Rpt. 4.

REPORT ON MACHINERY.

No. 7767.

Received at London Office SAT JUN. 21. 1913

Date of writing Report 20th June 1913. When handed in at Local Office 20 JUN 1913 Port of DUNDEE

No. in Reg. Book. SUPPLEMENT 37 Survey held at Dundee Date, First Survey 14th Oct. 1912. Last Survey 18th June 1913 (Number of Visits 29)

on the Machinery of the STEEL Sc. St. "IMPOCO" Tons { Gross 2256.88. Net 1382.89.

Master J. Clark. Built at Grangemouth By whom built Greenock & Grangemouth D.y. Co. Ld. When built 1913

Engines made at Dundee By whom made Cooper & Greig when made 1913

Boilers made at Do. By whom made Do. when made 1913

Registered Horse Power ✓ Owners Imperial Oil Company Ld. Port belonging to Sarnia

Nom. Horse Power as per Section 28 224 Is Refrigerating Machinery fitted for cargo purposes no. Is Electric Light fitted yes.

ENGINES, &c.—Description of Engines Triple Surface Condensing No. of Cylinders 3 No. of Cranks 3

Dia. of Cylinders 21", 34", 56" Length of Stroke 36" Revs. per minute ___ Dia. of Screw shaft as per rule 10.96 (11.3") as fitted 11 3/4" Material of screw shaft Steel.

Is the 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 in the propeller boss yes. If the liner is in more than one length are the joints burned ✓ If the liner does not fit tightly at the part between the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive ✓ If two liners are fitted, is the shaft lapped or protected between the liners ✓ Length of stern bush 4'-6"

Dia. of Tunnel shaft as per rule 10.23" as fitted "None" Dia. of Crank shaft journals as per rule 10.73 as fitted 11" Dia. of Crank pin 11" Size of Crank webs 22" x 7 1/4 Dia. of thrust shaft under collars 11" Dia. of screw 13'-6 1/2 Pitch of Screw 14'-6" No. of Blades 4 State whether moveable no. Total surface 64 sq ft

No. of Feed pumps 2 Diameter of ditto 3 1/2" Stroke 18" Can one be overhauled while the other is at work yes.

No. of Bilge pumps 2 Diameter of ditto 3 1/2" Stroke 18" Can one be overhauled while the other is at work yes.

No. of Donkey Engines 2 Sizes of Pumps { 8" & 8" x 8" WEIR'S; 7" & 4 1/2" x 8" LAMONT'S } No. and size of Suctions connected to both Bilge and Donkey pumps

In Engine Room 6 @ 3" In Holds, &c. none.

No. of Bilge Injections 1 sizes 6" Connected to ~~condenser, or to~~ circulating pump yes. Is a separate Donkey Suction fitted in Engine room & size yes, 3"

Are 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 none.

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

Are 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 above.

Are 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.

What pipes are carried through the bunkers none. How are they protected ✓

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

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

Dates of examination of completion of fitting of Sea Connections 16/5/13 of Stern Tube 16/5/13 Screw shaft and Propeller 20/6/13

Is the Screw Shaft Tunnel watertight none. Is it fitted with a watertight door ✓ worked from ✓

BOILERS, &c.—(Letter for record S.) Manufacturers of Steel Wm. Beardmore & Co. Ltd. and David Colville & Sons, Ld.

Total Heating Surface of Boilers 3716 sq ft Is Forced Draft fitted no. No. and Description of Boilers 2 ~ S.E. cylindrical multitubular

Working Pressure 180 lbs. Tested by hydraulic pressure to 360 lbs. Date of test 7-5-13 No. of Certificate 941

Can each boiler be worked separately yes. Area of fire grate in each boiler 58 sq ft No. and Description of Safety Valves to each boiler Two - direct spring Area of each valve 7.06 □" Pressure to which they are adjusted 180 lbs. Are they fitted with easing gear yes.

Smallest distance between boilers ~~or~~ uptakes and bunkers ~~or woodwork~~ 5'-0" INTl. ~~Mean~~ dia. of boilers 14'-6" Length 10'-6" Material of shell plates Steel.

