

REPORT ON STEAM TURBINE MACHINERY.

No. 96691.

Received at London Office FEB 1930

Date of writing Report *Feb 12th 1930* When handed in at Local Office *19 FEB. 1930* Port of *Birkenhead*
 No. in Survey held at *Birkenhead* Date, First Survey *14th January 1929* Last Survey *9th February 1930*
 Reg. Book. *96* on the *Swan S.S. "Saltan Star"* (Number of Visits *160*)
 Built at *Birkenhead* By whom built *Messrs. Cammell Laird & Co. Ltd.* Yard No. *955* When built *1930*
 Engines made at *Birkenhead* By whom made *Cammell Laird & Co. Ltd.* Engine No. *955* When made *1930*
 Boilers made at *Birkenhead* By whom made *Cammell Laird & Co. Ltd.* Boiler No. *955* When made *1930*
 Shaft Horse Power at Full Power *10400* Owners *Blue Star Line, Ltd.* (1930) Port belonging to *London*
 Nom. Horse Power as per Rule *2030* Is Refrigerating Machinery fitted for cargo purposes *Yes* Is Electric Light fitted *Yes*

See below

TEAM TURBINE ENGINES, &c. — Description of Engines *Double Reduction geared* No. of Turbines *6 (2 H.P. 2 L.P.)*
 Ahead *6 (2 H.P. 2 L.P.)*
 Astern *2 (L.P.)*

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

ARTICULARS OF 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	<i>1 1/4"</i>	<i>13 7/8"</i>	<i>10</i>	<i>2 5/8"</i>	<i>15 1/2"</i>	<i>9</i>	<i>2 1/16"</i>	<i>3'-0 1/8"</i>	<i>5</i>	<i>1 1/4"</i>	<i>3'-0 1/2"</i>	<i>2</i>
2ND	<i>1 1/4"</i>	<i>15"</i>	<i>8</i>	<i>2 3/4"</i>	<i>17"</i>	<i>7</i>	<i>2 13/16"</i>	<i>3'-1 9/8"</i>	<i>5</i>	<i>2"</i>	<i>3'-2"</i>	<i>2</i>
3RD	<i>1 3/8"</i>	<i>15 7/8"</i>	<i>7</i>	<i>2 3/4"</i>	<i>18 3/4"</i>	<i>5</i>	<i>4"</i>	<i>3'-4"</i>	<i>5</i>	<i>3 1/4"</i>	<i>3'-4 1/2"</i>	<i>2</i>
4TH	<i>1 3/8"</i>	<i>17 3/4"</i>	<i>6</i>	<i>2 3/4"</i>	<i>18 3/4"</i>	<i>5</i>	<i>3 1/16"</i>	<i>4'-0 3/8"</i>	<i>2</i>	<i>3 1/4"</i>	<i>3'-4 1/2"</i>	<i>2</i>
5TH							<i>4 9/8"</i>	<i>4'-2 1/4"</i>	<i>2</i>	<i>3 1/4"</i>	<i>3'-4 1/2"</i>	<i>2</i>
6TH							<i>5 3/4"</i>	<i>4'-4 1/2"</i>	<i>2</i>			
7TH							<i>7 1/8"</i>	<i>4'-7 1/4"</i>	<i>1</i>			
8TH							<i>8 3/16"</i>	<i>4'-9 3/8"</i>	<i>1</i>			
							<i>8 3/4"</i>	<i>4'-10 1/2"</i>	<i>3</i>			

