

Rpt. 4.

REPORT ON MACHINERY.

No. 3068

Received at London Office

24 DEC 1930

Date of writing Report 29th NOVEMBER 1930 When handed in at Local Office

19 Port of SHANGHAI

No. in Survey held at SHANGHAI

Date, First Survey 24th JULY 1929 Last Survey 26th NOVEMBER 1930

Reg. Book. on the STEEL TWIN SC TWIN MST "PAO WO"

(Number of Visits 66)

Tons Gross 2517
Net 1494
When built 1930

Master Built at SHANGHAI

By whom built SHANGHAI DOCK & ENGINEERING CO. LD

Engines made at SHANGHAI

By whom made SHANGHAI DOCK & ENG. CO. LD.

when made 1930

Boilers made at SHANGHAI

By whom made SHANGHAI DOCK & ENG. CO. LD.

when made 1930

Registered Horse Power

Owners INDO-CHINA STEAM NAV. CO. LD.

Port belonging to SHANGHAI

Nom. Horse Power as per Section 28 214

Is Refrigerating Machinery fitted for cargo purposes NO

Is Electric Light fitted YES

ENGINES, &c.—Description of Engines TWIN SCREW VERTICAL TRIPLE EXP. SURFACE COND. No. of Cylinders 3 EACH ENGINE No. of Cranks 3 EACH

Dia. of Cylinders 13 1/4" - 22" - 35" Length of Stroke 18" Revs. per minute 233 Dia. of Screw shaft as per rule 6.42" Material of screw shaft MILD STEEL as fitted 1" shaft

Is the screw shaft fitted with a continuous liner the whole length of the stern tube NO (VICKER'S RINGS FITTED) Is the after end of the shaft 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 3'-0"

Dia. of Tunnel shaft as per rule 5.886" as fitted 6 3/8" Dia. of Crank shaft journals as per rule 6.18" as fitted 6 3/8" Dia. of Crank pin 6 3/8" Size of Crank webs 4 1/2" x 7 1/2" Dia. of thrust shaft under collars 6 3/8" Dia. of screw 7'-0" Pitch of Screw 6'-6" No. of Blades 4 State whether moveable NO Total surface 21.5 sq ft in ONE PROPELLER

No. of Feed pumps TWO Diameter of ditto 8" x 6" Stroke 18" Can one be overhauled while the other is at work YES

No. of Bilge pumps ONE Diameter of ditto 7" x 4" Stroke 7" Can one be overhauled while the other is at work YES

No. of Auxiliary Engines ONE FAN ENG. ONE CENTRAL ENG. Sizes of Pumps (CENTRAL 10" 1" 7" x 7" x 7" 1.8" x 6" x 8") No. and size of Suctions connected to both Bilge and Donkey pumps In Engine Room THREE 2 1/2" In Holds, &c. ONE 2 1/2" FORE PEAK SUCTION, TWO 3" FORE HOLD SUCTIONS ONE 2 1/2" FORE COFFERDAM SUCTION, ONE 2 1/2" AFT COFFERDAM SUCTION, TWO 2 1/2" AFT HOLD SUCTIONS

No. of Bilge Injections ONE size 7" Connected to bilge, or to circulating pump YES Is a separate Donkey Suction fitted in Engine room & size 3 1/2"

Are all the bilge suction pipes fitted with roses YES Are the roses in Engine room always accessible YES Are the valves on Engine room bulkheads always accessible YES

Are all connections with the sea direct on the skin of the ship YES Are they Valves or Cocks VALVES + COCKS

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 7 FORWARD SUCTIONS How are they protected CASED IN

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

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 STEEL COY OF SCOTLAND LTD.

