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# REPORT ON STEAM TURBINE MACHINERY. No. 10500

M.O.B. 17674

Date of writing Report 22-3-1944 when handed in at Local Office 24-3-1944 Port of W. Hartlepool  
No. in Survey held at Hartlepool Date, First Survey 20th Aug. 1943 Last Survey 20th Dec. 1943  
Reg. Book. S/S "EMPIRE MILNER" (Number of Visits 51)  
on the S/S "EMPIRE MILNER" Gross Tons 8135  
Built at Hawerton Hill By whom built Furness S.B. Co Yard No. 358 When built 1944  
Engines made at Hartlepool By whom made Richardson Westcott & Co. Engine No. 2742 When made "  
Boilers made at " By whom made " " " Boiler No. 2742 When made "  
Shaft Horse Power at Full Power 6800 Owners Ministry of War Transport Port belonging to Huddersburgh  
Nom. Horse Power as per Rule 1215 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes  
Trade for which Vessel is intended 1210

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

No. of Turbines Ahead 2 Direct coupled, single reduction geared, double reduction geared } to 1 propelling shafts. No. of primary pinions to each set of reduction gearing 2  
Astern 1  
Direct coupled to { Alternating Current Generator phase periods per second } rated Kilowatts Volts at revolutions per minute;  
or supplying power for driving Propelling Motors, Type  
rated Kilowatts Volts at revolutions per minute. Direct coupled, single or double reduction geared to propelling shafts.

	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	1.23	17.46	7				1.875	39.34	3	Rotor 4	49.12	1
2nd "	1.52	18.04	7				1.324	Cyl.	1	" 7	52.34	1
3rd "	1.68	18.36	6				1.896	Flare	1	" 9	55	1
4th "	2.07	19.14	6				2.468	Tapered	1	Impulse Blading		
5th "	2.58	20.16	6				3.109	between	1			
6th "	above blading preceded by 2 row impulse wheel as per particulars below						3.824	1st	1			
7th "							4.539	2nd	1			
8th "	1.715	30.47	1				5.3	12th	1			
9th "	1.68	31.69	1				6.13	Expansion	1			
10th "							7.047		1			
11th "							8.185		1			
12th "							9	56	1			

NOTE all dimensions in inches  
Shaft Horse Power at each turbine { H.P. 3500 ✓ I.P. 3300 ✓ L.P. 3300 ✓ }  
Revolutions per minute, at full power, of each Turbine Shaft { H.P. 9.426 ✓ I.P. 13.068 ✓ L.P. 2863 ✓ }  
Rotor Shaft diameter at journals { H.P. 5" ✓ I.P. 7" ✓ L.P. 7" ✓ }  
Pitch Circle Diameter { 1st pinion 13.068" 1st reduction wheel 51.204" 2nd pinion 19.789" main wheel 124.647" }  
Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion 10 1/8" 2nd pinion 16 3/4" }  
Flexible Pinion Shafts, diameter { 1st 11" 2nd 11" }  
Pinion Shafts, diameter at bearings { External 11" Internal 11" }  
Generator Shaft, diameter at bearings 11"  
Propelling Motor Shaft, diameter at bearings 11 3/4"  
Thrust Shaft, diameter at collars 16 3/4"  
Screw Shaft, diameter 17 1/4"  
Is the screw shaft fitted with a continuous liner { Yes }  
Bronze Liners, thickness in way of bushes { as per rule 1/8" as fitted 1/8" }  
Thickness between bushes { as per rule 1/8" as fitted 1/8" }  
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 }  
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 }  
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 { Yes }  
Length of Bearing in Stern Bush next to and supporting propeller 5'-10"  
Propeller, diameter 18'-0" Pitch Varying No. of Blades 4 State whether Moveable No Total Developed Surface 121 square feet.  
Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine { Yes }  
Can the H.P. Turbine exhaust direct to the condenser { Yes }  
No. of Turbines fitted with astern wheels one Feed Pumps { No. and size 2-3" Turbo Feed Pumps (Axiis) How driven Steam }  
Pumps connected to the Main Bilge Line { No. and size 1-10" x 9" x 10" Fore & Aft & 1-10" x 9" x 10" Ballast How driven Steam }  
Ballast Pumps, No. and size 1-10" x 9" x 10" Lubricating Oil Pumps, including Spare Pump, No. and size 2-9" x 8" x 18"  
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 4-3 1/2" E. & B. Space, 2-2 1/2" E. & B. Space, 2 1/2" Tunnel Hall In Pump Room  
Holds, &c.  
Main Water Circulating Pump Direct Bilge Suctions, No. and size 1-12" Independent Power Pump Direct Suctions to the Engine Room  
Bilges, No. and size 1-5" 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 }  
Do pipes pass through the bunkers { none } How are they protected { none }  
Do pipes pass through the deep tanks { none } Have they been tested as per rule { Yes }  
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

