

Rpt. 4a.

REPORT ON MACHINERY.

No. 33/35

Received at London Office. 15 JAN. 1922

Date of writing Report 19 When handed in at Local Office

4/1/22 Port of HULL

No. in Survey held at HULL

Date, First Survey May 17/20 Last Survey 3/2/1922

Reg. Book.

on the S.S. CITY OF DURBAN

(Number of Visits 180)

Tons Gross 4499
Net 2847

Master Built at Hull By whom built Charles H. & Co. Ltd When built 1921

Engines made at Hull By whom made do when made 1921

Boilers made at do By whom made do when made 1921

Registered Horse Power Owners Ellerman Lines Ltd (Incorporated in England) Port belonging to Liverpool

Shaft Horse Power at Full Power 2800 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

TURBINE ENGINES, &c.—Description of Engines DOUBLE REDUCTION GEARED TURBINES No. of Turbines 3.

Diameter of Rotor Shaft Journals, H.P. 3" MP. 4", L.P. 6" Diameter of Pinion Shaft 1 1/2" 4 1/2" 2" 10 1/2"
 Diameter of Journals 1 1/2" 4 1/2" 2" 10 1/2" Distance between Centres of Bearings 2" 5-2 1/2" Diameter of Pitch Circle 1 1/2" 7-12" 2" 9-25"
 Diameter of Wheel Shaft 1 1/2" Distance between Centres of Bearings 5-4 1/2" Diameter of Pitch Circle of Wheel 1 1/2" 39-75" 2" 94-2 1/4"
 Width of Face 1 1/2" 15" 2" 24" Diameter of Thrust Shaft under Collars 15" as per rule 13-7"
 Diameter of Tunnel Shaft as fitted 14 1/2"
 No. of Screw Shafts ONE Diameter of same as per rule 15-18" Diameter of Propeller 18-0" Pitch of Propeller 17-3"
 No. of Blades 4 State whether Moveable YES Total Surface 93 1/2" Diameter of Rotor Drum, H.P. 13 1/2" L.P. 3-4 astern 2-9"
 Thickness at Bottom of Groove, H.P. SOLID L.P. 2 DISCS. Astern DISCS. Revs. per Minute at Full Power, Turbine H.P. 3200 L.P. 2290 Propeller 75

PARTICULARS OF BLADING.

H.P. ASTERN
2 ROW IMPULSE WHEEL 2-9 MEAN DIA.

	H. P.			L. P.			L. P. ASTERN.		
	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.
1ST EXPANSION	1 1/2"	1-4"	9	1 1/2"	2-8"	4 ROWS	1 1/2"	2-11 1/2"	2
2ND	1 1/2"	1-4 1/2"	9	2 1/2"	2-9 1/2"	4 ROWS	2" 2"	3-1"	2
3RD	1 1/2"	1-4 1/2"	9	3 1/2"	2-10 1/2"	4 ROWS	3" 2 1/2"	3-2"	1
4TH	1 1/2"	1-4 1/2"	9	4 1/2"	3-8 1/2"	4 ROWS	4" 2 1/2"	3-2"	1
5TH 1ST	1 1/2"	1-8 1/2"	6	5 1/2"	3-9 1/2"	2 ROWS	5" 2 1/2"	3-2"	1
6TH 2ND	1 1/2"	1-10 1/2"	5	6 1/2"	3-11 1/2"	2 ROWS	6" 2 1/2"	3-2"	1
7TH 3RD	1 1/2"	2-0 1/2"	4	7 1/2"	4-0 1/2"	2 ROWS	7" 2 1/2"	3-2"	1
8TH 4TH	1 1/2"	2-4 1/2"	3	8 1/2"	4-2"	1 ROW	8" 2 1/2"	3-2"	1
				9" 10" 11"	4-4"	1 ROW			

No. and size of Feed pumps ONE WEIRS 8" x 10 1/2" x 21" & ONE WEIRS 5" x 7" x 12"

No. and size of Bilge pumps ONE DUPLEX 6" x 7" x 7"

No. and size of Bilge suction in Engine Room 4 @ 3 1/2", 1 @ 3 1/2" INDEPENDANT, & 1 @ 2 1/2" TUNNEL 1 @ 2 1/2"

In Holds, &c. 10, @ 3 1/2"

No. of Bilge Injections ONE sizes 11" Connected to condenser, or to circulating pump OR P.M.P. Is a separate Donkey Suction fitted in Engine Room & size YES 3 1/2"

Are all the bilge suction pipes fitted with roses YES Are the roses in Engine room always accessible YES

Are all connections with the sea direct on the skin of the ship YES Are they Valves or Cocks BOTH

Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates YES Are the Discharge Pipes above or below the deep water line ABOVE

Are they each fitted with a Discharge Valve always accessible on the plating of the vessel YES Are the Blow Off Cocks fitted with a spigot and brass covering plate YES

What pipes are carried through the bunkers FOR BILGE SUCTIONS How are they protected STRONG WOOD CASINGS

Are all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times YES

Are the Bilge Suction Pipes, Cocks, and Valves arranged so as to prevent any communication between the sea and the bilges YES

Is the Screw Shaft Tunnel watertight YES Is it fitted with a watertight door YES worked from UPPER DECK

BOILERS, &c.—(Letter for record S.) Manufacturers of Steel J. SPENCER & SONS.

