

Report on Steam Turbine Machinery.

No. 18802
21 DEC 1946

Date of writing Report 19-12-1946 When handed in at Local Office 20-12-1946 Port of West Hartlepool
No. in Survey held at Hartlepool Date, First Survey 11-2-44 Last Survey 12-12-1946
Reg. Book (Number of Visits 144)

on the S.S. WAVE PREMIER Tons {Gross
Net
Built at HAVERTON HILL & TEES By whom built FURNESS S.B.C. L^d Yard No. 389 When built 1946
Engines made at HARTLEPOOL By whom made RICHARDSONS WESTGARTH L^d Engine No. 2753 When made 1946
Boilers made at HARTLEPOOL By whom made RICHARDSONS WESTGARTH L^d Boiler No. When made 1946
Shaft Horse Power at Full Power 6800 Owners THE ADMIRALTY Port belonging to LONDON
Nom. Horse Power as per Rule 1470 MN Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted YES
Trade for which Vessel is intended

STEAM TURBINE ENGINES, &c.—Description of Engines. Double Reduction Gear Turbines.

No. of Turbines Two Ahead Two Direct coupled, single reduction geared } to One propelling shafts. 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 — Kilowatts — Volts at — revolutions per minute;
or supplying power for driving { Direct Current Generator }
Propelling Motors, Type —
at — Kilowatts — Volts at — revolutions per minute. Direct coupled, single or double reduction geared to — propelling shafts.

| TURBINE | H. P. | | | I. P. | | | L. P. | | | ASTERN. | | |
|---------------|--|---------------------|-----------------|----------------------|---------------------|-----------------|--|--|-----------------------|---|---------------------------------------|------------------------------------|
| LOADING. | 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 | 1.23" | 17.46" | 7 | | | | Height varies from 2" at 1st Row to 34.1" at 57.8" | Cyl. line is tapers from 2" all | 18 | 94" Rotor Outlet | 45.02 | 12 Impulse Blades |
| 2nd | 1.52" | 18.04" | 7 | | | | | | | | 45.49 | |
| 3rd | 1.68" | 18.36" | 6 | | | | | | | | | |
| 4th | { 2.07 0.57 L 2.75 Taper 19.44 | { 19.44 19.44 | { 3 3 | | | | 9.9" at last row at Outlet side | Rotor dia. is tapers 30" 38" | increasing heights | Height varies from 1.75" at 1st Rotor Blade | Cyl. line is tapers from 31.27" | 4 in at 9 increasing heights |
| 5th | 3.05 L 3.42 Taper 21.34 | 21.34 | 6 | | | | | | | | | |
| 6th | Cyl. line tapers Rotor 14 1/2" dia throughout | | | | | | 9 Rotor Blades | last 38" dia parallel in way of 6 final rotor blades | | 3.75" at last Rotor Blade outlet | 35.5" | Raction Blading |
| 7th | Above blading preceded by | | | | | | | | | | | |
| 8th | 2 Rows impulse wheel as follows | | | | | | | | | | | |
| 9th | | | | | | | | | | | | |
| 10th | | | | | | | | | | | | |
| 11th | 1.715 | 30.47 | 1 | | | | | | | | | |
| 12th | 1.68 | 31.49 | 1 | | | | | | | | | |

Shaft Horse Power at each turbine { H.P. 3400 ✓ I.P. 3400 ✓ L.P. 3400 ✓ }
Revolutions per minute, at full power, of each Turbine Shaft { H.P. 5700 ✓ I.P. 5700 ✓ L.P. 5700 ✓ }
Rotor Shaft diameter at journals { H.P. 5" ✓ I.P. 5" ✓ L.P. 7" ✓ }
Pitch Circle Diameter { 1st pinion 19.789" ✓ 2nd pinion 19.789" ✓ }
1st reduction wheel 57.204" ✓ main wheel 124.647" ✓

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion 10'6" ✓ 2nd pinion 16'4" ✓ }
1st reduction wheel 20'8" ✓ main wheel 20" ✓

Flexible Pinion Shafts, diameter { 1st 11" ✓ 2nd 11" ✓ }
Pinion Shafts, diameter at bearings { 1st 11" ✓ 2nd 11" ✓ }
Wheel Shafts, diameter at bearings { 1st 11" ✓ 2nd 11" ✓ }
Main 17'1/2" ✓ diameter at wheel shroud, { 1st 3'11" ✓ 2nd 3'11" ✓ }
Generator Shaft, diameter at bearings. ✓
Propelling Motor Shaft, diameter at bearings. ✓

