

# REPORT ON BOILERS.

No. 2241

Received at London Office

17 MAR 1928

Date of writing Report *9th March 1928* When handed in at Local Office *13th March 1928* Port of *Barrow-in-Furness*  
 To, in Survey held at *Barrow* Date, First Survey *April 7th 1926* Last Survey *March 5th 1928*  
 Book. *Barrow*  
 Name of vessel *on the Tug Screw Steamer "Orford"* (Number of Visits *69*) Gross *1994.5*  
 Tons Net *1202.4*  
 Built at *Barrow* By whom built *Bickers-Armstrongs Ltd* Yard No. *624* When built *1928*  
 Engines made at *Barrow* By whom made *Bickers-Armstrongs Ltd* Engine No. *624* When made *1928*  
 Boilers made at *Barrow* By whom made *As* Boiler No. *624* When made *1928*  
 Nominal Horse Power *3825* Owners *Orford Steam Navigation Co Ltd* Port belonging to *Barrow*

## UNITED. ULTITUBULAR BOILERS—MAIN, AUXILIARY, OR DONKEY.

Manufacturers of Steel *W. Beardmore & Co Ltd, David Colville & Son Ltd* (Letter for Record *S*)  
 Heating Surface of Boilers (Single Ended) *6654* Is forced draught fitted *Yes* Coal or Oil fired *Oil*  
 and Description of Boilers *Two single ended cylindrical multitubular* Working Pressure *215 lb*  
 Tested by hydraulic pressure to *343 lb* Date of test *28/3/24; 16/3/27* No. of Certificate *411 & 413* Can each boiler be worked separately *Yes*  
 Area of Firegrate in each Boiler *145 sq ft* No. and Description of safety valves to each boiler *Two direct spring loaded high lift*  
 Pressure to which they are adjusted *220 lb* Are they fitted with easing gear *Yes*  
 Use of donkey boilers, state whether steam from main boilers can enter the donkey boiler *Yes*  
 Smallest distance between boilers on uptakes and bankers on woodwork *18"* Is oil fuel carried in the double bottom under boilers *No*  
 Smallest distance between shell of boiler and tank top plating *22 1/2"* Is the bottom of the boiler insulated *Yes*  
 Greatest internal dia. of boilers *16'-6"* Length *11'-2"* Shell plates: Material *Steel* Tensile strength *30 to 34 tons*  
 Thickness *1 1/2"* Are the shell plates welded or flanged *No* Description of riveting: circ. seams *and* *inter.*  
 seams *Yell. (All butt straps)* Diameter of rivet holes in *circ. seams* *1 9/16"* Pitch of rivets *4.0142"*  
 Percentage of strength of circ. end seams *plate* *61%* *rivets* *45.8%* Percentage of strength of circ. intermediate seam *plate* *85.1%* *rivets* *84.54%*  
 Percentage of strength of longitudinal joint *combined* *84.73%* Working pressure of shell by Rules *215.6 lb*  
 Thickness of butt straps *outer* *1 5/32"* *inner* *1 9/32"* No. and Description of Furnaces in each Boiler *3 Morrison 3 c.f.*  
 Material *Steel* Tensile strength *26 to 30 tons* Smallest outside diameter *44.425"*  
 Thickness of plates *crown* *23/32"* *bottom* *23/32"* Description of longitudinal joint *Weld*  
 Dimensions of stiffening rings on furnace or c.e. bottom *Yes* Working pressure of furnace by Rules *222 lb*  
 Plates in steam space: Material *Steel* Tensile strength *26 to 30 tons* Thickness *1 3/4"* Pitch of stays *16 1/2" x 18"*  
 Are stays secured *Double nuts* Working pressure by Rules *220 lb*  
 Plates: Material *front* *Steel* *back* *Steel* Tensile strength *26 to 30 tons* Thickness *1 9/16"* *1 7/16"*  
 Pitch of stay tubes in nests *11 1/2" x 4 1/2"* Pitch across wide water spaces *13 1/2"* Working pressure *front* *239 lb* *back* *(216 lb + 239 lb)*  
 Girders to combustion chamber tops: Material *Steel* Tensile strength *28 to 32 tons* Depth and thickness of girder *26 to 30 tons*  
 Centre *8" x 1 1/2"* Length as per Rule *30 27/32"* Distance apart *8 1/4"* No. and pitch of stays *2 @ 10"*  
 Working pressure by Rules *216 lb* Combustion chamber plates: Material *Steel*  
 Tensile strength *26 to 30 tons* Thickness: Sides *23/32"* Back *23/32"* Top *23/32"* Bottom *1 5/16"*  
 Pitch of stays to ditto: Sides *10 3/8" x 4 3/4"* Back *10 3/8" x 8"* Top *10" x 8 1/4"* Are stays fitted with nuts or riveted over *Nuts*  
 Working pressure by Rules *216 lb* Front plate at bottom: Material *Steel* Tensile strength *26 to 30 tons*  
 Thickness *1 5/16"* Lower back plate: Material *Steel* Tensile strength *26 to 30 tons* Thickness *1 5/16"*  
 Pitch of stays at wide water space *10 3/8" x 15"* Are stays fitted with nuts or riveted over *Nuts*  
 Working Pressure *220 lb* Main stays: Material *Steel* Tensile strength *28 to 32 tons*  
 At body of stay, *2 3/4"* No. of threads per inch *6* Area supported by each stay *244 sq in*  
 Over threads *Yes* Screw stays: Material *Steel* Tensile strength *26 to 30 tons*  
 At turned off part, *1 3/4"* No. of threads per inch *9* Area supported by each stay *82.5 sq in*  
 Over threads *Yes*



