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M.O.B. 17674

# REPORT ON STEAM TURBINE MACHINERY. No. 1000

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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 Feb, 1944  
Reg. Book. S/S "EMPIRE MILNER" (Number of Visits 51)

Built at Haverston 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  
Asteron 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.

TURBINE	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	None	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 "	1.15	30.47	1				4.539	4	1			
8th "	1.68	31.69	1				5.3	12th	1			
9th "							6.13	Expansion	1			
10th "							7.047		1			
11th "							8.185		1			
12th "							9		1			

NOTE all dimensions in inches

Shaft Horse Power at each turbine { H.P. 3500 ✓ I.P. 3300 ✓ L.P. 3969 ✓ } 1st reduction wheel 731 ✓ main shaft 116 ✓

Propeller 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" ✓ } Width of Face { 1st reduction wheel 20 1/2 + 3/4" ✓ main wheel 39 + 2/4" ✓ }

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 3/4" ✓ main wheel 20" ✓ }

External Pinion Shafts, diameter at bearings { 1st 6" ✓ 2nd 5" ✓ } diameter at bottom of pinion teeth { 1st 8.91, 12.552" ✓ 2nd 18.941" ✓ }

Internal Pinion Shafts, diameter at bearings { 1st 3'-11" ✓ 2nd 9'-11 3/4" ✓ } Generator Shaft, diameter at bearings 11" ✓ Propelling Motor Shaft, diameter at bearings 16.31" ✓

Wheel Shafts, diameter at bearings { 1st 11" ✓ main 17 1/2" ✓ } diameter at wheel shroud, { 1st 15.54" ✓ main 17 1/2" ✓ }

Intermediate Shafts, diameter as per rule 16" ✓ as fitted 16" ✓ Thrust Shaft, diameter at collars as per rule 16 3/4" ✓ as fitted 16 3/4" ✓

Propeller Shaft, diameter as per rule 17.04" ✓ as fitted 17 3/4" ✓ Is the 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 3/4" ✓ as fitted 3/4" ✓ 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 Yes.

Propeller, diameter 18'-0" ✓ Pitch Varying ✓ No. of Blades 4 ✓ State whether Moveable No ✓ Total Developed Surface 121 ✓ square feet. Length of Bearing in Stern Bush next to and supporting propeller 5'-10" ✓

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 (Weirs) ✓ How driven Steam ✓ }

Pumps connected to the Main Bilge Line { No. and size 1-10" x 9" x 10" Fore & Bilge & 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" O.B. Space, 12-2 1/2" O.B. Space, 2 1/2" Tunnel Hall ✓ In Pump Room none ✓

Holdings, &c. Main Water Circulating Pump Direct Bilge Suctions, No. and size 1-12" ✓ Independent Power Pump Direct Suctions to the Engine Room 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 all pipes pass through the bunkers none ✓ How are they protected none ✓

Do all 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 ✓

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Rpt. 5c.  
JAN 1944

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  $\frac{18}{17}$*   
 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 *22/4/42* General Pumping Arrangements *28/7/43* Oil Fuel Burning Arrangements *13/9/43*  
 Has the spare gear required by the Rules been supplied *SPARE GEAR.*  
 State the principal additional spare gear supplied

for RICHARDSONS, WESTGARTH & Co. LIMITED.

*W.S. Dunning*  
DIRECTOR, Manufacturer.

The foregoing is a correct description,

1943. Aug 20, 24, 26. Sept 2, 3, 15, 20, 24. Oct 4, 18, 27. Nov 22, 25, 29, 30. Dec 2, 8, 10, 11, 14, 15, 16, 17, 20, 23, 25.  
 1944. Jan 1, 5, 10, 12, 17, 18, 20, 21, 25. Feb 2, 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* Pinion shaft, 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 AEG*  
 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  $\frac{16}{17}$*   
 Date of test *See Nottingham Certificates 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 under 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 Havelock 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 $\frac{1}{2}$ LMC less 3 drums ... £ 95 : 19 : 4	<i>24/7 1944</i>
Donkey Boiler Fee ... £ :	When received,
Supervision	
Travelling Expenses (if any) £ 28 : 13 : 8	19...

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

Committee's Minute *TUES. 25 JUL 1944*  
 Assigned *see minute on DE Rpt*

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

Dates of Survey while building  
 Is this boiler  
 GENERAL  
 & econ  
 approved  
 The w  
 Survey F  
 Travelling

