

## REPORT ON STEAM TURBINE MACHINERY.

No. 59569

Received at London Office 1938

Date of writing Report 19 When handed in at Local Office 2. 4. 19 Port of Glasgow

No. in Survey held at Glasgow Date, First Survey 8-6-36 Last Survey 29-3-1938

Reg. Book. on the new steel S/S "MACHARDA". (Number of Visits 152)

Gross Tons 7998 Net Tons 4762

Built at Port Glasgow By whom built W. Hamilton & Co. Ltd. Yard No. 430 When built 1938

Engines made at Glasgow By whom made David Rowan & Co. Ltd. Engine No. 1002 When made 1938

Boilers made at Glasgow By whom made David Rowan & Co. Ltd. Boiler No. 1002 When made 1938

Shaft Horse Power at Full Power Owners T & J. Brocklebank & Co. Ltd. Port belonging to Liverpool

Nom. Horse Power as per Rule 5500 Is Refrigerating Machinery fitted for cargo purposes no Is Electric Light fitted yes

Trade for which Vessel is intended 1157 1170

## STEAM TURBINE ENGINES, &amp;c.—Description of Engines. Parsons three cylinder - geared turbines

No. of Turbines Ahead 3 Direct coupled, single reduction geared } to one propelling shafts. No. of primary pinions to each set of reduction gearing 3

Astern 2 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. ROTOR			I. P. ROTOR			L. P. ROTOR			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	1 1/16"	20 3/8"	13	1 7/8"	2 5/4"	7	3 7/8"	4 1 1/4"	2	H.P. astern in I.P. casing.		
2ND	1"	21"	13	2 5/8"	2 6 3/4"	7	4 3/4"	4 3 1/2"	2	Impulse wheel 45" mean dia.		
3RD	1 5/16"	21 5/8"	13	3 5/16"	2 8 1/8"	7	5 1/2"	4 5"	2	3 rows of blades.		
4TH	1 7/8"	22 3/4"	13	4 3/8"	2 10 1/4"	7	6 1/2"	4 7"	1	L.P. astern		
5TH	2 5/16"	23 7/8"	13	4 3/8"	2 10 1/4"	7	8"	4 10"	1	Impulse wheel 45" mean dia.		
6TH							9"	5 0"	1	2 rows of blades.		
7TH							9"	5 0"	1	Reaction blading		
8TH							9"	5 0"	1	2 1/8"	3 4 1/4"	2
9TH										3"	3 6"	2
10TH										4 1/4"	3 8 1/2"	2
11TH										4 1/4"	3 8 1/2"	2
12TH										4 1/4"	3 8 1/2"	2

Shaft Horse Power at each turbine { H.P. 1833 I.P. 1833 L.P. 1833 } Revolutions per minute, at full power, of each Turbine Shaft { H.P. 2105 I.P. 2105 L.P. 2105 } 1st reduction wheel — main shaft 108

Rotor Shaft diameter at journals { H.P. 6 1/2" I.P. 6 1/2" L.P. 6 1/2" } Pitch Circle Diameter { 1st pinion 7.497" 1st reduction wheel — 2nd pinion — main wheel 145.029" } Width of Face { 1st reduction wheel — main wheel 35"

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion 13 1/4" - 16 1/2" 1st reduction wheel — 2nd pinion — main wheel 18 3/4"

Flexible Pinion Shafts, diameter { 1st — 2nd — } Pinion Shafts, diameter at bearings External Internal { 1st 6" 2nd — } diameter at bottom of pinion teeth { 1st 7.358" 2nd — }

Wheel Shafts, diameter at bearings { 1st — 2nd — } diameter at wheel shroud { 1st 17 1/2" 2nd — } Generator Shaft, diameter at bearings — Propelling Motor Shaft, diameter at bearings —

Intermediate Shafts, diameter as per rule 14.86" as fitted 15 3/4" Thrust Shaft, diameter at collars as per rule 15.603" as fitted 16 1/2" Tube Shaft, diameter as per rule — as fitted —

Screw Shaft, diameter as per rule 16.4" as fitted 18" Is the screw shaft fitted with a continuous liner { yes } Bronze Liners, thickness in way of bushes as per rule .8" as fitted 7/8"

Thickness between bushes as per rule .6" as fitted 13/16" 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 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 { yes } 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 { no } Length of Bearing in Stern Bush next to and supporting propeller 6'0"

Propeller, diameter 18'6" Pitch 15'1 1/2" No. of Blades 4 State whether Moveable { no } Total Developed Surface 108.4 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 { yes } No. and size 2 MAIN { ONE-RECIPROCATING - 10'13 1/2" x 24" STROKE. ONE TURBINE PUMP } AUXILIARY-RECIPROCATING - 8'10 1/2" x 22" STEAM

Condenser { yes } No. of Turbines fitted with astern wheels 2 Feed Pumps { No. and size 2 MAIN { ONE-RECIPROCATING - 10'13 1/2" x 24" STROKE. ONE TURBINE PUMP } AUXILIARY-RECIPROCATING - 8'10 1/2" x 22" STEAM } How driven STEAM

Pumps connected to the Main Bilge Line { No. and size Ballast pump 12'-10 1/2" x 24". Bilge pump 9'-8" x 18". Sanitary - 9'-8" x 18" - Steam } How driven Steam Auxiliary service - 9'-8" x 18" - Steam

