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# REPORT ON MACHINERY.

No. 100  
3819

Received at London Office

Date of writing Report 15 June 1920 When handed in at Local Office 15 June 1920 Port of Pittsburgh, Pa  
 in Survey held at East Pittsburgh Pa Date, First Survey 20 Dec 1918 Last Survey 9 June 1920  
 Reg. Book. ESSEXINGTON, PA  
 on the New Steel S.S. "City of Vernon" (Pennacola S.S. Co. Hull # 977) (Westinghouse Co's H.P. Turbine # 7689, L.P. # 7709) GEAR. 964. Tons { Gross 5407  
 Net 3364  
 Master Mr Lavin Built at Pennacola, Fla. By whom built Pennacola S.S. Co. When built 1920  
 Engines made at East Pittsburgh Pa. By whom made Westinghouse E & M. Co. when made 1920  
 Boilers made at Oil City Pa. By whom made Oil City Boiler Works when made 1920  
 Registered Horse Power 664 Owners United States Shipping Board Port belonging to Pennacola  
 Shaft Horse Power at Full Power 3000 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

LINE ENGINES, &c.—Description of Engines Double Reduction Gear Turbines No. of Turbines 2 { One H.P. L.P.  
 Diameter of Rotor Shaft Journals, H.P. 4.49" L.P. 4.49" Diameter of Pinion Shafts 2.45" BORE 4 3/4"  
 Diameter of Journals 4.2" Distance between Centres of Bearings 18 1/2" Diameter of Pitch Circle 29.238 (28 TEETH)  
 Diameter of Wheel Shaft 3.235" Distance between Centres of Bearings 4.02" Diameter of Pitch Circle of Wheel 66.45 (18 TEETH)  
 Diameter of Face 2.2" Diameter of Thrust Shaft under Collars 1.8" Diameter of Tunnel Shaft 1.314"  
 Diameter of same as per rule 1.44" Diameter of Propeller 14'-0" Pitch of Propeller 14'-0"  
 State whether Moveable Yes Total Surface 90 sq ft Diameter of Rotor Drum, H.P. 17" L.P. 24"  
 Astern Impulse Revs. per Minute at Full Power, Turbine 3360 Propeller 90

## DETAILS OF BLADING.

EXPANSION	H. P. REACTION			L. P. REACTION			Impulse Blading Data		
	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.
	2"	21"	8	3"	30"	3	30 1/2"	27 1/2"	27 1/2"
	3"	23"	6	4"	32"	2	29 1/2"	27 1/2"	27 1/2"
				5"	34"	1	32"	32"	32"
				6"	36"	3	33 1/2"	35 1/2"	35 1/2"
				6"	36"	1	34 1/2"	36 1/2"	36 1/2"
							N. of Rotating Rows	2	2
							Width of Blade	1"	1 1/2"
							" " "	1"	1"

Size of Feed pumps Two Cameron 12" x 8" x 24"  
 Size of Bilge pumps One 12" x 8 1/2" x 12" One 6" x 5 3/4" x 6"  
 Size of Bilge suction in Engine Room 4 of 3 1/2"  
 In Holds, &c. 2 of 3 1/2" in each hold and one 3 1/2" in Tunnel Well  
 Bilge Injections One sizes 10" Connected to condenser, or to circulating pump Pump Is a separate Donkey Suction fitted in Engine Room & size Yes: 3 1/2"  
 Are the bilge suction pipes fitted with roses Yes Are the roses in Engine room always accessible Yes  
 Are 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 Both  
 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  
 How are they protected How  
 Are 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 Upper deck platform

MANIFOLDERS, &c.—(Letter for record) Manufacturers of Steel  
 Heating Surface of Boilers Is Forced Draft fitted No. and Description of Boilers  
 Working Pressure Tested by hydraulic pressure to Date of test No. of Certificate  
 Can each boiler be worked separately Area of fire grate in each boiler No. and Description of Safety Valves to  
 Area of each valve Pressure to which they are adjusted Are they fitted with easing gear  
 Minimum distance between boilers or uptakes and bunkers or woodwork Mean dia. of boilers Length Material of shell plates  
 Range of tensile strength Are the shell plates welded or flanged Descrip. of riveting: cir. seams  
 Diameter of rivet holes in long. seams Pitch of rivets Lap of plates or width of butt straps  
 Working pressure of shell by rules Size of manhole in shell  
 No. and Description of Furnaces in each Boiler Material Outside diameter  
 Thickness of plates Description of longitudinal joint No. of strengthening rings  
 Working pressure of furnace by the rules Combustion chamber plates: Material Thickness: Sides Back Top Bottom  
 Working pressure by rules If stays are fitted with nuts or riveted heads Working pressure by rules  
 Diameter at smallest part Area supported by each stay Working pressure by rules End plates in steam space  
 Thickness Pitch of stays How are stays secured Working pressure by rules Material of stays  
 Area supported by each stay Working pressure by rules Material of Front plates at bottom  
 Material of Lower back plate Thickness Greatest pitch of stays Working pressure of plate by rules  
 Pitch of tubes Material of tube plates Thickness: Front Back Mean pitch of stays  
 Working pressures by rules Girders to Chamber tops: Material Depth and  
 Length as per rule Distance apart Number and pitch of stays in each  
 Steam dome: description of joint to shell % of strength of joint Diameter  
 Material Description of longitudinal joint Diameter of rivet holes Pitch of rivets  
 Crown plates: Thickness How stayed



