

REPORT ON BOILERS.

Received at London Office 29 MAR 1943

Date of writing Report 19 When handed in at Local Office 26 MAR 1943 Port of Sunderland.

No. in Survey held at Sunderland Date, First Survey Last Survey 17 July 1943

Reg. Book. "EMPIRE BEN" (Number of Visits) Gross Tons Net

Built at By whom built Yard No. When built

Engines made at Sunderland By whom made G. Clark (1938) L.D. Engine No. 1264 When made 1942.

Boilers made at Sunderland By whom made G. Clark (1938) L.D. Boiler No. 1264 When made 1942.

Nominal Horse Power Owners Port belonging to

MULTITUBULAR BOILERS—MAIN, AUXILIARY, OR DONKEY.

Manufacturers of Steel Steel Company of Scotland (Letter for Record S.)

Total Heating Surface of Boilers 2781 sq. ft. Is forced draught fitted Yes. Coal or Oil fired Coal

No. and Description of Boilers One Single Ended multitubular return tube marine Working Pressure 200

Tested by hydraulic pressure to 350 Date of test 9/9/42 No. of Certificate 4444 Can each boiler be worked separately Yes.

Area of Firegrate in each Boiler 40 sq. ft. No. and Description of safety valves to each boiler Two Cockburn Imp. High Lift.

Area of each set of valves per boiler {per Rule 8.19 sq. ft. as fitted 9.8 sq. ft. Pressure to which they are adjusted 200 lb. 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 bunkers 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 Yes. Is the bottom of the boiler insulated Yes.

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

Thickness 1 13/32" Are the shell plates welded or flanged No. Description of riveting: circ. seams {end D.R. Lap. inter. 4.643" long. seams T.R.D.B.S. Diameter of rivet holes in {circ. seams 1 1/2" long. seams 1 1/16" Pitch of rivets {plate 9 23/32" rivets

Percentage of strength of circ. end seams {plate 64.9 rivets 42.65 Percentage of strength of circ. intermediate seam {plate 85.3 rivets 84.43 combined 88.15

Percentage of strength of longitudinal joint {plate 85.3 rivets 84.43 combined 88.15

Thickness of butt straps {outer 1 1/16" inner 1 3/16" No. and Description of Furnaces in each Boiler Three Corrugated (Leighton)

Material Steel Tensile strength 26/30 Smallest outside diameter 3'-11 1/32"

Length of plain part {top Yes bottom Yes Thickness of plates {crown 43/64" bottom 43/64" Description of longitudinal joint Weld.

Dimensions of stiffening rings on furnace or c.c. bottom Yes

End plates in steam space: Material Steel Tensile strength 26/30 Thickness 1 15/32" Pitch of stays 22 1/2" x 22"

How are stays secured Double nuts

Tube plates: Material {front Steel back Steel Tensile strength {front 26/30 back 26/30 Thickness {front 29/32" back 24/32"

Mean pitch of stay tubes in nests 13 1/8" x 8 3/4" Pitch across wide water spaces 14 1/4" x 8 3/4"

Girders to combustion chamber tops: Material Steel Tensile strength 28/32 Depth and thickness of girder at centre 2 - 10 7/8" x 3/4" Length as per Rule 34" Distance apart 10" No. and pitch of stays in each 3 @ 9"

Tensile strength 26/30 Thickness: Sides 13/16" Back 11/16" Lingo Top 13/16" Bottom 13/16"

Pitch of stays to ditto: Sides 9 3/8" x 8 5/8" Top 9" x 9" Bottom 9" x 10" Are stays fitted with nuts or riveted over Nuts.

Front plate at bottom: Material Steel Tensile strength 26/30 Thickness 29/32" Lower back plate: Material Steel Tensile strength 26/30 Thickness 3/32"

Pitch of stays at wide water space 14 1/4" x 9" Are stays fitted with nuts or riveted over Nuts.

Main stays: Material Steel Tensile strength 28/32

Diameter {At body of stay, or Over threads 3 3/4" v 3 1/2" No. of threads per inch 6

Screw stays: Material Steel Tensile strength 26/30

Diameter {At turned off part, or Over threads 1 3/4" No. of threads per inch 9

Are the stays drilled at the outer ends no. Margin stays: Diameter ^{At turned off part.} 1 7/8" + 2"
 or ^{Over threads} 1 7/8" + 2"
 No. of threads per inch 9.
 Tubes: Material P. D. Steel External diameter ^{Plain} 3 1/4" Thickness ^{8 WG.} 5/16" No. of threads per inch 9.
^{Stay} 3 1/4"
 Pitch of tubes 4 3/8" x 4 3/8" Manhole compensation: Size of opening in
 shell plate 20" x 16" Section of compensating ring 9 3/8" x 1 1/32" No. of rivets and diameter of rivet holes 38 @ 1 1/2"
 Outer row rivet pitch at ends 10 1/4" Depth of flange if manhole flanged 2 3/4" 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 _____ Thickness of crown _____ No. and diameter of
 stays _____ Inner radius of crown _____
 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} _____
^{Steel forgings} _____
^{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 _____
 Pressure to which the safety valves are adjusted _____ Hydraulic test pressure: _____
 tubes _____ forgings and 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 22 inclusive for boilers been complied with Yes.

The foregoing is a correct description,
A. J. Berry Manufacturer.
 DIRECTOR & GENERAL MANAGER

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

Is this Boiler a duplicate of a previous case _____ If so, state Vessel's name and Report No. _____

GENERAL REMARKS (State quality of workmanship, opinions as to class, &c.) This boiler has been
Constructed under Special Survey in accordance with the approved
Plan, Specification & the requirements of the Society's rules.
The materials & workmanship are good. On completion it
was tested by hydraulic pressure of 350 lbs/sq. & found tight & sound
at that pressure.
For recommendation please see Rpt 4.

Survey Fee ... £ See Machinery When applied for, 19
 Travelling Expenses (if any) £ Rpt. When received, 19

W. H. Mason
 Engineer Surveyor Lloyd's Register of Shipping.

Committee's Minute FRI. 2 APR 1943
 Assigned See Inl J.E. 51877

