

REPORT ON MACHINERY.

Date of writing Report Mar 26th 1923 When handed in at Local Office April 4th 1923 Port of Belfast Received at London Office APR. 11 1923

No. in Survey held at Belfast Date, First Survey Feb 23 1920 Last Survey Mar 27 1923

Reg. Book. on the Steel S.S. "Imveravon" (Number of Visits 76) Gross 6906.53 Net 2651.49

Master Belfast Built at Belfast By whom built Harland & Wolff Ltd (591) Tons 591 When built 1923

Engines made at Belfast By whom made Harland & Wolff Ltd No. 591 when made 1923

Boilers made at Belfast By whom made Harland & Wolff Ltd when made 1923

Registered Horse Power 540 Owners British Mexican Petroleum Co. Ltd. Andrew Weir Mgr. Port belonging to London

Nom. Horse Power as per Section 28 534 540 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

ENGINES, &c.—Description of Engines Single Screw Triple Expansion No. of Cylinders 3 No. of Cranks 3

Dia. of Cylinders 24 x 44 x 42 Length of Stroke 48 Revs. per minute 12 Dia. of Screw shaft 14.8 Material of screw shaft Steel

Is the screw shaft fitted with a continuous liner the whole length of the stern tube Yes Is the after end of the liner made water tight in the propeller boss Yes If the liner is in more than one length are the joints burned 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 Yes Length of stern bush 5'-6"

Dia. of Tunnel shaft 12.22 Dia. of Crank shaft journals 12.99 Dia. of Crank pin 14.34 Size of Crank webs 28 x 9 Dia. of thrust shaft under collars 15 Dia. of screw 18'-0" Pitch of Screw 16'-6" No. of Blades 4 State whether moveable Yes Total surface 102

No. of Feed pumps 2 Diameter of ditto 4 1/2 Stroke 24 Can one be overhauled while the other is at work Yes

No. of Bilge pumps 2 Diameter of ditto 4 1/2 Stroke 24 Can one be overhauled while the other is at work Yes

No. of Donkey Engines See following Sizes of Pumps 1 @ 4", 6 @ 3 1/2", 5 @ 2 1/2" No. and size of Suctions connected to both Bilge and Donkey pumps In Engine Room 2 @ 4", 6 @ 3 1/2", 5 @ 2 1/2" In Holds, &c. 11 @ 3 1/2" & 1 @ 3"

No. of Bilge Injections 1 sizes 1 1/2" Connected to condenser, or to circulating pump Yes Is a separate Donkey Suction fitted in Engine room & size Yes 4"

Are all the bilge suction pipes fitted with roses Yes Are the roses in Engine room always accessible Yes Are the sluices on Engine room bulkheads always accessible Yes

Are all connections with the sea direct on the skin of the ship Yes Are they 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 Discharge Pipes above or below the deep water line Both

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 are carried through the bunkers Main Cargo Line How are they protected Yes

Are all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times Yes

Are the Bilge Suction Pipes, Cocks, and Valves arranged so as to prevent any communication between the sea and the bilges Yes

Is the Screw Shaft Tunnel watertight Yes Is it fitted with a watertight door Yes worked from Top platform

BOILERS, &c.—(Letter for record 5) Manufacturers of Steel D. B. Sullivan & Sons Ltd

Total Heating Surface of Boilers 10224 Is Forced Draft fitted No No. and Description of Boilers 4 Single ended

Working Pressure 180 lbs Tested by hydraulic pressure to 360 lbs Date of test 1-12-22 No. of Certificate 818

Can each boiler be worked separately Yes Area of fire grate in each boiler oil fuel No. and Description of Safety Valves to each boiler 2 spring loaded Area of each valve 11.04 Pressure to which they are adjusted 185 lbs Are they fitted with easing gear Yes

Smallest distance between boilers or uptakes and bunkers or woodwork 24" dia. of boilers 15'-6" Length 11'-6" Material of shell plates Steel

Thickness 1/2" Range of tensile strength 98 to 102 tons Are the shell plates welded or flanged No Descrip. of riveting: cir. seams DR. lap long. seams T.R.D.S. Diameter of rivet holes in long. seams 1 1/16" Pitch of rivets 9.175 Lap of plates or width of butt straps 19 1/2"

