

Rpt. 4.

# REPORT ON MACHINERY.

No. 8843

Received at London Office FRI. DEC. 11 1922

Date of writing Report 10 When handed in at Local Office 30-11-22 Port of Belfast  
No. in Survey held at Belfast. Date, First Survey 1920 Feb. 23 Last Survey Nov 23 1922  
Reg. Book. 62989 on the S/S. "INVERURIE" (Number of Visits)

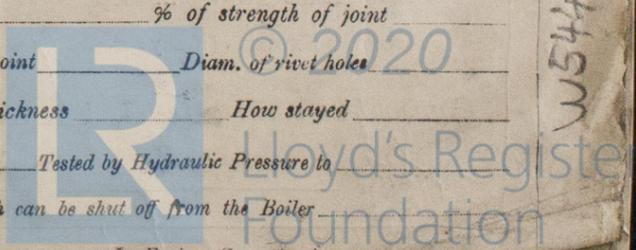
Master Built at Belfast. By whom built Harland & Wolff Ltd. Tons Gross Net  
Engines made at Belfast By whom made Harland & Wolff Ltd. when made 1921.  
Boilers made at Belfast By whom made Harland & Wolff Ltd. when made  
Registered Horse Power Owners British Mexican Petroleum Co. Port belonging to London.  
Nom. Horse Power as per Section 28 537.540 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 27"-44"-73" Length of Stroke 48" Revs. per minute 72 Dia. of Screw shaft as per rule 14.876 Material of Steel  
as fitted 15.75 screw shaft  
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  
as fitted 13.875 as fitted 14.75 Dia. of Crank pin 14 3/4 Size of Crank webs 28x9 Dia. of thrust shaft under  
collars 15" Dia. of screw 15'-0" Pitch of Screw 16'-6" No. of Blades 4 State whether moveable Yes Total surface 102.59-feet.  
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 — Sizes of Pumps See Separate sheet 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 and 1-3.  
No. of Bilge Injections 1 sizes 13" 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 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  
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 of Eng. Room.

BOILERS, &c.—(Letter for record S.) Manufacturers of Steel D. Colville & Sons Ltd.  
Total Heating Surface of Boilers 10224 Is Forced Draft fitted No. No. and Description of Boilers 4 Single ended cylindrical  
Working Pressure 180 lbs per sq. in. Tested by hydraulic pressure to 360 lbs per sq. in. Date of test 18/3/21 No. of Certificate 786  
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- Direct Spring. Area of each valve 11.04 sq. in. Pressure to which they are adjusted 185 lbs per sq. in. Are they fitted with easing gear Yes.  
Smallest distance between boilers or uptakes and bunkers or woodwork 25" Mean dia. of boilers 15'-6" Length 11'-6" Material of shell plates Steel.  
Thickness 1 1/4" Range of tensile strength 28-32 tons Are the shell plates welded or flanged No. Descrip. of riveting: cir. seams Lap & double  
long. seams Double Butt. Tube Diameter of rivet holes in long. seams 1 5/16" Pitch of rivets 9 1/8" Lap of plates or width of butt straps 19 1/2"  
Per centages of strength of longitudinal joint rivets 88.1 Working pressure of shell by rules 182 lbs. Size of manhole in shell 16" x 12".  
plate 85.6  
Size of compensating ring Mrs. Neils No. and Description of Furnaces in each boiler 3-Dighton. Material Steel Outside diameter 50 3/16"  
Length of plain part top 4" Thickness of plates crown 1 1/2" Description of longitudinal joint Weld. No. of strengthening rings  
bottom 8" bottom 3/32"  
Working pressure of furnace by the rules 188 lbs. Combustion chamber plates: Material Steel Thickness: Sides 2 3/32" Back 2 1/32" Top 2 3/32" Bottom 2 3/32"  
Pitch of stays to ditto: Sides 10 7/8" x 9 1/4" Back 10 1/8" 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 1.76-2.4 sq. in. Area supported by each stay 86 sq. in. Working pressure by rules 186 lbs. End plates in steam space:  
Material Steel Thickness 1 1/2" Pitch of stays 2 1/4" x 20 1/2" How are stays secured S. nuts and plates. Working pressure by rules 181 lbs. Material of stays Steel  
Area at smallest part 8.27 sq. in. Area supported by each stay 473 sq. in. Working pressure by rules 181 lbs. Material of Front plates at bottom Steel.  
Thickness 3/32" Material of Lower back plate Steel Thickness 27/32" Greatest pitch of stays 3 5/8" x 8 1/2" Working pressure of plate by rules 191  
Diameter of tubes 2 3/4" Pitch of tubes 4" x 3 7/8" Material of tube plates Steel Thickness: Front 3 1/32" Back 3/4" Mean pitch of stays 8" x 7 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 9 1/4" x (7 1/8" x 2) Length as per rule 33" Distance apart 10 5/8" Number and pitch of stays in each 3-8 1/2"  
Working pressure by rules 181 lbs. Steam dome: description of joint to shell % 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 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  
Pressure to which each is adjusted Is Easing Gear fitted

W544-0056 1/2



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

SPARE GEAR. State the articles supplied: -  
See separate sheet.