Thickness 1 3/16" Range of tensile strength 28-32 Are the shell plates welded or flanged no. Descrip. of riveting: cir. seams D.R., L.

long. seams T.R., D.B.S. Diameter of rivet holes in long. seams 1 1/4" Pitch of rivets 8 5/16" ~~lap of plates or~~ width of butt straps 21"

Per centages of strength of longitudinal joint rivets 92.67 plate 84.96 Working pressure of shell by rules 182.6 Size of manhole in shell 16" x 12" { OPENING 20" x 16" }

Size of compensating ring McNeil's 8 1/2" - 13/16" No. and Description of Furnaces in each boiler 3 ~ Deightons Material Steel Outside diameter 3'-10 1/2"

Length of plain part top ✓ bottom Thickness of plates crown bottom } 9/16" Description of longitudinal joint Welded. No. of strengthening rings ✓

Working pressure of furnace by the rules 189 Combustion chamber plates: Material Steel Thickness: Sides 5/8" Back 5/8" Top 5/8" Bottom 7/8"

Pitch of stays to ditto: Sides { 8 1/2" x 8 1/2"; 8 1/2" x 8" } Back { 8 1/4" x 8 1/4"; 8 1/4" x 7" } Top 8 1/2" x 8 1/2 If stays are fitted with nuts or riveted heads nuts Working pressure by rules 186.6

Material of stays Steel ~~Diameter at~~ smallest part 2.03 □" Area supported by each stay 72.25 □" Working pressure by rules 252.8 End plates in steam space:

Material Steel. Thickness 1 7/32" Pitch of stays 20" (18") x 19 1/4 How are stays secured D. Ns. Working pressure by rules 182 Material of stays Steel,

AREA ~~Diameter~~ at smallest part 8.48 □" Area supported by each stay 367 □" Working pressure by rules 240 Material of Front plates at bottom Steel.

Thickness 3/4" Material of Lower back plate Steel. Thickness 13/16" Greatest pitch of stays 13 1/4" x 8 1/4" Working pressure of plate by rules 187

Diameter of tubes 3 1/4" Pitch of tubes 4 1/2" x 4 1/2" Material of tube plates Steel. Thickness: Front 3/4" Back 23/32" Mean pitch of stays 9.625"

Pitch across wide water spaces 14 1/4" Working pressures by rules 200 lbs. Girders to Chamber tops: Material Steel. Depth and thickness of girder at centre 9 1/4" x 1 1/2" Length as per rule 2'-8 5/8" Distance apart 8 1/2" Number and pitch of stays in each 3 @ 8 1/2"

Working pressure by rules 204 Superheater or Steam chest; how connected to boiler ___ Can the superheater be shut off and the boiler worked separately ___ Diameter ___ Length ___ Thickness of shell plates ___ Material ___ Description of longitudinal joint ___ Diam. of rivet holes ___ Pitch of rivets ___ Working pressure of shell by rules ___ Diameter of flue ___ Material of flue plates ___ Thickness ___ If stiffened with rings ___ Distance between rings ___ Working pressure by rules ___ End plates: Thickness ___ How stayed ___ Working pressure of end plates ___ Area of safety valves to superheater ___ Are they fitted with easing gear ___

VERTICAL DONKEY BOILER— Manufacturers of Steel

No. Description None fitted.

Made at By whom made When made Where fixed

Working pressure tested by hydraulic pressure to Date of test No. of Certificate Fire grate area Description of Safety

Valves No. of Safety Valves Area of each Pressure to which they are adjusted Date of adjustment

If fitted with easing gear If steam from main boilers can enter the donkey boiler Dia. of donkey boiler Length

Material of shell plates Thickness Range of tensile strength Descrip. of riveting long. seams

Dia. of rivet holes Whether punched or drilled Pitch of rivets Lap of plating Per centage of strength of joint Rivets Plates

Working pressure of shell by rules Thickness of shell crown plates Radius of do. No. of stays to do. Dia. of stays

Diameter of furnace Top Bottom Length of furnace Thickness of furnace plates Description of joint

Working pressure of furnace by rules Thickness of furnace crown plates Radius of do. Stayed by

