

REPORT ON STEAM TURBINE MACHINERY. No. 96890

Date of writing Report **14/11/38** When handed in at Local Office **14/11/38** Port of **NEWCASTLE-ON-TYNE**
 No. in Survey held at **Newcastle-on-Tyne** Date, First Survey **30 July 1937** Last Survey **11/11/38**
 Reg. Book. **Supp.** (Number of Visits) **16**
 7009 on the **STEEL T.W. Sc. "AMRA"** Tons **Gross 8314 Net 3993**
 Built at **Newcastle-on-Tyne** By whom built **Swan, Hunter & Wigham Richardson Ltd** No. **1570** When built **1938**
 Engines made at **Newcastle-on-Tyne** By whom made **Parsons Marine Turbine Co. Ltd** No. **318** When made **1938**
 Boilers made at **Renfrew & Newcastle** By whom made **Babcock & Wilcox Ltd** No. **1331** When made **1938**
 Shaft Horse Power at Full Power **9700** Owners **British India Ste. Nav. Co. Ltd** No. **1570** Port belonging to **London**
 Nom. Horse Power as per Rule **2155** Is Refrigerating Machinery fitted for cargo purposes **yes** Is Electric Light fitted **yes**
 Trade for which Vessel is intended **✓**

STEAM TURBINE ENGINES, &c. — Description of Engines **Single Screw, S.F. Sealed Turbines, Impulse Reaction Type.**

No. of Turbines **6** **single reduction geared** to **2** propelling shafts. No. of primary pinions to each set of reduction gearing **3**
 Direct coupled to **Alternating Current Generator** — phase — periods per second — rated — Kilowatts — Volts at — revolutions per minute;
 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 LADING.	H. P.			I. 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.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.
1ST EXPANSION	Impulse			Reaction			Reaction			Impulse		
2ND	1.3"	2-6 3/8"	1	1 5/16"	21 1/2"	7	2 5/8"	36 1/4"	3	1.52"	2-11 1/16"	1
3RD	1.36"	2-7 1/8"	1	1 3/4"	23"	6	4 1/4"	40 1/2"	2	2.81"	3-1 1/4"	1
4TH	Reaction			Reaction			Reaction			Reaction		
5TH	1 7/8"	17 3/8"	11	3 1/16"	25 5/8"	6	5 1/4"	42 1/2"	2	2"	30 1/2"	2
6TH	1 3/16"	17 3/8"	10	Astern			6 1/2"	45"	2	2 3/4"	32"	2
7TH	1 5/16"	17 5/8"	10	Impulse			7 1/2"	47"	4	3 3/4"	34"	2
8TH	1 5/8"	18 1/4"	10	1.24"	2-6 1/8"	1				3 3/4"	34"	2
9TH				1.88"	2-7"	1						
10TH				2.89"	2-8 3/4"	1						

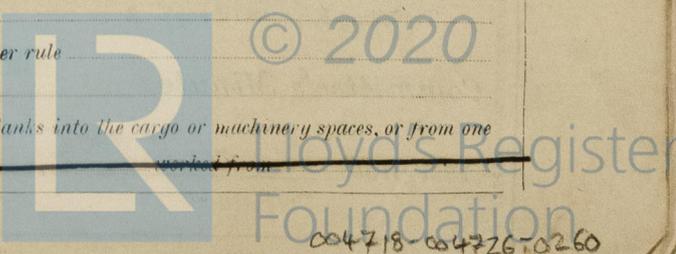
Shaft Horse Power at each turbine **H.P. 1590 I.P. 1470 L.P. 1790** Revolutions per minute, at full power, of each Turbine Shaft **H.P. 2872 I.P. 2872 L.P. 2462**
 Rotor Shaft diameter at journals **H.P. 5" I.P. 5" L.P. 6"** Pitch Circle Diameter **1st pinion — 2nd pinion —** main wheel **137.7582"** Width of Face **1st reduction wheel — main wheel 2 @ 15"**
 Distance between centres of pinion and wheel faces and the centre of the adjacent bearings **1st pinion 12 5/8" + 11 1/8" 2nd pinion — main wheel 19 7/8"**

Flexible Pinion Shafts, diameter **1st 1 1/2" 2nd 1 1/2"** Pinion Shafts, diameter at bearings **External 1st 1 1/2" 2nd 1 1/2" Internal 1st 1 1/2" 2nd 1 1/2"** diameter at bottom of pinion teeth **1st H.P. & I.P. 5.9607" 2nd L.P. 6.9219"**
 Wheel Shafts, diameter at bearings **1st — 2nd 15 1/2"** diameter at wheel shroud, **1st — 2nd 11-1 1/4"** Generator Shaft, diameter at bearings — Propelling Motor Shaft, diameter at bearings —
 Intermediate Shafts, diameter as per rule — as fitted — Thrust Shaft, diameter at collars as per rule — as fitted —

Tube Shaft, diameter as per rule — as fitted — Screw Shaft, diameter as per rule — as fitted — Is the (tube / screw) shaft fitted with a continuous liner { }
 Bronze Liners, thickness in way of bushes as per rule — as fitted — Thickness between bushes as per rule — as fitted — Is the after end of the liner made watertight in the propeller boss. 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.
 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.
 Propeller, diameter — Pitch — No. of Blades — State whether Moveable — Total Developed Surface — square feet.
 If Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine. Can the H.P. or I.P. Turbine exhaust direct to the Condenser.

Condenser No. of Turbines fitted with astern wheels. Feed Pumps { No. and size How driven }
 Pumps connected to the Main Bilge Line { No. and size How driven }
 Ballast Pumps, No. and size Lubricating Oil Pumps, including Spare Pump, No. and size
 Are two independent means arranged for circulating water through the Oil Cooler. Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge Pumps, No. and size: — In Engine and Boiler Room In Pump Room
 In Holds, &c.