Intermediate Shafts, diameter { as per rule 15.52" ✓ as fitted 16" ✓ }
Thrust Shaft, diameter at collars { as per rule 16.31" ✓ as fitted 17" ✓ }

Tube Shaft, diameter { as per rule 17.04" ✓ as fitted 17'3/4" ✓ }
Screw Shaft, diameter { as per rule 17.04" ✓ as fitted 17'3/4" ✓ }
Is the { tube screw } shaft fitted with a continuous liner { Yes ✓ }

Bronze Liners, thickness in way of bushes { as per rule 821" ✓ as fitted 7/8" ✓ }
Thickness between bushes { as per rule 6.15" ✓ as fitted 3/4" ✓ }
Is the after end of the liner made watertight in the propeller boss. Yes ✓

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. Yes ✓
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. ✓

Propeller, diameter 18'0" ✓ Pitch Varying ✓ No. of Bades 4 ✓ State whether Moveable No ✓ Total Developed Surface 121 square feet. ✓
If Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine. Yes ✓ Can the H.P. or I.P. Turbines exhaust direct to the Condenser. Yes ✓

No. of Turbines fitted with astern wheels One ✓ Feed Pumps { No. and size 2-3" Turbo Feed Pump. (Main) ✓ How driven Steam ✓ }
Pumps connected to the Main Bilge Line { No. and size One - 10" x 9" x 10" Fin. & Bilge. ✓ One 10" x 9" x 10" Ballast ✓ How driven Steam ✓ }

Ballast Pumps, No. and size One 10" x 9" x 10" ✓ Lubricating Oil Pumps, including Spare Pump, No. and size Two 9" x 8" x 18" ✓

Are two independent means arranged for circulating water through the Oil Cooler Yes ✓ Suctions, connected both to Main Bilge Pumps and Auxiliary Bilge Pumps, No. and size:—In Engine and Boiler Room 4-3 1/2" ✓ 2-2 1/2" ✓ Eng. & Boiler spaces 1-2 1/2" ✓ In Pump Room A 2-4" ✓

In Holds, &c. ✓ Main Water Circulating Pump Direct Bilge Suctions, No. and size One - 13 1/2" ✓ Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size One - 5" & Ballast Pump ✓

Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes. Yes ✓ 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. Yes ✓

Are all Sea Connections fitted direct on the skin of the ship. Yes ✓ Are they fitted with Valves or Cocks. Both. ✓ Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates. Yes ✓

Are the Overboard Discharges above or below the deep water line. Below ✓ Are they each fitted with a Discharge Valve always accessible on the plating of the vessel. Yes ✓ Are the Blow Off Cocks fitted with a spigot and brass covering plate. Yes ✓

What pipes pass through the bunkers. ✓ How are they protected. ✓ 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. Yes ✓ 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. Yes ✓

Is the Shaft Tunnel watertight. Yes ✓ Is it fitted with a watertight door. No ✓ worked from. ✓

BOILERS, &c.—(Letter for record *S.*) Total Heating Surface of Boilers *6840 sq 10905*
Is Forced Draft fitted *Yes* No. and Description of Boilers *2 - Type Foster Wheeler* Working Pressure *490 lb. (Spec. 475 lb.)*
Is a Report on Main Boilers now forwarded? *Yes* HPL Rpt N° 18734.
Is ^{a Donkey} ~~an~~ Auxiliary Boiler fitted? *2 - Marine Type* If so, is a report now forwarded? *Yes* SLD. Rpt N° 34460
Is the donkey boiler intended to be used for domestic purposes only. *✓*
Plans. Are approved plans forwarded herewith for Shafting *25/6/42* Main Boilers *18/6/42* Auxiliary Boilers. *✓* Donkey Boilers. *✓*
(If not, state date of approval)
Superheaters *22/7/42* General Pumping Arrangements *30/9/43* Oil Fuel Burning Arrangements *1/6/44*

SPARE GEAR.

Has the spare gear required by the Rules been supplied. *Yes*
State the principal additional spare gear supplied. *See attached list.*

For RICHARDSONS, WESTGARTH & Co. LIMITED.

