

REPORT ON MACHINERY.

No.

7968

Received at London Office

JUN 1918

of writing Report 2nd June 18 When handed in at Local Office

Port of Belfast

in Survey held at Belfast

Date, First Survey 2nd March 1914 Last Survey 25th May 1918

Book on the T.S.S. "ORCA"

(Number of Visits 126 Gross 15119

ter Built at Belfast

By whom built Harland & Wolff L^{td} Tons Net 9444

When built 1918

nes made at Belfast By whom made

when made

ers made at By whom made

when made

stered Horse Power

Owners Pacific Steam Navigation Co Port belonging to Liverpool

Horse Power as per Section 28 1631

Is Refrigerating Machinery fitted for cargo purposes Yes Is Electric Light fitted Yes

INES, &c.—Description of Engines Four Crank Triple Expansion + one L.P. Turbine No. of Cylinders 8 No. of Cranks 8

of Cylinders 26 $\frac{1}{2}$ - 42 - 47 $\frac{1}{2}$ - 47 $\frac{1}{2}$ Length of Stroke 51 Revs. per minute 87 Dia. of Screw shaft as per rule 5.08 Material of I. Steel

he 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

he 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

een the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive If two

s are fitted, is the shaft lapped or protected between the liners Length of stern bush 5'-6"

of Tunnel shaft as per rule 14.13 Dia. of Crank shaft journals as per rule 14.8 Dia. of Crank pin 16 Size of Crank webs 30" x 11 $\frac{1}{2}$ Dia. of thrust shaft under

rs 15 $\frac{3}{4}$ Dia. of screw 17'-6 Pitch of Screw 21'-3 No. of Blades 3 State whether moveable Yes Total surface 80 sq ft.

of Feed pumps Diameter of ditto on Stroke Main Can Engine room while the other is at work

of Bilge pumps Diameter of ditto on Stroke Main Can Engine room while the other is at work

of Donkey Engines Scales of Pumps other sheet No. and size of Suctions connected to both Bilge and Donkey pumps

Engine Room 6-3 $\frac{1}{2}$ + 6-2 $\frac{1}{2}$ Emergency 3-6 In Holds, &c. 3-3 $\frac{1}{2}$ + 12-2 $\frac{1}{2}$ Emergency 12-6

of Bilge Injections 2 sizes 13 $\frac{1}{2}$ Connected to condenser, or to circulating pump Pumps a separate Donkey Suction fitted in Engine room & size 3-4 $\frac{1}{2}$

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

all connections with the sea direct on the skin of the ship Yes Are they Valves or Cocks Both

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

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

at pipes are carried through the bunkers Fore hold suction How are they protected Wood casings

all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times Yes

the Bilge Suction Pipes, Cocks, and Valves arranged so as to prevent any communication between the sea and the bilges Yes

the Screw Shaft Tunnel watertight Yes Is it fitted with a watertight door Yes worked from Bulkhead & Upper L Room

ILERS, &c.—(Letter for record 3) Manufacturers of Steel R. Calville & Son L^{td}

tal Heating Surface of Boilers 28032 sq ft Forced Draft fitted No No. and Description of Boilers 6-Double End Cylindrical

orking Pressure 215 lbs Tested by hydraulic pressure to 400 lbs Date of test 10-12-17 No. of Certificate 515

n each boiler be worked separately Yes Area of fire grate in each boiler 118 $\frac{1}{2}$ sq ft. No. and Description of Safety Valves to

h boiler 3 Direct Spring Area of each valve 9.62 sq Pressure to which they are adjusted 215 lbs Are they fitted with easing gear Yes

allest distance between boilers or uptakes and bunkers or woodwork about 22 Mean dia. of boilers 15'-0 Length 9'-6 Material of shell plates Steel

ickness 1 $\frac{3}{4}$ Range of tensile strength 29-33 tons Are the shell plates welded or flanged No Descrip. of riveting: cir. seam Lap D. & S.

