

REPORT ON STEAM TURBINE MACHINERY.

No. 51945

Received at London Office [9 DEC. 1931

Date of writing Report 10 When handed in at Local Office 2. 12. 1931 Port of Glasgow
 No. in Survey held at Glasgow Date, First Survey 12 Oct 1930 Last Survey 26 Nov 1931
 Reg. Book. 39703 on the Steel Twin Screw Steamer "Carthage" (Number of Visits 108)
 Tons { Gross 14304
 Net 7810
 Built at Glasgow By whom built A. Stephen & Sons Ltd. Yard No. 535 When built 1931
 Engines made at do. By whom made do. Engine No. 535 When made 1931
 Boilers made at do. By whom made A. Stephen & Sons Ltd. Boiler No. 535 When made 1931
 Shaft Horse Power at Full Power _____ Owners T. & P. Steam Navigation Co. Port belonging to London
 Nom. Horse Power as per Rule 2997 Is Refrigerating Machinery fitted for cargo purposes N/A Is Electric Light fitted N/A
 Trade for which Vessel is intended China

STEAM TURBINE ENGINES, &c.—Description of Engines Parsons Turbines

No. of Turbines 6 Direct coupled, single reduction geared } to two propelling shafts. No. of primary pinions to each set of reduction gearing 3
4 double reduction geared }
 direct coupled to { Alternating Current Generator — phase — periods per second } rated — Kilowatts — Volts at — revolutions per minute;
 Direct Current Generator }
 for supplying power for driving — Propelling Motors, Type —
 rated — Kilowatts — Volts at — revolutions per minute. Direct coupled, single or double reduction geared to — propelling shafts.

TURBINE BLADING.	H. P.			I. 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.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.
1ST EXPANSION	3"	18 1/2"	15	1 7/8"	23 3/8"	4	1 1/2"	3-1 1/2"	3	1-3 Bucket Impulse wheel 2-10 3/4 P.C.D.		
2ND "	3 1/4"	19"	13	1 7/8"	24 3/8"	7	2 1/2"	3-8 3/4"	3			
3RD "	1"	19 1/2"	13	1 3/8"	24 3/8"	6	3 1/4"	3-10 1/2"	2			
4TH "	1 1/2"	20 1/2"	13	2 3/8"	25 3/4"	6	4"	4-0"	2	LP Astern		
5TH "				3 3/8"	24 1/2"	6	5 1/4"	4-2 1/2"	2	1-2 Bucket Impulse wheel 4-1 1/2 P.C.D.		
6TH "							1 3/4"	4-6 1/4"	2			
7TH "							4 3/8"	4-7 3/4"	1	2 3/8"	3-1 3/4"	2
8TH "							9 1/4"	4-10 1/2"	1	3 3/8"	3-3 3/4"	2
9TH "							9 1/4"	4-10 1/2"	1	4 3/4"	3-6 3/4"	2
10TH "							9 1/4"	4-10 1/2"	1	4 3/4"	3-6 1/2"	2
11TH "							9 1/4"	4-10 1/2"	1	4 3/4"	3-6 1/2"	2
12TH "												

Shaft Horse Power at each turbine { H.P. 2260 ^{MAX.} 2285 ^{NORMAL} } I.P. 2100 ^{MAX.} 2100 ^{NORMAL} } 1st reduction wheel 129 ^{MAX.}
 { L.P. 2420 ^{MAX.} 2615 ^{NORMAL} } I.P. 2480 ^{MAX.} 2400 ^{NORMAL} } main shaft 125 ^{NORMAL}
 Rotor Shaft diameter at journals { H.P. 5 1/2" } Pitch Circle { 1st pinion — 1st reduction wheel — Width of Face { 1st reduction wheel —
 { I.P. 6 1/2" } Diameter { 2nd pinion — main wheel — } main wheel —
 { L.P. 8 1/2" }

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion — 1st reduction wheel —
 { 2nd pinion — main wheel —

Flexible Pinion Shafts, diameter { 1st — Pinion Shafts, diameter at bearings External 1st { 2nd { diameter at bottom of pinion teeth { 1st —
 { 2nd — Internal 1st { 2nd { diameter at bottom of pinion teeth { 2nd —

Wheel Shafts, diameter at bearings { 1st — diameter at wheel shroud, { 1st — Generator Shaft, diameter at bearings —
 { main — } main — Propelling Motor Shaft, diameter at bearings —

