

REPORT ON STEAM TURBINE MACHINERY.

h/db. 17523.

No. 18429

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Port of WEST HARTLEPOOL

No. in Survey held at Reg. Book. on the

Date, First Survey 6th July, 1942 Last Survey 29th June, 1943

S.S. "EMPIRE CHIEFTAIN"

Tons Gross 9904 Net 8904

Built at Harland & Wolff
Engines made at Hartlepool
Boilers made at "

By whom built Furness P.B. Co.
By whom made Richardson Westgarth & Co.
By whom made "

Yard No. 354
Engine No. 2438
Boiler No. "
When built 1943
When made 1943
When made 1943

Shaft Horse Power at Full Power 6800
Nom. Horse Power as per Rule 1214
Trade for which Vessel is intended 1210

Owners Ministry of War Transport
Is Refrigerating Machinery fitted for cargo purposes "

Port belonging to Middleborough
Is Electric Light fitted Yes

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

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
direct coupled to Alternating Current Generator phase " periods per second " 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 one 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.
1.23"	17.46"	4				7/8"	39 3/4"	3	4"	49 1/2"	1
1.52"	18.04"	4				1.324"	Cyl.	1	" 7"	52 3/4"	1
1.68"	18.36"	6				1.896"	Bore	1	" 9"	55"	1
2.07"	19.14"	6				2.468"	tapped	1			
2.58"	20.16"	6				3.109"	between	1			
cf bore blading preceded by 2 Row Impulse wheel as per particulars below			Rotor Outlet			3.824"	first t	1			
						4.539"	twelfth	1			
						5.3"	expansions	1			
						6.13"		1			
						7.047"		1			
1.68"	31.69"	1				8.185"		1			
						9	56"	1			

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. 5. I.P. 4.26. L.P. 4.26. }

Rotor Shaft diameter at journals { H.P. 5". I.P. 4". L.P. 4". }
Pitch Circle Diameter { 1st pinion 13.068". 2nd pinion 19.789". }

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 1st 14 1/2". 2nd 15". Internal 1st 14 1/2". 2nd 15". }

Wheel Shafts, diameter at bearings { 1st 11". 2nd 11". }
Generator Shaft, diameter at bearings { 1st 3'-11". 2nd 9'-11 3/4". }

Intermediate Shafts, diameter { as per rule 15.54". as fitted 15 3/4". }
Thrust Shaft, diameter at collars { as per rule 16.31". as fitted 16 3/4". }

Screw Shaft, diameter { as per rule 17.04". as fitted 17 1/2". }
Tube Shaft, diameter { as per rule 16.31". as fitted 16 3/4". }

Thickness between bushes { as per rule 6.15". as fitted 3 1/4". }
Bronze Liners, thickness in way of bushes { as per rule 8.21". as fitted 7 1/4". }

Propeller, diameter 18'-0". Pitch Varying. No. of Blades 4. State whether Moveable No. Total Developed Surface 121 square feet.

If Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine Yes. Can the H.P. or I.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 1-5" Fire & Bilge (Drysdale). How driven Electric. }

Ballast Pumps, No. and size 1-8" Drysdale electric. Lubricating Oil Pumps, including Spare Pump, No. and size 2-5" Drysdale electric.

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 Engines and Boiler Room 4-3 1/2" in ER & BR combined.

In Holds, &c. 2-3" in each No 1 & 2 Holds. 2-3 1/2" No 3 Hold. 2-3 1/2" Cargo Tank. 2-3" No 5 Hold. 2-3" No 6 Hold.

Main Water Circulating Pump Direct Bilge Suctions, No. and size 1-12". Independent Power Pump Direct Suctions to the Engine Room { No. and size 1-5 1/2" (S) Ballast Pump. }

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 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.

BOILERS, &c.—(Letter for record *S*) Total Heating Surface of Boilers *6840 Sq. ft. excluding economiser*
Is Forced Draft fitted *Yes* No. and Description of Boilers *2 Foster Wheeler D. Type* Working Pressure *480*
Is a Report on Main Boilers now forwarded? *Yes*
Is *a Donkey* Boiler fitted? *Yes* If so, is a report now forwarded? *NO*
(an Auxiliary)
Plans. Are approved plans forwarded herewith for Shifting *18.6.42* Main Boilers *18.6.42* Auxiliary Boilers Donkey Boilers
(If not state date of approval)
Superheaters *2.7.42* General Pumping Arrangements *3.6.43* Oil Fuel Burning Arrangements *3.6.43*
Spare Gear. State the articles supplied:—

W. E. Mudge
DIRECTOR

The foregoing is a correct description,

1942. July 6. Oct 14. 20. 23. Nov 2. 5. 10. 12. 19. Dec 9. 15. 22. 1943. Jan 8. 12. Feb 1. 2. 9. 10. 17. 24. March 1. 10. 17. 19. 20. 23. 27. 30. April 1. 5. 14. 22. 28. 29. 30. May 1. 3. 6. 7. 10. 11. 12. 13. 14. 15. 17. 18. 19. 20. 21. 31. June 1. 6. 7. 8. 11. 12. 15. 16. 17. 18. 20. 22. 23. 24. 25. 28. 30. 1944. July 1. 5. 12. 19. 26. 31. Aug 2. 9. 16. 23. 30. Sept 6. 13. 20. 27. Oct 4. 11. 18. 25. Nov 1. 8. 15. 22. Dec 3. 10. 17. 24. 31.

Dates of Survey while building
During progress of work in shops --
During erection on board vessel --
Total No. of visits *14*

Dates of Examination of principal parts—Casings *12.11.42* Rotors *17.2.43* Blading *17.3.43* Gearing *17.3.43*
Wheel shaft *10.2.43* Thrust shaft *16.2.43* Intermediate shafts *25/3, 4/5, 5/5/42* Tube shaft *✓* Screw shaft *3/5/43*
Propeller. Stern tube. *5/5/43* Engine and boiler seatings Engine holding down bolts
Completion of pumping arrangements Boilers fired Engines tried under steam
Main boiler safety valves adjusted Thickness of adjusting washers
Rotor shaft, Material and tensile strength *steel 34/38 1000/0'* Identification Mark *HP5487 WH*
COUPLINGS Flexible Pinion Shaft, Material and tensile strength *stars 28/32 sleeves 34/38 steel* Identification Mark *LP5733 WH*
Pinion shaft, Material and tensile strength *nickel steel 40 1000/0'* Identification Mark *41063*
1st Reduction Wheel Shaft, Material and tensile strength *nickel steel 40 1000/0'* Identification Mark *HP6140 WH*
Wheel shaft, Material *steel* Identification Mark *5287 WH* Thrust shaft, Material *steel* Identification Mark *LP5833 WH*
Intermediate shafts, Material *steel* Identification Marks *8325, 8232, 8269, 8239, 8342, 8343* Identification Marks *HP 6239 WH*
Screw shaft, Material *steel* Identification Marks *8315 E.R.B.* Steam Pipes, Material Identification Marks *LP 6237 WH*
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 carrying and burning oil fuel 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 engines & 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 Haverton Hill for fitting on board.
Messrs. Furness S.B. Co. No 354
The machinery of this vessel will be eligible, in my opinion, to have run of + L.M.C. "with date" on completion.

The amount of Entry Fee ... £ *6* : *0* : *0* When applied for,
Special *4 LMC + 20% of 2* ... £ *114* : *14* : *3* 21/1/1943
Donkey Boiler Fee ... £ : : When received,
Supervision ... £ : :
Travelling Expenses (if any) ... £ *28* : *13* : *4* 19

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

Committee's Minute

Assigned

See fee rpt. Mch. 17523