

REPORT ON BOILERS.

No. 2973.

Rpt. 5a.

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Date of writing Report 18/2/44. When handed in at Local Office 22.2.44. Port of **BARROW-IN-FURNESS.**

No. in Survey held at **BARROW** Date, First Survey 18/8/43. Last Survey 16 February, 1944.

9435 on the **S.S. EMPIRE RABAU** (Number of Visits 25.) Tons { Gross 7306.83 Net 5104.81

Master Built at **S. Shields** By whom built **J. Readhead & Sons Ltd** No. 543 When built 1945

Engines made at **South Shields** By whom made **J. Readhead & Sons Ltd** Engine No. 543 When made 1945

Boilers made at **BARROW** By whom made **Vickers-Armstrongs, Ltd.** Boiler No. 850 When made 1944 -2

Original Horse Power Owners **Ministry of War Transport** Port belonging to **S. Shields**

MULTITUBULAR BOILERS—MAIN, AUXILIARY, OR DONKEY.

Manufacturers of Steel **Colvilles & Steel Co. of Scotland** (Letter for Record **S**)

Total Heating Surface of Boilers **7248⁰ ft.** Is forced draught fitted **Yes** Coal or Oil fired **Coal** Working Pressure **220 lbs. ⁰ "**

No. and Description of Boilers **3 SB.**

Tested by hydraulic pressure to **380 lbs. ⁰ "** Date of test **14.10.43** No. of Certificate **496** Can each boiler be worked separately **Yes**

Area of Firegrate in each Boiler **54.8⁰ ft.** No. and Description of safety valves to each boiler **2 Improved high lift spring loaded**

Area of each set of valves per boiler (per Rule **6.42⁰ "** as fitted **9.82⁰ "** Pressure to which they are adjusted **220 lbs. ⁰ "** Are they fitted with easing gear **Yes**

In case of donkey boilers, state whether steam from main boilers can enter the donkey boiler **Yes**

Smallest distance between boilers or uptakes and hangers or woodwork **1'-6"** Is oil fuel carried in the double bottom under boilers **No**

Smallest distance between shell of boiler and tank top plating **2'-0"** Is the bottom of the boiler insulated **Yes**

Largest internal dia. of boilers **15'-0.1/16"** Length **11'-6"** Shell plates: Material **Steel** Tensile strength **29/33 tons ⁰ "**

Thickness **1.15/32"** Are the shell plates welded or flanged **No** Description of riveting: circ. seams { end **D.R.lap** } inter. **--**

Long. seams **T.R. - D.B.S.** Diameter of rivet holes in { circ. seams **1.31/64"** } long. seams **do** Pitch of rivets { **4.07"** } **10.7/32"**

Percentage of strength of circ. end seams { plate **63.5%** } rivets **45.8%** Percentage of strength of circ. intermediate seam { plate **--** } rivets **--**

Percentage of strength of longitudinal joint { plate **85.4%** } rivets **88.4%** Working pressure of shell by Rules **220 lbs. ⁰ "** combined **88.5%**

Thickness of butt straps { outer **1 1/8"** } inner **1 1/4"** No. and Description of Furnaces in each Boiler **3 cf. Deighton Section**

Material **Steel** Tensile strength **26/30 tons ⁰ "** Smallest outside diameter **45 1/2"**

Length of plain part { top **--** } bottom **--** Thickness of plates { crown **11/16"** } bottom **--** Description of longitudinal joint **Weld**

Dimensions of stiffening rings on furnace or c.c. bottom Working pressure of furnace by Rules **220 lbs. ⁰ "**

End plates in steam space: Material **Steel** Tensile strength **26/30 tons ⁰ "** Thickness **1.13/32"** Pitch of stays **20" x 21"**

How are stays secured **Nuts inside and out** Working pressure by Rules **220 lbs. ⁰ "**

Tube plates: Material { front **Steel** } back **Steel** Tensile strength { **26/30 tons ⁰ "** } Thickness { **15/16"** } **25/32"**

Mean pitch of stay tubes in nests **9.7/16"** Pitch across wide water spaces **14" x 8 1/4"** Working pressure { front **220 lbs. ⁰ "** } back **220 lbs. ⁰ "**

Girders to combustion chamber tops: Material **Steel** Tensile strength **28/32 tons ⁰ "** Depth and thickness of girder at centre **10 1/2" x 1.5/8" (2 x 11/16")** Length as per Rule **2'-9.7/16"** Distance apart **9 1/4"** No. and pitch of stays **3 @ 8" pitch**

Tensile strength **26/30 tons ⁰ "** Working pressure by Rules **220 lbs. ⁰ "** Combustion chamber plates: Material **Steel** Thickness: Sides **11/16"** Back **25/32"** Top **11/16"** Bottom **13/16"**

Pitch of stays to ditto: Sides **8" x 9 1/4"** Back **8" x 9 1/4"** Top **8" x 9 1/4"** Are stays fitted with nuts or riveted over **Nuts**

