

19 NOV 1943

IN D.O.

## Report on Steam Turbine Machinery. No. 17523

Received at London Office

18 NOV 1943

Date of writing Report 3rd Nov. 19 43 When handed in at Local Office 4th Nov. 1943 Port of MIDDLESBROUGH  
 No. in Survey held at MIDDLESBROUGH Date, First Survey 16th April Last Survey 28th Oct. 1943  
 Reg. Book (Number of Visits 81)

on the s.s. "EMPIRE CHIEFTAIN" Tons (Gross 9904 Net 8904)  
 Built at HAVERTON HILL By whom built FURNESS S.B. CO. LTD. Yard No. 354 When built 1943  
 Engines made at HARTLEPOOL By whom made RICHARDSONS WESTGARTH Engine No. 2738 When made 1943  
 Boilers made at -do- By whom made -do- & CO. Boiler No. 2738 When made 1943  
 Shaft Horse Power at Full Power 6800 Owners MINISTRY OF WAR TRANSPORT Port belonging to MIDDLESBROUGH  
 Nom. Horse Power as per Rule 1210 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes  
 Trade for which Vessel is intended

## STEAM TURBINE ENGINES, &amp;c.—Description of Engines

No. of Turbines Ahead Direct coupled, single reduction geared } to propelling shafts. No. of primary pinions to each set of reduction gearing.  
 Astern Direct coupled, double reduction geared }  
 direct coupled to Alternating Current Generator phase periods per second } rated Kilowatts Volts at revolutions per minute;  
 for supplying power for driving Direct Current Generator }  
 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 |                   |                  |              |                   |                  |              |                   |                  |              |                   |                  |              |
| 2nd "         |                   |                  |              |                   |                  |              |                   |                  |              |                   |                  |              |
| 3rd "         |                   |                  |              |                   |                  |              |                   |                  |              |                   |                  |              |
| 4th "         |                   |                  |              |                   |                  |              |                   |                  |              |                   |                  |              |
| 5th "         |                   |                  |              |                   |                  |              |                   |                  |              |                   |                  |              |
| 6th "         |                   |                  |              |                   |                  |              |                   |                  |              |                   |                  |              |
| 7th "         |                   |                  |              |                   |                  |              |                   |                  |              |                   |                  |              |
| 8th "         |                   |                  |              |                   |                  |              |                   |                  |              |                   |                  |              |
| 9th "         |                   |                  |              |                   |                  |              |                   |                  |              |                   |                  |              |
| 10th "        |                   |                  |              |                   |                  |              |                   |                  |              |                   |                  |              |
| 11th "        |                   |                  |              |                   |                  |              |                   |                  |              |                   |                  |              |
| 12th "        |                   |                  |              |                   |                  |              |                   |                  |              |                   |                  |              |

Shaft Horse Power at each turbine H.P. I.P. L.P. Revolutions per minute, at full power, of each Turbine Shaft H.P. I.P. L.P. 1st reduction wheel main shaft

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

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

Wheel Shafts, diameter at bearings 1st 2nd Generator Shaft, diameter at bearings Propelling Motor Shaft, diameter at bearings

Intermediate Shafts, diameter as per rule as fitted Thrust Shaft, diameter at collars as per rule as fitted

Tube Shaft, diameter as per rule as fitted Screw Shaft, diameter as per rule as fitted Is the tube screw shaft fitted with a continuous liner

Bronze Liners, thickness in way of bushes as per rule as fitted Thickness between bushes as per rule as fitted Is the after end of the liner made watertight in the propeller boss

If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner

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

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

If so, state type Length of Bearing in Stern Bush next to and supporting propeller

Propeller, diameter Pitch No. of Blades State whether Moveable Total Developed Surface square feet

If Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine Can the H.P. or L.P. Turbines exhaust direct to the

Condenser No. of Turbines fitted with astern wheels Feed Pumps No. and size How driven

Pumps connected to the Main Bilge Line No. and size How driven

Ballast Pumps, No. and size Lubricating Oil Pumps, including Spare Pump, No. and size

Are two independent means arranged for circulating water through the Oil Cooler Suctions, connected both to Main Bilge Pumps and Auxiliary

Bilge Pumps, No. and size:—In Engine and Boiler Room In Pump Room

In Holds, &c.