Total Heating Surface of Boilers 7825 Is Forced Draft fitted YES No. and Description of Boilers 3 CYL. MULT. S.E. (2 WING 1 CENTRE)

Working Pressure 225 LBS. Tested by hydraulic pressure to 450 LBS. Date of test 30/7/20 No. of Certificate 3445

Can each boiler be worked separately YES THE FOLLOWING PARTICULARS ARE FOR TWO WING BOILERS. SEE FURTHER REPORT FOR CENTRE BOILER. No. and Description of Safety Valves to

each boiler TWO SPRING LOADED. Area of fire grate in each boiler 63 1/2" Pressure to which they are adjusted 230 LBS. Are they fitted with easing gear YES

Smallest distance between boilers or uptakes and bunkers or woodwork 4-6" Mean dia. of boilers 15-3" Length 12-6" Material of shell plates STEEL

Thickness 1 1/2" Range of tensile strength 30 TO 34 TONS Are the shell plates welded or flanged NO Descrip. of riveting: cir. seams DOUBLE R. LAP

long. seams T.R.D.B.S. Diameter of rivet holes in long. seams 1 1/2" Pitch of rivets 10 1/2" Lap of plates or width of butt straps 1-9 1/2"

Per centages of strength of longitudinal joint rivets 92 1/2" plates 85-23% Working pressure of shell by rules 225 LBS. Size of manhole in shell 16" x 12"

Size of compensating ring 9 1/2" x 13 1/2" No. and Description of Furnaces in each Boiler 3 DEIGHTONS Material STEEL Outside diameter 4-1"

Length of plain part top Thickness of plates crown 4 1/2" Description of longitudinal joint WELDED No. of strengthening rings

bottom Working pressure of furnace by the rules 231 LBS. Combustion chamber plates: Material STEEL Thickness: Sides 3/4" Back 3/4" Top 3/4" Bottom 1 1/2"

Pitch of stays to ditto: Sides 9 1/2" x 8 1/2" Back 9 1/2" x 8 1/2" Top 9" x 8 1/2" If stays are fitted with nuts or riveted heads BOTH Working pressure by rules 230 LBS.

Material of stays STEEL Diameter at smallest part 2-07" Area supported by each stay 770" Working pressure by rules 242 LBS. End plates in steam space

Material STEEL Thickness 1 1/2" Pitch of stays 20" x 15 1/2" How are stays secured J. NUTS Working pressure by rules 233 LBS. Material of stays STEEL

Diameter at smallest part 7-85" Area supported by each stay 362.5" Working pressure by rules 226 LBS. Material of Front plates at bottom STEEL

Thickness 1 1/2" Material of Lower back plate STEEL Thickness 3/4" Greatest pitch of stays 14 1/2" x 8 1/2" Working pressure of plate by rules 242 LBS.

Diameter of tubes 3" Pitch of tubes 4 1/2" x 4 1/2" Material of tube plates STEEL Thickness: Front 1 1/2" Back 1 1/2" Mean pitch of stays 10 1/2"

Pitch across wide water spaces 13 1/2" Working pressures by rules 237 LBS. Girders to Chamber tops: Material STEEL Depth and

thickness of girder at centre 11" x 1 1/2" Length as per rule 38 1/2" Distance apart 8 1/2" Number and pitch of stays in each 329"

Working pressure by rules 231 LBS. Steam dome: description of joint to shell 1/10 of strength of joint Diameter

Thickness of shell plates Material Description of longitudinal joint Diameter of rivet holes Pitch of rivets

Working pressure of shell by rules Crown plates: Thickness How stayed

005180-005186-0277

SUPERHEATER. Type *N.E. MARINE* Date of Approval of Plan *6/1/21* & GENERAL AP. Tested by Hydraulic Pressure to *450 LBS.*
Date of Test *9/11/20* Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler *YES.*
Diameter of Safety Valve *2"* Pressure to which each is adjusted *240 LBS.* (WASHERS $\frac{5}{16}$ $\frac{1}{2}$) Is Easing Gear fitted *YES.*

