

## REPORT ON STEAM TURBINE MACHINERY.

Received at London Office FRI. DEC. 8 1922

Date of writing Report 7<sup>th</sup> Dec 1922 When handed in at Local Office 7<sup>th</sup> Dec 1922 Port of Manchester  
 No. in Survey held at Manchester Date, First Survey 6<sup>th</sup> January 1922 Last Survey 5<sup>th</sup> Feb 1923  
 Reg. Book. on the Turbines No. 1963 and Double Reduction Gears No. 2001 for S.S. British Lady. No. 861 (Number of Visits 88)  
 Tons { Gross 6098  
 Net 3520  
 Built at Sunderland By whom built J.S. Thompson & Sons Ltd. Yard No. 548 When built 1923  
 Engines made at Manchester By whom made Metropolitan Vickers Elec. Ltd. Engine No. When made 1922  
 Boilers made at Sunderland By whom made J. Dickinson & Sons Ltd. Boiler No. 861 When made 1923  
 Shaft Horse Power at Full Power 3200 Owners British Tankers Co. Ltd. Port belonging to London  
 Nom. Horse Power as per Rule 644 Is Refrigerating Machinery fitted for cargo purposes no Is Electric Light fitted yes

STEAM TURBINE ENGINES, &c.—Description of Engines Rating Impulse H.P. and L.P. No. of Turbines Ahead Two  
 Astern Two  
 Direct coupled, single or double reduction geared to one propelling shafts. No. of primary pinions to each set of reduction gearing 2, direct coupled to phase  
 periods per second, Alternating Current Generator rated Kilowatts Volts at revolutions per minute; for supplying power for driving  
 Propelling Motors. Propelling Motors, Type  
 rated Kilowatts Volts at revolutions per minute. Direct coupled, single or double reduction geared to propelling shafts.

## PARTICULARS OF TURBINE BLADING.

	H.P.			L.P.			H.P. ASTERN.			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	1 1/2"	3' 2 1/2"	2	1 5/16"	3' 3 3/8"	1	1"	3' 2 3/4"	2	2 1/2"	3' 0 1/2"	1
2ND	1 1/8"	3' 2 1/8"	1	1 3/16"	3' 3 1/8"	1	2 1/8"	3' 3 3/8"	1	6 3/16"	3' 4 3/16"	1
3RD	7/8"	3' 2 3/8"	1	2 1/8"	3' 4 1/8"	1						
4TH	7/8"	3' 2 3/8"	1	4 3/16"	3' 6 3/16"	1						
5TH	1"	3' 3"	1	6 3/8"	3' 8 3/8"	1						
6TH				8 1/4"	3' 10 1/4"	1						
7TH				10 3/16"	4' 0 3/16"	1						
8TH												