Intermediate Shafts, diameter as per rule 15.3" Thrust Shaft, diameter at collars as per rule 16.06 Tube Shaft, diameter as per rule —
 as fitted 16.0" as fitted 17.0" as fitted —

Screw Shaft, diameter as per rule 16.75" vs the { screw } shaft fitted with a continuous liner { N/A } Bronze Liners, thickness in way of bushes as per rule 1 1/8"
 as fitted 17.75" as fitted 1"

Thickness between bushes as per rule 3/4" Is the after end of the liner made watertight in the propeller boss N/A If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner — If the liner does not fit tightly at the part between the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive Yes If two liners are fitted, is the shaft lapped or protected between the liners — Is an approved Oil Gland or other appliance fitted at the after end of the tube shaft No. Length of Bearing in Stern Bush next to and supporting propeller 6-5 3/4"

Propeller, diameter 17-6" Pitch 16.6" No. of Blades 3 State whether Moveable N/A Total Developed Surface 88 square feet.
 If Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine N/A Can the H.P. or L.P. Turbine exhaust direct to the Condenser N/A

Condenser: N/A No. of Turbines fitted with astern wheels 4 Feed Pumps { No. and size 2 Turbine 40 T/H: 1 duplex 18 1/2 x 24: 2 duplex 18 1/2 x 24 }
 How driven Steam

Pumps connected to the Main Bilge Line { No. and size 3 @ 150 T/H: 1 @ 200 T/H: 1 @ 200 T/H }
 How driven elec. motor

Ballast Pumps, No. and size 1 @ 200 T/H Lubricating Oil Pumps, including Spare Pump, No. and size 2 @ 9x10x24"
 Are two independent means arranged for circulating water through the Oil Cooler N/A Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge Pumps, No. and size:—In Engine and Boiler Room 4 @ 3 1/2": 2 @ 3": 3 @ 4": 1 @ 1 1/2": 1 @ 1 1/2": 2 @ 1 1/2"

In Holds, &c. No. 1-1 @ 3": No. 2-2 @ 2 1/2" x 1 @ 3": No. 3-2 @ 2 1/2" x 1 @ 3": No. 4-2 @ 3": No. 5-1 @ 3": No. 6-2 @ 3"
 Main Water Circulating Pump Direct Bilge Suctions, No. and size 2 @ 16" Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size 4 @ 6"

Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes N/A
 Are the Bilge Suctions in the Machinery Space led from easily accessible mud-boxes, placed above the level of the working floor, with straight tail pipes to the bilges N/A
 Are all Sea Connections fitted direct on the skin of the ship Yes Are they fitted with Valves or Cocks B.T.H.

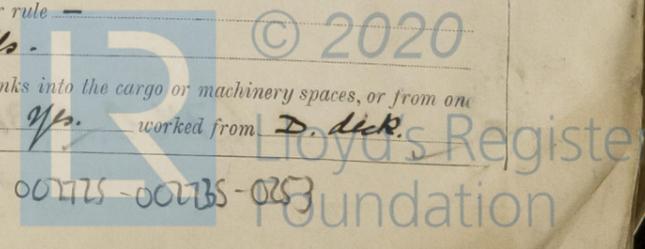
Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates N/A Are the Overboard Discharges above or below the deep water line Below
 Are they each fitted with a Discharge Valve always accessible on the plating of the vessel N/A Are the Blow Off Cocks fitted with a spigot and brass covering plate N/A

What pipes pass through the bunkers None How are they protected —
 What pipes pass through the deep tanks None Have they been tested as per rule —

Are all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times N/A
 Is the arrangement of valves and their connections such as to prevent the possibility of water passing from the sea or from water tanks into the cargo or machinery spaces, or from one compartment to another N/A Is the Shaft Tunnel watertight See hull Report Is it fitted with a watertight door N/A worked from D. Deck

Now

Im. 11. 2. 1. T.



BOILERS, &c. — (Letter for record S) Total Heating Surface of Boilers 25200 sq
 Is Forced Draft fitted Y/No No. and Description of Boilers 4 Water Tube (Jammys) Working Pressure 425 lbs
 Is a Report on Main Boilers now forwarded? Y/No
 Is 2 Donkey an Auxiliary Boiler fitted? Y/No If so, is a report now forwarded? Y/No
 Plans. Are approved plans forwarded herewith for Shafting 6.8.30 Main Boilers Y/No Auxiliary Boilers — Donkey Boilers Y/No
 (If not state date of approval)
 Superheaters Y/No General Pumping Arrangements Y/No Oil Fuel Burning Arrangements Y/No
 Spare Gear. State the articles supplied:—

Int. Shafting

47885	47909
47886	47911
47887	47912
47888	47913
47889	47915
47891	47926
47893	47907

In accordance with Rules and additional

FOR ALEXANDER STEPHEN & SONS, LIMITED.

