

REPORT ON STEAM TURBINE MACHINERY.

Rpt. 4a.

No. 96890

Received at London Office

Date of writing Report

19

When handed in at Local Office

14/11/38

Port of NEWCASTLE-ON-TYNE

No. in Survey held at

Newcastle

Date, First Survey

2/2/38

Last Survey

11/11/

1938

Reg. Book.

87009 on the *Lwin Se. s/s "AMRA"*

(Number of Visits 113.)

Tons

Gross

Net

Built at Newcastle

By whom built *Swan Hunter & Wigham*

Yard No. 1570

When built 1938-11

Engines made at do

By whom made *Parsons Marine Steam Turb. Co. Ltd.*

Engine No. 318

When made 1938

Boilers made at *Ranfear & Newcastle*

By whom made *Butcher & Wilson and S. H. & W. R. L.*

Boiler No. 1570

When made 1938

Shaft Horse Power at Full Power 9700.

Owners *British India Steam Navigation Co. Ltd.*

Port belonging to

Nom. Horse Power as per Rule 2155

Is Refrigerating Machinery fitted for cargo purposes Yes

Is Electric Light fitted Yes

Trade for which Vessel is intended

Open sea service

STEAM TURBINE ENGINES, &c.—Description of Engines *Six Steam Turbines, S.R. Geared to 2 Screw Shafts.*

No. of Turbines Ahead 6, Astern 4, direct coupled, single reduction geared to Two propelling shafts. No. of primary pinions to each set of reduction gearing 3.
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.

TUBINE 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														
2ND														
3RD														
4TH														
5TH														
6TH														
7TH														
8TH														
9TH														
10TH														
11TH														
12TH														

SEE SEPARATE REPORT
ON STM. TURBINES.

SEE SEPARATE REPORT ON SIX TURBINES.

Shaft Horse Power at each turbine H.P. 1590, I.P. 1470, L.P. 1790. Revolutions per minute, at full power, of each Turbine Shaft H.P. 2872, I.P. 2872, L.P. 2462. 1st reduction wheel 134.

Rotor Shaft diameter at journals H.P., I.P., L.P. Pitch Circle Diameter 1st pinion, 1st reduction wheel, 2nd pinion, main wheel. Width of Face 1st reduction wheel, main wheel.

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings 1st pinion, 1st reduction wheel, 2nd pinion, main wheel.

Flexible Pinion Shafts, diameter 1st, 2nd. Pinion Shafts, diameter at bearings External, Internal 1st, 2nd. diameter at bottom of pinion teeth 1st, 2nd.

Wheel Shafts, diameter at bearings 1st, 2nd. diameter at wheel shroud, main 15 1/2. Generator Shaft, diameter at bearings main. Propelling Motor Shaft, diameter at bearings main.

Intermediate Shafts, diameter as per rule 13.23, as fitted 13 3/4. Thrust Shaft, diameter at collars as per rule 13.89, as fitted 14 3/8.

Tube Shaft, diameter as per rule, as fitted. Each Screw Shaft, diameter as per rule 14.46, as fitted 15. Is the after end of the liner made watertight in the propeller boss Yes.

Bronze Liners, thickness in way of bushes as per rule 74, as fitted 25/32. Thickness between bushes as per rule 56, as fitted 23/32. Is the after end of the liner made watertight in the propeller boss Yes.

If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner C.L. is in one piece. 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 tight fit.

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 no. If so, state type Length of Bearing in Stern Bush next to and supporting propeller 67.

Propeller, diameter 14.9, Pitch 14.9 MEAN. No. of Blades 4. State whether Moveable Yes. Total Developed Surface 77 square feet.

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 Yes.

No. of Turbines fitted with astern wheels 4. Feed Pumps No. and size 2 main 45 tons/hr each; 1 aux. 6.75 tons/hr. How driven by Steam Turbines.

Pumps connected to the Main Bilge Line No. and size Five: 1 of 300 tons/hr, 1 of 170 tons/hr Bilge, 2 of 100 tons/hr Bilge, 1 of 100 tons/hr Emergency Bilge. How driven by Electric Motors.

Ballast Pumps, No. and size One 8" Dunsdale R. 200 tons/hr. Lubricating Oil Pumps, including Spare Pump, No. and size Two 5" Dunsdale Vertical 12,000 galls/hr.

Are two independent means arranged for circulating water through the Oil Cooler Yes. Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge Pumps, No. and size: In Engine and Boiler Room In ER. 2 of 3"; In Blk. Rm. 2 of 3" & 1 of 2 1/2". In Pump Room.

In Holds, &c. No 1 Hold, 2 of 3"; No 2 Hold, 2 of 3"; No 3 Hold, 2 of 3"; No 4 Hold, 1 of 3"; Tunnel Well 2 of 2 1/2". Main Water Circulating Pump Direct Bilge Suctions, No. and size Two 12". Independent Power Pump Direct Suctions to the Engine Room.

Bilges, No. and size 2 of 5" in ER. & 2 of 5" in Blk. R. Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes Yes.

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 Yes.

Are all Sea Connections fitted direct on the skin of the ship Yes. Are they fitted with Valves or Cocks Both.

