

REPORT ON STEAM TURBINE MACHINERY.

No. 102035

Rpt. 4a.

Date of writing Report 26-4 1944 When handed in at Local Office 26-4 1944 Port of NEWCASTLE-ON-TYNE Received at London Office 25 APR 1944

No. in Survey held at NEWCASTLE-ON-TYNE Date, First Survey (1943) Apr. 28 Last Survey 12th April 1944
 Reg. Book. on the 5/5 "EMPIRE SHEBA" (Wave King) (Number of Visits 52)

Built at GLASGOW By whom built HARLAND AND WOLFF LD. Yard No. 1222 (G) When built 1944
 Engines made at NEWCASTLE-ON-TYNE By whom made C.A. PARSONS AND CO. LD. Engine No. 2574/5 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 (1215) 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 to ONE propelling shafts. No. of primary pinions to each set of reduction gearing TWO
 Astern ONE single reduction geared }
double reduction geared }

direct coupled to { Alternating Current Generator ✓ phase _____ periods per second _____
 Direct Current Generator _____ 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 _____ propelling shafts.

TURBINE BLADING.

| 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 | | | | 1.23" | 39.68" | 3 | | | |
| 2ND " | 1.52" | 18.165" | 7 | | | | 1.129" | 40.258" | 1 | | | |
| 3RD " | 1.68" | 18.485" | 6 | | | | 1.626" | 41.392" | 1 | | | |
| 4TH " | 2.07" | 19.265" | 6 | | | | 2.268" | 42.536" | 1 | | | |
| 5TH " | 2.58" | 20.285" | 6 | | | | 2.834" | 43.668" | 1 | | | |
| 6TH " | | | | | | | 3.55" | 45.1" | 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 " | 7.15" | 30.47" | 1 | | | | 7.66" | 53.32" | 1 | | | |
| 12TH " | 1.68" | 31.69" | 1 | | | | 8.92" | 55.84" | 1 | | | |

Shaft Horse Power at each turbine { H.P. 3,500 ✓
 I.P. _____ ✓
 L.P. 3,300 ✓ } Revolutions per minute, at full power, of each Turbine Shaft { H.P. 3971 ✓
 I.P. _____ ✓
 L.P. 2865 ✓ } 1st reduction wheel L.P. 731 ✓
 main shaft 116 ✓

Rotor Shaft diameter at journals { H.P. 5" ✓
 I.P. _____ ✓
 L.P. 7" ✓ } Pitch Circle Diameter { 1st pinion L.P. 13.0688 ✓ 1st reduction wheel 51.2041 ✓
 2nd pinion 10.7894 ✓ main wheel 124.6478 ✓ } Width of Face { 1st reduction wheel 20 1/2 ✓
 main wheel 39 ✓

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion HP 13 1/4 ✓
 LP 16 3/4" ✓ } 1st reduction wheel 38 3/4 ✓
 2nd pinion 38 3/4 ✓ } main wheel 42 ✓

Flexible Pinion Shafts, diameter { 1st _____ ✓
 2nd _____ ✓ } Pinion Shafts, diameter at bearings { External 1st HP 7 1/2 ✓
 Internal 1st HP 1 1/2 ✓ 2nd 5" ✓ } diameter at bottom of pinion teeth { 1st HP 9.2809 ✓
 2nd 18.9412 ✓ }

Wheel Shafts, diameter at bearings { 1st 11" ✓
 main 17 1/2 ✓ } diameter at wheel shroud, { 1st 47" ✓
 main 119 3/4 ✓ } 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 } shaft fitted with a continuous liner { _____
 screw } _____

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 mated 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 _____ Working Pressure _____
 Is Forced Draft fitted _____ No. and Description of Boilers _____
 Is a Report on Main Boilers now forwarded? _____ If so, is a report now forwarded? _____
 Is { a Donkey } Boiler fitted? _____
 { an Auxiliary }
 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 _____



Manufacturer.

The foregoing is a correct description,

Dates of Survey while building { During progress of work in shops -- (1943) Apr. 28, 30, May 24, 26, 29, 31 June 1, 10, 19, 29 July 2, 16, 28 Aug. 16, 27 Sept. 1, 2, 3, 7, 17, 22, 27 Oct. 6, 8, 18, 19, 21, 27, 28 Nov. 6, 15, 23 Dec. 1, 14, 20, 23, 30, 31 (1944) Jan. 5, 10, 18, 20, 22, 25, 27, 31 Mar. 4, 6, 15, 21 Apr. 12 }
 Total No. of visits 52
 Dates of Examination of principal parts—Casings 19-6-43 etc. Rotors 16-8-43 etc. Blading 16-8-43 etc. Gearing 27-8-43 etc.
 Wheel shaft 27-8-43 etc. Thrust shaft _____ Intermediate shafts _____ Tube shaft _____ Screw shaft _____
 Propeller _____ Stern tube _____ Engine and boiler seatings _____ Engine holding down bolts _____
 Completion of fitting sea connections _____ 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. - O.H. STEEL, 36 TONS/INS². L.P. 39 TONS/INS². Identification Mark H.P. 15834 L.P. 13432
 Flexible Pinion Shaft, Material and tensile strength Identification Mark H.P. 13935 L.P. 13939
 Pinion shafts Material and tensile strength H.P. - O.H. STEEL (Ni) 44 TONS/INS². L.P. - O.H. STEEL (Ni) 45 TONS/INS². Identification Mark H.P. 13943 L.P. 13947
 1st Reduction Wheel Shaft, Material and tensile strength PORT - O.H. STEEL (Ni) 45 TONS/INS². STD. O.H. STEEL (Ni) 44 TONS/INS². Identification Mark PORT 13943 STD. 13947
 Wheel shaft, Material O.H. STEEL. Identification Mark LLOYDS. S. 6498 Thrust shaft, Material Identification Mark
 Intermediate shafts, Material Identification Marks W.H. 73-43. 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 EMPIRE CAPTAIN, out Dundee 29/4/44
 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 Glasgow for installation in a Vessel classified with the British Corporation Register.
 Forging Reports will be sent on completion of this type Engine Programme.

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

The amount of Entry Fee 7/5 £ 52 : 3 :
 SPECIFICATION 25% ... £ 13 : 0 : 9 }
 Donkey Boiler Fee ... £ : :
 Travelling Expenses (if any) £ : :
 When applied for, 24 APR 1947
 When received, 19

John E. Martin
 Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute
 Assigned N.S. for Classing Committee

