

Rpt. 4.

## REPORT ON MACHINERY.

No. 403

Received at London Office

Date of writing Report 17<sup>th</sup> Sept 1918 When handed in at Local Office 3<sup>rd</sup> Oct 1918 Port of Seattle, Washington U.S.A.  
 No. in Survey held at Seattle Wash. U.S.A. Date, First Survey 3-6-18 Last Survey 29<sup>th</sup> Aug 1918  
 Reg. Book. (Number of Visits)  
 Entry on the Steel Screw Steamer WESTERN STAR  
 Master R.E. Yull Built at Seattle Wash. By whom built J.F. Duthie & Coy Tons { Gross 5628.69  
 Engines made at Trenton N.J. By whom made DeLaval Steam Turbine Co. when made 1918  
 Boilers made at Seattle Wash. By whom made Commercial Boiler Works when made 1918  
 Registered Horse Power 3000 S.H.P. Owners U.S. Shipping Bd. & Emergency Fleet Corp. Port belonging to Seattle  
 Nom. Horse Power as per Section 28 500 676 Is Refrigerating Machinery fitted for cargo purposes no Is Electric Light fitted yes

ENGINES, &c.—Description of Engines DeLaval Double Reduction Turbines No. of Cylinders ✓ No. of Cranks ✓  
 Dia. of Cylinders ✓ Length of Stroke ✓ Revs. per minute 90 Dia. of Screw shaft as per rule 14-29" Material of screw shaft as fitted 14-2" 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 yes 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'-11"  
 Dia. of Tunnel shaft as per rule 13-27" Dia. of Crank shaft journals as per rule ✓ Dia. of Crank pin ✓ Size of Crank webs ✓ Dia. of thrust shaft under  
 collars 13 31/32" Dia. of screw 16'-6" Pitch of Screw 15'-0" No. of Blades 4 State whether moveable yes Total surface 79 ft<sup>2</sup>  
 No. of Feed pumps 2 Diameter of ditto 9" Stroke 16" Can one be overhauled while the other is at work yes  
 No. of Bilge pumps 1 Simplex Diameter of ditto 8" Stroke 10" Can one be overhauled while the other is at work ✓  
 No. of Donkey Engines 1 Simplex Sizes of Pumps 12 x 10 1/2 x 16 No. and size of Suctions connected to both Bilge and Donkey pumps  
 In Engine Room 4 3 1/2" Boiler Room 2 3 1/2" In Holds, &c. No 1 Hold 2 3 1/2" No 2 Hold 2 3 1/2" No 3 Hold 2 3 1/2"  
 No 4 Hold 4 3 1/2" Recess 1 3 1/2" Shaft Tunnel 2 3 1/2"  
 No. of Bilge Injections 1 sizes 10" Connected to condenser, or to circulating pump yes Is a separate Donkey Suction fitted in Engine room & size 2-3 1/2"  
 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 yes  
 Are all connections with the sea direct on the skin of the ship yes Are they Valves or Cocks Valves  
 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 Below  
 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  
 Is the Screw Shaft Tunnel watertight yes Is it fitted with a watertight door yes worked from Engine Room Above load line  
 BOILERS, &c.—(Letter for record New York 6<sup>th</sup> June 1917 Manufacturers of Steel (Shell) Illionis Steel Coy (Comb. Chs). Oris Steel Coy

