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REPORT ON STEAM TURBINE MACHINERY.

No. 123744

Received at London Office 27 FEB 1946

Date of writing Report 4/2/46 When handed in at Local Office 10 Port of Liverpool
No. in Survey held at Birkenhead Date, First Survey 24/4/44 Last Survey 8/2/1946
Reg. Book. s/s "CITY OF CARLISLE" (Number of Visits 82) Gross Tons 9913
on the Birkenhead By whom built Cammell Laird & Co Ltd Yard No. 1156 When built 1946
Engines made at Glasgow By whom made Bartley Curle & Co Ltd Engine No. FW.160 When made 1946
Boilers made at Birkenhead By whom made Cammell Laird & Co Ltd Boiler No. 1156 When made 1946
Shaft Horse Power at Full Power 8000 Owners Ellerman Lines Ltd Port belonging to London
Nom. Horse Power as per Rule 1687 Is Refrigerating Machinery fitted for cargo purposes no Is Electric Light fitted yes
Trade for which Vessel is intended MN for RB = 1798

STEAM TURBINE ENGINES, &c.—Description of Engines Parsons Reaction (Astern impulse)

No. of Turbines Three Two one propelling shafts. No. of primary pinions to each set of reduction gearing Three
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 BLADING.	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												
2ND												
3RD												
4TH												
5TH												
6TH												
7TH												
8TH												
9TH												
10TH												
11TH												
12TH												

Shaft Horse Power at each turbine { H.P. I.P. L.P. } Revolutions per minute, at full power, of each Turbine Shaft { H.P. I.P. L.P. } 1st reduction wheel main shaft
Rotor Shaft diameter at journals { H.P. I.P. L.P. } Pitch Circle Diameter { 1st pinion 2nd pinion } 1st reduction wheel main wheel Width of Face { 1st reduction wheel main wheel }
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 Internal { 1st 2nd } diameter at bottom of pinion teeth { 1st 2nd }
Wheel Shafts, diameter at bearings { 1st main } diameter at wheel shroud, { 1st main } Generator Shaft, diameter at bearings Propelling Motor Shaft, diameter at bearings
Intermediate Shafts, diameter as per rule as fitted 14.53" 17.24" Thrust Shaft, diameter at collars as per rule as fitted 18.4" 19.0"
Tube Shaft, diameter as per rule as fitted 14.625" Screw Shaft, diameter as per rule as fitted 19.11" 19.75" Is the shaft filled with a continuous liner { yes }
Bronze Liners, thickness in way of bushes as per rule as fitted .886" .9345" Thickness between bushes as per rule as fitted .664" .6845" Is the after end of the liner made watertight in the propeller boss { yes } One length.

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 { yes } 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 6' 8 5/8"
Propeller, diameter 19.0" Pitch 14' 5" mean of Blades 4. State whether Moveable { no } Total Developed Surface 143 square feet.
If Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine { yes } Can the H.P. or I.P. Turbine exhaust direct to the Condenser { I.P. can do so. } No. of Turbines fitted with astern wheels 2. Feed Pumps No. and size 2 FOR MAIN BLRS 2 FOR D.B. How driven TURBINE STEAM D.A.

Pumps connected to the Main Bilge Line { No. and size Ballast 250 Tons/Hr. Fire Bilge 120 Tons/Hr. } How driven Electrically.
Ballast Pumps, No. and size 1 @ 250 Tons/Hr. Lubricating Oil Pumps, including Spare Pump, No. and size 2 @ 120 Gals/hr.
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 4 @ 3 1/2" 1 @ 2 1/2" 2 @ 2 1/2" (Cofferdam) In Pump Room 2 @ 3" N1. 2 @ 3" N2. 2 @ 3 1/2" N3. 2 @ 2" Fd. Cofferdam. 2 @ 3 1/2" Cargo Tanks. 1 @ 2 1/2" Tunnel.
In Holds, &c. One 2 1/2" Shaft Tunnel. 2 @ 3" N6 Hold. 2 @ 3 1/2" Fd. Cofferdam. Main Water Circulating Pump Direct Bilge Suctions, No. and size 1 @ 5 1/2" Independent Power Pump Direct Suctions to the Engine Room
Bilges, No. and size 1 @ 5 1/2" 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 { Some on bulk } 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 { 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 pass through the bunkers { o.f. suction } How are they protected { yes }
What pipes pass through the deep tanks { o.f. suction } Have they been tested as per rule { yes }
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 upper deck.