Ballast Pumps, No. and size one @ 12'-10 1/2" x 24" Lubricating Oil Pumps, including Spare Pump, No. and size 1 @ 10'-10" x 24". 1 @ 10 1/2" x 10 1/2" DA (SHAFT)

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 Engine room - 3 @ 3 1/2". Stokehold - 4 @ 2 1/2" & 2 @ 3 1/2". Transfer pump suction from E.R. stoke - 1 @ 2". In Holds, etc. N°1 - 2 @ 3 1/2". N°2 - 2 @ 3 1/2". N°3 - 2 @ 3 1/2". Deep tank - 2 @ 3 1/2". N°4 - 2 @ 3 1/2". N°5 - 2 @ 3 1/2". Tunnelwell - 1 @ 3 1/2". Bunker - stoke - 1 @ 2 1/2". all fitted at G.R.K.

Main Water Circulating Pump Direct Bilge Suctions, No. and size one @ 15" Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size one @ 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 { yes } 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 { both }

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 { none } How are they protected —

What pipes pass through the deep tanks { none } 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 { 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 decks



BOILERS, &c.—(Letter for record (r) ) Total Heating Surface of Boilers 14060 sq ft

Is Forced Draft fitted yes No. and Description of Boilers Four single ended Working Pressure 250

Is a Report on Main Boilers now forwarded? yes

Is { a Donkey } Boiler fitted? no

If so, is a report now forwarded? -

Plans. Are approved plans forwarded herewith for Shafting no Main Boilers yes Auxiliary Boilers - Donkey Boilers -

Superheaters yes General Pumping Arrangements no Oil Fuel Burning Arrangements yes

Spare Gear. State the articles supplied:— In accordance with the Rules and in addition — one  
pinion shaft complete with bushes also one impeller for circulating pump, one piston,  
rod and bucket for each power pump and one spare Weiss feed pump shuttle valve chest complete

The foregoing is a correct description,

For David, Rowan & Co. Ltd  
Arch. H. Grierson Manufacturer.

Dates of Survey  
During progress of work in shops -- 1936 June 8 July 17 Aug 18 Oct 15 14 15 16 Nov 4 5 9 12 16 17 19 20 27 30 Dec 1 2 3 4  
During erection on board vessel --- Mar 1 5 9 10 11 15 24 30 Apr 2 5 7 9 13 14 15 16 20 21 23 26 27 29 May 3 4 6 7 10 11 13 14 21 25 26 27 June 3 4 9 30 July 2 9 Aug 12 26 Sep 6 8 13 14 15 21 22 23 24 29 Oct 1 5 7 8 13 14 21 25 26 27 Nov 1 4 12 15 16 18 23 24 25 26 29 Dec 3 6 8 10 13 17 20 21 28 29 (1938) Jan 12 25 31 Feb 1 5 7 8 13 14 21 25 26 27 Mar 2 4 10 17 24 29  
Total No. of visits 152

Dates of Examination of principal parts—Casings 27-5-37 Rotors 7-10-37 Blading 14-9-37 Gearing 20-12-37

Wheel shaft 25-10-37 Thrust shaft 18-10-37 Intermediate shafts 9-2-37 Tube shaft - Screw shaft 5-11-37

Propeller 5-11-37 3-12-36 Stern tube 25-11-37 Engine and boiler seatings Gk Engine holding down bolts 25-1-38

Completion of pumping arrangements 2-3-38 Boilers fired 2-3-38 Engines tried under steam 29-3-38

Main boiler safety valves adjusted 17-3-38 Thickness of adjusting washers aft started boiler both 1 1/2" all others 3/8"

Rotor shaft, Material and tensile strength Siemens Martin Ingersoll HP-37.5 tons MP-37.5 tons LP-36.8 tons Identification Mark HP-10916 MP-10945 LP-10946

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

Pinion shaft, Material and tensile strength S.M. Nickel steel see Def Rpt No 37703. Copy herewith Identification Mark 10904 10905 10906 10907

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

Wheel shaft, Material S.M. 2 steel Identification Mark 110105 110162 110170 25-10-37 5313-4-5 11374-5-6 Thrust shaft, Material S.M. 2 steel Identification Mark 11364-4-5 11370-5-6

Intermediate shafts, Material S.M. 2 steel Identification Marks 11375-4-5 11376-5-6 Tube shaft, Material - Identification Marks -

Screw shaft, Material S.M. 2 steel Identification Marks 5312 110150 5437 Steam Pipes, Material steel Test pressure 750 lb

Date of test to 2-3-38 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 yes If so, state name of vessel "Malanka". G.R. Rpt No 58575

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

The materials and workmanship are good

The machinery has been constructed under special survey, satisfactorily fitted in the vessel, tried under steam and found good.

It is eligible in my opinion for classification and the records -  
+ LMC 3,38. Fitted for oil fuel 3,38 F.P. above 150° F

2/4/38

The amount of Entry Fee ... £ 6 : :  
Special ... £ 128 : 18 : 6  
Donkey Boiler Fee ... £ : :  
Travelling Expenses (if any) £ : :  
When applied for, 5 APR 1938  
When received, 8.4 38 89.4

Sh Davis

Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute GLASGOW 5 APR 1938

Assigned + LMC 3,38

FD

Fitted for oil fuel 3,38 F.P. above 150° F



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