

## REPORT ON STEAM TURBINE MACHINERY.

Received at London Office 29 MAR 1945

Date of writing Report 20th Mar 45 When handed in at Local Office 24th Mar 45 Port of MIDDLESBROUGH.

No. in Survey held at MIDDLESBROUGH. Date, First Survey 18th Sept. 1944 Last Survey 8th March, 1945, Reg. Book.

on the s.s. "WAVE GOVERNOR".

(Number of Visits 50) Tons { Gross 8196 Net 4568

Built at Haverton Hill-on-Tees. By whom built Furness Shipbuilding Co. Ltd. Yard No. 362 When built 1945-5

Engines made at West Hartlepool. By whom made Richardsons Westgarth &amp; Co. Ltd. Engine No. 2751 When made 1945

Boilers made at -do- By whom made -do- Boiler No. 2751 When made 1945

Shaft Horse Power at Full Power 6800 Owners The Admiralty. Port belonging to LONDON.

Nom. Horse Power as per Rule 1220 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

## STEAM TURBINE ENGINES, &amp;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 \_\_\_\_\_

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 \_\_\_\_\_ as per rule \_\_\_\_\_ as fitted \_\_\_\_\_ diameter of Thrust Shafting \_\_\_\_\_ as per rule \_\_\_\_\_ as fitted \_\_\_\_\_

Tunnel Shafting \_\_\_\_\_

diameter of Screw Shaft \_\_\_\_\_ as per rule \_\_\_\_\_ as fitted \_\_\_\_\_ SEE 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 \_\_\_\_\_

connected to both Main Bilge Pumps and Auxiliary Bilge Pumps;—In Engine and Boiler Room \_\_\_\_\_ and in Holds, &amp;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 \_\_\_\_\_

BOILERS, &amp;c.—(Letter for record \_\_\_\_\_) Total Heating Surface of Boilers \_\_\_\_\_

Is Forced Draft fitted \_\_\_\_\_ No. and Description of Boilers \_\_\_\_\_



Is a Report on Main Boilers now forwarded?

See Hartlepool Report No. 18600

Are

Is a Donkey Boiler fitted?

Yes

If so, is a report now forwarded? See Middlesbrough Rpts. Nos. 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

Plans. Are approved plans forwarded herewith for Shafting  
(If not state date of approval)

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,

Manufacturer.

Dates of Survey while building  
During progress of work in shops -- 1944. Sept. 18, 22, Oct. 9, 12, 16, 17, 25, 26, Nov. 2, 3, 6, 7, 13, 14, 15, 16, 17, 23, 27, 28, 30, Dec. 4, 6, 7, 14, 18, 22, 27, 1945. Jan. 3, 11, 14, 15, 18, 19, 22, 25, 29, Feb. 2, 6, 8, 12, 16, 19, 20, 21, 23, 28, March, 2, 7, 8.  
During erection on board vessel --  
Total No. of visits 50.

Dates of Examination of principal parts—Casings Rotors Blading Gearing  
Wheel shaft Thrust shaft Tunnel shafts 11/1/45 Screw shaft 13/11/44 Propeller 14/11/44  
Stern tube 26/10/44. 7/11/44 24/11/44 Engine and boiler seatings 26/10/44 8/12/44 Engines holding down bolts 29/1/45  
Completion of pumping arrangements 28/2/45 Boilers fired 3/1/45 Engines tried under steam  
Main boiler safety valves adjusted 21/2/45. Thickness of adjusting washers Port Blr:- Drum 5/16 Spt. P = 5/16 S = 5/16  
Starbd. " " " " " = 9/32 S = 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".  
Have Emperor. with Mr. Dyke.

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. 3/45. and notation of TS/CL/3/45. forced draught and superheated.

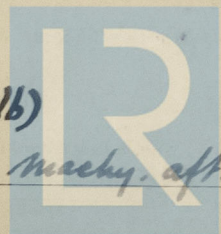
The amount of Entry Fee ... £ : : When applied for.  
Special LMC ... £ 26 - 1 - 6 28.3.19.45.  
Donkey Boiler Fee ... £ : : When received.  
Supervision  
Travelling Expenses (if any) £ 6 - 10 - 4 19.

L. Hurman Stuart  
Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute

FRI. 13 APR 1945

Assigned + LMC 3.45 F.D. C.L. 2 W.T.B. 490lb (Spt. 475lb)  
FITTER FOR SEA PVEL. 3.45 FLASH POINT ABOVE 140° F. 2 D.B. 180lb.



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