

REPORT ON STEAM TURBINE MACHINERY. No. 12887

Rpt. 4a.

Received at London Office 15 JAN 1946

Date of writing Report 5-1-1948 When handed in at Local Office 6-1-1948 Port of West Hartlepool

No. in Survey held at West Hartlepool Date, First Survey 12th November 1947 Last Survey 22nd December, 1947

Reg. Book. 36812 on the S.S. "ARABIA" (Number of Visits 109)

Gross Tons 8723 Net 5001

Built at Sunderland By whom built Sir Jas Laming Esq & Co Yard No. 774 When built 1947

Engines made at Hartlepool By whom made Richardson Westgarth & Co Engine No. 2764 When made 1947

Boilers made at Hartlepool By whom made Richardson Westgarth & Co Boiler No. 2767 When made 1947

Shaft Horse Power at Full Power 7250 H.P. Owners Cunard White Star Ltd. Port belonging to Liverpool

Nom. Horse Power as per Rule 1524 M.H.P. Is Refrigerating Machinery fitted for cargo purposes Yes Is Electric Light fitted Yes

Trade for which Vessel is intended Ocean going

STEAM TURBINE ENGINES, &c.—Description of Engines Double Reduction Gears Turbines

No. of Turbines Ahead 2 Direct coupled, single reduction geared to One propelling shafts. No. of primary pinions to each set of reduction gearing 2

Astern 2 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	Impulse Blading						Reaction Blading			HP Impulse Blading		
2ND	32 1/2"	33 1/2"	one				Height Cyl bore increasing tapered			at Rotor 29 1/2"	33 1/2"	one
3RD	37 1/2"		one				43 1/2"	27 1/2"	830 & 1507 1/2"	rotor 39 1/2"		one
4TH	Reaction Blading						at Rotor outlet		20	LP Reaction Blading		
5TH	Height increasing tapered									Height Cyl bore increasing tapered		
6TH	36 1/2"	71 1/2"	27				Rotor dia tapered			36 1/2"	112 1/2"	78 1/2"
7TH	at Rotor outlet	47 1/2"	623 1/2"				74 1/2"	96 1/2"		at Cyl bore 93 1/2"		6
8TH										Rotor outlet at last rotor blade		
9TH										Rotor 71 1/2"		
10TH										dia parallel		
11TH												
12TH												

Shaft Horse Power at each turbine H.P. 3625 I.P. 3625 L.P. 3625

Revolutions per minute, at full power, of each Turbine Shaft H.P. 9426 I.P. 13465 L.P. 2863

Rotor Shaft diameter at journals H.P. 5" I.P. 7" L.P. 7"

Pitch Circle Diameter 1st pinion 13.465" 1st reduction wheel 57.202" 2nd pinion 19.789" main wheel 124.647"

Width of 1st reduction wheel 22 1/2" + 22 9/16" main wheel 57 + 25 1/2" gap

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings 1st pinion 10 1/8" 1st reduction wheel 2'-8 1/2" 2nd pinion 16 1/2" main wheel 19 3/4"

Flexible Pinion Shafts, diameter 1st 11" 2nd 11"

Pinion Shafts, diameter at bearings External 1st 6'-7 1/2" 2nd 11" Internal 1st 1 1/2" - 2 1/2" 2nd 5"

diameter at bottom of pinion teeth 1st 9'-28" - 12'-9 1/2" 2nd 18'-9 1/4"

Wheel Shafts, diameter at bearings 1st 11" 2nd 11"

diameter at wheel shroud, main 18"

Generator Shaft, diameter at bearings 1st 3'-11" 2nd 9'-11 3/4"

Propelling Motor Shaft, diameter at bearings 1st 17'-0 31" 2nd 17'-4"

Intermediate Shafts, diameter as per rule 16'-22" as fitted 16 1/2"

Thrust Shaft, diameter at collars as per rule 17'-7" as fitted 18'-3 1/4"

Tube Shaft, diameter as per rule 17'-7" as fitted 18'-3 1/4"

Screw Shaft, diameter as per rule 17'-7" as fitted 18'-3 1/4"

Is the tube screw shaft fitted with a continuous liner Yes

Bronze Liners, thickness in way of bushes as per rule 842" as fitted 7/8"

Thickness between bushes as per rule 631" as fitted 13/16"

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 Yes

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 Yes

If two liners are fitted, is the shaft lapped or protected between the liners Yes

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 6'-3"

Propeller, diameter 17'-9" Pitch Varying 14'-2" No. of Blades 4 State whether Moveable No

Total Developed Surface 118.5 square feet

Can the H.P. or I.P. Turbine exhaust direct to the Condenser Yes

No. of Turbines fitted with astern wheels 2

Feed Pumps No. and size 1-8" Vert Rotary Ballast pump 1-5" Vert Rotary Bilge & Fire Pump

Pumps connected to the Main Bilge Line No. and size 1-8" Vert Rotary How driven Electric

Lubricating Oil Pumps, including Spare Pump, No. and size 2-5" Vert Rotary

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 3-3 1/2" + 2-2" ER Copper lam. In Pump Room

In Holds, &c. N1 2 1/2" N2 2 1/2" N3 2 1/2" N4 2 1/2" N5 2 1/2" N6 1-2 1/2" Tunnel Well 1-2 1/2"

Main Water Circulating Pump Direct Bilge Suctions, No. and size One 15"

Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size One 5" Ballast Pump

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 fixed 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 below