g. seams M. Lable Diameter of rivet holes in long. seams 1 $\frac{3}{4}$ Pitch of rivets 10 $\frac{1}{2}$ Lap of plates or width of butt straps 22 $\frac{1}{2}$

r centages of strength of longitudinal joint rivets 88.6 Working pressure of shell by rules 250 lbs Size of manhole in shell 16" x 12"

se of compensating ring M^{rs} Neils No. and Description of Furnaces in each boiler 6-Mansions Material Steel Outside diameter 47 $\frac{1}{2}$

length of plain part top Thickness of plates crown 3 $\frac{1}{16}$ Description of longitudinal joint Weld No. of strengthening rings 4

orking pressure of furnace by the rules 238 lbs Combustion chamber plates: Material Steel Thickness: Sides 3 $\frac{1}{2}$ Back 3 $\frac{1}{2}$ Top 3 $\frac{1}{2}$ Bottom 3 $\frac{1}{2}$

itch of stays to ditto: Sides 8 $\frac{1}{2}$ x 8 Back 8 $\frac{1}{2}$ x 8 Top 8 $\frac{1}{2}$ x 8 If stays are fitted with nuts or riveted heads Nuts inside Working pressure by rules 228 lbs

aterial of stays Steel Area at smallest part 1.77 x 2.07 sq supported by each stay 65 sq Working pressure by rules 243 lbs and plates in steam space:

aterial Steel Thickness 1 $\frac{3}{32}$ Pitch of stays 17 $\frac{3}{8}$ x 15 How are stays secured Spaced into plate Working pressure by rules 218 lbs Material of stays Steel

rea at smallest part 5.64 x 6.44 sq supported by each stay 260 $\frac{1}{2}$ sq Working pressure by rules 258 lbs Material of Front plates at bottom Steel

ickness 7 $\frac{1}{8}$ Material of Lower back plate Thickness Greatest pitch of stays Working pressure of plate by rules

iameter of tubes 2 $\frac{1}{4}$ Pitch of tubes 4" x 4" Material of tube plates Steel Thickness: Front 7 $\frac{1}{8}$ Back 7 $\frac{1}{8}$ Mean pitch of stays 8" x 8"

itch across wide water spaces 14 Working pressures by rules 291 lbs with 4 Doubles Girders to Chamber tops: Material Iron Depth and

ickness of girder at centre 9" x (7 x 2) Length as per rule 57 Distance apart 8 $\frac{1}{2}$ x 8 Number and pitch of stays in each 6-7 $\frac{1}{4}$

orking pressure by rules 342 lbs Steam dome: description of joint to shell % of strength of joint

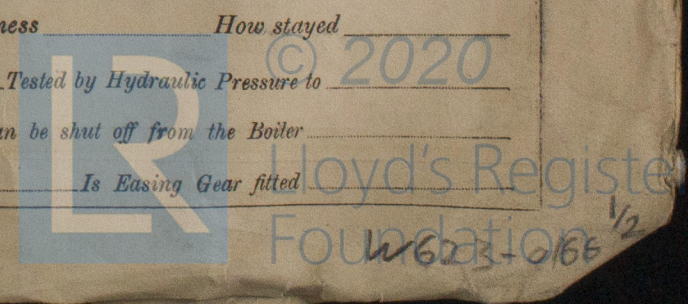
iameter Thickness of shell plates Material Description of longitudinal joint Diam. of rivet holes

itch of rivets Working pressure of shell by rules Crown plates Thickness How stayed

PERHEATER. Type Date of Approval of Plan Tested by Hydraulic Pressure to

ate of Test Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler

meter of Safety Valve Pressure to which each is adjusted Is Easing Gear fitted



IS A DONKEY BOILER FITTED? *No*

If so, is a report now forwarded?

SPARE GEAR. State the articles supplied: *See separate sheet*

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

Crosby

Manufacturer.

