

REPORT ON MACHINERY.

No. 9048

Received at London Office

29 MAY 1924

Date of writing Report 26/5/24 When handed in at Local Office 26/5/24 Port of Belfast
No. in Survey held at Belfast Date, First Survey Feb 23-1920 Last Survey April 1924
Reg. Book. on the New Steel S/S Invergarry (Number of Visits 97)
Master Built at Belfast By whom built Harland & Wolff Ltd Tons Gross 6907 Net 4314
Engines made at Belfast By whom made Harland & Wolff Ltd when made 1921
Boilers made at Belfast By whom made Harland & Wolff Ltd when made 1921
Registered Horse Power Owners British Mexican Petroleum Co Ltd Port belonging to London
Nom. Horse Power as per Section 28 531 Is Refrigerating Machinery fitted for cargo purposes no Is Electric Light fitted yes

ENGINES, &c.—Description of Engines Triple Expansion No. of Cylinders 3 No. of Cranks 3
Dia. of Cylinders 24" x 44" x 43" Length of Stroke 44" Revs. per minute 112 Dia. of Screw shaft 14" x 15" Material of 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 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 Length of stern bush 5'-6"
Dia. of Tunnel shaft as per rule 13-33 Dia. of Crank shaft journals as per rule 13-99 Dia. of Crank pin 14" x 15" Size of Crank webs 28" x 9" Dia. of thrust shaft under
collars 15" Dia. of screw 16'-0" Pitch of Screw 16'-6" No. of Blades 4 State whether moveable yes Total surface 102 sq ft
No. of Feed pumps 2 Diameter of ditto 14" Stroke 24" Can one be overhauled while the other is at work yes
No. of Bilge pumps 2 Diameter of ditto 14" Stroke 24" Can one be overhauled while the other is at work yes
No. of Donkey Engines See list Sizes of Pumps No. and size of Suctions connected to both Bilge and Donkey pumps
In Engine Room 4 @ 3" & 2 @ 4", 2 @ 3" dry tank In Holds, &c. 2 @ 3" in each hold
Pump room, 4 @ 3" tunnel well
No. of Bilge Injections 1 sizes 15 Connected to condenser, or to circulating pump 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
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 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 plates yes
What pipes are carried through the bunkers none How are they protected
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 worked from upper deck

BOILERS, &c.—(Letter for record 5) Manufacturers of Steel DeLaval & Sons Ltd 45B
Total Heating Surface of Boilers 9992 sq ft 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 26-9-23 No. of Certificate 828
Can each boiler be worked separately yes Area of fire grate in each boiler 62 3/4 sq ft No. and Description of Safety Valves to
each boiler Two spring loaded Area of each valve 11-0 sq ft Pressure to which they are adjusted 185 lbs Are they fitted with easing gear yes
Smallest distance between boiler or uptakes and bunkers 20" Mean dia. of boilers 15'-6" Length 11'-6" Material of shell plates Steel
Thickness 1 1/2" Range of tensile strength 24 to 32 tons Are the shell plates welded or flanged no Descrip. of riveting: cir. seams D.R.
long. seams T.R.D.B.S Diameter of rivet holes in long. seams 1 1/2" Pitch of rivets 9" Lap of plates or width of butt straps 1-8 1/2"
Per centages of strength of longitudinal joint rivets 92-1 Working pressure of shell by rules 202 lbs Size of manhole in shell 16" x 12"
Size of compensating ring 24 x 30 x 1 1/2 No. and Description of Furnaces in each boiler 3 corrugated Material Steel Outside diameter 4'-2 3/4"
Length of plain part top 2' 13" Thickness of plates crown 3/32" Description of longitudinal joint welded No. of strengthening rings 4
bottom 2' 13" Working pressure of furnace by the rules 213 lbs Combustion chamber plates: Material Steel Thickness: Sides 3/32" Back 1/16" Top 3/32" Bottom 1/16"
Pitch of stays to ditto: Sides 9 3/4" x 9 1/2" Back 11" x 9" Top 10 1/2" x 8 1/2" If stays are fitted with nuts or riveted heads nuts Working pressure by rules 209 lbs
Material of stays Steel Area at smallest part 1 1/4" x 1 1/2" Area supported by each stay 82-8 1/2" Working pressure by rules 218 lbs Material of stays Steel
Material Steel Thickness 1 1/2" Pitch of stays 23 1/2" x 15 1/2" How are stays secured D.H. Wash Working pressure by rules 221 lbs Material of Front plates at bottom Steel
Area at smallest part 8-2" x 10" Area supported by each stay 362 sq in Working pressure by rules 221 lbs Working pressure of plate by rules 229 lbs
Thickness 1/4" Material of Lower back plate Steel Thickness 1/4" Greatest pitch of stays 12 1/4" x 1 1/2" Mean pitch of stays 8 1/2"
Diameter of tubes 3" Pitch of tubes 14" x 14" Material of tube plates Steel Thickness: Front 1/8" Back 3/16" Mean pitch of stays 8 1/2"
Pitch across wide water spaces 14" Working pressures by rules 266 lbs Girders to Chamber tops: Material Steel Depth and
thickness of girder at centre 20" x 11 1/2" Length as per rule 33" Distance apart 10 5/8" Number and pitch of stays in each 3 @ 11 1/2"
Working pressure by rules 210 lbs Steam dome: description of joint to shell none % of strength of joint
Diameter Thickness of shell plates Material Description of longitudinal joint Diam. of rivet holes
Pitch of rivets Working pressure of shell by rules Crown plates Thickness How stayed
SUPERHEATER. Type none Date of Approval of Plan Tested by Hydraulic Pressure to
Date of Test Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler
Diameter of Safety Valves Pressure to which each is adjusted Is Easing Gear fitted

Ho ✓



See list. ✓

For HARLAND & WOLFF Ltd.

and is a copy of the original signed by us.

