

AUX.

11

# REPORT ON STEAM TURBINE MACHINERY.

No. 10

pt. 4a.

SEP 21 1938

Received at London Office APR 28 1939

Date of writing Report 14<sup>th</sup> APR 1939 When handed in at Local Office

Port of BIRMINGHAM

No. in Survey held at BIRMINGHAM

Date, First Survey 3<sup>rd</sup> JUN 1937 Last Survey 31<sup>st</sup> MAR 1938

Reg. Book. on the T.S. CANTON

(Number of Visits 18)

Tons } Gross  
Net

built at LIVERPOOL GLASSON By whom built ALEX. STEPHEN & SONS LTD Yard No. 557. When built 1930

Engines made at By whom made Engine No. When made

Boilers made at By whom made Boiler No. When made

Shaft Horse Power at Full Power Owners P & O STEAM NAV. CO. LTD. Port belonging to

nom. Horse Power as per Rule Is Refrigerating Machinery fitted for cargo purposes Is Electric Light fitted

Trade for which Vessel is intended

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

No. of Turbines Ahead 3 Direct coupled, single reduction geared to GENERATORS No. of primary pinions to each set of reduction gearing 6000/1000 RPM

Direct coupled to { Alternating Current Generator phase periods per second } EACH 450 Kilowatts 220 Volts at 1000 revolutions per minute;  
AUX. Direct Current Generator

supplying power for driving GENERATOR Propelling Motors, Type.

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

TURBINE LOADING.	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	3 1/2	15 1/2	2									
2nd	4 1/2	16 1/2	1									
3rd	4 1/2	16 1/2	1									
4th	4 1/2	16 1/2	1									
5th	5 1/2	18 1/2	1									
6th	5 1/2	18 1/2	1									
7th	5 1/2	18 1/2	1									
8th	5 1/2	18 1/2	1									
9th	5 1/2	18 1/2	1									
10th	5 1/2	18 1/2	1									
11th	5 1/2	18 1/2	1									
12th	5 1/2	18 1/2	1									
13th	5 1/2	18 1/2	1									
14th	5 1/2	18 1/2	1									
15th	5 1/2	18 1/2	1									
16th	5 1/2	18 1/2	1									
17th	5 1/2	18 1/2	1									
18th	5 1/2	18 1/2	1									
19th	5 1/2	18 1/2	1									
20th	5 1/2	18 1/2	1									
21st	5 1/2	18 1/2	1									
22nd	5 1/2	18 1/2	1									
23rd	5 1/2	18 1/2	1									
24th	5 1/2	18 1/2	1									
25th	5 1/2	18 1/2	1									
26th	5 1/2	18 1/2	1									
27th	5 1/2	18 1/2	1									
28th	5 1/2	18 1/2	1									
29th	5 1/2	18 1/2	1									
30th	5 1/2	18 1/2	1									
31st	5 1/2	18 1/2	1									
32nd	5 1/2	18 1/2	1									
33rd	5 1/2	18 1/2	1									
34th	5 1/2	18 1/2	1									
35th	5 1/2	18 1/2	1									
36th	5 1/2	18 1/2	1									
37th	5 1/2	18 1/2	1									
38th	5 1/2	18 1/2	1									
39th	5 1/2	18 1/2	1									
40th	5 1/2	18 1/2	1									
41st	5 1/2	18 1/2	1									
42nd	5 1/2	18 1/2	1									
43rd	5 1/2	18 1/2	1									
44th	5 1/2	18 1/2	1									
45th	5 1/2	18 1/2	1									
46th	5 1/2	18 1/2	1									
47th	5 1/2	18 1/2	1									
48th	5 1/2	18 1/2	1									
49th	5 1/2	18 1/2	1									
50th	5 1/2	18 1/2	1									
51st	5 1/2	18 1/2	1									
52nd	5 1/2	18 1/2	1									
53rd	5 1/2	18 1/2	1									
54th	5 1/2	18 1/2	1									
55th	5 1/2	18 1/2	1									
56th	5 1/2	18 1/2	1									
57th	5 1/2	18 1/2	1									
58th	5 1/2	18 1/2	1									
59th	5 1/2	18 1/2	1									
60th	5 1/2	18 1/2	1									
61st	5 1/2	18 1/2	1									
62nd	5 1/2	18 1/2	1									
63rd	5 1/2	18 1/2	1									
64th	5 1/2	18 1/2	1									
65th	5 1/2	18 1/2	1									
66th	5 1/2	18 1/2	1									
67th	5 1/2	18 1/2	1									
68th	5 1/2	18 1/2	1									
69th	5 1/2	18 1/2	1									
70th	5 1/2	18 1/2	1									
71st	5 1/2	18 1/2	1									
72nd	5 1/2	18 1/2	1									
73rd	5 1/2	18 1/2	1									
74th	5 1/2	18 1/2	1									
75th	5 1/2	18 1/2	1									
76th	5 1/2	18 1/2	1									
77th	5 1/2	18 1/2	1									
78th	5 1/2	18 1/2	1									
79th	5 1/2	18 1/2	1									
80th	5 1/2	18 1/2	1									
81st	5 1/2	18 1/2	1									
82nd	5 1/2	18 1/2	1									
83rd	5 1/2	18 1/2	1									
84th	5 1/2	18 1/2	1									
85th	5 1/2	18 1/2	1									
86th	5 1/2	18 1/2	1									
87th	5 1/2	18 1/2	1									
88th	5 1/2	18 1/2	1									
89th	5 1/2	18 1/2	1									
90th	5 1/2	18 1/2	1									
91st	5 1/2	18 1/2	1									
92nd	5 1/2	18 1/2	1									
93rd	5 1/2	18 1/2	1									
94th	5 1/2	18 1/2	1									
95th	5 1/2	18 1/2	1									
96th	5 1/2	18 1/2	1									
97th	5 1/2	18 1/2	1									
98th	5 1/2	18 1/2	1									
99th	5 1/2	18 1/2	1									
100th	5 1/2	18 1/2	1									