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

How are they protected

What pipes pass through the bunkers

Have they been tested as per rule Yes

What pipes pass through the deep tanks

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 top of 2nd Room

BOILERS, &c.—(Letter for record S) Total Heating Surface of Boilers 8500 sq Economiser 4810 sq
Is Forced Draft fitted Yes No. and Description of Boilers 2-D type Foster Wheeler WT Working Pressure 490 lbs
Is a Report on Main Boilers now forwarded? Yes
Is a Donkey Boiler fitted? Donkey Waste Heat Boiler fitted If so, is a report now forwarded? Yes
an Auxiliary
Is the donkey boiler intended to be used for domestic purposes only Waste heat boiler for domestic purposes only
Plans. Are approved plans forwarded herewith for Shafting 31.1.46 Main Boilers 18.6.42 Auxiliary Boilers ✓ Donkey Boilers ✓
(If not state date of approval)
Superheaters 18.6.42 General Pumping Arrangements 30.5.46 Oil Fuel Burning Arrangements 6.8.47

SPARE GEAR.
Has the spare gear required by the Rules been supplied Yes
State the principal additional spare gear supplied Spare screw shaft supplied, etc spare for 2763 12767
see also attached list.

By RICHARDSON, WESTGARTH & CO. LIMITED.

W.E. Dorey

Manufacturer.

The foregoing is a correct description,

Dates of Survey while building
During progress of work in shops -- 1945. Nov. 12. 1946. Feb. 19. March 14. June 20. Aug. 7. 12. 13. Sept. 5. 11. 12. 17. 21. Oct. 2. 16. 30. 31. Nov. 7. 22. Dec. 4. 1947. Jan. 3. 7. 14. 21. Feb. 4. 7. 12. 17. March 6. 7. 13. 14. 24. 25. 27. 28. 29. April 1. 3. 9. 10. 11. 15. 16. 17. 18. 23. 25. 29. May 2. 16. 19. 20. 23. June 3. 13. 30. July 2. 9. 10. 14. 18. 22. 23. Aug. 1. 13. 14. 15. 18. 24. 28. Sept. 1. 3. 4. 5. 10. 13. 17. 25. 28. 30. Oct. 7. 8. 10. 13. 14. 15. 16. 20. 21. 22. 23. 24. 28. Dec. 9. 22.
Total No. of visits 103.

Dates of Examination of principal parts—Casings 7.2.47 Rotors 17.4.47 Blading 17.4.47 Gearing 1.4.47
Wheel shaft 17.2.47 Thrust shaft 16.10.46 Intermediate shafts 23.7.47 Tube shaft ✓ Screw shaft 8.7.47
Propeller 8.7.47 Stern tube 8.7.47 Engine and boiler seatings 1.9.47 Engine holding down bolts 7.10.47

Completion of fitting sea connections 16.7.47 Completion of pumping arrangements 9.12.47 Boilers fired 1.9.47 Engines tried under steam 24.10.47

Main boiler safety valves adjusted 24.10.47 Thickness of adjusting washers Port 1/2" Sup 7/4" 9/4" Start 3/8" Sup 5/16" 3/4"

Rotor shaft, Material and tensile strength Carbon steel 34/38 tons Identification Mark LP 2897 EB

Flexible Pinion Shaft, Material and tensile strength Carbon steel 34/38 tons Identification Mark HP 2138 EB LP 2301

Pinion shaft, Material and tensile strength 39.5% Nickel steel 40 tons Identification Mark HP 2675 WK LP 2674

1st Reduction Wheel Shaft, Material and tensile strength 39.5% Nickel steel 40 tons Identification Mark HP 2889 EB LP 2867

Wheel shaft, Material OH Steel Identification Mark 2187 EB Thrust shaft, Material OH Steel Identification Mark 289 AEG

Intermediate shafts, Material OH Steel Identification Marks 298-299.300 307 306 312 314 315 AEG Tube shaft, Material ✓ Identification Marks ✓

Screw shaft, Material OH Steel Identification Marks 283 AEG Steam Pipes, Material S.D. Steel Test pressure 1440 lb. D.

Date of test 6.9.47 Is an installation fitted for burning oil fuel Yes

Is the flash point of the oil to be used over 150°F. Yes Have the requirements of the Rules for the use of oil as fuel been complied with Yes

Is the vessel (not being an oil tanker) fitted for carrying oil as cargo No 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 "ASIA" HPL Rpt No 18819

General Remarks (State quality of workmanship, opinions as to class, &c.) The Boilers and Machinery of this vessel

have been constructed under Special Survey and in accordance with the approved plan

On completion machinery was tested under full working conditions at sea

with satisfactory results. The materials and workmanship have been found good.

The Machinery of this vessel is eligible in my opinion to have the record

*LMC 12.47 2 WT. Boilers (Spt) 1 DB 105 lb° 1 DB 40 lb° F.D. C.L.

Fitted for oil fuel 12.47 FP above 150°F.

The amount of Entry Fee ... £ 209-12-0 :
Special ... £ 134-2 :
Welded gear case ... £ 8-8 :
Donkey Boiler Fee ... £ 8-8 :
Travelling Expenses (if any) £ : :
When applied for, 6-1-1948
When received, 19

SWOODS

Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute

Assigned + LMC 12.47

FITTED FOR OIL FUEL 12.47 FLASH POINT ABOVE 150°F. F.D. C.L. 2 WT.B 490 lb (Spt 475 lb)
1 DB 105 lb. 1 DB 40 lb



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