Total Heating Surface of Boilers 3632 sq ft Is Forced Draft fitted YES No. and Description of Boilers 2, HORIZONTAL CYL. MULT. BOILERS

Working Pressure 200 lbs/sq in Tested by hydraulic pressure to 350 lbs/sq in Date of test 13-6-30, 25-6-30 No. of Certificate 36 + 37

Can each boiler be worked separately YES Area of fire grate in each boiler 51 sq ft No. and Description of Safety Valves to each boiler 2- SPRING LOADED Area of each valve 5.9 sq ins Pressure to which they are adjusted Are they fitted with easing gear YES

Smallest distance between boilers or uptakes and bunkers or woodwork 1-9" Mean dia. of boilers 13'-1 1/2" Length 11'-0 1/2" Material of shell plates STEEL

Thickness 1 1/8" Range of tensile strength 30-35 TONS Are the shell plates welded or flanged NO Descrip. of riveting: cir. seams DOUBLE long. seams TREBLE Diameter of rivet holes in long. seams 1 3/16" Pitch of rivets 8 1/4" Lap of plates or width of butt straps 19"

Per centages of strength of longitudinal joint rivets 85-4% plate 85-6% Working pressure of shell by rules 203.5 lbs Size of manhole in shell 16" x 12"

Size of compensating ring 3'-1 1/4" x 2'-9 1/4" No. and Description of Furnaces in each boiler 3 MORRISON TYPE Material STEEL Outside diameter 3'-5 1/4" Length of plain part top — bottom — Thickness of plates crown 17/32" Description of longitudinal joint No. of strengthening rings —

Working pressure of furnace by the rules 201.8 Combustion chamber plates: Material STEEL Thickness: Sides 11/16" Back 5/8" Top 11/16" Bottom 11/16" Pitch of stays to ditto: Sides 8 3/4" x 7 3/8" Back 8" x 8" Top 8 3/4" x 7 3/8" If stays are fitted with nuts or riveted heads NUTS Working pressure by rules 211.5 lbs/sq in

Material of stays STEEL Area at smallest part 1.43 sq ins Area supported by each stay 64.53 sq ins Working pressure by rules 235.6 End plates in steam space: Material STEEL Thickness 1 1/8" Pitch of stays 18 1/2" x 18" How are stays secured NUTS Working pressure by rules 201-39 Material of stays STEEL

Area at smallest part 6.15 sq ins Area supported by each stay 333 sq ins Working pressure by rules 201.8 Material of Front plates at bottom STEEL Thickness 7/8" Material of Lower back plate STEEL Thickness 13/16" Greatest pitch of stays 13 1/2" x 8" Working pressure of plate by rules 218.2

Diameter of tubes 2 3/4" Pitch of tubes 3 7/8" Material of tube plates STEEL Thickness: Front 1/2" Back 3/4" Mean pitch of stays 11 5/8" x 7 3/4" Pitch across wide water spaces 13 1/2" x 4 3/4" Working pressures by rules 213.5 Girders to Chamber tops: Material STEEL Depth and thickness of girder at centre 9" x 2 at 1/16" Length as per rule 2'-7" Distance apart 8 3/4" Number and pitch of stays in each 30 11 3/8" Pitch

Working pressure by rules 206 lbs/sq in Steam dome: description of joint to shell % of strength of joint —

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

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

SUPERHEATER. Type NONE Date of Approval of Plan — Tested by Hydraulic Pressure to —

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

Diameter 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:—

TWO TOP + TWO BOTTOM END BOLTS & NUTS, TWO MAIN BEARING BOLTS & NUTS, ONE SET COUPLING BOLTS, AIR PUMP ROD, CIRCULATING PUMP IMPELLER, ONE SET OF RINGS FOR H.P. I.P. + L.P. PISTONS, ONE SET OF VALVES FOR GENERAL SERVICE + INDEPENDENT FEED PUMPS, TWO SCREW SHAFTS, TWO PROPELLERS, ONE PAIR OF TOP + BOTTOM END BRASSES, ONE ECCENTRIC STRAP COMPLETE, ONE SET OF CHECK VALVES, TWELVE JUNK RING BOLTS, SIX CYLINDER COVER STUDS, SIX VALVE CHEST COVER BOLTS, FIFTY CONDENSER TUBES, ESCAPE VALVE SPRINGS OF EACH SIZE, TWO BOILER SAFETY VALVES & SPRINGS, ASSORTED SIZES OF VARIOUS BOLTS & NUTS & OTHER ARTICLES AS PER OWNER'S SPECIFICATION.