The foregoing is a correct description.  
FOR HARLAND & WOLFF Ltd.

J.P. Keay. Manufacturer.

Dates of Survey: During progress of work in shops - 1920 Feb. 23, Mar. 2, 11, 29, Apr. 22, May 11, 20, 31, June 1, July 22, Aug 11, 17, 21, 24, Sep 6, 15, 24, 28, Oct 1, 24, 30, Dec 11, 16, 22, 1921, Jan 11, Feb 5, 10, 29, Mar 10, 14, 15, 18, 25, Apr 5, 12, 14, 25, 27, 30, May 5, 9, 16, 25, June 7, 9, 13, 21, 23, 25, 29, 30, July 5, 7, 20, 22, 23, 26, 28, 30, Nov 17, 1922, Dec 7, 20, 23, while board vessel - - - building Total No. of visits 63

Dates of Examination of principal parts - Cylinders 1/11/20. Slides 6/10/20. Covers 1/11/20. Pistons 1/11/20. Rods 18/9/20. Connecting rods 24/9/20. Crank shaft 1/11/20. Thrust shaft 9/5/21. Tunnel shafts 9/5/21. Screw shaft 9/5/21. Propeller 24/2/21. Stern tube 24/2/21. Steam pipes tested 22/7/21. Engine and boiler seatings 24/2/21. Engines holding down bolts 30/7/21. Completion of pumping arrangements 7/11/22. Boilers fixed 23/7/21. Engines tried under steam 7/11/22. Completion of fitting sea connections 30/4/21. Stern tube 5/4/21. Screw shaft and propeller 5/4/21. Main boiler safety valves adjusted 7/11/22. Thickness of adjusting washers 8-11" / 32. Material of Crank shaft Steel. Identification Mark on Do. Material of Thrust shaft Steel. Identification Mark on Do. Material of Tunnel shafts Steel. Identification Marks on Do. Material of Screw shafts Steel. Identification Marks on Do. Material of Steam Pipes Steel. Test pressure 540 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 Yes. If so, state name of vessel Imvigoil.

General Remarks (State quality of workmanship, opinions as to class, &c.)  
The machinery of this vessel has been constructed under Special Survey and in accordance with the Rules. The workmanship and the materials are good, and on trial in Belfast Lough the machinery worked satisfactorily. In my opinion it is eligible for record + L.M.C. - 11, 22 with notations "Electric Light" and "Fitted for oil fuel F.P. above 150°F."

It is submitted that this vessel is eligible for THE RECORD. + L.M.C. 11.22. C.L.  
"Fitted for oil fuel" 11.22. F.P. above 150°F.  
A.H.D. 6/12/22

The amount of Entry Fee ... £ 6.00  
Special ... £ 101.11.0  
Donkey Boiler Fee ... £ : :  
Travelling Expenses (if any) £ : :

H.P. Southwell. Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute FRI. 18 DEC. 1922  
Assigned + L.M.C. 11.22. C.L.

Fitted for oil fuel 11.22 F.P. above 150°F.

5/8" INVERURIE.

LIST of PUMPS.

- 1- Weir's Feed pump - 10 1/2" x 8" x 21"
- 1- " " " (Austrian) 8" x 6" x 18"
- 1- Main circulating - 36" Impeller - 18" pipe
- 1- General Service 7" x 5" x 8"
- 1- Ballast 12 1/2" x 12" x 12"
- 1- Air pump (drain off main Engines) 24" x 24"

Principal Items of Spare Gear.

- 1 Propeller shaft and 1 propeller blade.
- 1 pair bottom end braces
- 1 A.P. piston valve.
- 12 Condenser tubes and 50 frames.
- Piston rod packing rings.
- Slide " "
- 1 Feed pump escape valve spring.
- 1 set Evaporator coils.
- 12 Boiler tubes.
- Spare gear for all pumps.
- Spare gear for oil fuel installation.
- In addition, all spare gear as required by Rules.

A.P. Southwell.

RETAIN

W544-0056 2/2