

# REPORT ON STEAM TURBINE MACHINERY.

No. 105606  
17 MAR 1938

Received at London Office

Date of writing Report 11/3/38 When handed in at Local Office 11/3/38 Port of London  
No. in Survey held at Rugby Date, First Survey 4<sup>th</sup> Oct 1938 Last Survey 4<sup>th</sup> March 1938  
Reg. Book. City of Edinburgh (Number of Visits 9)

Built at Birkenhead By whom built Bammell David & Co Ltd Yard No. 1032 When built 1938  
Engines made at Rugby By whom made B.T.H. Co Ltd Turbine No. R.2034 Engine No. R.2035 When made 1938  
Boilers made at Rugby By whom made B.T.H. Co Ltd GENERATOR No. R.2036 Boiler Nos. 58453, 58454 When made 1938  
Shaft Horse Power at Full Power 675 Owners The Ellerman Lewis Ltd Port belonging to Liverpool  
Nom. Horse Power as per Rule 112.5 Is Refrigerating Machinery fitted for cargo purposes Is Electric Light fitted yes  
Trade for which Vessel is intended

## TEAM TURBINE ENGINES, &c.—Description of Engines Three - 150KW Turbo-electric generator sets

No. of Turbines 3 (1 per set) Direct coupled, single reduction geared to generator propelling shafts. No. of primary pinions to each set of reduction gearing 1  
direct coupled to Alternating Current Generator phase periods per second Each 150KW Kilowatts 220 Volts at 800 revolutions per minute;  
for supplying power for and lighting Propelling Motors, Type Direct Current Generator rated ✓ Kilowatts ✓ Volts at ✓ revolutions per minute. Direct coupled, single or double reduction geared to ✓ propelling shafts.

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.
1ST EXPANSION	<u>Row 1</u> .70"	<u>19.54"</u>	<u>2</u>	/	/	/	/	/	/	/	/	/
2ND "	<u>INTER.</u> .92"	<u>18.00"</u>										
3RD "	<u>Row 2</u> 1.20"	<u>18.98"</u>										
4TH 2ND "	<u>Row 1</u> .52"	<u>19.32"</u>										
5TH "	<u>INTER.</u> .72"	<u>18.00"</u>										
6TH "	<u>Row 2</u> .94"	<u>19.75"</u>										
7TH 3RD "	<u>Row 1</u> .90"	<u>20.08"</u>										
8TH "	<u>inter.</u> 1.18"	<u>18.00"</u>										
9TH "	<u>Row 2</u> 1.48"	<u>20.84"</u>										
10TH "												
11TH "												
12TH "												

Shaft Horse Power at each turbine { H.P. 6500 1st reduction wheel ✓  
I.P. 225 main shaft Generator 800  
L.P. ✓

Rotor Shaft diameter at journals { H.P. 1.75 Pitch Circle Diameter { 1st pinion 2.6245 1st reduction wheel ✓  
I.P. ✓ main wheel 21.3896 Width of Face { 1st reduction wheel ✓  
L.P. end 1.75 2nd pinion ✓ main wheel 4" x 2 = 8"

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion 7" and 8" 1st reduction wheel ✓  
2nd pinion ✓ main wheel 7" and 8"

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

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

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

Tube Shaft, diameter as per rule ✓ Screw Shaft, diameter as per rule ✓ Is the { tube } shaft fitted with a continuous liner { ✓  
as fitted ✓ as fitted ✓ as fitted ✓ as fitted ✓

Bronze Liners, thickness in way of bushes as per rule ✓ Thickness between bushes as per rule ✓ Is the after end of the liner made watertight in the propeller boss ✓  
as fitted ✓ as fitted ✓

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 ✓ If so, state type ✓ 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 Holds, &c. ✓ In Pump Room ✓

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-bones ✓

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 ✓ worked from ✓

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?  
{ an Auxiliary }

Is the donkey boiler intended to be used for domestic purposes only

Plans. Are approved plans forwarded herewith for Shafting 5-1-37 Main Boilers Auxiliary Boilers Donkey Boilers  
(If not state date of approval)

Superheaters General Pumping Arrangements Oil Fuel Burning Arrangements

SPARE GEAR.

Has the spare gear required by the Rules been supplied *yes*

State the principal additional spare gear supplied *1 set of turbine gears and generator bearings, 1 set of gland packing, 1 set of carbon brushes, 1 bush spindle, 1 set bush springs, 1 set governor springs.*

THE BRITISH THOMSON-HOUSTON CO., LTD. (MARINE DEPT.)

The foregoing is a correct description,

Manufacturer.

Dates of Survey while building { During progress of work in shops -- } 1937, Oct 4<sup>th</sup> Nov 10, 29; 1938 Jan 28, Feb 8, 14, 18 28, Mar 4<sup>th</sup>  
{ During erection on board vessel --- }  
Total No. of visits 9

Dates of Examination of principal parts—Casings 8<sup>th</sup> Feb, 14<sup>th</sup> Feb 38 Rotors 10-1-38, 28-1-38 Blading 28-1-38 to 4-3-38 Gearing 28-1-38 to 4-3-38

Wheel shaft 10-11-37 to 4-3-38 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 fixed Engines tried under steam

Main boiler safety valves adjusted Thickness of adjusting washers

Rotor shaft, Material and tensile strength *39 Steel, 422, 25.0%, 408, 26.0, 42.4, 25.0%* Identification Mark *838 and 171, 173, 175*

Flexible Pinon Shaft, Material and tensile strength Identification Mark

Pinion shaft, Material and tensile strength *Nickel steel, 50.8, 25.0%; 51.0, 24.0%; 51.2, 24.0%* Identification Mark *266/191, 192, 192*

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

Wheel shaft, Material *2.8 Steel* Identification Mark *849/195, 196, 197* 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

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 *yes* If so, state name of vessel *SS "City of Cape Town"*

General Remarks (State quality of workmanship, opinions as to class, &c.)

*These three turbo electric generating sets have been specially surveyed during construction and in accordance with the approved plans and the Rules. The materials used have been made at works approved by the Committee and tested by the Surveyors to the Society. Full power, overspeed, governing and tub gear tests were witnessed in the shop and found satisfactory. They have now been dispatched to Birkenhead for fitting on board. These have now been fitted on board & examined under full working conditions & found satisfactory. Attached hereto reports on three generators & list of stampings. Forging certificates are common to both 1032 and 1034 and will be attached to report on vessel 1034*

The amount of Entry Fee ... £ : :  
Special ... £ 11 : 4 - 0  
Donkey Boiler Fee ... £ : :  
Travelling Expenses (if any) £ 4 - 4 - 0

When applied for, 17 MAR 1938  
When received, Lon Lh to 24/3/38

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

Committee's Minute Assigned



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

Rpt. No. i Reg. 7234 Built Owners Elect Is the System Pressu Direct If alter Has the Gener are they Where series u approve Have c Are all short c Positi in way woodwo are the Earth in mel a fuse Switch injury horizon materia is it of non-hyg type omnibu "off" p switches T. P. C. D. P. L. Are tur fire-resi voltmete do these