

REPORT ON STEAM TURBINE MACHINERY

ELECTRIC GENERATING.

No. 103164
6 JUL 1936

Rpt. 4a.

Date of writing Report 4th July 1936 When handed in at Local Office 6 JUL 1936 Port of London
No. in Survey held Rugby Date, First Survey 2nd April 1936 Last Survey 29th June 1936
Reg. Book. on the S/S CITY OF BENARES (Number of Visits 7)

Built at Glasgow By whom built Barclay Curle & Co. Ltd. Yard No. 656 When built 1936
Engines made at Rugby By whom made British Thomson Houston Co. Ltd. Engine No. R.1864/5/6 When made 1936
Boilers made at Manchester By whom made Metropolitan Vickers Electrical Co. Ltd. Boiler No. 416260/2/01 When made 1936
Shaft Horse Power at Full Power 447 Owners Ellerman Lines Ltd. Port belonging to Glasgow
Nom. Horse Power as per Rule 745 Is Refrigerating Machinery fitted for cargo purposes Is Electric Light fitted
Trade for which Vessel is intended

STEAM TURBINE ENGINES, &c.—Description of Engines 3. 100 K.W. Turbo electric generating sets

No. of Turbines 1 each set Direct coupled, single reduction geared to generator propelling shafts No. of primary pinions to each set of reduction gearing one
direct coupled to Alternating Current Generator phase periods per second each rated 100 Kilowatts 110 Volts at 800 revolutions per minute;
for supplying power for driving Auxiliary lighting Propelling Motors, Type —
rated — Kilowatts — Volts at — revolutions per minute. Direct coupled, single or double reduction geared to — propelling shafts.

TURBINE BLADING.	MEAN HEIGHT OF BLADES.	H. P.		I. P.		L. P.		ASTERN.	
		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	0.76"	14.80"	1						
2ND do	1.19"	15.26"	1						
3RD do	0.91"	14.60"	1						
4TH do	1.34"	15.06"	1						
5TH do	1.275"	15.33"	1						
6TH do	1.96"	16.20"	1						
7TH									
8TH									
9TH									
10TH									
11TH									
12TH									

Shaft Horse Power at each turbine H.P. 149 Revolutions per minute, at full power, of each Turbine Shaft I.P. 6500 L.P. 800
L.P. 13/4" end Pitch Circle Diameter 1st pinion 2.6245" 1st reduction wheel Width of Face 1st reduction wheel
L.P. 13/4" end 2nd pinion main wheel 21.3894" main wheel 2 at 2 3/4"

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings 1st pinion 5 3/4" and 6 3/4" 1st reduction wheel
2nd pinion main wheel 5 3/4" and 6 3/4"

Flexible Pinion Shafts, diameter 1st 2 1/4" Pinion Shafts, diameter at bearings External 1st 2 1/4" 2nd 2 1/4" diameter at bottom of pinion teeth 1st 2.3429"
2nd

Wheel Shafts, diameter at bearings 1st diameter at wheel shroud 1st Generator Shaft, diameter at bearings 3 3/4"
main Propelling Motor Shaft, diameter at bearings

Intermediate Shafts, diameter as per rule Thrust Shaft, diameter at collars as per rule Tube Shaft, diameter as per rule
as fitted as fitted as fitted

Screw Shaft, diameter as per rule Is the tube shaft fitted with a continuous liner Bronze Liners, thickness in way of 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 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 Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge
Are two independent means arranged for circulating water through the Oil Cooler

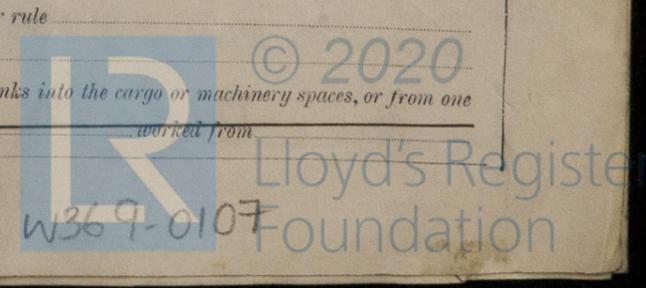
Pumps, No. and size:—In Engine and Boiler Room Independent Power Pump Direct Suctions to the Engine Room
In Holds, &c. Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes

Main Water Circulating Pump Direct Bilge Suctions, No. and size 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
Bilges, No. and size Are they fitted with Valves or Cocks

Are all Sea Connections fitted direct on the skin of the ship 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 worked from



ELECTRIC GENERATORS

BOILERS, &c. — (Letter for record) Total Heating Surface of Boilers

Is Forced Draft fitted? No. and Description of Boilers Working Pressure

Is a Report on Main Boilers now forwarded?

Is a Donkey Boiler fitted? If so, is a report now forwarded?

Plans: Are approved plans forwarded herewith for Shafting Main Boilers Auxiliary Boilers Donkey Boilers

(If not state date of approval)

Superheaters General Pumping Arrangements Oil Fuel Burning Arrangements

Spare Gear. State the articles supplied:—

Turbine 1 set turbine bearings 2 oil strainers, 1 set governor and emergency springs
1 set gland packings

Gears 1 set gear box bearings

Generator 1 complete set of carbon brushes, 1 set brush springs, 1 brush spindle with brush box
1 bearing.

THE BRITISH THOMSON-HOUSTON CO., LTD. Manufacturer

The foregoing is a correct description,

Dates of Survey while building: During progress of work in shops -- 1936 April 2, May 12, 19, June 5, 9, 22, 29 = 7 visits.
During erection on board vessel ---
Total No. of visits

Dates of Examination of principal parts: Casings 19.5.36 - 5/9.6.36 Rotors 5.6.36 to 29.6.36 Blading 5.6.36 to 29.6.36 Gearing 24.36 to 29.6.36

Wheel shaft 2.4.36 to 29.6.36 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 **Forged Nickel Steel. 42.0 to 46.2 ton ultimate strength.** Identification Mark **Lloyds 257. ac** See attached test

Flexible Pinion Shaft, Material and tensile strength Identification Mark

Pinion shaft, Material and tensile strength **Forged Nickel Steel. 51.6 to 52.12 ton ult. strength.** Identification Mark **Lloyds 262. HMCC 19.3.36 SAL 12.5.36**

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

Wheel shaft, Material **Forged Nickel Steel.** Identification Mark **Lloyds 256 HMCC 17.3.36 SAL 12.5.36** 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. **Workmanship good.**)

These three turbo-electric generating sets have been specially surveyed during construction. The materials used have been made at works approved by the Committee and tested by the surveyors to the Society. Full power governing trip gear & over speed tests were witnessed with the turbine coupled to their respective generators at Rugby when all worked satisfactorily. They have now been dispatched to Glasgow for fitting onboard. They have been efficiently secured in position on four sets.

Attached hereto: Fitting certificate 6 in 11. - Report on generation from 76. 3 in 11. - List of Manings on fittings - 30 tabs

The amount of Entry Fee ... £

Special ... £ 14. 14. 0.

Donkey Boiler Fee ... £

Travelling Expenses (if any) £ 8. 6. 6.

When applied for, **6 JUL 1936** (Payable by R.T.N.)

When received, **10/9/36**

Geo. Laing
Engineer Surveyor to Lloyd's Register of Shipping.

TUE. 29 DEC 1936

Committee's Minute **GLASGOW 20 OCT 1936**

Assigned **See G.L. Rpt. No. 57571.**

(The Surveys are requested not to write on or below the space for Committee's Minute.)