Shaft Horse Power at each turbine 1600 Revolutions per minute, at full power, of each Turbine Shaft 3125 1st reduction wheel 492  
 main shaft 739 Pitch Circle Diameter, 1st pinion 6' 7 9/41" 2nd pinion 11' 6 4 9/1" 1st reduction wheel 43' 100/12" main wheel 78' 26 7/77"  
 Width of Face, 1st reduction wheel 20" main wheel 40" Distance between centres of pinion and wheel faces and the centre of the adjacent bearings,  
 1st pinion 0" and 1' 7 3/4" 2nd pinion 0" and 2' 9 1/4" 1st reduction wheel 1' 9" main wheel 2' 11 1/2" Flexible Pinion Shafts, diameter 1st 3 1/8" 2nd 5 3/4"  
 Pinion Shafts, diameter at bearings External 1st 6" 2nd 10" diameter at bottom of teeth of pinion 1st 6' 2 1/751 2nd 10' 7 3/36"  
 Internal 1st 3 7/16" 2nd 6"  
 Wheel Shafts, diameter at bearings, 1st 10" main 19" diameter at wheel shroud, 1st main  
 Generator Shafts, diameter at bearings Propelling Motor Shafts, diameter at bearings (Turbines) 6 1/2".  
 Main Shafting, diameter of Tunnel Shafting as per rule 14' 1" as fitted 19" diameter of Thrust Shafting as per rule 14' 8" as fitted 19"  
 diameter of Screw Shaft as per rule 16' 5" as fitted 17 1/2" Is the screw shaft fitted with a continuous liner the whole length of the stern tube no Is the after end of the liner  
 made watertight in the propeller boss If the liner is in more than one length are the joints burned 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 If two liners are fitted, is the  
 shaft lapped or protected between the liners no liners Is an approved appliance fitted at the after end of the shaft to permit of it being efficiently  
 lubricated yes Length of Stern Bush 5' 9" Diameter of Propeller 18' 3"  
 Pitch of Propeller 17' 9" No. of Blades 4 State whether Moveable no Total Surface 1100 sq. feet. If Single Screw, are  
 arrangements made so that steam can be led direct to the L.P. Turbine, and either the H.P. or I.P. Turbine can exhaust direct to the Condenser yes  
 No. of Turbines fitted with astern wheels 2 Total number of power driven Main and Auxiliary Pumps 14  
 No. and size of Feed Pumps 1 Duplex 2 1/2" Electric centrifugal How driven steam No. and size of Pumps connected to the Main Bilge Line 1 @ 6" x 6" Duplex  
 How driven Electric No. and size of Ballast Pumps 1 @ 10 1/8" x 10" (steam) No. and size of Lubricating Oil Pumps, including  
 Spare Pump 1 Roto Plunge pump 100 gallon 1 Weir pump 100 gallon Are two independent means arranged for circulating water through the Oil Cooler yes No. and size of suction  
 connected to both Main Bilge Pumps and Auxiliary Bilge Pumps;—In Engine and Boiler Room 3 @ 3 1/2" and in Holds, &c. 2 @ 2" (for hold)  
 No. and size of Main Water Circulating Pump Bilge Suctions 1 @ 11" No. and size of Donkey Pump Direct Suctions  
 to the Engine Room Bilges 1 @ 3 1/2" Are all the bilge suction pipes in holds and tunnel well fitted with strum-boxes hats with perforated tops  
 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 bilge  
 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 both  
 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 none How are they protected  
 Are all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times yes  
 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 yes Is the Screw Shaft Tunnel watertight none Is it fitted with a watertight door worked from Mch. 2022

BOILERS, &c.—(Letter for record 5) Total Heating Surface of Boilers 8265 sq. ft.  
 Is Forced Draft fitted yes No. and Description of Boilers Three single ended marine Working Pressure 200 lbs



If so, is a report now forwarded? yes ✓

Plans. Are approved plans forwarded herewith for Shafting British Lord Main Boilers yes Auxiliary Boilers ✓ Donkey Boilers yes  
(If not state date of approval)

Spare Gear. State the articles supplied:— Turbines: 2 bearing bushes for rotor, 20 bolts (or studs) & nuts for casing joints, 1 set of coupling bolts, 1 set of Michell Thrust pads, 2 bolts & nuts (or studs) for each size fitted to rotor bearings & for each bearing, 1 gland box complete. Diaphragm gland rings. Gears 1 primary pinion and flexible shaft, 2 bearing bushes main shaft, 3 d: for each 1st & 2nd pinions 2 s: for 1st Red. Shaft, 2 bolts (or studs) & nuts for each size & for each bearing fitted, 1 set of coupling bolts 1/2" gear case joint bolts (or studs) & nuts. General. 3 thermometers, 1 spring for each size fitted, 1 nest of tubes for oil cooler, 1 set of group valves & one piston & pump rod with bucket for "Weir" oil pump, Roto plunger pump.

*The foregoing is a correct description*

METROPOLITAN-VICKERS ELECTRICAL CO. LTD.

