

## REPORT ON STEAM TURBINE MACHINERY. No. 9330

Date of writing Report 22 Oct 1928 When handed in at Local Office 22 Oct 1928 Port of London  
 No. in Survey held at Turkey Date, First Survey 1928 Last Survey 22 Oct 1928  
 Reg. No. 92560 on the Twin L. R. "VICEROY OF INDIA" (Number of Visits 12) Tons Gross 19,000  
 Built at Glasgow By whom built A. Stephens & Son L. Yard No. 519 When built  
 Engines made at Turkey By whom made British Thomson-Houston Co. Engine No. When made  
 Boilers made at Glasgow By whom made Thorn. Yarrow & Co. Boiler No. When made  
 Shaft Horse Power at Full Power 17,000 Owners Peninsular & Oriental S.S. Nav. Co. Port belonging to London  
 Nom. Horse Power as per Rule 3565 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 Two High Pressure Curtis Impulse  
 No. of Turbines Two Direct coupled, single reduction geared to propelling shafts. No. of primary pinions to each set of reduction gearing No gearing  
 No. of Turbines None Direct coupled, double reduction geared to propelling shafts. No. of primary pinions to each set of reduction gearing No gearing  
 direct coupled to 2 Alternating Current Generators 3 phase 44.8 periods per second 2720 revolutions per minute; 2690 revolutions per minute;  
 for supplying power for driving Two Propelling Motors, Type Three phase fifty-six poles  
 Each rated 6,341 Kilowatts 3150 Volts at 109 revolutions per minute. Direct coupled, single or double reduction geared to Two propelling shafts.

H.P.			H.P.			H.P.			H.P.		
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	1.35"	3-5 3/4"	10	2.41"	2-7 3/8"						
2ND	1.45"	2-6"	11	1.14"	3-9 1/8"						
3RD	1.55"	2-6 3/16"	12	1.38"	4-0 5/8"						
4TH	1.68"	2-6 7/16"	13	1.90"	4-1 3/8"						
5TH	1.81"	2-6 1/16"	14	2.45"	4-2 3/8"						
6TH	1.96"	2-6 5/16"	15	3.57"	4-4 1/8"						
7TH	2.08"	2-7 5/16"	16	5.14"	4-8"						
8TH	2.24"	2-7 9/16"	17	7.65"	5-1"						
9TH	2.45"	2-7 7/8"	18	12.01"	5-9 3/8"						

(1) Shaft Horse Power at each Turbine when driving Alternator on 2 Motors ..... 12,000  
 (2) Shaft Horse Power at each Turbine when driving Alternator on 1 Motor ..... 8,760  
 L.P. 4"  
 H.P. 9"  
 Rotor Shaft diameter at journals 9"  
 Pitch Circle Diameter 9"  
 Distance between centres of pinion and wheel faces and the centre of the adjacent bearings 1st pinion 1st reduction wheel Width of Face 1st reduction wheel  
 Flexible Pinion Shafts, diameter 1st 2nd Pinion Shafts, diameter at bearings External 1st 2nd diameter at bottom of pinion teeth 1st 2nd  
 Wheel Shafts, diameter at bearings 1st 2nd diameter at wheel shroud 1st 2nd Generator Shaft, diameter at bearings 10 1/2"  
 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 shaft Length of Bearing in Stern Bush next to and supporting propeller  
 Propeller, diameter Pitch No. of Blades State whether Movable 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 L.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 1 Main Pump, 113 gal/min Tolly's Pump  
 Are two independent means arranged for circulating water through the Oil Cooler Sum. do. 180 do do  
 Pumps, No. and size:—In Engine and Boiler Room Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge  
 In Holds, &c.

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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  
 That pipes pass through the bunkers How are they protected  
 That 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  
 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 worked from



BOILERS, &c. — (Letter for record)

Total Heating Surface of Boilers

32,500  $\text{sq ft}$

Is Forced Draft fitted

No. and Description of Boilers

Working Pressure

375 lb

Is a Report on Main Boilers now forwarded?

Is (a Donkey / an Auxiliary) Boiler fitted?

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

Superheaters

General Pumping Arrangements

Oil Fuel Burning Arrangements

Spare Gear. State the articles supplied

10% of turbine buckets & spacers - 2 Bolts & nuts for each size of bearing - 1 bearing liner for each size of bearing - 1 bearing liner for each size of alternator bearing - 1 bearing liner for motor - 4 sets of carbon plank packings - 1 escape valve spring for each size fitted - 20 ft cooler tubes & 40 ferrules - 6 thermometers - 1 set gauges - 1 set Governor springs - 1 set main control gear wearing parts - 1 contactor solenoid of each size fitted - 1 set motor & alternator slip brushes & holders - 5% total number of bolts & nuts for each turbine casing joint - 200 condenser tubes & 400 screwed flanges.

The foregoing is a correct description.

THE BRITISH THOMSON-HOUSTON CO. LTD.

per Lloyd's Register

Manufacturers

Dates of Survey while building  
During progress of work in shops - Jan. 4. Feb. 9. 20. April. 30. July 10. Aug. 9. 20. Sep. 7. 24. 28. Oct 3. 22. 1928.  
During erection on board vessel -  
Total No. of visits 12

Dates of Examination of principal parts - Casings July 10. Sep 7. 28. Rotors Feb 9. 20. July 10. Sep 24. Blading Feb. 9. Sep. 24. 28. Gearing ✓

Wheel shaft ✓ Thrust shaft ✓ Intermediate shafts ✓ Tube shaft ✓ Screw shaft ✓

Propeller ✓ Stern tube ✓ Engine and boiler seatings ✓ Engine holding down bolts ✓

Completion of pumping arrangements ✓ Boilers fixed ✓ Engines tried under steam ✓

Main boiler safety valves adjusted ✓ Thickness of adjusting washers ✓

Rotor shaft, Material and tensile strength Ingot Steel 40/43 2 1/2" Identification Mark SEE SEPARATE SHEET

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 ✓ 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

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 If so, have the requirements of the Rules 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.) This Machinery has been

constructed under Special Survey in accordance with the Rules and has been despatched to Glasgow at which port it is to be fitted on board. The Workmanship & Materials have been tested in accordance with Rule Requirements and, so far as can be seen, are good. In my opinion this machinery will be eligible for the record of T.L.M.C. (with date) when it has been installed and examined under working conditions under the Society's Survey.

The amount of Entry Fee ... £ 214-14-3  
Donkey Boiler Fee ... £  
Travelling Expenses (if any) £ 22-12-0  
When applied for ...  
See Glasgow Report.

Arthur J. Helms.  
Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute GLASGOW 12 MAR 1929

Assigned See Accompanying Mach Report - 43950