Total Heating Surface of Boilers 9217.8 Is Forced Draft fitted yes No. and Description of Boilers 3 Single Ended Scotch Marine  
 Working Pressure 210 lbs. Tested by hydraulic pressure to 315 lbs. Date of test 1-8-18 No. of Certificate —  
 Can each boiler be worked separately yes Area of fire grate in each boiler 63-2 ft<sup>2</sup> No. and Description of Safety Valves to  
 each boiler 2-3 1/2" Area of each valve 9.6 Pressure to which they are adjusted 210 Are they fitted with easing gear yes  
 Smallest distance between boilers or uptakes and bunkers 14" Mean dia. of boilers 15'-6" Length 11 Material of shell plates Steel  
 Thickness 1 1/2" Range of tensile strength 62720-71680 Are the shell plates welded or flanged no Descrip. of riveting: cir. seams Double  
 long. seams Triple Diameter of rivet holes in long. seams 1 9/16 Pitch of rivets 10 1/8 Top of plates or width of butt straps 22 5/8  
 Per centages of strength of longitudinal joint rivets 93.87 Working pressure of shell by rules 210.5 lbs Size of manhole in shell 12" x 16"  
 plate 84.57 Size of compensating ring Flanged No. and Description of Furnaces in each boiler 3 Morrison Material steel Outside diameter 50 5/16"  
 Length of plain part top — bottom — Thickness of plates crown 21 bottom 32 Description of longitudinal joint Welded No. of strengthening rings —  
 Working pressure of furnace by the rules 212.7 Combustion chamber plates: Material Steel Thickness: Sides 11/16 Back 11/16 Top 11/16 Bottom 7/8  
 Pitch of stays to ditto: Sides 7 1/2" x 7 1/2" Back 7 1/4" x 7 1/2" Top 8 5/8" x 8 5/8" If stays are fitted with nuts or riveted heads Surface Stays Riveted Working pressure by rules 216  
 Material of stays Wrought Iron Area at smallest part 1.77 Area supported by each stay 59.37 Working pressure by rules 223.5 End plates in steam space:  
 Material Steel Thickness 1 1/4" Pitch of stays 18 x 18 How are stays secured Double Nuts Working pressure by rules 216 Material of Front plates at bottom Steel  
 Area at smallest part 3 3/8" Area supported by each stay 324 ft<sup>2</sup> Working pressure by rules 216 Material of Front plates at bottom Steel  
 Thickness 13/16 Material of Lower back plate Steel Thickness 11/16 Greatest pitch of stays 13 1/2" Working pressure of plate by rules 225  
 Diameter of tubes 2 3/4" Pitch of tubes 3 7/8" x 3 3/4" Material of tube plates Steel Thickness: Front 13/16 Back 13/16 Mean pitch of stays Tubes 7 1/2" x 11 1/4"  
 Pitch across wide water spaces 13 1/2" Working pressures by rules 235 Girders to Chamber tops: Material Steel Depth and  
 thickness of girder at centre 10 x 3/4" Length as per rule 2'-10" Distance apart 8 5/8" Number and pitch of stays in each 3 - 8 5/8"  
 Working pressure by rules 215 Steam dome: description of joint to shell none % 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 Foster Date of Approval of Plan ✓ Tested by Hydraulic Pressure to  
 Date of Test Aug 17<sup>th</sup> 1918 Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler yes  
 Diameter of Safety Valve 1 1/2" Pressure to which each is adjusted 211 Is Easing Gear fitted yes

211270-096500-02271/2

In addition to general spare gear entered on Report Form  
the following list of spare parts for turbines were supplied

- 2 Turbine Bearings
- 2 High Speed Pinion Bearings
- 2 High Speed Reduction Gear Bearings
- 2 Slow speed Pinion Bearings
- 1 Slow speed Pinion middle bearing
- 2 Slow speed gear Bearings
- 1 High speed pinion with turning pin attached
- 10 High speed coupling pins
- 10 Bronze bushings for High Speed couplings
- 40 Coupling Bolts (2nd Reduction Coupling)
- 80 Rubber lined steel bushings for same
- 12 -  $1\frac{1}{2}$ " nuts for Bearing Cap Studs
- 9 -  $1\frac{1}{4}$ " " " " " "
- 5 - 1" " " " " "
- 8 -  $1\frac{1}{2}$ " Studs for Bearing Caps
- 7 -  $1\frac{1}{4}$ " Bolts " " "
- 16 Shoes for thrust Bearings
- 16 Pins for same attached
- 16 Hardened pin seats for thrust bearing
- 1 Shaft collar for thrust bearing
- 2 Bell rings for thrust bearings
- 2 Retaining rings for thrust Block
- 2 -  $1\frac{1}{8} \times \frac{3}{8}$  steel pins for thrust bearing
- 6 -  $\frac{1}{4} \times \frac{1}{2}$  screws for thrust Bearing
- 3 Carbon packing Rings
- 3 Springs for same
- 3 aluminum Shaft packing Rings
- 4 Parts sight-feed lubricator

