

## REPORT ON STEAM TURBINE MACHINERY.

No. 80753

DEC 1926

Date of writing Report 3-12-1926 When handed in at Local Office 6-12-1926 Port of **NEWCASTLE-ON-TYNE**  
 No. in Survey held at **Jarrow** Date, First Survey 18<sup>th</sup> Sept 1925 Last Survey 26<sup>th</sup> Nov 1926  
 Reg. Book. 87909 on the **S.S. "AFRICSTAR"** (Number of Visits 95)  
 Built at **Hebburn** By whom built **Palmer's S. & J. Co. Ltd** Yard No. **958** When built **1926**  
 Engines made at **Jarrow** By whom made " " Engine No. **958** When made **1926**  
 Boilers made at **Jarrow** By whom made " " Boiler No. **958** When made **1926**  
 Shaft Horse Power at Full Power **6600** Owners **Blue Star Line (1920) Ltd.** Port belonging to **London**  
 Nom. Horse Power as per Rule **1581** Is Refrigerating Machinery fitted for cargo purposes **Yes** Is Electric Light fitted **Yes**

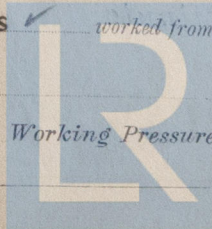
**STEAM TURBINE ENGINES, &c.**—Description of Engines **TURBINES, SINGLE REDUCTION**, No. of Turbines Ahead **4**  
 direct coupled, single or double reduction geared to **Two** propelling shafts. No. of primary pinions to each set of reduction gearing —, direct coupled to — phase  
 — periods per second, Alternating Current Generator rated — Kilowatts — Volts at — revolutions per minute; for supplying power for driving  
 Propelling Motors. Propelling Motors, Type —  
 — Kilowatts — Volts at — revolutions per minute. Direct coupled, single or double reduction geared to — propelling shafts.

## PARTICULARS OF 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.
EXPANSION IMPULSE	$\frac{3}{4}$ , 1", 1 $\frac{1}{4}$	34 $\frac{3}{8}$ , 35 $\frac{3}{8}$	—									
1st	1 $\frac{1}{8}$	21 $\frac{1}{8}$	—				1 $\frac{1}{8}$	34 $\frac{3}{8}$	3	1 $\frac{1}{8}$ , 2 $\frac{1}{8}$ , 3 $\frac{1}{8}$ , 4 $\frac{1}{8}$ , 5 $\frac{1}{8}$ , 6 $\frac{1}{8}$	43 $\frac{1}{2}$ , 44 $\frac{1}{2}$	20, 14, 3, Rotor
2nd	1 $\frac{7}{8}$	21 $\frac{7}{8}$	—				2 $\frac{1}{8}$	35 $\frac{3}{8}$	3	1"	—	2
3rd	1 $\frac{3}{4}$	22 $\frac{1}{2}$	—				2 $\frac{3}{8}$	36 $\frac{1}{2}$	2	1 $\frac{3}{4}$	—	2
4th	2 $\frac{1}{4}$	23 $\frac{1}{2}$	—				2 $\frac{1}{2}$	44"	2	2 $\frac{1}{2}$	—	1
5th	3"	25"	—				3"	45"	1	3"	—	1
6th	—	—	—				3 $\frac{5}{8}$	46 $\frac{1}{2}$	1	3"	—	1
7th	—	—	—				4 $\frac{3}{8}$	47 $\frac{3}{8}$	1	—	—	—
8th	—	—	—				5 $\frac{1}{8}$	49 $\frac{1}{2}$	1	—	—	—
9th	—	—	—				6 $\frac{1}{8}$	51 $\frac{1}{2}$	1	—	—	—
10th	—	—	—				6 $\frac{3}{8}$	51 $\frac{1}{2}$	1	—	—	—

