

# REPORT ON MACHINERY.

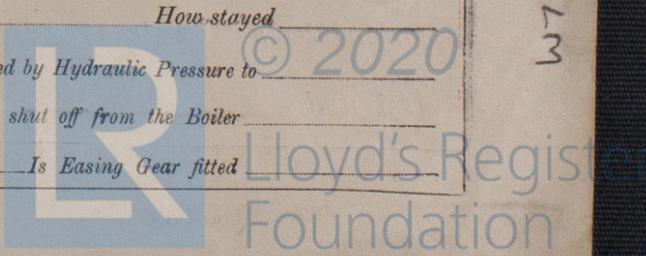
No. 7939

Date of writing Report 19<sup>th</sup> April 1918 When handed in at Local Office 19<sup>th</sup> APR. 1918  
 No. in Survey held at Belfast Port of Belfast  
 Reg. Book. S.S. War Bittern Date, First Survey 26 June 1917 Last Survey 10<sup>th</sup> April 1918  
 on the S.S. War Bittern (Number of Visits 42)  
 Master Belfast Built at Belfast By whom built Harland & Wolff L<sup>td</sup> Tons Gross 5178  
 Engines made at Belfast By whom made Harland & Wolff L<sup>td</sup> When built 1918  
 Boilers made at Belfast By whom made Harland & Wolff L<sup>td</sup> when made 1918  
 Registered Horse Power 518 Owners The Shipping Controller Port belonging to London  
 Nom. Horse Power as per Section 28 518 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

ENGINES, &c.—Description of Engines Triple Screw Triple Expansive Cylinders 3 No. of Cranks 3  
 Dia. of Cylinders 27-44-73 Length of Stroke 48 Revs. per minute 78 Dia. of Screw shaft as per rule 14.68 Material of S. 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  
 liners are fitted, is the shaft lapped or protected between the liners Yes Length of stern bush 60 1/2  
 Dia. of Tunnel shaft as per rule 13.3 Dia. of Crank shaft journals as per rule 13.9 Dia. of Crank pin 4 1/2 Size of Crank webs 28 x 9 Dia. of thrust shaft under  
 collars 14 1/4 Dia. of screw 17-6 Pitch of Screw 16-6 No. of Blades 4 State whether moveable No Total surface 102 1/2 sq ft  
 No. of Feed pumps 2 Diameter of ditto 4 Stroke 24 Can one be overhauled while the other is at work Yes  
 No. of Bilge pumps 2 Diameter of ditto 4 Stroke 24 Can one be overhauled while the other is at work Yes  
 No. of Donkey Engines See other sheet No. and size of Suctions connected to both Bilge and Donkey pumps  
 In Engine Room 4-3 1/2 In Holds, &c. 9-3 1/2 + 1-3  
 No. of Bilge Injections 1 sizes 8 Connected to condenser, or to circulating pump Pump a separate Donkey Suction fitted in Engine room & size 1-3 1/2  
 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 - Except Main Tank Suction Chest 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 plate Yes  
 What pipes are carried through the bunkers Fore hold suction How are they protected Wood casing  
 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 No - 4.7 worked from Trunks from Deck

OILERS, &c.—(Letter for record S) Manufacturers of Steel W. Colville Sons L<sup>td</sup>  
 Total Heating Surface of Boilers 7668 sq ft forced Draft fitted Yes No. and Description of Boilers 3 Single End Cylinders  
 Working Pressure 180 lbs Tested by hydraulic pressure to 360 lbs Date of test 5-3-18 No. of Certificate 519  
 Can each boiler be worked separately Yes Area of fire grate in each boiler 63 1/2 sq ft No. and Description of Safety Valves to  
 each boiler 2 - Direct Spring Area of each valve 9.62 sq in 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 Plant 2 ft Mean dia. of boilers 15-6 Length 11-6 Material of shell plates Steel  
 Thickness 1/4 Range of tensile strength 28-32 tons Are the shell plates welded or flanged No Descrip. of riveting: cir. seams Lap S. Riv  
 long. seams Mr. Lalle Riv Diameter of rivet holes in long. seams 1/16 Pitch of rivets 9/8 Gap of plates or width of butt straps 19 1/2  
 Percentages of strength of longitudinal joint 86.3 Working pressure of shell by rules 182 lbs Size of manhole in shell 16 x 12  
 Size of compensating ring No No. and Description of Furnaces in each boiler 3 - Doughton Material Steel Outside diameter 56 3/4  
 Length of plain part 5 Thickness of plates 7 1/2 Description of longitudinal joint Weld No. of strengthening rings 0  
 Working pressure of furnace by the rules 188 lbs Combustion chamber plates: Material Steel Thickness: Sides 23/32 Back 1/16 Top 23/32 Bottom 23/32  
 Pitch of stays to ditto: Sides 10 5/8 x 9 1/4 Back 10 5/8 x 8 1/2 Top 10 5/8 x 9 1/4 If stays are fitted with nuts or riveted heads Nuts Working pressure by rules 180 lbs  
 Material of stay Steel Area at smallest part 2.39 sq in supported by each stay 98 1/2 sq in Working pressure by rules 186 lbs End plates in steam space:  
 Material Steel Thickness 1/32 Pitch of stays 21 1/2 x 21 1/2 How are stays secured Nuts Working pressure by rules 180 lbs Material of stays Steel  
 Area at smallest part 8.29 sq in Area supported by each stay 459 1/2 sq in Working pressure by rules 187 lbs Material of Front plates at bottom Steel  
 Thickness 3/32 Material of Lower back plate Steel Thickness 3/32 Greatest pitch of stays 1/32 Working pressure of plate by rules 189 lbs  
 Diameter of tube 4 1/2 Pitch of tubes 4 x 3 1/2 Material of tube plates Steel Thickness: Front 3/32 Back 3/4 Mean pitch of stays 12 x 7 1/2  
 Pitch across wide water spaces 13 1/2 Working pressures by rules 181 lbs Girders to Chamber tops: Material Steel Depth and  
 thickness of girder at centre 10 x (7-2) Length as per rule 35 7/8 Distance apart 10 5/8 Number and pitch of stays in each 3-9 1/4  
 Working pressure by rules 182 lbs Steam dome: description of joint to shell Yes % of strength of joint 100

