

# REPORT ON STEAM TURBINE MACHINERY. No. 102396

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Date of writing Report 5.10.44 When handed in at Local Office 6.10.44 Port of NEWCASTLE-ON-TYNE  
 No. in Survey held at Newcastle-on-Tyne Date, First Survey (1943) Sept. 29 Last Survey Sept. 20<sup>th</sup> 1944  
 Reg. Book. S/S. "EMPIRE ALLENBY" (Number of Visits 43)  
 on the Tons Gross Net  
 Built at Sunderland By whom built J. L. Thomson's Yard No. 633 When built 1944  
 Engines made at Newcastle-on-Tyne By whom made C.A. Parsons & Co., Ltd. Engine No. 2606/7 When made 1944  
 Boilers made at By whom made Boiler No. When made  
 Shaft Horse Power at Full Power 6,800 Owners Port belonging to  
 Nom. Horse Power as per Rule 1,215 Is Refrigerating Machinery fitted for cargo purposes Is Electric Light fitted  
 Trade for which Vessel is intended 1210

## STEAM TURBINE ENGINES, &c.—Description of Engines Impulse reaction steam turbines.

No. of Turbines Ahead Two Direct coupled, single reduction geared to one propelling shaft. No. of primary pinions to each set of reduction gearing Two.  
 Astern One double reduction geared  
 direct coupled to Alternating Current Generator phase periods per second rated 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 propelling shafts.

TURBINE BLADING.	H.P.			I.P.			L.P.			ASTERN.		
	EFFECTIVE HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	EFFECTIVE HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	EFFECTIVE HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.
1ST EXPANSION	1.23"	17.585"	7				0.84"	39.68"	3			
2ND	1.52"	18.165"	7				1.129"	40.258"	1			
3RD	1.68"	18.485"	6				1.696"	41.392"	1			
4TH	2.07"	19.265"	6				2.268"	42.586"	1			
5TH	2.58"	20.285"	6				2.834"	43.668"	1			
6TH							3.55"	45.10"	1			
7TH							4.259"	46.518"	1			
8TH							4.977"	47.954"	1			
9TH							5.802"	49.604"	1			
10TH							6.634"	51.268"	1			
11TH							7.66"	53.32"	1			
12TH							8.92"	55.84"	1			

Shaft Horse Power at each turbine H.P. 3,500. I.P. 3,971. L.P. 3,300. 1st reduction wheel L.P. 731. main shaft 116.  
 Rotor Shaft diameter at journals H.P. 5" I.P. 13.0688" L.P. 7" 1st pinion L.P. 13.0688" 1st reduction wheel 51.2041" main wheel 124.6478" 2nd pinion 19.7894" 2nd reduction wheel 38 3/4".

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings 1st pinion 6" 2nd pinion 38 3/4" 1st reduction wheel 38 3/4" main wheel 442".  
 Flexible Pinion Shafts, diameter 1st 11" 2nd 17 1/2" Pinion Shafts, diameter at bearings External 1st 47" 2nd 5" Internal 1st 47" 2nd 5" Generator Shaft, diameter at bearings 11" Propelling Motor Shaft, diameter at bearings 119 3/4".

Wheel Shafts, diameter at bearings 1st 11" 2nd 17 1/2" 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 I.P. Turbine 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 to both 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 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 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 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? ✓  
Is { a Donkey } Boiler fitted? ✓ 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 ✓ Main Boilers ✓ Auxiliary Boilers ✓ Donkey Boilers ✓  
(If not state date of approval)  
Superheaters ✓ General Pumping Arrangements ✓ Oil Fuel Burning Arrangements ✓  
**SPARE GEAR.**  
Has the spare gear required by the Rules been supplied ✓  
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) Sept. 29, Oct. 1, 18, 27, 28, 29 Nov. 23, Dec. 1, 3, 6, 10, 14, 15, 17, 20, 23 (1944) Jan. 10, 11, 18, 20, 25  
During erection on board vessel -- 31 Feb. 1 Mar. 4, 6, 24 Apr. 27 May 17, 18, 25 June 1, 21, 22 July 12, 19, 20, 25, 31 Aug. 23, 26  
Total No. of visits 43

Dates of Examination of principal parts—Casings 29.9.43 etc. Rotors 18.10.43 etc. Blading 6.12.43 etc. Gearing 23.11.43 etc.

Wheel shaft 24.3.44 etc. Thrust shaft ✓ Intermediate shafts ✓ Tube shaft ✓ Screw shaft ✓

Propeller ✓ Stern tube 30/9/44 ✓ Engine and boiler seatings ✓ Engine holding down bolts ✓

Completion of fitting sea connections 17/10/44 ✓ Completion of pumping arrangements ✓ Boilers fixed ✓ Engines tried under steam ✓

Main boiler safety valves adjusted ✓ Thickness of adjusting washers ✓

Rotor shafts Material and tensile strength H.P.: C.M. Mo. steel, 40.1 Tons/ft<sup>2</sup> L.P.: O.H. steel 38.4 Tons/ft<sup>2</sup> Identification Mark H.P.: LLOYDS, 55790 L.P.: LLOYDS, J243 BG. 22.3.

Flexible Pinion Shaft, Material and tensile strength Identification Mark LLOYDS, 5768

Pinion shafts Material and tensile strength H.P.: Ni. steel, 41.6 Tons/ft<sup>2</sup> L.P.: Ni. steel, 39.8 Tons/ft<sup>2</sup> Identification Mark H.P.: 6.9.43 WH. L.P.: 3.9.4

1st Reduction Wheel Shafts Material and tensile strength Port: Siemens steel, 43.2 Tons/ft<sup>2</sup> Starb.: Ni. steel, 40.8 Tons/ft<sup>2</sup> Identification Mark Port: 29.9.43 STD. 3.12.4

Wheel shaft, Material O.H. imp. steel. Identification Mark 29.10.43 H.M.I. Thrust shaft, Material Identification Mark ✓

Intermediate shafts, Material Identification Marks ✓ Tube shaft, Material Identification Marks ✓

Screw shaft, Material Identification Marks ✓ Steam Pipes, Material Test pressure ✓

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 the use of oil as fuel been complied with ✓

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 S.S. EMPIRE SHEBA

General Remarks (State quality of workmanship, opinions as to class, &c.) This machinery has been constructed under

Special Survey in accordance with the Secretary's letters, approved plans, specification and

the Society's Rules.

Materials and workmanship are good.

The machinery has now been despatched to Messrs. North Eastern & Mercantile Dock Co. Ltd.

Newcastle-on-Tyne for installation in the vessel.

Forging Reports will be sent on completion of this type machinery with D/R Clearing

These have been satisfactory and after working conditions are satisfactory

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