Main Water Circulating Pump Direct Bilge Suctions, No. and size Independent Power Pump Direct Suctions to the Engine Room
 Bilges, No. and size. Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes.
 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.
 Are all Sea Connections fitted direct on the skin of the ship. Are they fitted with Valves or Cocks.
 Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates. Are the Overboard Discharges above or below the deep water line.
 Are they each fitted with a Discharge Valve always accessible on the plating of the vessel. Are the Blow Off Cocks fitted with a spigot and brass covering plate.
 What pipes pass through the bunkers. How are they protected.
 What pipes pass through the deep tanks. 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.
 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. Is the Shaft Tunnel watertight. Is it fitted with a watertight door.



BOILERS, &c.—(Letter for record **S**) Total Heating Surface of Boilers **17895** \$
 Is Forced Draft fitted **yes**. No. and Description of Boilers **3 Water Tube Babcock & Wilcox** Working Pressure **450 lbs./sq. in.**
 Is a Report on Main Boilers now forwarded? **yes**

Is **a Donkey** Boiler fitted? **no** If so, is a report now forwarded?
an Auxiliary

Is the donkey boiler intended to be used for domestic purposes only
 Plans. Are approved plans forwarded herewith for Shafting **Gearing yes** Main Boilers **yes** Auxiliary Boilers Donkey Boilers
 (If not state date of approval)

Superheaters **yes** General Pumping Arrangements Oil Fuel Burning Arrangements

Has the spare gear required by the Rules been supplied **yes** **SPARE GEAR.**

State the principal additional spare gear supplied **one (H.P. or I.P.) Pinion; one L.P. Pinion. Relief valves and springs for each size fitted. Fitted bolts for flexible coupling sleeves. Stud and nuts for H.P., I.P. & L.P. rotor bearings; studs and nuts, fitted bolts and nuts and ordinary bolts and nuts for H.P., I.P., and L.P. Turbine horizontal joints. Stud and nuts for main gear wheel shaft bearings; collar studs and nuts for pinion bearings; studs and nuts, fitted bolts and nuts and ordinary bolts and nuts for gear case main joints. Goggles, lifting gear, and adjusting gear etc.**

The foregoing is a correct description, Manufacturer.

1937 July 30, Aug. 15, Sep. 16, Oct. 16, 19, 26, 28, Nov. 4, 15, 16, 22, 26, Dec. 2, 6, 15, 30, 1938 Jan. 6, 12, 13, 14, 21, 24, 25.
 Dates of Survey while building: During progress of work in shops -- Feb. 3, 15, 21, 25, Mar. 9, 16, 29, Apr. 4, 19, 25, May 2, 4, 11, 12, 18, 19, 22, 24, 30.
 During erection on board vessel --- June 2, 7, 15, 27, Sep. 9, 14.
 Total No. of visits **51** & See Machinery Report.
 FOR THE PARSONS MARINE STEAM TURBINE CO. LIMITED.
 W. H. Plummer
 Managing Director & Secretary.

Dates of Examination of principal parts—Casings **1.10.37 to 15.6.38** Rotors **11.5.38 to 15.6.38** Blading **19.10.37 to 15.6.38** Gearing **19.10.37 to 15.6.38**

Wheel shaft **4.5.38** Thrust shaft Intermediate shafts Tube shaft Screw shaft
 Propeller Stern tube Engine and boiler seatings Engine holding down bolts

Completion of fitting sea connections Completion of pumping arrangements Boilers fired Engines tried under steam

Main boiler safety valves adjusted Thickness of adjusting washers

Rotor shaft, Material and tensile strength **Steel 34/38 tons/□"** Identification Mark **See List of**

Flexible Pinion Shaft, Material and tensile strength Identification Mark **Marks with Forg**

Pinion shaft, Material and tensile strength **Rickel Steel 40 tons/□"** Identification Mark **Reports attached**

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

Wheel shaft, Material **Steel 31/35 tons/□"** Identification Mark **See attached list** Thrust shaft, Material Identification Mark

Intermediate shafts, Material Identification Marks Tube shaft, Material Identification Marks

Screw shaft, Material Identification Marks Steam Pipes, Material Test pressure

Date of test Is an installation fitted for burning oil fuel **no**

Is the flash point of the oil to be used over 150°F. Have the requirements of the Rules for the use of oil as fuel been complied with

Is the vessel (not being an oil tanker) fitted for carrying oil as cargo **no** If so, have the requirements of the Rules been complied with

If the notation for ice strengthening is desired, state whether the requirements in this respect have been complied with

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.) **These Turbines and Gearing have been constructed under special survey; the materials and workmanship are good. The units have been erected and subjected to steam trials on the test bed in the shop with satisfactory results, afterwards dismantled, examined and found satisfactory and forwarded to Messrs. Swan, Hunter & Wigham Richardson Ltd., Wallsend, for instalment in the vessel.**

These Turbines & Gears have been fitted on board & satisfactorily tested under working conditions
 A. C. Bath
 11/11/38

The amount of Entry Fee ... £	When applied for,
Special ... £	19
Donkey Boiler Fee ... £	When received,
Travelling Expenses (if any) £	19

H. G. Forster
 Engineer Surveyor to Lloyd's Register of Shipping.

TUE 22 NOV 1938

Committee's Minute
 Assigned **+ LMC 11.38**
Spl. FD CL



Newcastle-on-Tyne

Certificate (if required) to be sent to
 (The Surveyors are requested not to write on or below the space for Committee's Minute.)