Main Water Circulating Pump Direct Bilge Suctions, No. and size Independent Power Pump Direct Suctions to the Engine Room

Bilges, No. and size Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes

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

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

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

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

covering plate What pipes pass through the bunkers How are they protected

What pipes pass through the deep tanks 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

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 Is the Shaft Tunnel watertight Is it fitted with a watertight door



**BOILERS, &c.**—(Letter for record) Total Heating Surface of Boilers

Is Forced Draft fitted? No. and Description of Boilers

Working Pressure 490 lb. (Sp)

Is a Report on Main Boilers now forwarded? See West Hartlepool Report No.18422

Is a Donkey Boiler fitted? Yes

If so, is a report now forwarded? See Glasgow Report No.67085

Is the donkey boiler intended to be used for domestic purposes only?

Plans. Are approved plans forwarded herewith for Shafting. Main Boilers. Auxiliary Boilers. Donkey Boilers.

Superheaters. General Pumping Arrangements. Oil Fuel Burning Arrangements.

**SPARE GEAR.**

Has the spare gear required by the Rules been supplied. As per rule requirements (see also attached list)

State the principal additional spare gear supplied.

The foregoing is a correct description,

Dates of Survey while building: During progress of work in shops - 1943  
During erection on board vessel - April 16, 20, 27, May 6, 7, 13, 17, 20, 21, 31, June 1, 2, 4, 7, 10, 15, 17, 22, 24, 28, 29, July 5, 8, 9, 13, 14, 16, 19, 21, 23, Aug. 3, 4, 9, 11, 12, 16, 18, 19, 20, 23, 24, 25, 26, 28, 30, 31, Sep. 6, 7, 9, 13, 14, 15, 17, 18, 20, 21, 22, 23, 24, 27, 29, 30, 30, Oct. 1, 5, 7, 7, 11, 12, 14, 15, 16, 17, 23, 27, 28  
Total No. of visits: 81.  
Dates of Examination of principal parts—Casings. Rotors. Blading. Gearing.  
Wheel shaft. Thrust shaft. Intermediate shafts. Tube shaft. Screw shaft. 17.5.43  
Propeller. 31.5.43 Stern tube. 7.5.43 Engine and boiler seatings. 31.5.43 Engine holding down bolts. 16.8.43  
Completion of fitting sea connections. Completion of pumping arrangements. 22.9.43 Boilers fixed. 23.7.43 Engines tried under steam. 12.10.43  
Main boiler safety valves adjusted. 21.9.43 Thickness of adjusting washers. P. Blr. Drum- 17/64 Spt. P-5/16 S-19/64 S-11/32 Spt. P - 13/32 S = 1/4"  
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. Identification Mark.  
Intermediate shafts, Material. Identification Marks. Tube shaft, Material. Identification Marks.  
Screw shaft, Material. Identification Marks. Steam Pipes, Material. Steel. Test pressure. 1350 lbs.  
Date of test. Various dates see attached certs. (Nott. C.1828 & C.1833). 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. No. If so, state name of vessel.

**General Remarks.** (State quality of workmanship, opinions as to class, &c.) The engines and boilers were fitted on board this vessel in accordance with the approved plans and Rule requirements, and on completion the machinery was tried out under working conditions and found satisfactory (see attached report and memoranda) and in our opinion is now eligible for record of L.M.C. 10.43 and notation of T.S. (CL) 10.43, forced draught and superheated.

The amount of Entry Fee ... £ : : When applied for.  
1/5 Special LMC ... £ 26 : 1 5 5:10: 19 43  
1/5 Supervision ... £ 6 : 10 4  
Donkey Boiler Fee ... £ : :  
Super. Donkey Blr. ... £ 1 : 1 0  
Travelling Expenses (if any) £ : : 19

L. Norman Stuart & S. H. Forsyth.  
Engineer Surveyor to Lloyd's Register of Shipping.

FRI. 17 DEC 1943

Committee's Minute.

Assigned

+ LMC 10.43



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Foundation