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BOILERS, &c.—(Letter for record *S*) Total Heating Surface of Boilers *6840 Sq. ft.*  
Is Forced Draft fitted *Yes* No. and Description of Boilers *2 Foster Wheeler Water-tube* Working Pressure *480 LB.*  
Is a Report on Main Boilers ~~now~~ forwarded? *Yes*  
Is *a Donkey* Boiler fitted? *Yes* 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 Shafting *25/6/42* Main Boilers *18/6/42* Auxiliary Boilers *✓* Donkey Boilers *✓*  
(If not state date of approval)  
Superheaters *22/7/42* General Pumping Arrangements *28/7/43* Oil Fuel Burning Arrangements *13/9/43*  
*SPARE GEAR.*  
Has the spare gear required by the Rules been supplied  
State the principal additional spare gear supplied

for RICHARDSONS, WESTGARTH & Co. LIMITED.

*W. S. D. Mudge*

DIRECTOR, Manufacturer.

The foregoing is a correct description,

1943. Aug 20, 24, 26. Sept 2, 3, 15, 20, 24. Oct 4, 15, 27. Nov 22, 23, 29, 30. Dec 2, 8, 10, 11, 14, 15, 16, 17, 20, 23, 25.  
1944. Jan 6, 10, 12, 17, 18, 20, 21, 25. Feb 3, 15, 16, 17, 21, 22, 25. Mar 1, 8, 9, 10, 16, 17, 20.  
Dates of Survey while building { During progress of work in shops -- }  
{ During erection on board vessel --- }  
Total No. of visits *51*  
Dates of Examination of principal parts—Casings *14/7/43* Rotors *7/10/43* Blading *20.9.43* Gearing *28/10/43*  
Wheel shaft *23/2/43* Thrust shaft Intermediate shafts *11.12.43* Tube shaft *✓* Screw shaft *2.12.43*  
Propeller Stern tube *3.12.43* Engine and boiler seatings Engine holding down bolts  
Completion of fitting sea connections Completion of pumping arrangements Boilers fixed Engines tried under steam  
Main boiler safety valves adjusted Thickness of adjusting washers  
Rotor shaft, Material and tensile strength *steel 34/38* Identification Mark *6167, 5788, 5854*  
Flexible Coupling, Material and tensile strength *Steel 28/32 Screws 34/38* Identification Mark *1092 T.T., DRN*  
Pinion shaft, Material and tensile strength *nickel steel 40* Identification Mark *S6450, S6454*  
1st Reduction Wheel Shaft, Material and tensile strength *nickel steel 40* Identification Mark *S6507, J2395 W*  
Wheel shaft, Material *Steel* Identification Mark *8425 ERB* Thrust shaft, Material *Steel* Identification Mark *21 A.E.G.*  
Intermediate shafts, Material *Steel* Identification Marks *12513 HAI* Tube shaft, Material *✓* Identification Marks *✓*  
Screw shaft, Material *Steel* Identification Marks *12305 HAI* Steam Pipes, Material *Steel* Test pressure *1290 & 1350 LB.*  
Date of test *See Nottingham Certificate 1968 & 2344* 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 *✓* 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 *RW 2741 sent Mdr. 23.3.44*

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

*The engine & boilers of this vessel have been constructed under Special Survey & in accordance with the approved plans & Specification.*

*The workmanship & materials have been found good.*

*The machinery has been forwarded to Harston Hill for fitting on board Messrs. Furness S.B. Co's Yard No 358.*

*The machinery of this vessel will be eligible, in my opinion, to have record of + LMC - with date - on completion.*

*Note: - Engine No 2745 allocated to this vessel & now renumbered 2742*

The amount of Entry Fee ... £ 6 : - : When applied for,  
Special *4/5 LMC less 3 drums* £ 95 : 19 : 4 *24/7/44*  
Donkey Boiler Fee ... £ : : When received,  
*Supervision* £ 28 : 13 : 8  
Travelling Expenses (if any) £ : : 19

*Clive Bell*  
Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute

Assigned

*see minute on DE Rpt*



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Lloyd's Register Foundation

Rpt. 5c.

JAN 1944

Date of writing Rpt.

No. in Reg. Bk.

Built at

Engines made

Boilers made

Nominal Horsepower

WATER

Date of Approval

of Boilers

No. of Certificate

Is forced draft

No. and type

each boiler

Are they fitted

Smallest diameter

Steam Drums

Range of Temperature

Cir. seams

Lap of plate

Diameter of

Working pressure

Radius of

in each boiler

welded or flange

long. seams

Percentage strength

Percentage strength

Tensile strength

Size of manhole

Material

Thickness

Inside diameter

Description of

butt straps

Working Pressure

Thickness

SUPERHEATERS

Thickness

or flanged

long. seams

Percentage strength

Percentage strength

Thickness

Working pressure

Date of Test

No. and description

Pressure to which

Spare Gear

Dates of Survey while building

Is this boiler

GENERAL

& econ.

approval

The work

Survey

Travelling

Committee

Assigned