

11 NOV 1936

Rpt. 4a.

# REPORT ON STEAM TURBINE MACHINERY.

No. 9445  
2 SEP 1936

Date of writing Report 18/5/1936 When handed in at Local Office 21/5/1936 Port of NEWCASTLE-ON-TYNE  
No. in Survey held at Newcastle on Tyne Date, First Survey 31/1/36 Last Survey 12/5/1936  
Reg. Book. "CLAN MACAULAY" (Number of Visits 24)  
on the Twin Sc. Tons Gross 10448 Net 6406  
Built at Greenock By whom built Greenock Dockyard & Co Yard No. 425 When built 1936  
Engines made at Newcastle on Tyne By whom made N. P. Mac. Eng Co Ltd Engine No. 2845 When made 1936  
EXTRA STEAM TURBINE Engines made at ditto By whom made Swan, Hunter & Wigham Richardson & Co No. 1502 When made 1936  
Shaft Horse Power at Full Power 2@1553 Owners The Clan Line Steamers, Ltd Port belonging to Glasgow  
Nom. Horse Power as per Rule 2x259 Is Refrigerating Machinery fitted for cargo purposes yes. Is Electric Light fitted yes.  
Total combined with Main Engines = 1538  
Trade for which Vessel is intended

## STEAM TURBINE ENGINES, &c.—Description of Engines Two BAUER-WACH EXHAUST STEAM TURBINES

No. of Turbines Ahead Two Direct coupled, single reduction geared to two propelling shafts. No. of primary pinions to each set of reduction gearing one  
Astern — 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 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							67"	934"	one			
2ND							88 "	976 "	"			
3RD							109 "	1018 "	"			
4TH							130 "	1060 "	"			
5TH							151 "	1102 "	"			
6TH							181 "	1162 "	"			
7TH							210 "	1220 "	"			
8TH												
9TH												
10TH												
11TH												
12TH												
Shaft Horse Power at each turbine { H.P. — I.P. — L.P. 1553 ✓												
Revolutions per minute, at full power, of each Turbine Shaft { H.P. — I.P. — L.P. 3190 ✓												
Rotor Shaft diameter at journals { H.P. — I.P. — L.P. 170"/m ✓												
Pitch Circle Diameter { 1st pinion 266.09"/m 1st reduction wheel 1640.03"/m 2nd pinion 434.44"/m main wheel 2362.29"/m												
Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion 325"/m 1st reduction wheel 7765"/m 2nd pinion 470"/m main wheel 580"/m												
Flexible Pinion Shafts, diameter { 1st 115"/m 2nd — Pinion Shafts, diameter at bearings { External 1st 160"/m 2nd 380"/m Internal 1st — 2nd 315"/m												
Wheel Shafts, diameter at bearings { 1st 280"/m 2nd 878"/m Generator Shaft, diameter at bearings 1550"/m												
Intermediate Shafts, diameter { as per rule 14.54" as fitted 385"/m (15.15")												
Tube Shaft, diameter { as per rule as fitted Screw Shaft, diameter { as per rule as fitted												
Bronze Liners, thickness in way of bushes { as per rule as fitted Thickness between bushes { as per rule as fitted												
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												
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 3- 9" dia oil, 8" dia steam 18" stroke												
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.												
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												



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? ✓  
{ an Auxiliary }

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

One Set "Michell" Pads for 2<sup>nd</sup> Redn Pinion Thrust Block, Port & Starboard.  
One Spring & Washers for Turbine Emergency Governor  
Seven (7) Turbine Rotor Blades & Packing Pieces for each Turbine  
Seven (7) Turbine Casing Blades & Packing Pieces for ditto.  
Sundry spare parts for "CLAN" Patent Couplings.

The foregoing is a correct description,

FOR  
SWAN, HUNTER & WISHAM ENGINEERING CO., LTD.

G. J. Sweeney  
DIRECTOR.

Manufacturer.

Dates of Survey { During progress of work in shops - - } 1936 Jan. 31. Feb. 4. 5. 10. 17. 19. 27. Mar. 10. 11. 16. 17. 19. 26. 27. Apr. 1. 7. 9. 14. 15. 17. 20. 28. 30. May 12.  
{ During erection on board vessel - - - }  
Total No. of visits 24

Dates of Examination of principal parts—Casings S 19/3/36 Rotors 27/2/36 Blading 20/4/36 Gearing 20/4/36

Wheel shaft 20/4/36 Thrust shaft S 12/5/36 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 fired ✓ TURBINE Engines tried under steam S 17/4/36

Main boiler safety valves adjusted ✓ Thickness of adjusting washers ✓

Rotor shaft, Material and tensile strength Forged mild steel P 38.4 tons/in<sup>2</sup> : S. 40.8 tons/in<sup>2</sup> Identification Mark P 221 CSP 20-4-36 AW

1<sup>st</sup> Redn Pinion Shaft, Material and tensile strength Nickel steel P 40.8 " : S. 42. " Identification Mark " 221 CSP 20-4-36 AW

2<sup>nd</sup> Redn Pinion shaft, Material and tensile strength Nickel steel P 42.8 " : S. 42.8 " Identification Mark " 221 CSP 20-4-36 AW

1st Reduction Wheel Shaft, Material and tensile strength Mild steel P 28.4 " : S. 29.6 " Identification Mark " 221 CSP 20-4-36 AW

Wheel shaft, Material Mild steel Identification Mark P 221 CSP 20-4-36 AW Thrust shaft, Material Mild steel Identification Mark P 5926 MAR. 20-4-36 AW

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 Yes If so, state name of vessel Clan Macarthur (Turbine no 1473)

General Remarks (State quality of workmanship, opinions as to class, &c.) & Clan (" no 1490.)

The machinery has been constructed under special survey in accordance with the Rules, examined under steam in shop, and found satisfactory. The materials and workmanship are good. The machinery is being sent to the Newcastle works of North Eastern Marine Eng. Co. to be fitted along with their engines no 2845 for Greenock Dockyard Ship no 425.

The amount of Entry Fee ... £ ...  
Special ... £ ...  
Donkey Boiler Fee ... £ ...  
Travelling Expenses (if any) £ ...

When applied for,

19...

When received,

19...

GLASGOW 10 NOV 1936

Committee's Minute

Assigned See Gen. Rpt. No. 20255.



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Foundation