Are they fitted sufficiently high on the ship's side to be seen without lifting the stokehold plates Yes. Are the Overboard Discharges above or below the deep water line both.

Are they each fitted with a Discharge Valve always accessible on the plating of the vessel Yes. Are the Blow Off Cocks fitted with a spigot and brass covering plate Yes.

What pipes pass through the bunkers bilge pipes to Forward Holds. How are they protected Steel plates.

What pipes pass through the deep tanks Deep Tank not fitted. 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 Yes.

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 Yes. Is the Shaft Tunnel watertight Yes. Is it fitted with a watertight door Yes. worked from upper platform in E.R.

BOILERS, &c.—(Letter for record) Total Heating Surface of Boilers 17895 sq. ft
Is Forced Draft fitted Yes. No. and Description of Boilers THREE Babcock & Wilcox Working Pressure 450 lbs/sq. in.
Is a Report on Main Boilers now forwarded? Yes Water-tube Boilers
Is a Donkey Boiler fitted? No. If so, is a report now forwarded? Yes

Is the donkey boiler intended to be used for domestic purposes only? Yes
Plans. Are approved plans forwarded herewith for Shafting No 22/5/38 Main Boilers See Rpt on Boilers
(If not state date of approval) Auxiliary Boilers Donkey Boilers

Superheaters See Rpt on Boilers General Pumping Arrangements 27/7/38; 29/11/37 Oil Fuel Burning Arrangements ✓
SPARE GEAR.

Has the spare gear required by the Rules been supplied? Yes

State the principal additional spare gear supplied 25-4" dia Inclined tubes, 25-1 1/16" dia Inclined tubes,
25-4" dia return tubes, 24-1 1/2" dia Superheater tubes, 10-2 3/4" dia Air heater tubes,
12. Gauge glasses, 4 Safety Valve Springs for boilers; 1 set turbine bearings and 1 armature
for Turbo-Generators; 1 Armature of each size for main Circ pumps, forced draught & induced
draught fans, main & Auxy Water extraction pumps, ballast, bilge, ash ejector & fresh water pump
lub. oil pumps & ash hoist; 1 set pump impellers, and 1 set bearings for each size main &
Auxy. turbo feed pumps; 10% feed heater tubes; 50 tubes & ferrules and 100 packings for main Condens
1 spare propeller shaft & unit.

FOR
SWAN, HUNTER, & WIGHAM RICHARDSON, LTD.

The foregoing is a correct description,

E. J. Tweedy Manufacturer.

Dates of Survey while building { During progress of work in shops -- 14/38 Feb. 2. 23. Mar. 4. 8. 9. 10. 14. 15. 16. 17. 18. 21. 22. 25. 28. 30. 31. Apr. 4. 5. 6. 7. 8. 11. 13. 19. 20. 21. 22. 28. May 2. 3.
During erection on board vessel --- 9. 10. 11. 16. 18. 23. 25. 26. 27. 31. June 1. 2. 7. 10. 14. 15. 16. July 1. 5. 6. 7. 8. 11. 15. 18. 20. 22. 25. 26. 28. 29. Aug. 3. 8. 10. 11. 18.
Total No. of visits 2. 8. 9. 11.

Dates of Examination of principal parts—Casings. See Separate Report on Turbines, Rotors, Blading, Gearing
Wheel shaft ✓ Thrust shaft P 4/4/38 Intermediate shafts 13. 21. 4/38 Tube shaft P 17/3/38
Propellers S. 20/4/38 Stern tube P 8/4/38 Engine and boiler seatings 6/4/38 Engine holding down bolts 1/7/38
Completion of fitting sea connections 20/4/38 Completion of pumping arrangements 14/10/38 Boilers fired 12/9/38 at day 14/10/38: at day 11/38
Main boiler safety valves adjusted AFT 19/10/38 Thickness of adjusting washers Port Valve 35/64 9/16 9/16
Sth. " 9/16 33/64 35/64
Spt. " 7/8 1 39/64 Identification Mark

Rotor shaft, Material and tensile strength Identification Mark
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 R Steel Identification Mark PFS. 7661 HAI
Intermediate shafts, Material F Steel Identification Marks 7661 HAI & Test nos. Tube shaft, Material Identification Marks
Screw shaft, Material F Steel Identification Marks 7661 HAI Steam Pipes, Material S D Steel Test pressure 1350 lbs/sq. in.
Date of test 17/6/38 & 13/10/38 Is an installation fitted for burning oil fuel No

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.)

The machinery has been constructed & installed under special survey
The main Condensers, which are hung directly below each L.P. Turbine are supported on
springs (4 for each). The machinery has been satisfactorily tested under
working conditions and the vessel is eligible in my opinion for record
+ LMC 11.38

The amount of Entry Fee £ 6 : 0 : 0 When applied for, 15 NOV 1938
Special £ 153 : 18 : 0
Donkey Boiler Fee £ : : : When received, 19/11 1938
Travelling Expenses (if any) £ : : : 20/11

Committee's Minute

Assigned

Aulatt

Engineer Surveyor to Lloyd's Register of Shipping.



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Foundation