

# REPORT ON STEAM TURBINE MACHINERY. No. 95106

Received at London Office JUN - 7 1937

4a.

of writing Report

When handed in at Local Office

14/16/37 Port of **NEWCASTLE-ON-TYNE**

Survey held at **Newcastle on Tyne**  
 on the S/S **"Lindenhall"**

Date, First Survey **15 March** Last Survey **3/6/1937**  
 (Number of Visits **10.**)

Yard No. **1076** When built **1937**  
 By whom built **Wm Gray & Co**  
 Engine No. **1076** When made **1937**  
 By whom made **Cent. Mar. Eng. Wks.**  
 Turbine No. **1548** When made **1937**  
 By whom made **Swan Hunter & Nigham Rickhous**  
 Owners: **West Hartlepool Steam Navigation Co. Ltd.** Port belonging to **West Hartlepool**  
 Horse Power at Full Power **881**  
 Horse Power as per Rule **147**  
 Is Refrigerating Machinery fitted for cargo purposes **No**  
 Is Electric Light fitted **Yes**  
 Vessel intended for **Ocean going.**

**STEAM TURBINE ENGINES, &c.**—Description of Engines **Recip Engine with 2 1/2 Steam Turbines (Bauer-Wach System) with hydraulic coupling D.R. cleared to Sc. Shaft.**

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

| EXPANSION | 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. <sup>m/m</sup> | DIAMETER AT TIP. <sup>m/m</sup> | NO. OF ROWS. | HEIGHT OF BLADES. | DIAMETER AT TIP. | NO. OF ROWS. |
| 1         |                   |                  |              |                   |                  |              | 64.                              | 728.                            | 1.           |                   |                  |              |
| 2         |                   |                  |              |                   |                  |              | 79.                              | 758.                            | 1.           |                   |                  |              |
| 3         |                   |                  |              |                   |                  |              | 94.                              | 788.                            | 1.           |                   |                  |              |
| 4         |                   |                  |              |                   |                  |              | 109.                             | 818.                            | 1.           |                   |                  |              |
| 5         |                   |                  |              |                   |                  |              | 126.                             | 852.                            | 1.           |                   |                  |              |
| 6         |                   |                  |              |                   |                  |              | 144.                             | 888.                            | 1.           |                   |                  |              |
| 7         |                   |                  |              |                   |                  |              | 160.                             | 920.                            | 1.           |                   |                  |              |

ft Horse Power at **EXH. STM.** turbine **881**  
 H.P. **881** ✓  
 I.P. ✓  
 L.P. **4231** ✓  
 Revolutions per minute, at full power, of each Turbine Shaft  
 H.P. ✓  
 I.P. ✓  
 L.P. **4231** ✓  
 or Shaft diameter at journals  
 H.P. ✓  
 I.P. ✓  
 L.P. **125 m/m** ✓  
 Pitch Circle Diameter  
 1st pinion **162.9169 m/m**  
 2nd pinion **342.1254 m/m**  
 1st reduction wheel **1515.1269 m/m**  
 main wheel **1998.4469 m/m**  
 1st pinion **265 m/m** AFT. **225 m/m**  
 1st reduction wheel **1560 m/m** AFT. **360 m/m**  
 2nd pinion **422.5 m/m**  
 main wheel **525 m/m**  
 1st reduction wheel **260 m/m**  
 main wheel **600 m/m**  
 distance between centres of pinion and wheel faces and the centre of the adjacent bearings  
 1st pinion **125 m/m**  
 2nd pinion **320 m/m**  
 1st reduction wheel **148.2715 m/m**  
 2nd reduction wheel **327.48 m/m**

Pinion Shafts, diameter at bearings  
 External 1st **125 m/m**  
 Internal 1st **320 m/m**  
 2nd **320 m/m**  
 diameter at bottom of pinion teeth  
 1st **144.5 m/m**  
 2nd **320 m/m**  
 Generator Shaft, diameter at bearings ✓  
 1st **1908 m/m**  
 Propelling Motor Shaft, diameter at bearings ✓  
 main **1908 m/m**  
 Thrust Shaft, diameter at collars  
 as per rule **13.115**  
 as fitted **350 m/m = 13.764** ✓  
 Is the { tube } shaft fitted with a continuous liner { ✓ }  
 { screw }

