

## REPORT ON STEAM TURBINE MACHINERY. No. 10,134

Received at London Office 20.3.29

of writing Report

19

When handed in at Local Office

19-3-1929 Port of Belfast

in Survey held at

Belfast

Date, First Survey 17 Aug 1928 Last Survey 5 Mar 1929

g. Book

41 on the

STEEL TWIN SC.

MONTCALM

(Number of Visits 66)

Tons { Gross 16418  
Net 9789

ilt at Glasgow

By whom built Brown &amp; Co. Ltd.

Yard No. 464

When built 1921-12

gines made at Belfast

By whom made Harland &amp; Wolff Ltd

Engine No. 8073

When made 1929

ilers made at Glasgow

By whom made Brown &amp; Co. Ltd

Boiler No. 464

When made 1921

aft Horse Power at Full Power 12500

Owners Canadian Pacific Railway (Canadian Pacific)

Port belonging to Liverpool.

m. Horse Power as per Rule 2390

Is Refrigerating Machinery fitted for cargo purposes Yes

Is Electric Light fitted Yes

ade for which Vessel is intended Ocean - going

## STEAM TURBINE ENGINES, &amp;c.—Description of Engines

Parsons - reaction type

of Turbines Ahead Lin Direct coupled, single reduction geared to 150 propelling shafts. No. of primary pinions to each set of reduction gearing Three

st coupled to Alternating Current Generator phase periods per second Direct Current Generator rated Kilowatts Volts at revolutions per minute;

supplying power for driving Propelling Motors, Type

d Kilowatts Volts at revolutions per minute. Direct coupled, single or double reduction geared to propelling shafts.

TURBINE LOADING.	Effective HEIGHT OF BLADES.	H.P.			I.P.			L.P.			ASTERN.		
		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.	HEIGHT OF BLADES.
EXPANSION	13 1/2"	21 3/8"	13	1 13/16"	29 5/8"	6	3 3/8"	50 1/4"	2	1 1/2" to 3 5/8"	40" M.D.	3 Impulse	
"	15 1/2"	21 7/8"	13	2 1/16"	30 3/8"	6	3 15/16"	51 7/8"	2	1 3/4" to 3 3/8"	48" M.D.	2 "	
"	2"	22 5/8"	13	2 7/8"	31 3/4"	6	5"	54"	2	2 1/16"	39 3/8"	2 Reaction	
"	2 3/8"	23 3/8"	13	3 1/16"	33 1/8"	6	6 3/8"	56 3/4"	2	3 1/16"	41 7/8"	2 "	
"	2 3/8"	24 3/8"	13	3 1/16"	33 7/8"	6	7 3/4"	59 1/2"	1	4 5/8"	44 1/4"	2 "	
"							9"	62"	1	4 7/8"	44 1/4"	2 "	
"							9"	62"	1	4 7/8"	44 1/4"	2 "	
"							9"	62"	1				
"							9"	62"	1				
"							9"	62"	1				
"							9"	62"	1				
"							9"	62"	1				
"							9"	62"	1				
"							9"	62"	1				

shaft Horse Power at each turbine { H.P. 2170  
I.P. 1990  
L.P. 2090  
Revolutions per minute, at full power, of each Turbine Shaft { H.P. 2100  
I.P. 2100  
L.P. 1800  
1st reduction wheel ✓  
main shaft 110

Motor Shaft diameter at journals { H.P. 6 1/4" ✓  
I.P. 6 1/4" ✓  
L.P. 8 1/2" ✓  
Pitch Circle Diameter { 1st pinion 7.498" ✓  
2nd pinion 8.783" ✓  
1st reduction wheel  
main wheel 144.1856" ✓  
Width of Face { 1st reduction wheel  
main wheel 38" ✓

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion  
2nd pinion  
1st reduction wheel  
main wheel

Flexible Pinion Shafts, diameter { 1st  
2nd  
Pinion Shafts, diameter at bearings { External 6 1/2" ✓  
Internal 2" ✓  
1st  
2nd  
diameter at bottom of pinion teeth { 1st H.P. 6.92" ✓  
2nd I.P. 6.92" ✓  
3rd L.P. 8.2" ✓

Wheel Shafts, diameter at bearings { 1st  
main 20" ✓  
diameter at wheel shroud, { 1st  
main 139 5/16" ✓  
Generator Shaft, diameter at bearings ✓  
Propelling Motor Shaft, diameter at bearings ✓

Intermediate Shafts, diameter { as per rule  
as fitted  
Thrust Shaft, diameter at collars { as per rule  
as fitted  
Tube Shaft, diameter { as per rule  
as fitted

Screw Shaft, diameter { as per rule  
as fitted  
Is the { tube  
screw } shaft fitted with a continuous liner {  
Thickness between bushes { as per rule  
as fitted  
Is the after end of the liner-made watertight in the propeller boss.  
If the liner is in more than one length are the junctions

made by fusion through the whole thickness of the liner  
plastic material insoluble in water and non-corrosive  
or other appliance fitted at the after end of the tube shaft  
Length of Bearing in Stern Bush next to and supporting propeller

Propeller diameter 18'-0" Pitch 17'-3" No. of Blades 3 State whether Moveable No. Total Developed Surface 82 square feet.  
If 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. of Turbines fitted with astern wheels Feed Pumps { No. and size  
How driven

Pumps connected to the Main Bilge Line { No. and size  
How driven

Ballast Pumps, No. and size Lubricating Oil Pumps, including Spare Pump, No. and size  
Are two independent means arranged for circulating water through the Oil Cooler Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge

Pumps, No. and size:—In Engine and Boiler Room

In Holds, &c.