Per centages of strength of longitudinal joint 88.1 Working pressure of shell by rules 182 lbs Size of manhole in shell 16" x 12"

Size of compensating ring Me Keils No. and Description of Furnaces in each boiler 3 Dighton Material Steel Outside diameter 4'-2 3/16"

Length of plain part 8" Thickness of plates 1 1/2" Description of longitudinal joint Weld No. of strengthening rings None

Working pressure of furnace by the rules 188 lbs Combustion chamber plates: Material Steel Thickness: Sides 3/32" Back 1/32" Top 1/32" Bottom 1/32"

Pitch of stays to ditto: Sides 10 5/8 x 9 1/4" Back 8 1/2 x 8 1/2" Top 10 5/8 x 8 1/2" If stays are fitted with nuts or riveted heads Nuts Working pressure by rules 180 lbs

Material of stays Steel Area at smallest part 1.642 Area supported by each stay 86 Working pressure by rules 186 lbs End plates in steam space: Material Steel Thickness 1 1/32" Pitch of stays 2 1/4 x 2 1/4" How are stays secured Single nuts secured with plate Working pressure by rules 181 lbs Material of stays Steel

Area at smallest part 8.27 Area supported by each stay 4 1/2 Working pressure by rules 181 lbs Material of Front plates at bottom Steel

Thickness 3/32" Material of Lower back plate Steel Thickness 3/32" Greatest pitch of stays 13 1/8 x 8 1/2" Working pressure of plate by rules 191 lbs

Diameter of tubes 2 1/4" Pitch of tubes 4" x 3 1/8" Material of tube plates Steel Thickness: Front 3/32" Back 1/4" Mean pitch of stays 8 x 4 3/4"

Pitch across wide water spaces 13 5/8" Working pressures by rules 193 lbs Girders to Chamber tops: Material Steel Depth and thickness of girder at centre 2 @ 9 1/4 x 1 1/8" Length as per rule 2'-9" Distance apart 10 5/8" Number and pitch of stays in each 3 @ 8 1/16"

Working pressure by rules 181 lbs Steam dome: description of joint to shell None % of strength of joint Yes

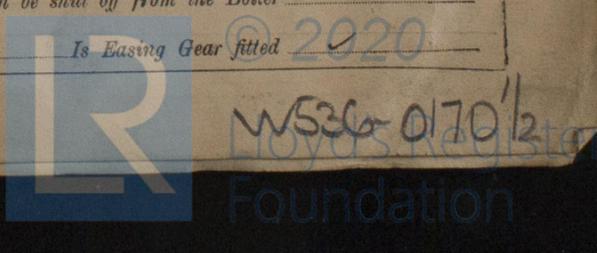
Diameter Yes Thickness of shell plates Yes Material Yes Description of longitudinal joint Yes Diam. of rivet holes Yes

Pitch of rivets Yes Working pressure of shell by rules Yes Crown plates Yes Thickness Yes How stayed Yes

SUPERHEATER. Type None Date of Approval of Plan Yes Tested by Hydraulic Pressure to Yes

Date of Test Yes Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler Yes

iameter of Safety Valve Yes Pressure to which each is adjusted Yes Is Easing Gear fitted 2020



IS A DONKEY BOILER FITTED? no If so, is a report now forwarded?

SPARE GEAR. State the articles supplied: - See following.

The foregoing is a correct description,
For HARLAND & WOLFF Ltd.

J.D. Keay Manufacturer.

1920 Feb. 23, Mar. 2, 11, 29, Apr. 22, May 11, 20, 31, July 22, Aug 11, 17, 21, 24, Sep 6, 15, 21, Oct 6,
Nov 1, 23, 24, 30, 1921 Jan. 11, Feb. 5, 10, 18, Mar. 10, 14, 15, Apr. 1, 20, 22, 28, May 27, 1922 Aug 11, 21,
23, Oct. 11, 13, 16, 20, 23, 27, Nov. 8, 9, 20, 21, 22, 27, 29, 30, Dec. 1, 4, 13, 18, 24, 1923 Jan. 3, 6, 9, 15, 25, 29,
Feb. 9, 15, 22, 21, 23, 28, Mar. 1, 5, 6, 7, 8, 16, 21, 26, 27
Dates of Survey: During progress of work in shops -- 23, Oct. 11, 13, 16, 20, 23, 27, Nov. 8, 9, 20, 21, 22, 27, 29, 30, Dec. 1, 4, 13, 18, 24, 1923 Jan. 3, 6, 9, 15, 25, 29,
During erection on board vessel --- Feb. 9, 15, 22, 21, 23, 28, Mar. 1, 5, 6, 7, 8, 16, 21, 26, 27
Are the outboard engines building Total No. of visits 76 Is the approved plan of main boiler forwarded herewith yes.