The foregoing is a correct description,

Alex MacLellan Director Manufacturer.

Dates of Survey while building
 During progress of work in shops -- 1930 Oct: 1. 8. 15. 22 Nov: 10. 21. 25 Dec: 4. 15. 22. 24. 29. 30 (1931) Jan: 6. 14. 19. 23 Feb: 2. 10. 17. 20. 23. 24
 During erection on board vessel --- Mar: 2. 4. 6. 10. 12. 18. 17. 18. 19. 20. 22. 25. 30. 31 Apr: 2. 3. 7. 8. 9. 10. 13. 14. 15. 17. 20. 21. 22. 24. 27. 28. 29. 30
 Total No. of visits 148 July: 1. 2. 3. 6. 7. 8. 9. 10. 13. 14. 18 Aug: 4. 5. 6. 7. 10. 11. 14. 17. 19. 20. 21. 24. 25. 27. 28. 29. 30. 31 Sept: 1. 2. 9. 10. 15. 17. 21. 29. 30
 Oct: 1. 2. 5. 6. 8. 13. 15. 19. 20. 22. 26. 27. 28. 29. 30 Nov: 8. 11. 16

Dates of Examination of principal parts—Casings 8.4.31 Rotors 17.8.31 Blading 1.9.31 Gearing

Wheel shaft Thrust shaft 4.6.31 Intermediate shafts 23.6.31 Tube shaft — Screw shaft 30.6.31

Propeller 7.7.31 Stern tube 11.6.31 Engine and boiler seatings 4.8.31 Engine holding down bolts 22.10.31

Completion of pumping arrangements 26.11.31 Boilers fixed 15.10.31 Engines tried under steam 26.11.31

Main boiler safety valves adjusted 3.11.31 Thickness of adjusting washers P.F.F. 1/2" 1/2" S.F.F. 1/2" 1/2" P.A.F. 1/2" 1/2" S.A.F. 1/2" 1/2" - T 1/2"

Rotor shaft, Material and tensile strength S.M. Sugot Steel 34.5/36.5 tons Identification Mark 3905: 1105

Flexible Pinion Shaft, Material and tensile strength — Identification Mark —

Pinion shaft, Material and tensile strength — Identification Mark —

1st Reduction Wheel Shaft, Material and tensile strength — Identification Mark —

Wheel shaft, Material — Identification Mark — Thrust shaft, Material S.M. Sugot Steel Identification Mark 48291

Intermediate shafts, Material S.M. Sugot Steel Identification Marks See above Tube shaft, Material — Identification Marks —

Screw shaft, Material do. Identification Marks 47916 }
47918 }
47900 } Steam Pipes, Material Steel Test pressure 12 1/2 lbs

Date of test 26/10/31 Is an installation fitted for burning oil fuel Y/No

Is the flash point of the oil to be used over 150°F. Y/No Have the requirements of the Rules for carrying and burning oil fuel been complied with Y/No

Is this machinery a duplicate of a previous case Y/No If so, state name of vessel S.S. "Corfu"

General Remarks (State quality of workmanship, opinions as to class, &c.)
 The Machinery of this vessel has been built under special Survey and in accordance with the Rules. The materials and workmanship are good. It has been efficiently secured in position on board and afterwards tried under full working conditions and found in order.

The Machinery of this vessel is eligible, in my opinion to be classed in the Register Book with notation of +L.M.C. 11.31. Fitted for oil fuel 11.31.
 F.P. above 150°F.

The amount of Entry Fee ... £ 6 : -
 Special 91878019.0 104 : 19
 2 Donkey Boilers Fee ... £ 31 : 4
 Travelling Expenses (if any) £ : :
 When applied for, 3/12/31
 When received, 8/12/31

John Munro
 Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute GLASGOW 8 - DEC 1931

Assigned + L.M.C. 11.31.

Fitted for oil fuel 11.31
 F.P. above 150°F.
 CERTIFICATE WRITTEN.



Copy 19/12/31

2/12/31

GLASGOW

The Surveyors are requested not to write on or below the space for Committee's Minute.