J. D. Keay

Manufacturer.

Dates of Survey while building	During progress of work in shops - -		During erection on board vessel - - -		Total No. of visits
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Is the approved plan of main boiler forwarded herewith forwarded
 9 plans in all were forwarded
 " " " donkey " " "

Dates of Examination of principal parts—Cylinders 2-1-73 Slides 14-8-73 Covers 14-8-73 Pistons 6-8-73 Rods 3-8-73
Connecting rods 16-8-73 Crank shaft 20-1-73 Thrust shaft 14-6-73 Tunnel shafts 16-73 Screw shaft 28-3-73 Propeller 24-5-73
Stern tube 10-4-73 Steam pipes tested 16-10-73 & 29-11-73 Engine and boiler seatings 24-1-73 Engines holding down bolts 6-12-73
Completion of pumping arrangements 16-4-74 Boilers fixed 29-11-73 Engines tried under steam 14-4-74
Completion of fitting sea connections 1-11-73 Stern tube 1-11-73 Screw shaft and propeller 1-11-73
Main boiler safety valves adjusted 8-4-74 Thickness of adjusting washers Frd Pst₃₂ 5¹⁹/₃₂; Aft Pst₁₆ 5¹⁹/₃₂; A.Cent Pst₁₆ 5¹⁹/₃₂; Aft Stand Pst₃₂ 5¹⁹/₃₂

Material of Crank shaft Steel Identification Mark on Do. 609 WB Material of Thrust shaft Steel Identification Mark on Do. 2118 WB
2464 WB 2241 WB 2461 WB 6410 WB 2561 WB
Material of Tunnel shafts Steel Identification Marks on Do. 2494 WB Material of Screw shafts Steel Identification Marks on Do. 2081 WB
Material of Steam Pipes Solid drawn Steel $5 \times \frac{5}{16} + 6 \frac{1}{2} \times \frac{21}{8}$ ✓ Test pressure 550 lb. \square ✓ yes ✓

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 *yes* ✓ except *pipe arrangements*
If so, state name of vessel *S.S. Inverleith*

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

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The Machinery of this Vessel has been built under Special Survey. Materials & Workmanship good. Hydraulic tests satisfactory. The whole of the machinery is efficiently fixed in the vessel & has been tried under steam & is in good & safe working condition & eligible in my opinion to be classed & have records **LMC. 4.24** T.S. C.L. Fitted for oil fuel H-2H Flash Point above 150°F Elect Lt. Subject to the Air Pump Casting being repaired at owners convenience. When on trial a crack about 1 1/2" long developed in the upper part of the Air Pump Casting, probably due to drawn metal, towards the end of the trial it took up considerably & the leakage was hardly noticeable. A small clamp was fitted in way of the crack and it was arranged with the owners representative to have the defect permanently repaired at their convenience.

The amount of Entry Fee ...	£	6	:	0	:	When applied for,	
Special ...	£	101	:	11	:	18-11	19-11
Electric light							
Donkey Boiler Fee ...	£	20	:	0	:	When received,	
Travelling Expenses (if any) £	✓	:	:	:	:	2-11-19	19-11

TUES. 8 JUN 1924

+ Lmb 4.24 C.L.

Listed for oil fuel 4. 2st
 F.C. above 150° F

William Butler.

Engineer Surveyor to Lloyd's Register of Shipping.

FRI. 6 NOV 1925

TUES. 11 MAY 1926

FRI. 14 JAN 1927

TUES. 6 SEP 1927

Belfast

Continuation of Report No. 9096 dated May 5th 1914 on the

S.S. Invergarry

List of Pumps.

- 1 Weirs feed pump (Main) 10" x 4 x 21 ✓
- 1 " " (Aux) 8 x 6 x 14 ✓
- 1 Main circulating pp. 36" Impeller x 13" discharge ✓
- 1 General service pp. 7 x 5 x 4 ✓
- 1 Ballast duplex pp. 12 1/2 x 12 x 12 ✓
- 1 Air pp. (main engine driven) 24" x 24" ✓
- 2 Fuel oil pp. with heaters & filters 6 x 4 x 9 ✓
- 2 Cargo oil pp. duplex 16" x 14" x 16" ✓

Spare Gear.

- 2 each bolts & nuts for top & bottom ends & main bearings. ✓
- 1 set Coupling bolts ✓
- 1 " feed & bilge pp. valves ✓
- Quantity assorted bolts nuts & iron. ✓
- 1 Propeller shaft + 1 blade ✓
- 1 Pair Bottom end bushes ✓
- 1 Piston valve ✓
- 12 tubes & 50 ferrules for Condensers ✓
- Seed pump escape valve & Springs ✓
- Spare gear for oil fuel installation & all pumps. ✓

William Butler.