Rpt. 4a.

No. 17621.

REPORT ON STEAM TURBINE MACHINERY.

Received at London Office 11 APR 1944

Date of writing Report 4th April, 44 When handed in at Local Office 7th April, 44 Port of MIDDLESBROUGH.

No. in Reg. Book. Survey held at Haverton-Hill-on-Tees. Date, First Survey 25th Feb. 1943 Last Survey 29th March, 1944. (Number of Visits 52)

on the s.s. "EMPIRE LAW". Tons Gross 8128 Net 4597

Built at Haverton Hill-on-Tees. By whom built Furness Shipbuilding Co. Ltd. Yard No. 357 When built 1944

Engines made at West Hartlepool. By whom made Richardsons Westgarth. Engine No. 2741 When made 1944

Boilers made at -do- By whom made -do- Boiler No. 2741 When made 1944

Shaft Horse Power at Full Power Owners Ministry of War Transport. Port belonging to Middlesbrough.

Nom. Horse Power as per Rule 1226 (For 490 lbs. W.P.) 1210 for 475 lbs W.P. Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

STEAM TURBINE ENGINES, &c.—Description of Engines

No. of Turbines Ahead Astern

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.

PARTICULARS 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 / Internal 1st / 2nd diameter at bottom of teeth of pinion 1st 2nd

HARTLEPOOL No. 18523

Wheel Shafts, diameter at bearings, 1st main diameter at wheel shroud, 1st main

Generator Shafts, diameter at bearings SEE **Propelling Motor Shafts,** diameter at bearings

Main Shafting, diameter of **Tunnel Shafting** as per rule / as fitted REPORT diameter of **Thrust Shafting** as per rule / as fitted

diameter of **Screw Shaft** as per rule / as fitted Is the screw shaft fitted with a continuous liner the whole length of the stern tube Is the after end of the liner 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 suctions connected to both Main Bilge Pumps and Auxiliary Bilge Pumps:—In Engine and Boiler Room and in Holds, &c. Main Pump Room. 2-3½" Ford. Pump Room 3-2½" Fore peak 1-4

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

Is a Report on Main Boilers now forwarded? See Hartlepool Report No. 18523.

Are ~~Is a~~ Donkey Boilers fitted? Yes *If so, is a report now forwarded?* See Middlesbrough Reports Nos. 17532 and 17534.

Plans. *Are approved plans forwarded herewith for Shafting* - *Main Boilers* - *Auxiliary Boilers* - *Donkey Boilers* -
(If not state date of approval)

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

The foregoing is a correct description,

Manufacturer.

Dates of Survey while building — *During progress of work in shops* / *During erection on board vessel*:
1943. - Feb. 25, Sept. 30, Oct. 6, 13, 26, 28, 29, Nov. 1, 16, 19, 29, Dec. 10, 13, 14, 17, 22, 28, 29,
1944. - Jan. 4, 7, 12, 17, 18, 21, 24, Feb. 1, 2, 10, 14, 17, 21, 22, 23, 24, 28, March. 1, 2, 6, 7, 8, 9, 13, 16, 17, 20, 22, 23, 24, 27, 28, 29.

Total No. of visits 52.

Dates of Examination of principal parts—Casings - *Rotors* - *Blading* - *Gearing* -

Wheel shaft - *Thrust shaft* - *Tunnel shafts* 10/2/44 *Screw shaft* 26/10/43 *Propeller* 1/11/43.

Stern tube 13/10/43 *Engine and boiler seatings* 30/9/43 & 14/12/43 *Engines holding down bolts* 6/3/44

Completion of pumping arrangements 29/3/44. *Boilers fixed* 24/1/44 & 1/2/44 *Engines tried under steam* 23/3/44

Main boiler safety valves adjusted 23/3/44 *Thickness of adjusting washers* P. Blr. Steam Driven = 1/2" Spt. Valves P. = 7/16 S = 5/16
S. " " " = 13/32 " " P = 5/16 S = 3/8

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 See C.1967 & 2188 (Nottingham) *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 BOUNTY".

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. 3.44. and notation of TS/CL/3.44. Forced draught and superheated.

Certificate (if required) to be sent to ......

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

The amount of Entry Fee	... £	:	:	When applied for,	
Special LMC	... £	26	: 1 : 6	7:4:1944	
Donkey Boiler Fee	... £	:	:	When received.	
Supervision ~~Travelling Expenses~~ (if any)	£	6	: 10 : 4	19	

C. Norman Stuart
Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute THURS 27 APR 1944

Assigned See Jr machy rpt.