

REPORT ON STEAM TURBINE MACHINERY. No. 96890

4a.

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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. 2009 on the STEEL T.W. Sc. "AMRA" (Number of Visits) Tons Gross 8314 Net 3993

Built at Newcastle-on-Tyne By whom built Swan, Hunter & Wig. Richardson & Co. Ltd. No. 1570 When built 1938.
 Engines made at Newcastle-on-Tyne By whom made Parsons Marine Steam 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 Ltd. Nav. Co. Ltd. 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 Turbine Screw, Sealed Turbines, Impulse Reaction Type.

No. of Turbines Ahead 6 single reduction geared to 2 propelling shafts. No. of primary pinions to each set of reduction gearing 3
 Astern 4 double reduction geared
 Direct coupled to Alternating Current Generator — phase — periods per second — rated — Kilowatts — Volts at — revolutions per minute;
 Direct Current Generator —
 supplying power for driving — Propelling Motors, Type —
 rated — Kilowatts — Volts at — revolutions per minute. Direct coupled, single or double reduction geared to — propelling shafts.

	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"	21 1/2"	7	2 5/8"	36 1/4"	3	1.52"	2'-11 1/16"	1
3RD	1.36"	2'-7 7/8"	1	1 5/16"	22 1/8"	7	3 3/8"	38 3/4"	2	2.81"	3'-1 1/4"	1
4TH				2 5/16"	24 3/8"	6	4 1/4"	40 1/2"	2			
5TH	Reaction			3 1/16"	25 5/8"	6	5 1/4"	42 1/2"	2			
6TH							6 1/2"	45"	2			
7TH							7 1/2"	47"	4			
8TH												
9TH	1 7/8"	17 3/8"	11	Astern						2 3/4"	30 1/2"	2
10TH	1 3/16"	17 3/8"	10	Impulse						3 3/4"	32"	2
11TH	1 5/16"	17 5/8"	10							3 3/4"	34"	2
12TH	1 5/8"	18 1/4"	10							3 3/4"	34"	2
13TH				1.24"	2'-6 1/8"	1						
14TH				1.88"	2'-7"	1						
15TH				2.89"	2'-8 3/4"	1						

Shaft Horse Power at each turbine H.P. 1590 I.P. 1470 L.P. 1790
 Rotor Shaft diameter at journals H.P. 5" I.P. 5" L.P. 6" Pitch Circle Diameter
 Distance between centres of pinion and wheel faces and the centre of the adjacent bearings
 Flexible Pinion Shafts, diameter 1st 2nd
 Pinion Shafts, diameter at bearings External 1st Internal 1st
 Wheel Shafts, diameter at bearings 1st 2nd
 Intermediate Shafts, diameter as per rule as fitted
 Tube Shaft, diameter as per rule as fitted
 Screw Shaft, diameter as per rule as fitted
 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
 Length of Bearing in Stern Bush next to and supporting propeller
 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
 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. Independent Power Pump Direct Suctions to the Engine Room
 Main Water Circulating Pump Direct Bilge Suctions, No. and size
 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

1st reduction wheel 2872
 main shaft 134
 1st reduction wheel 2872
 main wheel 137.7582
 1st pinion 12 5/8" + 11 1/8" 1st reduction wheel
 2nd pinion main wheel 19 7/8"
 H.P. 1.4 3/4 L.P. 5 3/4
 1st H.P. 1.4 3/4 L.P. 5 3/4
 2nd L.P. 6.9219
 Generator Shaft, diameter at bearings
 Propelling Motor Shaft, diameter at bearings
 Thrust Shaft, diameter at collars
 Is the tube shaft fitted with a continuous liner
 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
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 Main Water Circulating Pump Direct Bilge Suctions, No. and size
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 What pipes pass through the deep tanks Have they been tested as per rule
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BOILERS, &c.—(Letter for record *S*) Total Heating Surface of Boilers *17895* ^{sq ft}
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? *yes*
an Auxiliary
Is the donkey boiler intended to be used for domestic purposes only *yes*
Plans. Are approved plans forwarded herewith for Shafting *Gearing yes* Main Boilers *yes* Auxiliary Boilers *yes* Donkey Boilers *yes*
(If not state date of approval)

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

SPARE GEAR.
Has the spare gear required by the Rules been supplied *yes*.
State the principal additional spare gear supplied *One (H.P. or I.P.) Pinion; one L.P. Pinion. Relief valves for each size fitted. Fitted bolts for flexible coupling sleeves. Studs 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. Studs 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. Ganges, lifting gear, and adjusting gear etc.*
The foregoing is a correct description,

1937 July 30, Aug. 18, Sep. 16, Oct. 16, 19, 26, 28, Nov. 4, 15, 16, 22, 26, Dec. 1, 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, 28, 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 *Tracy 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/sq. in.* 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/sq. in.* Identification Mark *Reports attached*
1st Reduction Wheel Shaft, Material and tensile strength *✓* Identification Mark *✓*

Wheel shaft, Material *Steel 31/35 tons/sq. in.* 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
Ad Bath
11/11/38

The amount of Entry Fee ... £ *See separate Rpt* When applied for, *19*
Special ... £ : : When received, *19*
Donkey Boiler Fee ... £ : :
Travelling Expenses (if any) £ : :
TUE 22 NOV 1938

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

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