

REPORT ON STEAM TURBINE MACHINERY.

No. 47659

Date of writing Report *1-3-28* When handed in at Local Office *1-3-28* Port of *Glasgow*
No. in Survey held at *Blydebank* Date, First Survey *31-3-27* Last Survey *1st March 1928*
Reg. Book. on the *Triple Screw "Princess Elaine"* (Number of Visits *75*)
Built at *Blydebank* By whom built *John Brown & Co. Ltd.* Yard No. *520* Tons { Gross *2027*
Engines made at *do* By whom made *do* Engine No. *520* When built *1928*
Boilers made at *do* By whom made *do* Boiler No. *520* When made *1928*
Shaft Horse Power at Full Power *4600* Owners *Canadian Pacific Ry Co.* Port belonging to *Vancouver*
Nom. Horse Power as per Rule *934* Is Refrigerating Machinery fitted for cargo purposes *no* Is Electric Light fitted *yes*
Trade for which Vessel is intended *Vancouver, coasting.*

TEAM TURBINE ENGINES, &c.—Description of Engines *Brown Curtis Turbine*

No. of Turbines Ahead *3* Direct coupled, single reduction geared } to *3* propelling shafts. No. of primary pinions to each set of reduction gearing *One*
Astern *2* double reduction geared }
Direct coupled to { Alternating Current Generator *✓* phase *✓* periods per second *✓* rated *✓* Kilowatts *✓* Volts at *✓* revolutions per minute;
for supplying power for driving *✓* Propelling Motors, Type *✓*
rated *✓* Kilowatts *✓* Volts at *✓* revolutions per minute. Direct coupled, single or double reduction geared to *✓* propelling shafts.

TURBINE	H.P.			I.P.			L.P.			ASTERN.		
	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.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.
1st EXPANSION	<i>Brown Curtis</i>						<i>Brown Curtis</i>			<i>Brown Curtis</i>		
2nd												
3rd	<i>Turbines</i>						<i>Turbines</i>			<i>Turbines</i>		
4th												
5th												
6th												
7th												
8th												
9th												
10th												
11th												
12th												
13th												
14th												
15th												
16th												
17th												
18th												
19th												
20th												

Shaft Horse Power at each turbine { H.P. *✓* I.P. *✓* L.P. *✓* } Revolutions per minute, at full power, of each Turbine Shaft { H.P. *2380* 1st reduction wheel *✓* I.P. *✓* L.P. *2380* main shaft *430*
Motor Shaft diameter at journals { H.P. *✓* I.P. *✓* L.P. *✓* } Pitch Circle Diameter { 1st pinion *8.5698"* 1st reduction wheel *✓* 2nd pinion *✓* main wheel *47.3473"* Width of Face { 1st reduction wheel *✓* main wheel *21"*
Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion *10 1/8"* 1st reduction wheel *✓* 2nd pinion *✓* main wheel *12 1/2"*
Flexible Pinion Shafts, diameter { 1st *✓* 2nd *✓* } Pinion Shafts, diameter at bearings { External 1st *5 1/4"* 2nd *✓* Internal 1st *2 1/4"* 2nd *✓* } diameter at bottom of pinion teeth { 1st *8.0496* 2nd *✓*
Wheel Shafts, diameter at bearings { 1st *7 1/2"* 2nd *6.1"* } diameter at wheel shroud, { 1st *3.7 7/8"* 2nd *6.4"* } Generator Shaft, diameter at bearings *✓* Propelling Motor Shaft, diameter at bearings *✓*
Intermediate Shafts, diameter as per rule *6.83"* as fitted *6 3/8"* Thrust Shaft, diameter at collars as per rule *6 3/4"* as fitted *6 3/4"* Tube Shaft, diameter as per rule *✓* as fitted *✓*
Screw Shaft, diameter as per rule *7 5/8"* as fitted *7 5/8"* Is the tube screw shaft fitted with a continuous liner *no* Bronze Liners, thickness in way of bushes as per rule *57"* as fitted *5/8"*
Thickness between bushes as per rule *✓* as fitted *✓* Is the after end of the liner made watertight in the propeller boss *yes* If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner *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 *yes* If two liners are fitted, is the shaft lapped or protected between the liners *no* Is an approved Oil Gland or other appliance fitted at the after end of the tube shaft *no* Length of Bearing in Stern Bush next to and supporting propeller *36"*
Propeller, diameter *6'-1"* Pitch *5.4* No. of Blades *3* State whether Moveable *no* Total Developed Surface *16* square feet.
Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine Can the H.P. or I.P. Turbine exhaust direct to the condenser *no* No. of Turbines fitted with astern wheels *2* Feed Pumps { No. and size *2-14"x10"x24* How driven *Steam*
Pumps connected to the Main Bilge Line { No. and size *2-7"x7"x7" duplex* How driven *Steam*
Ballast Pumps, No. and size *2-7"x7"x7" dup* Lubricating Oil Pumps, including Spare Pump, No. and size *3-6 1/2"x7"x15"*
Are two independent means arranged for circulating water through the Oil Cooler *yes* Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge pumps, No. and size:—In Engine and Boiler Room *2-2 1/2" E.R. 2-2 1/2" B.R.*
Holds, &c. *1-2 1/2" each space*
Main Water Circulating Pump Direct Bilge Suctions, No. and size *2-9 1/2"* Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size *1-3 3/4"* Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes *yes*
Are the Bilge Suctions in the Machinery Space led from easily accessible mud-boxes, placed above the level of the working floor, with straight tail pipes to the bilges *yes*
Are all Sea Connections fitted direct on the skin of the ship *yes* Are they fitted with 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 Overboard Discharges 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*
That pipes pass through the bunkers *none* How are they protected *✓*
That pipes pass through the deep tanks *none* Have they been tested as per rule *✓*
Are all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times *yes*
Is the arrangement of valves and their connections such as to prevent the possibility of water passing from the sea or from water tanks into the cargo or machinery spaces, or from one compartment to another *yes* Is the Shaft Tunnel watertight *yes* Is it fitted with a watertight door *yes* worked from *Main M.*

