Rpt. 5a.

REPORT ON BOILERS.

No. 12784

Received at London Office NOV - 7 1940

Date of writing Report 6th Nov 1940 When handed in at Local Office 6th Nov 1940 Port of BELFAST

Visits included in T.E. mchy.

No. in Reg. Book. Survey held at BELFAST Date, First Survey Last Survey 24th Oct 1940

on the SINGLE SCREW MOTOR VESSEL "ARAYBANK" (Number of Visits ") Tons { Gross 7258 / Net 5247

Master Built at BELFAST By whom built HARLAND & WOLFF Yard No. 1034 When built 1940

Engines made at BELFAST By whom made HARLAND & WOLFF Engine No. 1034 When made 1940

Boilers made at BELFAST By whom made HARLAND & WOLFF Boiler No. 1034 When made 1940

Nominal Horse Power 490 Owners ANDREW WEIR & Co. LD. Port belonging to BELFAST

MULTITUBULAR BOILERS ~~MAIN, AUXILIARY, OR~~ DONKEY.

Manufacturers of Steel COLVILLES, LD. (Letter for Record S ✓)

Total Heating Surface of Boilers 1590 0' ✓ Is forced draught fitted No ✓ Coal or Oil fired OIL ✓

No. and Description of Boilers ONE S.E. MULTITUBULAR RETURN TUBE **Working Pressure** 120 LB/0" ✓

Tested by hydraulic pressure to 230 LB/0" Date of test 18.4.40 No. of Certificate 1079 Can each boiler be worked separately ✓

Area of Firegrate in each Boiler ✓ No. and Description of safety valves to each boiler 2-2½" APPROVED HIGH LIFT TYPE

Area of each set of valves per boiler { per Rule 14.70" / as fitted 9.80" } Pressure to which they are adjusted 120 LB/0" Are they fitted with easing gear YES ✓

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

Smallest distance between boilers or uptakes and bunkers or woodwork AMPLE ✓ Is oil fuel carried in the double bottom under boilers No ✓

Smallest distance between shell of boiler and tank top plating ✓ Is the bottom of the boiler insulated

Largest internal dia. of boilers 12' 9" ✓ Length 11'-0" ✓ **Shell plates:** Material S.M. STEEL Tensile strength 29-33 T/0" ✓

Thickness 47/64" ✓ Are the shell plates welded or flanged No ✓ Description of riveting: circ. seams { end D.R.L ✓ / inter. ✓

long. seams T.R.D.B.S. ✓ Diameter of rivet holes in { circ. seams 31/32" / long. seams 29/32" ✓ } Pitch of rivets { 3.018" ✓ / 5 3/4" ✓ }

Percentage of strength of circ. end seams { plate 67.8 / rivets 53 } Percentage of strength of circ. intermediate seam { plate ✓ / rivets ✓ }

Percentage of strength of longitudinal joint { plate 84.2 / rivets 112.6 / combined 91 } Working pressure of shell by Rules 124.8 LB/0" ✓

Thickness of butt straps { outer 19/32" / inner 23/32" } **No. and Description of Furnaces in each Boiler** TWO CORRUGATED MORRISON SECTION ✓

Material STEEL ✓ Tensile strength 26-30 T/0" ✓ Smallest outside diameter 42.875 ✓

Length of plain part { top ✓ / bottom ✓ } Thickness of plates { crown 7/16" ✓ / bottom } Description of longitudinal joint FIRE WELDED ✓

Dimensions of stiffening rings on furnace or c.c. bottom ✓ Working pressure of furnace by Rules 145.5 LB/0" ✓

End plates in steam space: Material STEEL ✓ Tensile strength 26/30 T./0" ✓ Thickness 7/8" ✓ Pitch of stays 18½" × 14¾" & VARIOUS.