The foregoing is a correct description,

THE SHANGHAI DOCK & ENGINEERING CO., LTD.

W. S. Burns

Managing Director

Manufacturer.

Dates of Survey while building: During progress of work in shops -- 1929-July 24-Aug 29-Sept 19, 24-Oct 9, 16, 29, 30-Nov 5, 9, 12, 16, 20, 27-Dec 2, 5, 11, 30-1930 JAN 8, 10, 13, 17, 23, 29-FEB 6, 14, 18, 20, 25, 27-MAR 7, 11, 12, 14, 17, 21, 26-APR 3, 12, 24, 29-MAY 8, 14, 23, 28-JUN 5, 13, 18, 24, 25-JUL 5, 11, 15-AUG 5, 12, 18, 23-SEPT 1, 5, 12, 15-NOV 7, 15, 18, 26. Total No. of visits 66. Is the approved plan of main boiler forwarded herewith " " " donkey " " "

Dates of Examination of principal parts: Cylinders 30-10-29, 18-2-30, 25-2-30, 7-3-30 Slides 25-2-30, 26-3-30 Covers 18-2-30, 11-3-30 Pistons 6-2-30, 14-3-30 Rods 29-8-29, 24-10-29, 30-10-29 Crank shaft 24-7-29, 24-4-30 Thrust shaft 20-2-30, 24-4-30 Tunnel shafts Screw shaft 24-4-30 Propeller 24-4-30 Stern tube 26-3-30 Steam pipes tested 26-9-30 Engine and boiler seatings 8-5-30 Engines holding down bolts 5-6-30 Completion of pumping arrangements 15-11-30 Boilers fixed 23-8-30 Engines tried under steam 15-11-30 Completion of fitting sea connections 5-8-30 Stern tube 5-8-30 Screw shaft and propeller 5-8-30 Main boiler safety valves adjusted 27-11-30 Thickness of adjusting washers STARBOARD BOILER 1/32" PORT BOILER 5/16" Material of Crank shaft MILD STEEL Identification Mark on Do. 1785-6 Material of Thrust shaft MILD STEEL Identification Mark on Do. 1206 Material of Tunnel shafts Identification Marks on Do. Material of Screw shafts MILD STEEL Identification Marks on Do. 5409, 5383 Material of Steam Pipes STEEL Test pressure 600 LBS PER SQUARE INCH 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 No If so, state name of vessel --

General Remarks (State quality of workmanship, opinions as to class, &c.) THE ENGINES + BOILERS OF THIS VESSEL HAVE BEEN BUILT IN ACCORDANCE WITH THE RULES AND APPROVED PLANS - THE MATERIALS AND WORKMANSHIP HAVE BEEN FOUND GOOD. THE ENGINES + BOILERS HAVE BEEN EXAMINED UNDER WORKING CONDITIONS AND FOUND SATISFACTORY, AND IT IS RECOMMENDED THAT THE RECORDS OF + LMC 11,30 TAIL SHAFTS (OG), ELECTRIC LIGHT FITTED, BE MADE IN THE REGISTER BOOK IN THE CASE OF THIS VESSEL.

SHANGHAI OFFICE

The amount of Entry Fee ... \$34.50 : When applied for, 24-11-1930 Special ... \$1045.00 : Donkey Boiler Fee ... £ 63.00 : Travelling Expenses (if any) \$ 63.00 : When received, 29-11-1930

J. Brooke Smith Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute FRI. 9 JAN 1931 Assigned + Lmb. 11.30 O.G., 20,