BOILERS, &c. — (Letter for record *S*) Total Heating Surface of Boilers *12120* *ft*
Is Forced Draft fitted *yes* No. and Description of Boilers *2 - Jamour* Working Pressure *200*
Is a Report on Main Boilers now forwarded?
Is *a Donkey* Boiler fitted? *no* If so, is a report now forwarded?
Plans. Are approved plans forwarded herewith for Shafting *15-2-27*. Main Boilers *yes* Auxiliary Boilers *yes* Donkey Boilers *yes*
(If not state date of approval)
Superheaters *yes* General Pumping Arrangements *yes* Oil Fuel Burning Arrangements *yes*
Spare Gear. State the articles supplied: — *As per Rules and attached list*

John Brown & Company, Limited

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Olverbank Secretary, Manufacturers

The foregoing is a correct description,

Dates of Examination of principal parts — Casings *21-4-27* Rotors *24-5-27* Blading *8-9-27* Gearing *1-7-27*
Wheel shaft *3-10-27* Thrust shaft *6-9-27* Intermediate shafts *3-10-27* Tube shaft *yes* Screw shaft *12-9-27*
Propeller *10-10-27* Stern tube *22-9-27* Engine and boiler seatings *6-9-27* Engine holding down bolts *18-1-28*
Completion of pumping arrangements *23-2-28* Boilers fixed *18-1-28* Engines tried under steam *23-2-28*
Main boiler safety valves adjusted *9-2-28* Thickness of adjusting washers *For 4" for P 3/8" S. 2 1/4" after for P 9/32" S. 2 3/64"*
Rotor shaft, Material and tensile strength *S. steel 33 to 40* Identification Mark *8391.2402.2*
Flexible Pinion Shaft, Material and tensile strength *yes* Identification Mark *yes*
Pinion shaft, Material and tensile strength *S. steel 33 to 40* Identification Mark *2386.2387.23*
1st Reduction Wheel Shaft, Material and tensile strength *yes* Identification Mark *yes*
Wheel shaft, Material *S* Identification Mark *2392.2393* Thrust shaft, Material *S* Identification Mark *2761.2762*
Intermediate shafts, Material *S* Identification Marks *2723.2500* Tube shaft, Material *yes* Identification Marks *2763*
Screw shaft, Material *S* Identification Marks *2724.2725.2685.2690.2477* Test pressure *600*
Date of test *17-11-27* 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 the Rules for carrying and burning oil fuel been complied with *yes*
Is this machinery a duplicate of a previous case *no* If so, state name of vessel

General Remarks (State quality of workmanship, opinions as to class, &c. *The machinery of this vessel has been built under special survey in accordance with the approved plans and the Society's Rules and requirements, the materials, and workmanship are good, it has been securely fixed on board, and satisfactorily tried under steam and in my opinion is eligible for the record + L.M.C. 3-28 with notation fitted for oil fuel 3-28, F.P. above 150°F. and O.G. fitted.*
It is submitted that this vessel is eligible for THE RECORD + L.M.C. 3.28. F.D. 2 Water tube boilers. Fitted for oil fuel 3.28. F.P. above 150°F.

The amount of Entry Fee ... £ *6* - - - When applied for, *1 - MAR 1928*
Special ... *121-14* - - -
Donkey Boiler Fee ... £ : : When received, *6-3-28*
Travelling Expenses (if any) £ : :
Committee's Minute *GLASGOW 6 - MAR 1928*

Assigned + L.M.C. 3.28. F.D.
Fitted for oil fuel 3.28. F.P. above 150°F.