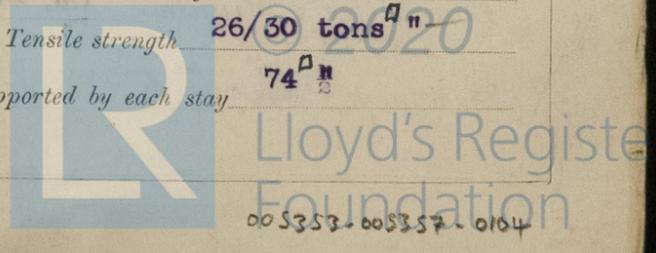
Working pressure by Rules **220 lbs. ⁰ "** Front plate at bottom: Material **Steel** Tensile strength **26/30 tons ⁰ "** Thickness **15/16"** Lower back plate: Material **Steel** Tensile strength **26/30 tons ⁰ "** Thickness **27/32"**

Pitch of stays at wide water space **14" x 8"** Are stays fitted with nuts or riveted over **Nuts**

Working Pressure **220 lbs. ⁰ "** Main stays: Material **Steel** Tensile strength **28/32 tons ⁰ "**

Diameter { At body of stay, **3 1/4"** } or Over threads **--** No. of threads per inch **6** Area supported by each stay **420 ⁰ "**

Working pressure by Rules **220 lbs. ⁰ "** Screw stays: Material **Steel** Tensile strength **26/30 tons ⁰ "** Diameter { At turned off part, **1 5/8"** } or Over threads **--** No. of threads per inch **9** Area supported by each stay **74 ⁰ "**



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Working pressure by Rules Are the stays drilled at the outer ends No Margin stays: Diameter At turned off part or Over threads $1\frac{7}{8}$ "

No. of threads per inch 9 Area supported by each stay $93\frac{1}{2}$ " Working pressure by Rules 8 W.G.

Tubes: Material **Steel** External diameter Plain Stay $3"$ Thickness $5/16"$ & $3/8"$ No. of threads per inch 9

Pitch of tubes $4\frac{1}{8} \times 4\frac{1}{4}$ Working pressure by Rules Manhole compensation: Size of opening

end /shell plate $16" \times 12"$ Section of compensating ring --- No. of rivets and diameter of rivet holes ---

Outer row rivet pitch at ends --- Depth of flange if manhole flanged **top $4\frac{1}{4}"$ btm. $3\frac{1}{4}"$** Steam Dome: Material None

Tensile strength --- Thickness of shell --- Description of longitudinal joint ---

Diameter of rivet holes --- Pitch of rivets --- Percentage of strength of joint Plate Rivets ---

Internal diameter --- Working pressure by Rules --- Thickness of crown --- No. and diameter

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 **Superheater Co's. "S" type** Manufacturers of Tubes Steel Forgings:- **Chesterfield Tube Co.** Weldless Steel Tube Co.

Number of elements **47 per Blr.** Material of tubes **Steel** Internal diameter and thickness of tubes **17m/m x $2\frac{1}{2}$ m/m**

Material of headers **Forged Steel** Tensile strength --- Thickness **1"** Can the superheater be shut off or the boiler be worked separately Yes

Area of each safety valve **$1.77\frac{1}{2}"$** Is a safety valve fitted to every part of the superheater which can be shut off from the boiler Yes

Rules Are the safety valves fitted with easing gear Yes Working pressure as per

tubes **Improved high life** and after assembly in place **440 lb** Hydraulic test pressure

to free the superheater from water where necessary Yes Are drain cocks or valves fitted

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

The foregoing is a correct description,
for **Vickers-Armstrongs Ltd**
Mitchell Manufacturer

Dates of Survey while building	During progress of work in shops - -	1943. Aug. 18, 24. Sept. 1, 10, 13, 15.	Are the approved plans of boiler and superheater forwarded herewith (If not state date of approval.)	Boiler 11.9.4	
		Oct. 6, 11, 14, 26, 27, 28, 29, 30.			Superheater see Man.
		Nov. 1, 17, 25. Dec. 3, 15, 17, 20, 21, 22.			
		1944. Feb. 2, 16.	Total No. of visits	25.	

Is this Boiler a duplicate of a previous case **YES.** See Brw. Rpt. 2905 & 2946.

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

These Boilers have been constructed under Special Survey in accordance with the approved plans, the Rules and the Specification. The workmanship and materials are good and when tested by hydraulic pressure the boilers were found tight and satisfactory in every respect. The boilers are completed awaiting instructions for transfer to Messrs. J. Readhead & Sons, Ltd., they having been provisionally allocated to their vessel A/MS.966.

These boilers have been efficiently installed & fixed in vessel, examined under steam & their safety valves adjusted to the approved pressure

J. H. Matthews

Survey Fee	£ 40	4	0	When applied for, 29.2. 1944.
Specification	10	1	0	
Travelling Expenses (if any)				
				When received, 192

D. J. G. Johnson
Engineer Surveyor to Lloyd's Register of Shipping

Committee's Minute **FRI, 23 MAR 1945**

Assigned *Su F. E. machy opt.*