SUPERHEATER. Ty. e Date of Approval of Plan Tested by Hydraulic Pressure to

Date of Test *See Book Report* 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 bolts & nuts for each eye of Prop. Bearing; 2 Bolts & nuts for  
Bear Wheel Bearing; 2 Bolts & nuts for Pinion Bearing; 1/2 Bolt & nuts, Laps, Studs & nuts for Gear & Yaw  
Casing joints; 3 Thermometers for Oil system; 1 Set of Bearing Brushes for each eye fitted; 1 Set of  
for Adjusting Blocks; 20 Spindle Gland packing rings; 24 Packing Ring Springs; 6 Kingstony  
bearing shoes; 2 Turbine bearings complete; 1 Set of Hard pump valves; 1 Set of  
Pump valves (for each pump); 1 Set of valves & assorted spare parts for oil pumps; 1  
valve spring; Assorted Bolts & nuts, Rod, splato steel etc.*

The foregoing is a correct description,  
Westinghouse Electric & Mfg. Co. Machine Works  
Successors to  
The Westinghouse Machine Co.  
East Pittsburgh, Pa. *W. W. Smith* Manufacturer.

1918 Dec. 20. - 1919 Jan 7. 20. Feb. 10. 27. March. 11. 27. April 8. 21. 26.

Dates of Survey while building { During progress of work in shops -- *June 4. 23. July 7. 30. Aug. 28 (16 visits at E. Pittsburgh)*  
During erection on board vessel --- *Jan 27. 30. Feb 5. 16. 15. 26. March 9. 10. 17. 19. 26. 29. April 2. 5. 20. 23. 24. May 6. 14. 19. June 7. 9.*  
Total No. of visits *53* Is the approved plan of main boiler forwarded herewith *no*

Dates of Examination of principal parts—Casings *12. 20. 18* Rotors *1. 20. 19* Blading *3. 11. 19* Gearing *12. 11. 19*

Rotor shaft *1. 20. 19* Thrust shaft  Tunnel shafts *24. 1. 20* Screw shaft *24. 1. 20* Propeller *24. 1. 20*

Stern tube *24. 1. 20* Steam pipes tested *30. 1. 20 7. 20. 4. 20* Engine and boiler seatings *24. 1. 20* Engines holding down bolts *24. 4. 20*

Completion of pumping arrangements *3. 5. 20* Boilers fixed *24. 4. 20* Engines tried under steam *3. 5. 20*

Main boiler safety valves adjusted *3. 5. 20* Thickness of adjusting washers *Double check nuts.*

Material and tensile strength of Rotor shafts *Cast Steel, H.P. 67820, L.P. 44200* Identification Mark on Do. *L.P. 711, P.H.C.*

Material and tensile strength of Pinion shafts *55 TO 65 CARBON* Identification Mark on Do. *964*

Material of Wheel shaft *Cast Steel* Identification Mark on Do. *964* Material of Thrust shaft  Identification Mark on Do.

Material of Tunnel shafts *Steel* Identification Marks on Do. *AB Survey* Material of Screw shafts *Steel* Identification Marks on Do. *AB Survey*

Material of Steam Pipes *Steel* Test pressure *425 lbs*

Is an installation fitted for burning oil fuel *Yes* Is the flash point of the oil to be used over 150°F. *Yes*

Have the requirements of Section 49 of the Rules been complied with *Yes*

Is this machinery a duplicate of a previous case *Yes* If so, state name of vessel *S.S. Newburgh*

General Remarks (State quality of workmanship, opinions as to class, &c.) *The Turbines have been built under special survey. The materials & workmanship are of good quality. The hydro tests on the Casings & the shop steaming trials proved satisfactory. They have been shipped to Pensacola, Fla. to be fitted into the vessel & the Survey there have been notified. The machinery of this vessel has been satisfactorily fitted on and tried under steam and is eligible in my opinion to have the notation of "L.P. 6. 20" in the Register Book; also the notation of "Fitted for Oil Fuel 6. 20. F.P. above 150°F."*

*It is submitted that this vessel is eligible for THE RECORD, + LMC 6. 20. F. D.*

*25 Steam Turbines geared to 1 Screw Shaft*

*Fitted for oil fuel 6. 20. F.P. above 150°F*

*3 Water Tube Boilers*

*Screw Shaft fitted with Continuous Liner.*

*Credit Pittsburgh + Philadelphia 16 fees each.*

The amount of Entry Fee ... \$ 15 : 00 : When applied for, *24th April 1920*

Special ... £ 266 : 75 : When received, *15th May 1920*

Donkey Boiler Fee ... £ : : *Subject to the Water Tube Boiler being surveyed annually.*

Travelling Expenses (if any) *Phil 5 : 00.*

Committee's Minute *New York JUN 22 1920*

Assigned *+ Lamb 6. 20*

*Subject.*

*MACHINERY MARKED WRITTEN 6. 7. 20*

