

# REPORT ON STEAM TURBINE MACHINERY.

Received at London Office

29 JAN 1945

Date of writing Report 4th Jan. 1945 When handed in at Local Office 5th Jan. 1945, Port of MIDDLESBROUGH.  
 No. in Survey held at MIDDLESBROUGH. Date, First Survey 18th August, Last Survey 20th Dec. 1944.  
 Reg. Book. (Number of Visits 47.)  
 on the s.s. "WAVE EMPEROR". Tons { Gross 8196.  
 Net 4566.

Built at Haverton Hill-on-Tees. By whom built Furness Shipbuilding Co., Ltd. Yard No. 361 When built 1944  
 Engines made at West Hartlepool. By whom made Richardsons Westgarth & Co., Ltd. Engine No. 2748 When made 1944  
 Boilers made at -do- By whom made -do- Boiler No. 2748 When made 1944  
 Shaft Horse Power at Full Power 6800 Owners The Admiralty. Port belonging to LONDON.  
 Nom. Horse Power as per Rule 1210 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

**TEAM TURBINE ENGINES, &c.**—Description of Engines No. of Turbines <sup>Ahead</sup> <sub>Astern</sub>  
 Direct coupled, single or double reduction geared to propelling shafts. No. of primary pinions to each set of reduction gearing, direct coupled to phase  
 periods per second, Alternating Current Generator rated Kilowatts Volts at revolutions per minute; for supplying power for driving  
 Propelling Motors. Propelling Motors, Type  
 rated Kilowatts Volts at revolutions per minute. Direct coupled, single or double reduction geared to propelling shafts.

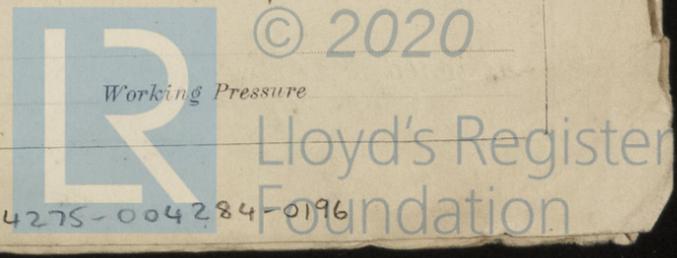
## ARTICULARS OF TURBINE BLADING.

	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												

Shaft Horse Power at each turbine **Revolutions per minute, at full power, of each Turbine Shaft** 1st reduction wheel  
 main shaft 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 teeth of pinion 1st 2nd  
 Internal  
**Wheel Shafts, diameter at bearings, 1st** main diameter at wheel shroud, 1st main.  
**Generator Shafts, diameter at bearings** **Propelling Motor Shafts, diameter at bearings**  
**Main Shafting, diameter of Tunnel Shafting** as per rule diameter of **Thrust Shafting** as per rule  
 as fitted diameter of **Screw Shaft** as per rule Is the screw shaft fitted with a continuous liner the whole length of the stern tube Is the after end of the liner  
 as fitted made watertight in the propeller boss If the liner is in more than one length are the joints burned 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 appliance fitted at the after end of the shaft to permit of it being efficiently  
 lubricated Length of Stern Bush Diameter of **Propeller**  
 Pitch of Propeller No. of Blades State whether Moveable Total Surface square feet. If Single Screw, are  
 arrangements made so that steam can be led direct to the **L.P. Turbine**, and either the **H.P. or I.P. Turbine** can exhaust direct to the Condenser

No. of Turbines fitted with astern wheels Total number of power driven **Main and Auxiliary Pumps**  
 No. and size of **Feed Pumps** How driven No. and size of Pumps connected to the **Main Bilge Line**  
 How driven No. and size of **Ballast Pumps** No. and size of **Lubricating Oil Pumps, including**  
 Spare Pump Are two independent means arranged for circulating water through the **Oil Cooler** No. and size of suction  
 connected to both Main Bilge Pumps and Auxiliary Bilge Pumps;—In Engine and Boiler Room and in Holds, &c.  
 No. and size of **Main Water Circulating Pump Bilge Suctions** No. and size of **Donkey Pump Direct Suctions**  
 to the Engine Room Bilges 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 connections with the sea direct on the skin of the ship Are they Valves or Cocks  
 Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates Are the Discharge Pipes above or below the deep water line  
 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 are carried through the bunkers How are they protected  
 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 Screw Shaft Tunnel watertight Is it fitted with a watertight door worked from

**BOILERS, &c.**—(Letter for record ) Total Heating Surface of Boilers  
 Is Forced Draft fitted No. and Description of Boilers Working Pressure



004275-004284-0196

Is a Report on Main Boilers now forwarded?

See Hartlepool Report No. 18588

Is a Donkey Boiler fitted? Yes

If so, is a report now forwarded? See Middlesbrough Rpts Nos. 1776, 1777

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

Spare Gear. State the articles supplied: - As per rule requirements (see also attached list).

The foregoing is a correct description.

Manufacturers.

Dates of Survey while building: During progress of work in shops -- 1944. Aug. 18, 31, Sept. 4, 6, 11, 12, 13, 18, 19, 20, 21, 22, 27, Oct. 2, 5, 9, 11, 16, 17, 20, 24, 26, 27, 30, Nov. 1, 2, 3, 6, 8, 10, 13, 14, 16, 17, 20, 23, 28, 30, Dec. 4, 5, 6, 7, 8, 11, 12, 13, 20.

Dates of Examination of principal parts: Casings - Rotors - Blading - Gearing - Wheel shaft - Thrust shaft - Tunnel shafts 27.10.44. Screw shaft 22.9.44. Propeller 22.9.44. Stern tube 13.9.44. Engine and boiler seatings 11.10.44. 24.10.44. Engines holding down bolts 14.11.44.

Completion of pumping arrangements 20.12.44. Boilers fixed 6.11.44. Engines tried under steam 12.12.44. Main boiler safety valves adjusted 11/12 & 23/12/44. Thickness of adjusting washers Starboard " " 23/64 " " 5/16 8 - 9/32

Material and tensile strength of Rotor shaft - Identification Mark on Do. - Material and tensile strength of Flexible Pinion Shaft - Identification Mark on Do. - Material and tensile strength of Pinion shaft - Identification Mark on Do. - Material and tensile strength of 1st Reduction Wheel Shaft - Identification Mark on Do. - Material of Wheel shaft - Identification Mark on Do. - Material of Thrust shaft - Identification Mark on Do. - Material of Tunnel shafts - Identification Marks on Do. - Material of Screw shafts - Identification Marks on Do. - Material of Steam Pipes - Test pressure - Date of test -

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 carrying and burning oil fuel been complied with Yes. Is this machinery a duplicate of a previous case Yes. If so, state name of vessel "Empire Protector".

General Remarks (State quality of workmanship, opinions as to class, &c. These 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 and in my opinion is now eligible for record of LMC, 12/44 and Notation of TS/CI/12/44 Forced draught & superheated.

Certificate (if required) to be sent to... (The Surveyors are requested not to write on or below the space for Committee's Minute.)

Table with columns for fee type (Entry Fee, Special LMC, Donkey Boiler Fee, Supervision, Travelling Expenses), amount (£), and dates (When applied for, When received).

Signature of E. Roman Stewart, Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute FRI. 26 JAN 1945

Assigned + LMC 12,44 F.D. C.L. 2 W.T.B. 490lb (Sph. 475lb) 2 D.B. 180lb. note for S.F.A.