Shaft Horse Power at each turbine **1650** ✓ Revolutions per minute, at full power, of each Turbine Shaft **2420** ✓  
 Pitch Circle Diameter, 1st pinion **7.304** 2nd pinion — 1st reduction wheel — main wheel **140.039**  
 Width of Face, 1st reduction wheel — main wheel **25** Distance between centres of pinion and wheel faces and the centre of the adjacent bearings,  
 1st pinion **3.11 $\frac{5}{8}$**  2nd pinion — 1st reduction wheel — main wheel **2.6 $\frac{3}{4}$**  Flexible Pinion Shafts, diameter 1st — 2nd —  
 Pinion Shafts, diameter at bearings External 1st **6"** ✓ 2nd — diameter at bottom of teeth of pinion 1st **6.582** ✓ 2nd —  
 Internal 1st — 2nd —  
 Wheel Shafts, diameter at bearings, 1st — main **14 $\frac{1}{2}$**  ✓ diameter at wheel shroud, 1st — main **15 to 17 $\frac{1}{4}$**   
 Propeller Shafts, diameter at bearings —  
 Propelling Motor Shafts, diameter at bearings —  
 Tunnel Shafting, diameter of Tunnel Shafting as per rule **11.86** " as fitted **11 $\frac{7}{8}$**  " ✓ diameter of Thrust Shafting as per rule **12.465** " as fitted **12.5** " ✓  
 Diameter of Screw Shaft as per rule **13.16** " as fitted **13.76** " ✓ Is the screw shaft fitted with a continuous liner the whole length of the stern tube **YES** ✓ Is the after end of the liner  
 watertight in the propeller boss **YES** ✓ If the liner is in more than one length are the joints burned — If the liner does not fit tightly at the  
 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  
 lapped or protected between the liners — Is an approved appliance fitted at the after end of the shaft to permit of it being efficiently  
 coated **YES** ✓ Length of Stern Bush **4.9** " ✓ Diameter of Propeller **15.0** " ✓  
 of Propeller **13.6** " No. of Blades **4** ✓ State whether Moveable **YES** ✓ Total Surface **76** " ✓ square 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 L.P. Turbine can exhaust direct to the Condenser —  
 of Turbines fitted with astern wheels **2** ✓ Total number of power driven Main and Auxiliary Pumps **19** ✓  
 and size of Feed Pumps **2 @ 17" x 12" x 24"** ✓ How driven **STEAM** ✓ No. and size of Pumps connected to the Main Bilge Line **2 SIMPLEX - 7" x 8" x 18"** ✓  
 driven **STEAM** ✓ No. and size of Ballast Pumps **1 SIMPLEX - 10 $\frac{1}{2}$ " x 12" x 24"** ✓ No. and size of Lubricating Oil Pumps, including  
 Pump **2 SIMPLEX - 8" x 9" x 18"** ✓ 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 **ER 2 @ 3", BR 2 @ 3"** ✓ and in Holds, &c. **2 @ 3" No 1, 2 - 2 @ 3 $\frac{1}{2}$ " No 3.** ✓  
 and size of Main Water Circulating Pump Bilge Suctions **2 @ 12"** ✓ No. and size of Donkey Pump Direct Suctions  
 Engine Room Bilges **1 @ 5 $\frac{1}{2}$ "** ✓ Are all the bilge suction pipes in holds and tunnel well fitted with strum-boxes **YES** ✓  
 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 **YES** ✓  
 all connections with the sea direct on the skin of the ship **YES** ✓ Are they Valves or Cocks **BOTH** ✓  
 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 **BELOW** ✓  
 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** ✓  
 pipes are carried through the bunkers **NONE** ✓ How are they protected —  
 Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times **YES** ✓  
 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  
 to another **YES** ✓ Is the Screw Shaft Tunnel watertight **YES** ✓ Is it fitted with a watertight door **YES** ✓ worked from **UPPER DECK** ✓  
**ERS, &c.**—(Letter for record **Y** ✓) Total Heating Surface of Boilers **22869** <sup>sq</sup>  
 forced Draft fitted **YES** ✓ No. and Description of Boilers **2D. & 2SB.** ✓ Working Pressure **200 LBS.** ✓

W325-0099

Lloyd's Register  
Foundation



Is a Report on Main Boilers now forwarded? YES

Is a Donkey Boiler fitted? No

If so, is a report now forwarded?

Plans. Are approved plans forwarded herewith for Shafting  
(If not state date of approval)

Main Boilers

Auxiliary Boilers

Donkey Boilers

Spare Gear. State the articles supplied:— 2 bolts and nuts for each size rotor bearing— 2 Studs for main gear wheel bearing— 2 Studs and nuts for pinion bearings— Set of coupling bolts— 1 Right and left hand propeller blade— 7 Nuts and studs for blades— 2 Thrust shoes— Bolts and nuts for gear and turbine casing joints— 2 thermometers for oil system— 1 Set of bushes for gear shafts, rotor and spindles— Half set of packing for rotors— 12 Adjusting block pads— 1 Set of liners for adjusting block— 6 Safety liners for glands— 1 Set of feed and bilge pump valves— 1 and rod for lubricating pump— 1 Set of valves for lubricating oil pump— Escape valve for each size fitted— 1 Spare pinion— 2 pinion oil baskets— 40 tubes and ferrules for main condensers— 12 tubes for oil cooler— 1 Feed pump piston and rings— Piston complete for lubricating pump— pump rod and 52 valves— 1 Impeller spindle and key— Crank shaft piston rod and shoe, piston rings, connecting rod brasses and coupling circulating pump— 4 Check valves, seats and springs— Fire bars, assorted sheet and bar iron— Assorted bolts and nuts, etc. etc.