W.E. Loring

Manufacture

The foregoing is a correct description,

Dates of Survey while building
During progress of work in shops - 1944. Feb. 11-12-16-18-21-24. March 2-30. April 3-4-6-12-15-29. May 3-19-26-30. June 7-8-9-15-20-26-27-28-30. July 5-26. Aug. 9-10-16-24-25-28-30. Sept. 13-16-21-22-23-29-Oct. 2-3-4-11-13-20-25. Nov. 2-3-13-24-27-30. Dec. 1-6-7-1945. Jan. 19-30. Feb. 15-20-21. March 6-7-19-30. April 12. May 1-8. Aug. 9-1946. Feb. 12. March 8-15-18-19-21-22-23-26. Aug. 6-7-8-13-14-15-19-21-22-23-26-29. Sept. 2-4-5-9-11-23-24-25-27-Oct. 3-31. Dec. 6-12
During erection on board vessel -
Total No. of visits

Dates of Examination of principal parts—Casings *21-2-45* Rotors *21-2-45* Blading *21-2-45* Gearing *29-5-46*
Wheel shaft *10-5-45* Thrust shaft *8-4-46* Intermediate shafts *8-4-46* Tube shaft *✓* Screw shaft *28/5/46*
Propeller *28/5/46* Stern tube *9/5/46* Engine and boiler seatings *4/9/46* Engine holding down bolts *4/9/46*
Completion of fitting sea connections *12/6/46* Completion of pumping arrangements *25/9/46* Boilers fixed *7/8/46* Engines tried under steam *24/9/46*
Main boiler safety valves adjusted *24/9/46* Thickness of adjusting washers *Port Drum 1/4" 3/8" Super. Steam 1 1/2" 3/4" 5/8"*
Rotor shaft, Material and tensile strength *Steel 24/38 tons* Identification Mark *HP 2521 FJM LP 9307 JD*
Flexible ^{Couplings} Pinion Shaft, Material and tensile strength *Steel Stan 28/32 tons sleeves 34/38 tons* Identification Mark *HP 8568 WH LP 189*
Pinion shaft, Material and tensile strength *Nickel steel 40 tons* Identification Mark *HP 59247 WH LP 59266 WH*
1st Reduction Wheel Shaft, Material and tensile strength *Nickel steel 40 tons* Identification Mark *HP 59247 WH LP 59266 WH*
Wheel shaft, Material *OH Steel* Identification Mark *8813 ERB* Thrust shaft, Material *OH Steel* Identification Mark *8843 ERB*
Intermediate shafts, Material *OH Steel* Identification Marks *8843 ERB 8714 ERB 12064 HAI* Tube shaft, Material *✓* Identification Marks *✓*
Screw shaft, Material *OH Steel* Identification Marks *14/46 HAI* Steam Pipes, Material *Steel* Test pressure *1440 lb. (1470 Rule)*
Date of test *15/7/46 & 23/8/46* 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. *Yes* If so, state name of vessel *NAVA SOVEREIGN HPL 18639.*

General Remarks. (State quality of workmanship, opinions as to class, &c.) *The Boilers & Machinery of this vessel have been constructed under Special Survey in accordance with Society's Rules, approved plans & specification. On completion machinery was tested under working conditions at sea, with satisfactory results. The materials & workmanship have been found good & in my opinion is suitable for classed + LMC 12.46 with notation C.L. 2 WT. Boilers (spt) 2 aux boilers FD & fitted for oil fuel 12.46 FP above 150°F.*

The amount of Entry Fee ... £ *6* : - : When applied for.
Special + LMC ... £ *15* : 15 : *20-12-1946*
20% for holding. 10 18 9
Donkey Boiler Fee ... £ : : When received.
Super. 36 18 5
Travelling Expenses (if any) *double* £ *25* : - : 19

Engineer Surveyor to Lloyd's Register of Shipping.



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Certificate (if required) to be sent to

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

Committee's Minutes

FRI. 17 JAN 1947

Assigned

+ LMC 12.46

FITTED FOR OIL FUEL

12.46 FLASH POINT ABOVE 150°F.

F.D. C.L.

2 WT.B 490lb (Spt. 475lb) 2 D.B. 180lb.