Shaft Horse Power at each turbine *LP 2600* Revolutions per minute, at full power, of each Turbine Shaft *4030* *IP 2040* 1st reduction wheel *430*
 main shaft *115 1/2* Pitch Circle Diameter, 1st pinion *77 1/2* *IP 152 1/2* 2nd pinion *25.07* 1st reduction wheel *72.19* main wheel *93.16*
 Width of Face, 1st reduction wheel *12"* *IP 18"* main wheel *36"* Distance between centres of pinion and wheel faces and the centre of the adjacent bearings,
 1st pinion *11 1/4"* *IP 14 1/2"* 2nd pinion *3'-2"* 1st reduction wheel *3'-2"* main wheel *3'-2"* Flexible Pinion Shafts, diameter 1st *✓* 2nd *✓*
 Pinion Shafts, diameter at bearings External 1st *4"* *IP 7"* 2nd *14"* diameter at bottom of teeth of pinion 1st *7.57"* *IP 15.07"* 2nd *24.93"*
 Internal 1st *1 1/2"* 2nd *2"*
 Wheel Shafts, diameter at bearings, 1st *14"* main *16"* diameter at wheel shroud, 1st *5'-8 3/4"* main *7'-4 3/4"*
 Generator Shafts, diameter at bearings *✓* Propelling Motor Shafts, diameter at bearings *✓*
 Main Shafting, diameter of Tunnel Shafting as per rule *14 1/4"* as fitted *14 3/4"* diameter of Thrust Shafting as per rule *15 1/2"* as fitted *15 1/2"*
 diameter of Screw Shaft as per rule *15.67"* as fitted *16 1/2"* 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 watertight in the propeller boss *Yes* If the liner is in more than one length are the joints burned *one length* 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 *Right* If two liners are fitted, is the
 shaft lapped or protected between the liners *✓* Is an approved appliance fitted at the after end of the shaft to permit of it being efficiently
 lubricated *no* Length of Stern Bush *5'-7"* Diameter of Propeller *17'-0"*
 Pitch of Propeller *16'-0"* No. of Blades *4* State whether Moveable *no* Total Surface *1040* square feet. If Single Screw, are
 arrangements made so that steam can be led direct to the L.P. Turbine, and either the H.P. or L.P. Turbine can exhaust direct to the Condenser *✓*

No. of Turbines fitted with astern wheels *2 (in L.P. casing)* Total number of power driven Main and Auxiliary Pumps *20* *207" x 8" x 8"*
 No. and size of Feed Pumps *4* How driven *Steam* No. and size of Pumps connected to the Main Bilge Line *10 1/2" x 12" x 24"* *10 1/2" x 8" x 18"*
 How driven *Steam* No. and size of Ballast Pumps *one 10 1/2" x 12" x 24"* No. and size of Lubricating Oil Pumps, including
 Spare Pump *two 10 1/2" x 12" x 24"* Are two independent means arranged for circulating water through the Oil Cooler *Yes* No. and size of suction
 connected to both Main Bilge Pumps and Auxiliary Bilge Pumps; — In Engine and Boiler Room *two 3 1/4" blue 8"* and in Holds, &c. *two 2" in off idgms* *No. 1, 2, 3, 4 holds each 203"*
 No. and size of Main Water Circulating Pump Bilge Suctions *two - 14" dia* No. and size of Donkey Pump Direct Suctions *tunnel well 103" N° 6 1/2 x 202"*
 to the Engine Room Bilges *one - 5 1/2"* Are all the bilge suction pipes in holds and tunnel well fitted with strainers *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 connections with the sea direct on the skin of the ship *Yes on steel plate* 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 *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*
 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 Screw Shaft Tunnel watertight *Yes* Is it fitted with a watertight door *Yes* worked from *Casing top*

BOILERS, &c. — (Letter for record *3/2*) Total Heating Surface of Boilers *23,700 sq ft* Working Pressure *230 lbs sq in*
 Is Forced Draft fitted *Yes* No. and Description of Boilers *three or one S.E.*

W448-0219

See Boiler Register Foundation

Yes

No

If so, is a report now forwarded?

Geo

Main Boilers

yes

Auxiliary Boilers

Donkey Bailey

Spare Gear. *State the articles supplied:—*

As per Rule requirements, and attached list

GAMMELL LAIRD AND COMPANY LIMITED.

Manufacturer.