How are stays secured SCREWED INTO BOTH PLATES & NUTS & WASHERS IN & OUT Working pressure by Rules 125 LB/0" ✓

Tube plates: Material { front STEEL / back STEEL } Tensile strength { 26-30 T./0" ✓ } Thickness { 13/16" / 3/4" ✓ }

Mean pitch of stay tubes in nests 10.375" ✓ Pitch across wide water spaces 14¼" ✓ Working pressure { front / back }

Girders to combustion chamber tops: Material STEEL ✓ Tensile strength 28-32 T/0" ✓ Depth and thickness of girder

at centre 7½" × (2 × ¾") ✓ Length as per Rule 31.44 ✓ Distance apart 10¾" ✓ No. and pitch of stays

in each 3 - 8¾" ✓ Working pressure by Rules 130 LB/0" ✓ **Combustion chamber plates:** Material STEEL ✓

Tensile strength 26-30 T/0" ✓ Thickness: Sides 5/8" ✓ Back 9/16" ✓ Top 5/8" ✓ Bottom 11/16" ✓

Pitch of stays to ditto: Sides 10" × 9¼" ✓ Back 9⅜" × 8¼" ✓ Top 10¾" × 8¾" ✓ Are stays fitted with nuts or riveted over NUTS ✓

Working pressure by Rules 145, 139 & 140 LB/0" ✓ **Front plate at bottom:** Material STEEL ✓ Tensile strength 26-30 T/0" ✓

Thickness 13/16" ✓ **Lower back plate:** Material STEEL ✓ Tensile strength 26-30 T/0" ✓ Thickness ¾" ✓

Pitch of stays at wide water space 12¾" ✓ Are stays fitted with nuts or riveted over NUTS ✓

Working Pressure **Main stays:** Material STEEL ✓ Tensile strength 28-32 T/0" ✓

Diameter { At body of stay, or Over threads 2½" ✓ } No. of threads per inch 6 ✓ Area supported by each stay

Working pressure by Rules **Screw stays:** Material STEEL ✓ Tensile strength 26-30 T/0" ✓

Diameter { At turned off part, or Over threads 1 3/8" - 1½" - 1 5/8" ✓ } No. of threads per inch 9 ✓ Area supported by each stay 77.40" ✓

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Working pressure by Rules 131 LB/□" *Are the stays drilled at the outer ends* No *Margin stays: Diameter* {*At turned off part, or Over threads*} 1½" ✓

No. of threads per inch 9 *Area supported by each stay* 98.4□" *Working pressure by Rules* 127.5□"

Tubes: *Material* WROT IRON *External diameter* {*Plain* 3¼" *Stay* 3¼"} *Thickness* {8 L.S.G. ¼"-9/32"} *No. of threads per inch* 9

Pitch of tubes 4½" × 4½" *Working pressure by Rules* 230 LB/□" (PLAIN) **Manhole compensation:** *Size of opening in shell plate* 16½" × 12½" *Section of compensating ring* 20" × 11/16" *No. of rivets and diameter of rivet holes* 28 - 15/32"

Outer row rivet pitch at ends 9" *Depth of flange of manhole* ~~flanged~~ END PLATE 3⅜" **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* ✓ *Rivets* ✓}

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 NONE *Manufacturers of* {*Tubes* ✓ *Steel castings* ✓}

Number of elements ✓ *Material of tubes* ✓ *Internal diameter and thickness of tubes* ✓

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 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

FOR HARLAND AND WOLFF, LIMITED.

The foregoing is a correct description,

A. S. Marshall

Secretary *Manufacturer*

Dates of Survey while building	During progress of work in shops - -	Are the approved plans of boiler and superheater forwarded herewith (If not state date of approval.)	26/7/3
	During erection on board vessel - - -	Total No. of visits	

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

This boiler was constructed under Special Survey and in accordance with the approved plan. The materials and workmanship are good. It has been tested by hydraulic pressure in accordance with the Rules. It was subsequently fitted on board the Vessel in an efficient manner, the safety valves were adjusted under steam and a satisfactory accumulation test carried out. The boiler is adapted for oil firing and the plant has been found to function satisfactorily under working conditions.

In our opinion the boiler is eligible to receive the notation of D.B. 120 lb/□"

Survey Fee ... ... £ See Machinery Rpt. When applied for, 192

Travelling Expenses (if any) : : When received, 192

Geo. G. Thomas & J. McGee

Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute TUE. 26 NOV 1940

Assigned See Bel. F.E. 12784