Diameter of uptake Thickness of uptake plates Thickness of water tubes Dates of survey

SPARE GEAR. State the articles supplied: ~~1~~ solid C.I. propeller. 1 propeller shaft. 1 slide valve spindle & block: 1 pair crank pin brasses; 1 pair top end brasses; 1 air pump rod & bucket; 1 ecc. sheave & strap; 2 piston rod, 2 connecting rod, 2 main bearing, 1 set coupling & 6 junk ring bolts and nuts; 1 set air, feed, bilge & donkey pump valves; 2 feed check valves; assorted bolts, studs & nuts; iron of various sizes: 24 boiler tubes; 1 set fire bars; 20 condenser tubes; 1 safety valve spring: 1 escape valve for each size. Spare set metallic packing for H.P. piston & valve rods; 1 piston, bucket, & rod, steam chest & valves, and set of pump valves for Weir's Pump. Sanitary valves.

The foregoing is a correct description,

Manufacturer. Cooper & Greig

Dates of Survey while building	During progress of work in shops	1912. Oct. 14. 15. 21. 25. Nov. 12. 20. 22. 25. Dec. 6. 10. 13. 18. 1913. Jan. 7. 14. 21. Feb. 4. 6. 17. 20. Apr. 15. 17 May. 7. June 11.
	During erection on board vessel	1913. May. 29. 30. June 4. 10. 11. 18. { Leith Visits, viz:- 1913 May 16 June 20.
	Total No. of visits	29 Leith 2 = 31 visits.

Is the approved plan of main boiler forwarded herewith yes.

" " " donkey " " " none.

Dates of Examination of principal parts—Cylinders 25/10/12 12.20/11/12 7/1/13 17/2/13 15.17/4/13 Slides 15/4/13 17/4/13 Covers 6/2/13 15/4/13 17/4/13 Pistons 15/4/13 17/4/13 Rods 21/10/12 20/11/12 17/4/13

Connecting rods 21/10/12 20/11/12 17/4/13 Crank shaft 20/8/12 5/11/12 Thrust shaft 23/8/12 4/9/12 Tunnel shafts — Screw shaft 20/9/12 12/5/13 Propeller 7/5/13 Spare 30/5/13

Stern tube 15/4/13 1/5/13 Steam pipes tested 11/6/13 Engine and boiler seatings 16/5/13 Engines holding down bolts 4/6/13 10/6/13

Completion of pumping arrangements 18-6-13 Boilers fixed 10-6-13 Engines tried under steam 18-6-13

Main boiler safety valves adjusted 18-6-13 Thickness of adjusting washers Port { P 7/16" 13 S 13/32 Starboard { P 13/32" S 7/16" 13.

Material of Crank shaft Steel. Identification Mark on Do. 3121 W.D.H. Material of Thrust shaft Steel. Identification Mark on Do. 3121 W.D.H.

Material of Tunnel shafts — Identification Marks on Do. — Material of Screw shafts Steel. Identification Marks on Do. 3350 W.D.H.

Material of Steam Pipes Seamless Copper 4 3/4" bore; No. 4 W.G. Test pressure 360 lbs.

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

This vessel's engines and boilers have been constructed under special survey in accordance with the approved plan and the Society's rules.

The material and workmanship are of good description.

The machinery has been examined under working conditions and found satisfactory and eligible, in my opinion, to have record of + LMC 6,13.

It is submitted that
this vessel is eligible for
THE RECORD. + LMC. 6.13

JWD 11/7/13. [initials]

The amount of Entry Fee .. £ 2 : 0 : 0 When applied for,

Special .. .. .. £ 31 : 4 : 0 June 1913 26th June, 1913 Lth.

Donkey Boiler Fee .. .. £ : : When received,

Travelling Expenses (if any) £ : 10/6 11/7/1913

James Cavanaghan. & [signature]

~~Engineer Surveyor~~ Surveyor to Lloyd's Register of British & Foreign Shipping.

Committee's Minute FRI JUL 11 1913

Assigned + LMC 6.13

MACHINERY CERTIFICATE WRITTEN.

(The Surveyors are requested not to write on or below the space for Committee's Minute.)

Certificate (if required) to be sent to