

AUG -5 1940

# REPORT ON STEAM TURBINE MACHINERY. No. 98226

pt. 4a.

Received at London Office 4/2/40  
NEWCASTLE-ON-TYNE  
Port of  
Date, First Survey 13.10.39 Last Survey 2nd Feb 1940.  
(Number of Visits 14)  
No. in Survey held at Newcastle on Tyne  
Reg. Book.  
on the Steel Screw Steamer "ITOLA"  
Built at West Hartlepool By whom built Wm Gray & Co. Yard No. 1102 When built 1940-  
Engines made at ditto By whom made Central Mar. Eng. Wks Engine No. 1102 When made "  
Boilers made at Newcastle on Tyne By whom made Swan, Hunter & Wigham Richardson L.P. Turbine Boiler No. 1634 When made 1940-  
Shaft Horse Power at Full Power 1165 Owners British India Steam Nav. Co Port belonging to London.  
Nom. Horse Power as per Rule 194 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes.  
Trade for which Vessel is intended Ocean going.

TEAM TURBINE ENGINES, &c.—Description of Engines 3 Cyl. Triple Exp. Recip + L.P. Turb. with D/P bearing and hydr. coupling.  
No. of Turbines Ahead One Direct coupled, single reduction geared to One propelling shafts. No. of primary pinions to each set of reduction gearing One  
Astern 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 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							61.	822.	one			
2ND							79.	858.	one			
3RD							97.	894.	one			
4TH							115.	930.	one			
5TH							137.	974.	one			
6TH							160.	1020.	one			
7TH							185.	1070.	one			
8TH												
9TH												
10TH												
11TH												
12TH												

Shaft Horse Power at turbine Exh. Stm. H.P. L.P. 1165. Revolutions per minute, at full power, of each Turbine Shaft Exh. Stm. H.P. L.P. 3677. 1st reduction wheel 466. main shaft 81.  
Rotor Shaft diameter at journals H.P. L.P. 170 m.m. Pitch Circle Diameter 1st pinion 206.3614 1st reduction wheel 1629.1687 m.m. 2nd pinion 378.6211 main wheel 2115.0556 m.m. Width of Face 1st reduction wheel 280 m.m. main wheel 580 m.m.  
Distance between centres of pinion and wheel faces and the centre of the adjacent bearings 1st pinion 255 m.m. 2nd pinion 440 m.m. 1st reduction wheel 370 m.m. main wheel 550 m.m.  
Flexible Pinion Shafts, diameter 1st 115 m.m. 2nd Pinion Shafts, diameter at bearings External 1st 150 m.m. 2nd 350 m.m. diameter at bottom of pinion teeth 1st 191.716 m.m. 2nd 357.076 m.m.  
Wheel Shafts, diameter at bearings 1st 250 m.m. 2nd 260 m.m. diameter at wheel shroud, 1st 1550 m.m. Generator Shaft, diameter at bearings main 2015 m.m. Propelling Motor Shaft, diameter at bearings as per rule 13.59" with Recip. Eng. & L.P. Turbine comb. (13" with Recip. Eng. alone). Thrust Shaft, diameter at collars as per rule 13.65 as fitted 365 m.m. = 14.37"  
Intermediate Shafts, diameter as fitted Tube Shaft, diameter as per rule as fitted Screw Shaft, diameter as per rule as fitted Is the tube 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? 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 Two-9 x 8" x 18" Stroke  
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. Independent Power Pump Direct Suctions to the Engine Room  
Main Water Circulating Pump Direct Bilge Suctions, No. and size Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-bones?  
Bilges, 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?  
Are all Sea Connections fitted direct on the skin of the ship Are they fitted with Valves or Cocks?  
Are they fired 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



4A ~~16061~~. 98226.

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 3/5/39 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. Bearing for each prop fitted  
1 set Thrust pads for each Thrust Bearing.  
1 Spring & 1 set gaskets for Emergency Governor, etc.*

FOR

SWAN, HUNTER, & WIGHAM RICHARDSON, LTD.

Manufacturer.

The foregoing is a correct description,

Dates of Survey while building { During progress of work in shops -- } 1939 Oct. 13, 26, Nov. 10, 13, 15, 16, Dec. 21, 27. 1940 Jan. 3, 10, 11, 19.  
{ During erection on board vessel -- } Feb. 1, 2.  
Total No. of visits 14.

Dates of Examination of principal parts—Casing 21/12/39 Rotor 10/11/39 Blading 19/1/40 Gearing 19/1/40

Wheel shaft 19/1/40 Thrust shaft 19/1/40 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 ✓ *L.P. Turbine in Works. Engines tried under steam 1-2-40*

Main boiler safety valves adjusted ✓ Thickness of adjusting washers ✓

Rotor shaft, Material and tensile strength *Forged Steel 36.4 tons (sgin.)* Identification Mark *8788 HAI. 364. QN*

*1st Red.* Flexible Pinion Shaft, Material and tensile strength *Nickel Steel 42.5 tons (YP. 26 tons)* Identification Mark *8788 HAI. L. 95. QN*

*2nd Red.* Pinion shaft, Material and tensile strength *Nickel Steel 44.4 tons (YP. 27.2 tons)* Identification Mark *59148/B2. CSP. QN*

1st Reduction Wheel Shaft, Material and tensile strength *F. Steel 29.4 tons* Identification Mark *8788 HAI. 357. QN*

Wheel shaft, Material *F. Steel* Identification Mark *8788 HAI. 359. QN* Thrust shaft, Material *F. Steel* Identification Mark *8788 HAI. 366. QN*

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 \_\_\_\_\_

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

*This Exhaust Steam Turbine & D/R Gearing have been constructed under special survey in accordance with the Society's Rules & approved plan, and the materials and workmanship are good. The Turbine was satisfactorily tested under steam (no load) in the works.*

*The machinery has been sent to W. Hartlepool for installing on board.*

*This turbine installation has now been satisfactorily fitted on board and tried under working conditions with satisfactory results.*

The amount of Entry Fee ... £ ... When applied for, *West Hartlepool.*

Special ... £ 19 : 8 ... -5 FEB 1940

Donkey Boiler Fee ... £ ... When received, *A Watt.*

Travelling Expenses (if any) £ ... 21-2-1940

**FRI 16 AUG 1940**

Committee's Minute

Assigned

*See Apl. J.E. 18061*



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Lloyd's Register Foundation

Newcastle-on-Tyne

Certificate (if required) to be sent to the Committee's Minute.

Rpt. 5a.

Date of writing

No. in Reg. Book.

Built at

Engines made

Boilers made

Nominal H.P.

MULTIPLE

Manufacturer

Total Heating Surface

No. and Description of Boilers

Tested by

Area of Fire

Area of each

In case of

Smallest diameter

Smallest diameter

Largest internal

Thickness

long, seams

Percentage

Percentage

Thickness

Material

Length of

Dimension

End plate

How are

Tube plate

Mean pitch

Girders

at centre

in each

Tensile strength

Pitch of

Front plate

Thickness

Pitch of

Main shaft

Diameter

Screw shaft

Diameter