

Sld. No 32139

# REPORT ON STEAM TURBINE MACHINERY. No. 95155

pt. 4a.

Received at London Office JUN 18 1937

Date of writing Report 17/6/37 When handed in at Local Office Port of NEWCASTLE-ON-TYNE  
No. in Survey held at Newcastle on Tyne Date, First Survey 8 Jan Last Survey 15 June 1937  
Reg. Book. on the S/S BIDDLESTONE (Number of Visits 10.)

Built at Sunderland By whom built Short Bros Yard No. 450 When built 1937  
Engines made at Newcastle on Tyne By whom made R+W. Hawthorn Leslie & Co. L.P. TURBINE Engine No. 9934. When made 1937.  
Boilers made at See Rpt on Recip. Engines No. When made  
Shaft Horse Power of Full Power 640 Owners 930 HP x 9 = 640 Port belonging to  
Nom. Horse Power as per Rule Is Refrigerating Machinery fitted for cargo purposes Is Electric Light fitted  
Trade for which Vessel is intended

TEAM TURBINE ENGINES, &c.—Description of Engines Comp. 4 Cyl. Recip. Eng. S/R Geared, and L.P. Turbine D/R Geared to screw shaft.  
No. of Turbines Ahead ONE COMBINED Direct coupled to ONE propelling shaft. No. of primary pinions to each set of reduction gearing  
Astern ONE CASING double reduction geared  
Direct coupled to Alternating Current Generator phase periods per second Direct Current Generator rated Kilowatts Volts at revolutions per minute;  
for 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.			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							2 ROWS PARALLEL, THUS:					
2ND							1" 22"	2.				3 ROW IMPULSE WHEEL
3RD							8 ROWS IN TAPER:-					MEAN DIA. BLADES 22 1/4"
4TH							1" to 2 1/8"	22 to 25 1/4"	8.			BLADE HEIGHTS 1 1/4" to 2"
5TH							6 ROWS IN TAPER:-					
6TH							2 1/8" to 5 1/16"	25 1/4 to 30 1/8"	6.			
7TH												
8TH												
9TH												
0TH												
1TH												
2TH												

Shaft Horse Power at each turbine { H.P. I.P. L.P. 640 } Revolutions per minute, at full power, of each Turbine Shaft { H.P. I.P. L.P. 3480 }  
Rotor Shaft diameter at journals { H.P. I.P. L.P. 4" } Pitch Circle Diameter { 1st pinion 2nd pinion } 1st reduction wheel main wheel  
Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion 2nd pinion } 1st reduction wheel main wheel

Flexible Pinion Shafts, diameter { 1st 2nd } Pinion Shafts, diameter at bearings External Internal { 1st 2nd } diameter at bottom of pinion teeth  
Wheel Shafts, diameter at bearings { 1st main } diameter at wheel shroud, { 1st main } 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 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  
If so, state type Length of Bearings in Stern Bush next to and supporting propeller

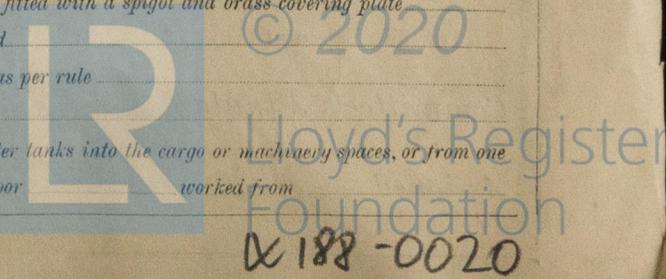
Propeller, diameter Pitch No. of Blades State whether Movable Total Developed Surface square feet.  
If Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine Can the H.P. or I.P. Turbine exhaust direct to the Condenser  
No. of Turbines fitted with astern wheels No. and size How driven

Pumps connected to the Main Bilge Line { No. and size How driven } 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 worked from

MADE ON BOARD FOR S/R-D/R GEAR POWER PLANT RPT. SEE LONDON



**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 ✓ 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, viz*

State the principal additional spare gear supplied.

- 2. main Bearing Bushes
- 1 complete Carbon Ring for Islands.
- 1 set Michell Thrust Pads.
- 1 set Liners for forward side of Thrust Block.
- 2 springs for Carbon Rings.
- 1 Relief valve spring.
- 1 Spring for Governor
- 2 Studs + nuts for Bearing Keeps; 1 stud, 1 bolt +

1 fitted bolt (each with nut) for Cylinder Horizontal Joint. HAWTHORN, LEA & CO., LIMITED

The foregoing is a correct description,

*R. B. Johnson* Manufacturer  
 DIRECTOR

Dates of Survey while building { During progress of work in shops - - } 1937 Jan 8. 12. Apr. 12. 26. May 5. 11. 14. 25. June 7. 15.  
 { During erection on board vessel - - - }  
 Total No. of visits 10.

Dates of Examination of principal parts—Casings 8/1/37 Rotors 12/4/37 Blading 7/6/37 Gearing ✓

Wheel shaft ✓ 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 ✓ LP Turbine on Test Bench 4/6/37

Main boiler safety valves adjusted ✓ Thickness of adjusting washers ✓

Rotor shaft, Material and tensile strength S.M. Steel 56.5 & 55.9 Kg/mm<sup>2</sup>. Identification Mark LLOYDS No 458 AM. 12-4

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 ✓

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 *95*

General Remarks (State quality of workmanship, opinions as to class, &c.) *This L.P. Turbine has been constructed in special survey in accordance with the Rules. The materials & workmanship are good. The Turbine was satisfactorily "steamed" in the Shop (no load), set up on its DR/5R Gear and afterwards dispatched to Sunderland for installation with its Reciprocating Engine on board the vessel.*

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

*A. Watt*  
 Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute

TUE 20 JUL 1937

Assigned *See Sld 32139*



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