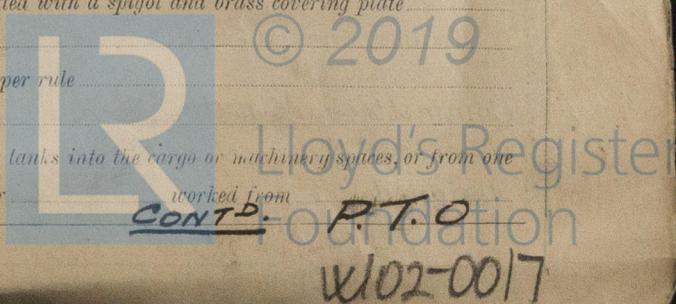
Intermediate Shafts, diameter  
 as per rule **12.877**  
 as fitted **15.5**  
 Screw Shaft, diameter  
 as per rule ✓  
 as fitted ✓  
 Is the { tube } shaft fitted with a continuous liner { ✓ }  
 { screw }  
 Thickness between bushes  
 as per rule ✓  
 as fitted ✓  
 Is the after end of the liner made watertight in the  
 If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner ✓  
 Is 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 ✓  
 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 Movable ✓ Total Developed Surface ✓ square feet.  
 Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine **No.** Can the H.P. or I.P. Turbine exhaust direct to the  
 No. of Turbines fitted with astern wheels ✓ Feed Pumps  
 No. and size ✓  
 How driven ✓

Fast Pumps, No. and size ✓  
 Lubricating Oil Pumps, including Spare Pump, No. and size **2-9" + 8" x 18 STROKE.**  
 Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge  
 In Pump Room

Water Circulating Pump Direct Bilge Suctions, No. and size ✓  
 Independent Power Pump Direct Suctions to the Engine Room  
 Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes ✓  
 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 ✓

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 stowhold 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 ✓  
 How are they protected ✓  
 Have they been tested as per rule ✓  
 All Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times ✓  
 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  
 department to another ✓ Is the Shaft Tunnel watertight ✓ Is it fitted with a watertight door ✓



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?  
{ an Auxiliary }

If so, is a report now forwarded?

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

Plans. Are approved plans forwarded herewith for <sup>THRUST</sup>Shafting 12/1/37. Main Boilers ✓ Auxiliary Boilers ✓ Donkey Boilers ✓  
(If not state date of approval) <sup>+ CONE COUPLING.</sup>

Superheaters ✓ General Pumping Arrangements ✓ Oil Fuel Burning Arrangements ✓

Has the spare gear required by the Rules been supplied? **Yes viz.** SPARE GEAR.  
1. Bearing of each size fitted.  
1. Set of Thrust Pads for each Thrust Bearing.  
1 Spring & 1 set of Washers for Emergency Governor.

State the principal additional spare gear supplied

FOR SWAN, HUNTER, & WIGHAM RICHARDSON, LTD

*J. J. Stueben*  
DIRECTOR

The foregoing is a correct description,

Dates of Survey while building { During progress of work in shops -- } 1937 Jan 15. Apr. 12. 27. 28. May 3. 11. 25. 28. 31. June 3.  
{ During erection on board vessel --- }  
Total No. of visits 10.

Dates of Examination of principal parts—Casing 27/4/37 Rotor 27/4/37 Blading 11/5/37 Gearing 28/5/37

Wheel shaft 28/5/37 Thrust shaft 28/5/37 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 ✓ <sup>EXHAUST TURBINE</sup> Engine tried under steam 28/5/37

Main boiler safety valves adjusted ✓ Thickness of adjusting washers ✓

Rotor shaft, Material and tensile strength S.M. Steel, 39.9 tons/□ (Y.P. 23.7 tons/□) Identification Mark 12041 J.L. LLOYDS No

1st Redn. Flexible Pinion Shaft, Material and tensile strength S.M. Steel 45.9 tons/□ (Y.P. 31.6 tons/□) Identification Mark 11982 J.L.

2nd Redn. Pinion shaft, Material and tensile strength S.M. Steel 45.1 tons/□ (Y.P. 34.7 tons/□) Identification Mark 12071 J.L.

1st Reduction Wheel Shaft, Material and tensile strength S.M. Steel 29.3 tons/□ Identification Mark 11847 J.L.

Wheel shaft, Material S.M. Steel Identification Mark 3439 F.S. Thrust shaft, Material S.M. Steel Identification Mark 635 L

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? No. If so, state name of vessel ✓

General Remarks (State quality of workmanship, opinions as to class, &c.) This Exhaust Steam Turbine with its D/R Gear, have been constructed under special survey in accordance with the Society's Rules and approved plan. The materials and workmanship are good. The Turbine & D/R Gear are being sent to W. Appl. for installation and found satisfactory.

The amount of Entry Fee ... £ ✓  
Special <sup>during Construction in Shops.</sup> 9:16  
Donkey Boiler Fee ... £ :  
Travelling Expenses (if any) £ : 85-6-1937

When applied for, 4 JUN 1937  
When received, 25-6-1937

*A. Watt & J. Brooke Smith*  
Engineer Surveyors to Lloyd's Register of Shipping.

Committee's Minute

Assigned

THE 2 NOV 1937

See Appl No 17750



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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.)