Dates of Survey while building
During progress of work in shops -- *2nd March 1914 to 25th May 1918*
During erection on board vessel ---
Total No. of visits *126*

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

Dates of Examination of principal parts—Cylinders *2nd March 1914* " donkey " " " *19th March 1914*
Connecting *18-2-18* Crank shaft *17* Thrust shaft *14* Tunnel shafts *5* Pistons *5* Rods *5*
Stern tube *15-3-17* Steam pipes tested *19-4-18* Engine and boiler seatings *2-2-18* Engines holding down bolts *13-3-18*
Completion of pumping arrangements *13-5-18* Boilers fixed *2-2-18* Engines tried under steam *16-5-18*
Completion of fitting sea connections *20-3-17* Stern tube *29-3-17* Screw shaft and propeller *5-4-17*
Main boiler safety valves adjusted *16-5-18* Thickness of adjusting washers *6-13-18*
Material of Crank shaft *Steel* Identification Mark on Do. *LLOYDS* Material of Thrust shaft *Steel* Identification Mark on Do. *Do*
Material of Tunnel shafts *Steel* Identification Marks on Do. *Do* Material of Screw shafts *Steel* Identification Marks on Do. *Do*
Material of Steam Pipes *Steel & Iron* Test pressure *64.5 lb* *11-2-18*

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 *Orbuna & Orbata*
General Remarks (State quality of workmanship, opinions as to class, &c.) *Orbuna* *Orbata*

The machinery of this vessel has been constructed under Special Survey, and in accordance with the Rules. The workmanship and the materials are of good description throughout, and on trial under steam in Belfast Lough, the machinery worked satisfactorily. In our opinion, it will be eligible for records + L.M.C. 5-18, provided the Diesel Engine which drives the Emergency Electrical Installation, from which (along with the Main Electrical Installation) the Emergency Bilge pumps are driven, be examined under working conditions.

It is submitted that
this vessel is eligible for
THE RECORD. + L.M.C. 5-18.

The amount of Entry Fee ... £ *3-0* When applied for, *5-6-1918*
Special ... £ *85-15*
Donkey Boiler Fee ... £
Travelling Expenses (if any) £ *27-1-18*

Committee's Minute

Assigned

+ L.M.C. 5-18

John Pollock
R. F. Bennett
Engineer Surveyor to Lloyd's Register of Shipping.

of *Belfast*

Continuation of Report No. *7968* dated *2nd June 1918* the

L.S. ORCA

Main Feed Mains *18-13-17* 2 Sanitary Mains *8-9-18*
Fuel *8-6-18* 1 Oil Cooling Circ. *7-7-15*
Emergency *8-6-18* 2 Lubricating Oil Mains *6-6-12*
2 Main Air *14-24-18* 1 Fresh Water *5-5-12*
Fuel *12-18-10* 1 Heating & Cooking Air *6-12-6*
2 Main Cent. Circ. *20-pipe* 1 - - - - - *5-6-18*
Fuel *8-* 2 Evaporators *30 Tons each*
1 General Supplies *12-8-12* 1 Distiller *✓*
1 Ice Extractor *12-8-12* 1 Feed Heater *✓*
1 Ballast *9-10-12* 2 - Filters *✓*
2 Emergency Bilge Pumps (Electric) *10-12* 1 Fuel Condenser *✓*
2 Bilge Mains *8-9-18* 1 Oil Cooler etc.

Spare Gear

1 propeller shaft, also set studs & nuts
2 piston rods & nuts
2 crosshead shoes
2 main top end braces
2 - bottom - -
1 Valve spindle H.P. on I.P.
1 - - - L.P.
1 set rings H.P. piston valve
1 - - - I.P.
1 - - - L.P.
1 - - - H.P. piston
1 - - - I.P.
2 - - - L.P.
1 Eccentric strap & bolts
1 escape valve spring, each size
50 Condenser tubes + 50 ferrules
1 set piston rings for Reversing Engine
1 - - - Change valve

Boiler spare gear
Donkey pump - - and all gear to Lloyd's Rules
Spare gear for Lubrication:-

2 sets gland rings
24 blade segments for rotors & cylinders
5% dummy strip
5% gland -
Escape valve spring etc.

R. F. Bennett