Total H.S. of Superheaters = 1900 ft

BOILERS, &c.—(Letter for record W.T.) Total Heating Surface of Boilers ^{only} 12920 ft²
Is Forced Draft fitted yes No. and Description of Boilers 2-B&W. Water Tube Working Pressure 460 lb
Is a Report on Main Boilers now forwarded? yes. Gls Rpt No 69609 Completed by fitting on board.

Is a Donkey Boiler fitted? yes If so, is a report now forwarded? Gls Rpt No 69772 Completed off.

Is the donkey boiler intended to be used for domestic purposes only no

Plans. Are approved plans forwarded herewith for Shafting X Main Boilers yes Auxiliary Boilers ✓ Donkey Boilers ✓
(If not state date of approval)

Superheaters ✓ General Pumping Arrangements yes Oil Fuel Burning Arrangements ✓

Has the spare gear required by the Rules been supplied yes SPARE GEAR.

State the principal additional spare gear supplied 100 Condenser Tubes + packing for 18 Tubes each Id Heater. One propeller
+ set coupling bolts. One main wheel bearing bush, One primary wheel bearing bush, One L.P. pinion
bearing bush for 1st aft. One pinion bearing bush fwd + one aft suitable for both HP + IP. Four L.P. rotor
bearing bushes, four rotor bearing bushes suitable for HP + IP. Two sets of HP. IP. L.P. labyrinth packing,
one set pads for one face Michel Thrust. One set pads for turbine thrust block suitable for HP or L.P. &
one set for one face for L.P. One set liners for adjusting block, One spindle for main Circ. pump,
Sobolite tube stoppers.

The foregoing is a correct description, for Cammell Laird & Co. Ltd. E. Stewart
14/2/46

Manufacturer.

Dates of Survey 24/4/44 to 2/2/46
During progress of work in shops --
while building 82
Total No. of visits

Dates of Examination of principal parts—Casings Gls Rpt. Rotors 23-8-45 + Blading ✓ Gearing 24-7-45
Wheel shaft 29-10-45 Thrust shaft 23-8-45 + Intermediate shafts various Tube shaft ✓ Screw shaft 24-7-45
Propeller 24-7-45 Stern tube 24-7-45 Engine and boiler seatings 9-10-45 Engine holding down bolts 4-12-45
Completion of fitting sea connections 22-10-45 Completion of pumping arrangements 24-1-45 Boilers fired 1-11-45 Engines tried under steam 8-2-46

Main boiler safety valves adjusted 24-1-45 Thickness of adjusting washers M. Bls. Port 2 1/32" Drums F. 1/32" A. 1/16" S.B. F. 1/2" A. 1/16"
Std. 1/32" Drums F. 1/16" A. 1/32"

Rotor shaft, Material and tensile strength — Identification Mark —

Flexible Pinion Shaft, Material and tensile strength — Identification Mark —

Pinion shaft, Material and tensile strength — Identification Mark —

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

Wheel shaft, Material — Identification Mark — Thrust shaft, Material Steel Identification Mark 32459 B.G.

Intermediate shafts, Material Steel Identification Marks 32453-4-5-6 Tube shaft, Material ✓ Identification Marks ✓

Screw shaft, Material Steel Identification Marks 32450 HS Steam Pipes, Material Steel Test pressure 1380 lb

Date of test 6-12-45 + various 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 the use of oil as fuel been complied with yes

Is the vessel (not being an oil tanker) fitted for carrying oil as cargo no If so, have the requirements of the Rules been complied with —

If the notation for ice strengthening is desired, state whether the requirements in this respect have been complied with ✓

Is this machinery a duplicate of a previous case no If so, state name of vessel Similar to Laporon of Harlan

General Remarks (State quality of workmanship, opinions as to class, &c.) The machinery noted in Gls Rpt

No 69970 has been fitted on the S.S. City of Carlisle, tried under

working conditions found satisfactory. It is eligible to be classed

with Record + LMC 2-46-2 W.T. Boilers. Spt: 3 Steam turbines DR geared

to one screwshaft C.L. Fitted for oil fuel, 2-46, F.P. above 150°F.

The amount of Entry Fee ... £ 6 When applied for, 20 FEB 1946

Special Lfe 15-28-8-9 ... £ 108-14-6 When received, 19

Donkey Boiler Fee ... £ : : Credit Gls Machine

Travelling Expenses (if any) £ : : L. 80-8-9

Committee's Minute LIVERPOOL 26 FEB 1946

Assigned + LMC 2-46 C.L.

W.T.B. Spt.

Fitted for oil fuel 2-46 F.P. above 150°F.



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