J. F. Denton Co.  
C. W. Bretherton  
Chf Eng.

Adel Ewing  
Surveyor to Lloyd's Register of Shipping

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Foundation

2/2 62220-094500-62227

## IS A DONKEY BOILER FITTED?

*If so, is a report now forwarded?*

SPARE GEAR. State the articles supplied:—

1 Tail Shaft	24 Boiler Tubes	1 Lubricating pump fitted
2 Propeller Blades	2 Thrust Shoes	
1 Set Coupling Bolts	1 Set Fire Bars	
1 Set Feed Pump Valves	1 Set Furnace Linings	
1 Set Bilge Pump Valves	assorted bolts & nuts	
40 Condenser tubes & 80 Yards		

*The foregoing is a correct description,*

J. F. Dunthie Co., C. O. Zetterich Dist. Ex. Manufacturer.

Dates of Survey while building	During progress of work in shops - -	June 3. 6. 19. 20. 21. 24. July 3. 6. 9. 11 Aug 1 <sup>st</sup>
	During erection on board vessel - - -	Aug 17 22 23. 26. 29
	Total No. of visits	16
	Is the approved plan of m	

Is the approved plan of main boiler forwarded herewith yes

Dates of Examination of principal parts—Cylinders		Slides	Covers	Pistons	Roils
Connecting rods	Crank shaft	Thrust shaft 9-7-18	Tunnel shafts 24-6-18	Screw shaft 24-6-18	Propeller 3-7-18
Stern tube 2-1-6-18	Steam pipes tested 17-8-18	Engine and boiler seatings 17-8-18	Engines holding down bolts 17-8-18		
Completion of pumping arrangements 22-8-18	Boilers fixed 17-8-18	Engines tried under steam 23-8-18			
Completion of fitting sea connections 23-7-18	Stern tube 21-6-18	Screw shaft and propeller 3-7-18			
Main boiler safety valves adjusted 22-8-18	Thickness of adjusting washers Part $\frac{1}{2}$ & $\frac{5}{8}$ Cent $\frac{23}{32}$ & $\frac{21}{32}$	SP $\frac{23}{32}$ & $\frac{53}{64}$			
Material of Crank shaft ✓	Identification Mark on Do. ✓	Material of Thrust shaft Steel	Identification Mark on Do. ✓	LLODS 27-11-18	6-12-18
Material of Tunnel shafts Steel	Identification Marks on Do. ✓	Material of Screw shafts Steel	Identification Marks on Do. ✓	LLODS 27-11-18	Spore 27-11-18
Material of Steam Pipes Steel ✓	Test pressure 630				
Is an installation fitted for burning oil fuel	no	Is the flash point of the oil to be used over 150°F. ✓			

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 Turbines & Reduction gear*

inspected by surveyor to the Society at Trenton N.J. Shipped to this port and installed on board with all shafting, excursions fitting and connections in accordance with approved plans. Boilers Built & installed under special survey together with mounting and fittings in accordance with approved plans. The material and workmanship are of good quality. The machinery has been tried under steam & found satisfactory. Eligible in my opinion for notation in register book + L.M.C. 8-13.

It is submitted that  
this vessel is eligible for  
THE RECORD, + LMC 8, 18 F.D.  
1 GEARED STEAM TURBINE

STEAM TURBINE  
F.P.  
12-11-18

Alex. Ewing  
Engineer Surveyor to Lloyd's Register of Shipping

The amount of Entry Fee	...	\$	15	<u>00</u>	:	When applied for.	
Special	...	\$	150	<u>00</u>	:		19 18
Donkey Boiler Fee	...	£	:		:	When received.	
Travelling Expenses (if any)	£	2	<u>50</u>		:		

Committee's Minute New York OCT 15 1918

Assigned + LMC 8/18

*Certificate (if required) to be sent to*