Dates of Examination of principal parts—Cylinders 9-1-22 Slides 21-11-22 Covers 21-11-22 Pistons 21-11-22 Rods 21-9-22
Connecting rods 11-12-22 Crank shaft 29-11-22 Thrust shaft 22-11-22 Tunnel shafts 19-12-22 Screw shaft 22-11-22 Propeller 17-8-22

Stern tube 14-8-22 Steam pipes tested 15-8-22 Engine and boiler seatings 19-9-22 Engines holding down bolts 5-3-23
Completion of pumping arrangements 16-2-23 Boilers fixed 5-3-23 Engines tried under steam 21-2-23

Completion of fitting sea connections 11-9-22 Stern tube 19-9-22 Screw shaft and propeller 18-9-22
Main boiler safety valves adjusted 21-2-23 Thickness of adjusting washers, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 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

Material of Crank shaft Steel Identification Mark on Do. 2154-8 Material of Thrust shaft Steel Identification Mark on Do. 5209
Material of Tunnel shafts Steel Identification Marks on Do. 5214, 5210, 5211 Material of Screw shafts Steel Identification Marks on Do. 5211

Material of Steam Pipes Solid drawn steel Test pressure 550 lbs sq in
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 Section 49 of the Rules been complied with Yes
Is this machinery duplicate of a previous case No If so, state name of vessel Invergoil.

General Remarks (State quality of workmanship, opinions as to class, &c.)

The Machinery of this vessel has been built under special survey and in accordance with the approved plans. Materials & workmanship good. Hydraulic tests satisfactory. The whole of the machinery has been satisfactorily installed & fixed in the vessel, & tried under steam, & is in good & safe working condition & eligible in my opinion to be classed and have records.

LMC 3-23, Tail shaft C.L., fitted for oil fuel 3-23
F.P. above 150°F in the Register Book.

It is submitted that
this vessel is eligible for
THE RECORD. **LMC 3.23. CL.**
Fitted for oil fuel 3.23. F.P. above 150°F.

The amount of Entry Fee ... £ 6 : 0 : 0
Special ... £ 101 : 11 : 0
Donkey Boiler Fee ... £ ✓ : :
Travelling Expenses (if any) £ ✓ : :
TUE. 17 APR. 1923

William Butts & J. Beattwell
Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute
Assigned + LMC 3.23 CL.
Listed for oil fuel 3.23
F.P. above 150°F.

J.D. Invergon.

List of Pumps.

- 1 Weir Feed Pump (main) ✓ 10 1/2" x 4" x 21"
- 1 " (Aux) ✓ 8" x 6" x 14"
- 1 Main Circulating Pump ✓ 36" Impeller x 13" disc
- 1 General Service ✓ 4" x 5" x 8"
- 1 Ballast ✓ 12 1/2" x 12" x 12"
- 1 Air Pump (main Eng.) ✓ 24" x 24"
- 2 Fuel oil pumps. ✓ 6" x 4" x 9"
- 2 Cargo oil Pumps. ✓ 16" x 14" x 16"

Spare Gear.

- 9 Bolts & nuts for top & bottom ends of main Bearings ✓
- 1 Set Snapping bolts ✓
- 1 set feed & bridge Pump valves ✓
- Quantity of assorted bolts nuts & iron ✓
- 1 Propeller shaft & blade ✓
- 1 Pair Bottom end braces ✓
- 1 H.P. Piston valve ✓
- 12 tubes & 50 ferrules for Condenser ✓
- Piston & Slide rod packing rings ✓
- 12 Boiler tubes ✓
- Feed pump escape valve & springs ✓
- 1 Set Evaporator coils ✓
- Spare gear for all pumps & oil fuel installation ✓

William Butts