SECRETARY

1929: Jan 14, 21, 29. Feb 11, 12, 18, 20, 22, 25, 28. Mar 4, 6, 8, 15, 21, 26. Apr 2, 5, 10, 12, 16, 17, 18, 22, 25, 30. May 2, 7, 8, 13, 27, 28, 29, 30. June 3

Dates of Survey while building	During progress of work in shops -- } 12.13.14.17.19.21.24.25.26.27. July 1.3.4.5.9.10.11.12.15.16.17.19.24.25.27.29.30. Aug 13.14.17.22.24.27.28.29.30.31. Sept 3.4.5.9.11.13.16.17.19.25.30. During erection on board vessel -- } Oct 2.4.5.7.8.9.11.14.18.21.22.24.25.28.29.30.31. Nov 1.4.5.7.8.11.12.13.14.15.16.18.19.20.21.22.25.26.27.28.29. Dec 2.5.6.9.11.12.13.14.17.18.19.20.23.24.30.31. Total No. of visits } Jan 2.3.6.7.8.9.14.15.16.16.18.24.30.31. Feb 4.5.6.7.8.9.
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Dates of Examination of principal parts—Casings ^{13.5.29, 3/6/29, 19/9} Rotors ^{13.5.29 17/6/29 17/9/29} Blading ^{17/6/29 12/9/29 24/9/29} Gearing ^{3/9/29 11/9/29 17/9/29}

Wheel shaft 25.429, 27/5 Thrust shaft 135.29, 27/5 27/6 Tunnel shafts 27.5.29 27/6 Screw shaft 24.5.29 6/6 11/6 13/6 Propeller 27/6 29 4/10 29

Stern tube 25/9/24 Engine and boiler seatings 25/9/24 Engines holding down bolts 24/2/30

Completion of pumping arrangements 24.1.30 Boilers fired 12/1/30 Engines tried under steam 4/2/30

Main boiler safety valves adjusted 18/1/30 18/1/30 Thickness of adjusting washers $\frac{7}{16}$ " H & A - $\frac{3}{16}$ " lat. $\frac{1}{16}$ " + $\frac{3}{16}$ " = $\frac{1}{2}$ " lat. Cylinders 11/16. Slip A

52.81 52.89 52.97

Material and tensile strength of Rotor shaft Steel 34-38 HRC Identification Mark on Do. 3250, 3300, 3400

Material and tensile strength of Flexible Pinion Shaft	✓	Identification Mark on Do.	✓
Material and tensile strength of Pinion shaft	✓	Identification Mark on Do.	✓

Material and tensile strength of 1st Reduction Wheel Shaft. *slab 31-35 tons* Identification Mark on Do. *5252 5253*

Material of Wheel shaft steel Identification Mark on Do. 5252, 5253 Material of Thrust shaft steel Identification Mark on Do. 1577 RWP, 15

Material of Tunnel shafts steel Identification Marks on Do. 104, 105, 1004
610, 1597 Material of Screw shafts steel Identification Marks on Do. 1583, 1597
1681

Material of Steam Pipes	Steel	Test pressure	690 lb	Date of test	2/10/24
Is the boiler fitted with a fusible plug?	Yes	In the back of the boiler	150 lb		2/10/24

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*

To this machinery a duplicate of a previous case *to* If so, state name of vessel *✓*

Is this machinery a duplicate of a previous case?

General Remarks (State quality of workmanship, opinions as to class, &c. The Machinery of this Vessel has been

constructed under special survey, and is in accordance with the Rules and the

approved plans. It was examined under full working conditions during sea trials ^{in 1914}

on completion of which the gears were opened up & examined. The H.P. & I.P. pinions & wheels were found

slightly abraded, and these pinions (of both engines) were taken to shop & recut, giving more clearance.

A further trial was afterward carried out & gears again examined, & found satisfactory & proved

London, where a further Survey is to be held. With above exceptions, the Mail was found satisfactory in all respects.

The Machinery of this vessel is Eligible in my opinion for records of 42 MC 2.30, fitted for

at fuel 2:30 Ft above 150 ft., Subject to most primary pinions & whole ring at bottom on lateral in.

The amount of Entry Fee ... £ 6.0.0) When applied for.
20 FEB 1930 *RM* *18 Milton*

Special ... £ 150. : 15. 0.

Donkey Boiler Fee ... £ ✓ When received. 18-3-30

Traveling Expenses (if any) \$ 1.00

Committee's Minute

Assigned + / MC 2 20

Assigned
12.11.20. 2.20.
Pitted for oil fuel 2.20
The end
over
found
12/21/21
APR 1930
Lloyd's Register

F.P. above 150° F.

Subject. Gr:
Eleo: light.