Simpson Eng. Co.  
Manufacturer

Dates of Survey while building	<div> <div> During progress of work in shops -- </div> <div> During erection on board vessel -- </div> <div> Total No. of visits </div> </div>	<div> <div> 1922 6/1, 10/2, 22/2, 27/2, 8/3, 13/3, 15/6, 6/7, 10/7, 11/7, 18/7, 27/8, 11/8, 21/8, 8/9, 12/9, 25/9, 30/9, 7/10, 12/10, 25/10, 30/10 </div> <div> fld. 1921, July, 14, 19, Sep. 15, Oct. 25, 31, Nov. 14, 23, Dec. 23, 1922 Jan. 21, 30, Feb. 6, 13, Apr. 5, 19, May 9, June 7, July, 17, 21, 26, 27, Aug. 2, 15, 16, 23, 28, Sep. 1, 6, 9, 11, 29, 31, Oct. 5, 10, 13, 16, 18, 19, 27, Nov. 16, 17, 20, 24, 26, Dec. 1, 11, 14, 18, 19, 30, 31, 1923 Jan. 5, 15, 19, 22, 23, 25, 26, Feb. 5 </div> <div> 88 </div> </div>
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Dates of Examination of principal parts—Casings 3-8-22, 1-9-22 Rotors 21-8-22 Blading 2-10-22 Gearing 11-7-22  
Wheel shaft 21-8-22 Thrust shaft 24-11-22 Tunnel shafts 5-4-22 Screw shaft 10-10-22 Propeller 30-9-22  
Stern tube 5-10-22 Engine and boiler seatings 19-10-22 Engines holding down bolts 19-1-23

Completion of pumping arrangements 5-2-23 Boilers fired 20-12-22 Engines tried under steam 26-1-23

Main boiler safety valves adjusted 26-1-23 Thickness of adjusting washers: Ford bl.  $P \frac{9}{16}$ ,  $S \frac{17}{32}$ ; Port bl.  $P \frac{13}{32}$ ,  $S \frac{1}{2}$ ; Standard bl. both  $\frac{9}{16}$ .

Material and tensile strength of Rotor shaft Mild Steel U-723 36.9 U-727 41.7 Identification Mark on Do. A or S

Material and tensile strength of Flexible Pinion Shaft *Low Speed 14795-51.0; 14827-51.8 Nickel Steel* Identification Mark on Do. *A*

Material and tensile strength of Pinion shaft *low speed, 13721 = 47.8; 13722 = 47.0 Carbon Steel* Identification Mark on Do. *A*

Material and tensile strength of 1st Reduction Wheel Shaft *Mild steel, 13574, 36.0 13575 - 36.0* Identification Mark on Do. *A*

Material of Wheel shaft Mild Steel Identification Mark on Do. A Material of Thrust shaft 1. Steel Identification Mark on Do. 6020

Material of Tunnel shafts Y. Steel ✓ Identification Marks on Do. 6019 Material of Screw shafts Y. Steel ✓ Identification Marks on Do. 6018 & 6019

Material of Steam Pipes Lapwelded Steel ✓ Test pressure 600 lbs ✓ Date of test (completion) 22-1-23

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 the Rules for carrying and burning oil fuel been complied with yes

1155 If so state name of 1st Brit. L. No 862

Is this machinery a duplicate of a previous case yes If so, state name of vessel N.Y. Fish Hawk 11-860.  
SLA RPT-28450

General Remarks (State quality of workmanship, opinions as to class, &c. These turbines and double reduction gear, also

*...the quality of administration; spirit of its laws, etc.*

been built under special survey and the materials used in accordance with the Rules of this Society and the app

plants. The materials and workmanship so far as can be seen are sound and good. The steam trial and subsequent

examination found satisfactory. This machinery is eligible in our opinion to be classed with + L.M.C 2, 22

Mark on Coupling of main gear wheel shaft. Lloyds

No. 15772  
2-11-22

FUNDRIAN 1000

SUNDERLAND 5-2-23. The machinery has been satisfactorily fitted in the vessel tried and found

good.

m. l. S. C. Davis

the amount of Entry Fee  $\frac{30}{100} \times 4 = 1.20$  When applied for.

Special *Std ... 77: 189-11-1921 9.2.23 A. Campbell Alfred H. Puc.*

Donkey Boiler Fee ... (£ 5: 18: 12) When received. 13/2/23 46. 49. 8/-). Engineer Surveyor to Lloyd's Register of Shipping.

Travelling Expenses (if any) £ : 10/- : 14/12/23 : 246/£30.4/-

THE 155

Committee's Minute

Assigned *1. Feb. 1993*

Assigned 2 NOV 2 23  
SITE 1  
Lloyd's Register

7. D. W. G.

asked for oil fuel 2,23  
JP 2,23 1954.4

1809