Working pressure by Rules 220 lb Are the stays drilled at the outer ends 40 Margin stays: Diameter turned off part  
 No. of threads per inch 9 Area supported by each stay 114.156 Working pressure by Rules 243 lb  
 Tubes: Material Iron External diameter Plain 2 1/2 Thickness 8 1/2 No. of threads per inch 9  
 Pitch of tubes 3 3/4 x 3 3/4 Working pressure by Rules 300 lb Manhole compensation: Size of opening in  
 shell plate 2 1/2 x 1 1/2 Section of compensating ring (40 1/4 x 32 1/4 x 1 1/2) flanged No. of rivets and diameter of rivet holes 36  
 Outer row rivet pitch at ends 10 1/2 Depth of flange if manhole flanged 4 3/8 x 1 1/2 Steam Dome: Material ✓  
 Tensile strength ✓ Thickness of shell ✓ Description of longitudinal joint ✓  
 Diameter of rivet holes ✓ Pitch of rivets ✓ Percentage of strength of joint Plate  
 Internal diameter ✓ Working pressure by Rules ✓ Thickness of crown ✓ No. and diameter of  
 stays ✓ Inner radius of crown ✓ Working pressure by Rules ✓  
 How connected to shell ✓ Size of doubling plate under dome ✓ Diameter of rivet holes and pitch  
 of rivets in outer row in dome connection to shell ✓

Type of Superheater

Manufacturers of Tubes  
 Number of elements Material of tubes Internal diameter and thickness of tubes Steel castings  
 Material of headers Tensile strength Thickness Can the superheater be shut off and  
 the boiler be worked separately Is a safety valve fitted to every part of the superheater which can be shut off from the boiler  
 Area of each safety valve Are the safety valves fitted with easing gear Working pressure as per  
 Rules Pressure to which the safety valves are adjusted Hydraulic test pressure: Tested by hydraulic  
 tubes castings and after assembly in place Are drain cocks or valves fitted  
 to free the superheater from water where necessary ✓

Have all the requirements of Sections 14 to 23 inclusive for boilers been complied with Yes

The foregoing is a correct description  
 VICKERS ARMSTRONGS LIMITED.  
 J. Ballance Manufacturer.

Dates of Survey During progress of work in shops - 1926 - Oct 24, 27, 30, Sept 1, 6, 24, 29, Oct 1, 8, 15, 25, Nov 5, 17  
During erection on board vessel - 1926 - Oct 4, 31, Nov 4, 15, 1925 Jan 23, 26, Feb 4  
 Total No. of visits 69

GENERAL REMARKS

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

These boilers have been built in accordance with the approved plans and the Rules, the workmanship and materials are good. They have been efficiently fitted on board the vessel and their safety valves adjusted under steam

Survey Fee ... £ 100 When applied for, 192  
 Travelling Expenses (if any) £ 100 When received, 192

Committee's Minute

TUES. 27 MAR 1928

Assigned

See Rpt attached

Engineer Surveyor to Lloyd's Register of Shipping.



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Rpt. 9a.

Port of Barrow-in-Furness

Continuation of Report No. 2241 dated 9<sup>th</sup> March 1928

V. S. S. "Orford"

Thickness of Safety valve washers

No. 1 Boiler	$\phi X \frac{27}{64}$	$\phi A \frac{13}{32}$	$SX \frac{3}{8}$	$SA \frac{3}{8}$
No. 2 "	$\phi X \frac{23}{64}$	$\phi A \frac{9}{16}$	$SX \frac{23}{64}$	$SA \frac{9}{16}$
No. 3 "	$\phi X \frac{3}{8}$	$\phi A \frac{21}{64}$	$SX \frac{3}{8}$	$SA \frac{13}{32}$
No. 4 "	$X \frac{27}{64}$	$A \frac{11}{32}$		
No. 5 "	$X \frac{23}{64}$	$A \frac{13}{32}$		
No. 6 "	$\phi X \frac{11}{32}$	$\phi A \frac{13}{32}$	$SX \frac{13}{32}$	$SA \frac{25}{64}$
No. 7 "	$\phi X \frac{3}{8}$	$\phi A \frac{23}{64}$	$SX \frac{25}{64}$	$SA \frac{23}{64}$
No. 8 "	$\phi X \frac{13}{32}$	$\phi A \frac{25}{64}$	$SX \frac{25}{64}$	$SA \frac{3}{8}$

Wm. Cairns



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W347-0108

Working Pressure

220 lb

Main stays: Material

Steel

Tensile strength

28 to