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

Motor 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 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

Bronze Liners, thickness in way of bushes as per rule as fitted 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

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

If two liners are fitted, is the shaft lapped or protected between the liners Is an approved Oil Gland or other appliance fitted at the after end of the tube

shaft If so, state type Length of Bearing in Stern Bush next to and supporting propeller

Propeller, diameter Pitch No. of Blades State whether Moveable Total Developed Surface 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 Pump Room

In Holds, &c. Independent Power Pump Direct Suctions to the Engine Room

Main Water Circulating Pump Direct Bilge Suctions, No. and size Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes

Bilges, No. and size 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

003333-003340-0155



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 } Boiler fitted?

If so, is a report now forwarded?

Is the donkey boiler intended to be used for domestic purposes only

Plans. Are approved plans forwarded herewith for Shafting  
(If not state date of approval)

Main Boilers

Auxiliary Boilers

Donkey Boilers

Superheaters

General Pumping Arrangements

Oil Fuel Burning Arrangements

SPARE GEAR.

Has the spare gear required by the Rules been supplied

State the principal additional spare gear supplied

1 Complete Rotor, 2 sets of bearings, 2 Royal segments,  
2 sets of Governor springs, parts, various small springs, 3 sets carbon packing  
springs, 1 Governor spindle, 2 Oil pump spindles, 1 set of oil pump gear  
Governor worm gears.

For Belliss & Morcom Ltd

H. T. Denton, Secretary

Manufacture

The foregoing is a correct description,

Dates of Survey while building { During progress of work in shops -- (3/6, 19/7, 17/8, 16/9, 1/10, 29/12/1937) (4/1, 18/2, 23/2, 24/2, 29/2, 1/3, 14/3, 17/3)  
During erection on board vessel --- 20/3, 21/3 (1938)  
Total No. of visits 18

Dates of Examination of principal parts—Casings 17/4/37 Rotors 16/9/37 1/10/37 Blading 10/1 29/12/37 Gearing

Wheel shaft 3/6/37 Thrust shaft Intermediate shafts Tube shaft Screw shaft

Propeller Stern tube Engine and boiler seatings Engine holding down bolts

Completion of fitting sea connections Completion of pumping arrangements Boilers fixed Engines tried under steam

Main boiler safety valves adjusted Thickness of adjusting washers

Rotor shaft, Material and tensile strength FORGED STEEL 37.2 mm/2 28% } SHEFFIELD F.R. N° 3/051 Identification Mark N 1186  
38.4 .. 30%

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 BIRMINGHAM F.R. N° 4447 MANCHESTER F.R. N° 5109 Identification Mark S.R.C. 19.1.38

Wheel shaft, Material Identification Mark Thrust shaft, Material Identification Mark

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

Screw shaft, Material Identification Marks Steam Pipes, Material Test pressure

Date of test Is an installation fitted for burning oil fuel

Is the flash point of the oil to be used over 150°F. Have the requirements of the Rules for the use of oil as fuel been complied with

Is the vessel (not being an oil tanker) fitted for carrying oil as cargo 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 If so, state name of vessel

General Remarks (State quality of workmanship, opinions as to class, &c.) These three turbines together with their condensers & reduction gear units have been built under special survey in accordance with the Rules and approved plans, the material and workmanship are sound & good. On completion each turbine was coupled to its respective generator and examined under a full load running trial at the works when it was found to be working satisfactorily. Governor trials also efficiently carried out. In my opinion the turbine units are considered suitable for auxiliary purposes in a vessel intended to have record of \* L. M. C. with date.

The amount of Entry Fee ... £ : When applied for,

Special ... £ 22 : 1 : 21st April 1938

Donkey Boiler Fee ... £ : When received,

Travelling Expenses (if any) £ : 3/6/38

Committee's Minute

GLASGOW 20 SEP 1938

Assigned

SEE ACCOMPANYING MACHINERY REPORT.

H. T. Denton  
Engineer Surveyor to Lloyd's Register of Shipping.



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