Diameter 10 Thickness of shell plates 3/32 Material Steel Description of longitudinal joint Weld Diam. of rivet holes 1/16  
 Pitch of rivets 1/2 Working pressure of shell by rules 182 lbs Crown plates Yes Thickness 3/32 How stayed Yes  
 SUPERHEATER. Type Vertical Date of Approval of Plan 5-3-18 Tested by Hydraulic Pressure to 360 lbs  
 Date of Test 5-3-18 Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler Yes  
 Diameter of Safety Valve 1 1/2 Pressure to which each is adjusted 182 lbs Is Easing Gear fitted Yes



W71-0250

IS A DONKEY BOILER FITTED? *No*

If so, is a report now forwarded? *✓*

SPARE GEAR. State the articles supplied:— *See other sheet*

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

*Submarine*

Manufacturer.

Dates of Survey while building { During progress of work in shops -- } 1917, June 26, July 11-31 + up till 10<sup>th</sup> April 1918  
{ During erection on board vessel --- }  
Total No. of visits 42

Is the approved plan of main boiler forwarded herewith *Yes*

Dates of Examination of principal parts—Cylinders 2 Covers 3-1 Pistons 5 Rods  
Connecting rods 3-1/8 Crank shaft 3 Thrust shaft 1 Tunnel shafts 5 Screw shaft 23-2-18 Propeller 5-2-18  
Stern tube 5-2-18 Steam pipes tested 9-11-17 Engine and boiler seatings 16-3-18 Engines holding down bolts 29-4-18  
Completion of pumping arrangements 8-4-18 Boilers fixed 16-3-18 Engines tried under steam 8-4-18  
Completion of fitting sea connections 8-4-18 Stern tube 19-3-18 Screw shaft and propeller 19-3-18  
Main boiler safety valves adjusted 8-4-18 Thickness of adjusting washers 2-6/16  
Material of Crank shaft *Steel* Identification Mark on Do. *LLOYDS F.J.B.* Material of Thrust shaft *Do* Identification Mark on Do. *Do*  
Material of Tunnel shafts *Do* Identification Marks on Do. *23-2-18* Material of Screw shafts *Do* Identification Marks on Do. *Do*  
Material of Steam Pipes *W. Iron* Test pressure 540 lbs

Is an installation fitted for burning oil fuel *No*

Is the flash point of the oil to be used over 150°F. *✓*

Have the requirements of Section 49 of the Rules been complied with *✓*

Is this machinery duplicate of a previous case *Yes* If so, state name of vessel *War Python etc*

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, also as per Specification and instructions issued by the Shipping Controller. The workmanship and the materials are of good description, and on trial under steam in Belfast Lough, the machinery worked satisfactorily. In our opinion, it is eligible for record + L.M.C. 4/18 with notation "Forced Draft" and "Electric Light".

It is submitted that  
this vessel is eligible for  
THE RECORD. + L.M.C. 4.18. F.D.

*APR*

*John Fallock*  
23/4/18.  
R. G. Bennett  
Engineer Surveyor to Lloyd's Register of Shipping.

The amount of Entry Fee ... £ : : When applied for,  
1/3 of Special Fee ... £ : : 13-4-18  
Special Fee ... £ : :  
Donkey Boiler Fee ... £ : :  
Travelling Expenses (if any) £ : : 18-5-18

Committee's Minute TUE. 23 APR. 1918

Assigned

+ L.M.C. 4:18. F.D.

MACHINERY CERTIFICATE  
WRITTEN.



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Foundation