IS A DONKEY BOILER FITTED? *NO* If so, is a report now forwarded? *—*

SPARE GEAR. State the articles supplied:— *2 Bearing brasses complete for H.P. M.O. & L.P. turbines. 6 bolts & nuts for H.P. & M.O. with coupling 6 H.P. & L.P. adjusting block brass & pinion. 4 H.P. & L.P. adjusting block brass & pinion. 6 bolts & nuts for turbine bearing. 12 bolts & nuts for turbine main joint. 6 carbon rings for H.P. glands. 3 helical springs for H.P. glands. 3 carbon rings for M.O. glands. 2 helical springs for M.O. glands. Complete set of pin strips in segments for 1 M.O. gland. 2 L.P. glands. 1 diaphragm gland. 10 flexible coupling bolts & nuts. 4 relief valve springs. 2.5 ft of blading. 10 ft of packing station upper. 48 in of blading strip. (approx 70% copper 30% zinc) 100 ft blading. 25 ft blading. 10 ft of packing station upper. 48 in of blading strip. 165 in of impulse blades & standing strips. GEARING & GEAR CASE. 1 set main shaft. 1 set main joint for H.P. & M.O. pinion. 1 set reduction pinion. 8 bolts & nuts for gear case main joint. 1 H.P. & M.O. pinion. 1 set main shaft. 2 C.T. propeller blades. 8 condenser tubes. 20 screws. 2 main & 2 aux check valves. 10 plane rivets. 10 plane rivets. 3 safety valve springs. 1 complete set of valves for all aux pumps. General service. Bilge. Air & feed. 1 impulse shaft & gears for centrifugal. 1 spare lubrication pump complete. 2 spare thrust pins. A quantity of worked bolts & nuts. **FOR EARLE'S***

The **SHIPBUILDING & ENGINEERING CO. LIMITED**

Manufacturer.

Dates of Survey while building { During progress of work in shops - *May 17th 1920* to *Jan 3/1922*
During erection on board vessel - *180*
Total No. of visits *180*

Is the approved plan of main boiler forwarded herewith *YES.*

Dates of Examination of principal parts—Casings *17/11/20 & 27/5/20* Rotors *2/12/20* Blading *15/12/20* Gearing *6/12/20*
Rotor shaft *21/12/20* Thrust shaft *21/12/20* Tunnel shafts *24/2/20* Screw shaft *26/7/20* Propeller *26/7/20*
Stern tube *26/7/20* Steam pipes tested *14/12/20 & 22/12/20* Engine and boiler seatings *26/2/21* Engines holding down bolts *24/2/21*
Completion of pumping arrangements *20/12/21* Boilers fixed *17/3/21* Engines tried under steam *20/12/21*
Main boiler safety valves adjusted *17/3/21 P.S. WING* Thickness of adjusting washers *PORT BOILER $\frac{5}{16}$ $\frac{1}{2}$ CENTRE B. $\frac{5}{16}$ $\frac{1}{2}$ STAR B. $\frac{5}{16}$ $\frac{1}{2}$*
Material and tensile strength of Rotor shaft *STEEL { LP 38 TONS " HP 35.6 TONS "* Identification Mark on Do. *3172 DMR 656 MR.*
Material and tensile strength of Pinion shaft *STEEL 34.2 TONS " 34.2 TONS " 34.8 TONS "* Identification Mark on Do. *3172 DMR.*
Material of Wheel shaft *STEEL* Identification Mark on Do. *148 MR.* Material of Thrust shaft *STEEL* Identification Mark on Do. *3172 DMR.*
Material of Tunnel shafts *STEEL* Identification Marks on Do. *344, 362, 342, 386, 384, 364.* Material of Screw shafts *STEEL* Identification Marks on Do. *3172 DMR.*
Material of Steam Pipes *S.D. STEEL* Test pressure *675 LBS "*

Is an installation fitted for burning oil fuel *YES.*

Is the flash point of the oil to be used over 150°F. *YES.*

Have the requirements of Section 49 of the Rules been complied with *YES.*

Is this machinery a duplicate of a previous case *NO* If so, state name of vessel *—*

General Remarks (State quality of workmanship, opinions as to class, &c.) *The engines & boilers of this vessel have been built under special survey & the materials & workmanship are good. On completion they were tried under full power trials at sea & found satisfactory. The machinery throughout is now in a good & efficient condition & eligible in my opinion to have the record LMC-1-22 marked in Red in the Society's Register Book. Also fitted for oil fuel F.P. above 150°F. The requirements of section 49 of the Rules have been fully complied with. The vessel is also fitted to burn coal as well as oil & the boilers have been tried under both systems.*

The amount of Entry Fee ... £ *6-0-0*
Special ... £ *105-7-0*
Donkey Boiler Fee ... £ *—*
Travelling Expenses (if any) £ *—*

When applied for, *2/12/1921*

When received, *24/12/1921*

Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute *TUE 10 JAN 1922*

Assigned *+ Linc. 1.22*

Fitted for oil fuel 1.22

Fl above 150°F



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