Main Water Circulating Pump Direct Bilge Suctions, No. and size Independent Power Pump Direct Suctions to the Engine Room

Bilges, No. and size Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes.

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

Are all Sea Connections fitted direct on the skin of the ship Are they fitted with Valves or Cocks

Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates Are the Overboard Discharges above or below the deep water line

Are they each fitted with a Discharge Valve always accessible on the plating of the vessel Are the Blow Off Cocks fitted with a spigot and brass covering plate

What pipes pass through the bunkers How are they protected

What pipes pass through the deep tanks 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

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 Is the Shaft Tunnel watertight Is it fitted with a watertight door worked from



BOILERS, &c. (Letter for record) Total Heating Surface of Boilers  
Is Forced Draft fitted No. and Description of Boilers Working Pressure  
Is a Report on Main Boilers now forwarded?  
Is a Donkey (or Auxiliary) Boiler fitted? If so, is a report now forwarded?  
Plans. Are approved plans forwarded herewith for Shafting Main Boilers Auxiliary Boilers Donkey Boilers  
(If not state date of approval)  
Superheaters General Pumping Arrangements Oil Fuel Burning Arrangements  
Spare Gear. State the articles supplied: - See separate list

For HARLAND AND WOLFF, LIMITED,

TE. Lebeck

Manufacturer.

The foregoing is a correct description,

Dates of Survey while building During progress of work in shops - 1928 Aug 17-30 31 Sept 10-11 13 14-17 22-25 27 Oct 2-5 8 11-12 16-18 25 Nov 9 13-14 15 19 21  
During erection on board vessel - 27 28 29 30 Dec 3-4 6 7 10 11 12 13 14 17 18 19 21 Jan 7 8 9 10 11 14 18 20 25 30 31 Feb 1 6  
Total No. of visits 13 18 19 21 22 23 25 27 28 29 30 31 1 2 5 = 66

Dates of Examination of principal parts - Casings 20.8.28 25.10.28 Rotors 11.12.28 9.1.29 Blading 11.12.28 9.1.29 Gearing 12.12.28 1.1.29  
Propeller 9.11.28 Thrust shaft Intermediate shafts Tube shaft Screw shaft

Wheel shaft 13.11.28 Engine and boiler seatings 22.1.29 Engine holding down bolts 13.2.29

Propeller Stern tube Boilers fixed Engines tried under steam

Completion of pumping arrangements

Main boiler safety valves adjusted Thickness of adjusting washers

Rotor shaft, Material and tensile strength S.M. Ingot Steel 38.5 38.14 38.14 Identification Mark HP 524 IP 472 LP 501

Pinion shaft, Material and tensile strength Nickel Steel 40.4 40.4 40.4 Identification Mark HP 524 IP 465 LP 524

Pinion shaft, Material and tensile strength Identification Mark 383

1st Reduction Wheel Shaft, Material and tensile strength Identification Mark

Wheel shaft, Material S.M. Steel Identification Mark 277 290 Thrust shaft, Material Identification Mark

Intermediate shafts, Material Identification Marks Tube shaft, Material Identification Marks

Screw shaft, Material Identification Marks Steam Pipes, Material S.D. Steel Test pressure 650 lbs/sq. in.

Date of test 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 If so, state name of vessel

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

These turbines have been constructed to approved designs and under special survey. They were subjected to a satisfactory test in the Engine Works and were efficiently installed and tried out on board the vessel. The spare propellers were altered and are now four-bladed mang. mang, moveable, 17'6" dia. 17'6" pitch and 103 sq. area.

The vessel is now eligible, in our opinion, for record - N.E. 3.29 - L.M.C. 3.29 T.S. Sec 3.29 C.L.

Not Boiler 222 lbs/sq. in. The Boilers 215 lbs/sq. in.

The amount of Entry Fee ... £ :  
Special £ 110 : 17 :  
Donkey Boiler Fee ... £ :  
Travelling Expenses (if any) £ :  
When applied for, 19-3-29  
When received, 19-4-29  
R. Lee Ames  
Engine Surveyor to Lloyd's Register of Shipping.

Committee's Minute TUE. 26 MAR 1929

Assigned see Minute on Bel Rpt 10134 attached



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