 2 of this Report.

Recommend the vessel to have notation of LLOYD'S R.M.C. 10-39 No I hold and tween deck chamber for temp 10°F, all other chambers for temp 28°F.

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					POWER.		INSULATED CARGO CHAMBERS.		
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.	System of	Cubic feet of air delivered per hour.	Ice melting capacity per 24 hours.	No.	Capacity.
					(1) Refrigerating (2) Insulating the Chambers.				
4	8	Ammonia	Hallen Markens fabrik	1939	direct expansion Exp Gr. Cork and "Isoplex"	127000	Tons 150	10	Cubic ft. 185000

Fee 800.00 (Fee applied for, 1939) Received by me, 7/12/1939

Committee's Minute TUE 10 OCT 1939

Assigned + Lloyd's Rmb 10, 39 No I hold & tween deck for temp 10°F all other chambers for temp 28°F

Surveyor to Lloyd's Register.

It is submitted that this vessel is eligible for

+ Lloyd's Rmb 10-39 No I hold & tween deck for temp 10°F all other chambers for temp 28°F

CERTIFICATE WRITTEN 7/10/39

GENERATOR CABLES.

DESCRIPTION.	KILOWATTS.	CONDUCTORS.		MAXIMUM CURRENT IN AMPERES.		APPROX. LENGTH (lead plus repairs feet).	INSULATED WITH.	HOW PROTECTED.
		No. in Parallel Per Pole.	Sectional Area or No. and Dia. of Strands. Sq. in. or sq. mm.	In the Circuit.	Rate.			
MAIN GENERATOR	240	2	2x625	1090	1170	4650/50	Vulcan.	Lead covered
" " EQUALISER		1	625		585	4650/50	India	Steel wire
AUX " "	15	1	35	68	78	30	rubber	armoured
EMERGENCY GENERATOR								
ROTARY TRANSFORMER: MOTOR								
" " GENERATOR								

MAIN DISTRIBUTION CABLES.

AUX. SWITCHBOARDS AND SECTION BOARDS								
Winches Ventil. Holes Hold I & E	1	150	200	205	90	Vulcan	Lead covered	
" Hold I & E Ventil. Holes Hold I & E	1	150	200	205	130	India	Steel wire armoured	
" Hatch III " " Hold I & E	1	150	200	205	100	rubber		
Galley	1	150	193	205	60			
Stores amidship	2	2x120	296	254	30			
" aft	1	50	92	98	120			
Cooling water pumps for auxiliary motor	1	35	64	78	24			
" " " main motor	1	70	102	124	30			

LIGHTING AND HEATING, ETC., CABLES.

WIRELESS	1	6	20	29	80			
NAVIGATION LIGHTS	1	2.5	2	16	80			
LIGHTING AND HEATING								
Engine room	1	10	16	38	40			
Holds forward	1	4	13	22	120			
" amidship	1	6	15	29	80			
" aft	1	10	24	38	80			
Accommodation amidship	1	10	37	38	30			
" aft	1	4	12	22	140			
Searchlight	1	10	23	38	160			

MOTOR CABLES.

ALL IMPORTANT MOTORS TO BE ENUMERATED.	No.	B.H.P.						
Cooling water pumps main motor	3	20	1	50	77	98	30/30/30	"
Lubricating oil pumps	3	27	1	70	102	124	24/24/24	"
Cooling water pumps aux. motor	2	8	1	10	32	38	16/16	"
Ballast pump	1	15	1	25	59	63	56	"
Bilge & sanitary pumps	2	8.5	1	10	32	38	60-56	"
Air compressors	2	60	1	185	225	235	70-60	"
Engine turning gear	2	8	1	10	32	38	10-24	"
Oil purifiers	3	3.5	1	4	15	22	16/16/16	"
Fuel oil transfer pump	1	5.5	1	6	23	29	16	"
Engine room ventilator	2	6	1	6	24	29	60	"
Crane	1	7.5	1	10	30	38	30	"
Windlass	1	50	1	120	187	195	150	"
Hoisting gear	1	15	1	35	60	78	300	"
Lifting truck	1	33	1	70	120	131	110	"
NH3 compressor Type E42	3	125	2	185	450	470	50/40/40	"
" " " E22	1	48	1	150	180	205	40	"
Cooling water pumps Ref. tank	3	8.5	1	10	34	38	12/12/12	"
Cooling pump for Ref. tank	2	7	1/1	16/2.5	28	47	12/12/12	"
" " Hold I, II, III, IV	3	35	1/1	35/2.5	102	150	50/50/50	"
" " Hold V	1	16	1/1	35/2.5	63	77	88/44	"
Ventilator for Hold I, II, III, IV, V	6	0.8	1	1.5	4	10	30-20	"
50 Winches	10	33	1	70	125	131/110	10-20	"
NH3 compressor provision	1	10	1	16	40	49	12	"
Cooling water pump " "	1	0.75	1	1.5	4	10	12	"
Ventilator amidship	2	3	1	4	10	22	24	"
" " NH3 compressor room	1	0.8	1	1.5	4	10	24	"

The Electrical Equipment is installed in accordance with the approved plans and the requirements of the Rules.

All Insulated Conductors are guaranteed to have been tested at the maker's works as specified in the Rules.

The foregoing is a correct description.

AKTIESELSKABET
HELSINGØRS JERNSKIBS- OG MASKINBYGGERI

Electrical Engineers.

Date *October 1939*

COMPASSES.

Minimum distance between electric ~~generators or~~ motors and standard compass *7 meters*

Minimum distance between electric ~~generators or~~ motors and steering compass *6 - "*

The nearest cables to the compasses are as follows:—

A cable carrying *10* Ampères *8* *4* feet from standard compass *6* *4* feet from steering compass.

A cable carrying *1* Ampères *5* *4* feet from standard compass *25* *4* feet from steering compass.

A cable carrying *0.07* Ampères *to light in feet from standard compass and in feet from steering compass.*

Have the compasses been adjusted with and without the electric installation at work at full power *yes*

Has the effect of switching on and off circuits, motors and other electro-magnetic apparatus within the vicinity of the compasses been noted *yes*

The maximum deviation due to electric currents was found to be *0* degrees on *all* course in the case of the standard compass, and *0* degrees on *all* course in the case of the steering compass.

AKTIESELSKABET
HELSINGØRS JERNSKIBS- OG MASKINBYGGERI

Builder's Signature.

Date *October 1939*

Is this installation a duplicate of a previous case *No* If so, state name of vessel *✓*

General Remarks (State quality of workmanship, whether insulation tests, etc., have been made, opinions as to class, etc.)

The electric installation has been constructed and fitted under special survey and in accordance with the Rules, the approved plans, and the requirements contained in the Secretary's letter E dated 26/5-2/6-14/7-26/7-1939.

The material used is in accordance with the Rules and the workmanship is good.

On completion the whole installation was tested under full power working conditions and found satisfactory

Notice

L. J.

24/10/39

Total Capacity of Generators *735* Kilowatts.

The amount of Fee ... *£ 1419.50* When applied for, *13.10.39*

Travelling Expenses (if any) *£ 102.00* When received, *7/12/39*

Surveyor to Lloyd's Register of Shipping.

S. Laurens

Committee's Minute

Assigned *See Cpn. 76 11024*