The foregoing is a correct description.

Palmer Shipbuilding & Iron Co., Ltd.  
W. Brown  
Manufacturer.  
Manager, Engine Works

Dates of Survey while building  
During progress of work in shops -- 1925 Sept. 18. 21. Oct. 1. 2. 8. 12. 21. 22. 23. 29. Nov. 3. 4. 9. 17. 19. 26. 30. Dec. 4. 11. 16. 23. 24. 1926 Jan. 4. 6. 11. 20. 22. 28. Feb. 1. 5. 8. 10. 11. 16. 24. 27.  
During erection on board vessel -- 5. 10. 17. 26. 29. 31. Oct. 12. 15. 16. 20. 21. 26. 27. 28. 30. Nov. 3. 7. 10. 14. 24. 26. 27. 28. Dec. 5. 29. 30. 1926 Jan. 1. 5. 6. 7. 9. 12. 13. 14. 15. 19. 20. 21. 23. 28. 29.  
Total No. of visits 95.

Dates of Examination of principal parts— Casings 16/12/25, 25/1/26, 1/2/26, Rotors 26-5-26 Blading 27/4/26, 28/4/26 Gearing 27-5-26

Wheel shaft 15-4-26 Thrust shaft 12-4-26 Tunnel shafts 12-4-26 Screw shaft 12-4-26 Propeller 12-4-26, 7/5/26

Stern tube 12-4-26 Engine and boiler seatings 5-7-26 Engines holding down bolts 5/7/26

Completion of pumping arrangements 28-7-26 Boilers fixed 10-9-26 Engines tried under steam 28/7/26

Main boiler safety valves adjusted 29/7/26 Thickness of adjusting washers. P.B. = SV  $\frac{3}{8}$  P.V.  $\frac{7}{16}$  S.B. = SV  $\frac{5}{16}$  P.V.  $\frac{3}{8}$  CEN. F.B. = SV  $\frac{5}{8}$  P.V.  $\frac{3}{8}$  CEN. A.B. = SV  $\frac{3}{8}$  P.V.  $\frac{3}{8}$

Material and tensile strength of Rotor shaft STEEL Identification Mark on Do. 1656, 6697/98, H.K. 17/12/25

Material and tensile strength of Flexible Pinion Shaft — Identification Mark on Do. —

Material and tensile strength of Pinion shaft STEEL Identification Mark on Do. 2414 X. 25

Material and tensile strength of 1st Reduction Wheel Shaft — Identification Mark on Do. —

Material of Wheel shaft STEEL Identification Mark on Do. 1647 E.E. 23. X. 25 Material of Thrust shaft STEEL Identification Mark on Do. 351. H.J. 28/9/25

Material of Tunnel shafts STEEL Identification Marks on Do. 352/3, H.J. 29/9/25, 353/4, H.J. 29/9/25, 354/5, H.J. 29/9/25, 355/6, H.J. 29/9/25, 356/7, H.J. 29/9/25, 357/8, H.J. 29/9/25, 358/9, H.J. 29/9/25, 359/10, H.J. 29/9/25, 360/11, H.J. 29/9/25, 361/12, H.J. 29/9/25, 362/13, H.J. 29/9/25, 363/14, H.J. 29/9/25, 364/15, H.J. 29/9/25, 365/16, H.J. 29/9/25, 366/17, H.J. 29/9/25, 367/18, H.J. 29/9/25, 368/19, H.J. 29/9/25, 369/20, H.J. 29/9/25, 370/21, H.J. 29/9/25, 371/22, H.J. 29/9/25, 372/23, H.J. 29/9/25, 373/24, H.J. 29/9/25, 374/25, H.J. 29/9/25, 375/26, H.J. 29/9/25, 376/27, H.J. 29/9/25, 377/28, H.J. 29/9/25, 378/29, H.J. 29/9/25, 379/30, H.J. 29/9/25, 380/31, H.J. 29/9/25, 381/32, H.J. 29/9/25, 382/33, H.J. 29/9/25, 383/34, H.J. 29/9/25, 384/35, H.J. 29/9/25, 385/36, H.J. 29/9/25, 386/37, H.J. 29/9/25, 387/38, H.J. 29/9/25, 388/39, H.J. 29/9/25, 389/40, H.J. 29/9/25, 390/41, H.J. 29/9/25, 391/42, H.J. 29/9/25, 392/43, H.J. 29/9/25, 393/44, H.J. 29/9/25, 394/45, H.J. 29/9/25, 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