

# REPORT ON STEAM TURBINE MACHINERY. No. 20/20. (a)

Rpt. 4a.

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Date of writing Report 10th July 1945 When handed in at Local Office 10 Port of Sydney, N. S. W.

No. in Survey held at Melbourne & Whyalla Date, First Survey 8th Sept 1942 Last Survey 10th July 1945

Reg. Book. on the S.S. "RIVER MURRUMBIDGEE" (Number of Visits 23)

Built at Whyalla By whom built Broken Hill Pty Co Ltd Yard No. 6 When built 1945

Engines made at Sydney By whom made Morts Dock & Eng Co Ltd Engine No. 475 When made 1945

Boilers made at Melbourne & Whyalla By whom made Thomson Camb. Eng. Badcock & Wilson & Broken Hill Pty Co Ltd Boiler No. ✓ When made 1945

Shaft Horse Power at Full Power 830 Owners Commonwealth of Australia Port belonging to Port Adelaide

Nom. Horse Power as per Rule 75 Is Refrigerating Machinery fitted for cargo purposes No. Is Electric Light fitted yes

Trade for which Vessel is intended International

## STEAM TURBINE ENGINES, &c.—Description of Engines L.P. Turbine with D.R. Gearing & Hydraulic Coupling

No. of Turbines One Direct coupled, single reduction geared to One propelling shafts. No. of primary pinions to each set of reduction gearing One

direct coupled to Alternating Current Generator ✓ phase ✓ periods per second ✓ Direct Current Generator ✓ 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 STAGING.	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							2.9134"	35.3544"	1			
2ND							3.7008	36.9292	1			
3RD							4.4882	38.5040	1			
4TH							5.2756	40.0788	1			
5TH							6.0630	41.6536	1			
6TH							6.9685	43.4646	1			
7TH							7.8740	45.2756	1			
8TH												
9TH												
10TH												
11TH												
12TH												

Shaft Horse Power at each turbine ✓ H.P. ✓ I.P. ✓ L.P. 830 Revolutions per minute, at full power, of each Turbine Shaft ✓ H.P. ✓ I.P. ✓ L.P. 3444 1st reduction wheel 502.5 main shaft 89.6

Rotor Shaft diameter at journals ✓ H.P. ✓ I.P. ✓ L.P. 6.693" Pitch Circle Diameter ✓ 1st pinion 8.784" 1st reduction wheel 60.2024" main wheel 79.1298" Width of Face ✓ 1st reduction wheel 10.25" main wheel 23.625"

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings ✓ 1st pinion F. 10.27", A. 8.55" 1st reduction wheel F. 61.5", A. 14.84" 2nd pinion F & A, 16.41" main wheel F & A 20.31"

Transmission Flexible Pinion Shafts, diameter ✓ 1st 4.12" 2nd ✓ Pinion Shafts, diameter at bearings ✓ External ✓ Internal ✓ 1st 4.59" 2nd 12.19" diameter at bottom of pinion teeth ✓ 1st 8.2074" 2nd 13.511"

Wheel Shafts, diameter at bearings ✓ 1st F. 9.14", A. 9.27" diameter at wheel shroud, ✓ 1st 57" main F & A 19.11" ✓ Generator Shaft, diameter at bearings ✓ 75.13" Propelling Motor Shaft, diameter at bearings ✓

Intermediate Shafts, diameter ✓ as per rule 13.14" as fitted 13.5" Thrust Shaft, diameter at collars ✓ as per rule 14.078" as fitted 14.14"

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. ✓ Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine ✓ Report on 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. ✓ 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 ✓

That pipes pass through the bunkers ✓ How are they protected ✓

That pipes pass through the deep tanks ✓ Have they been tested as per rule ✓

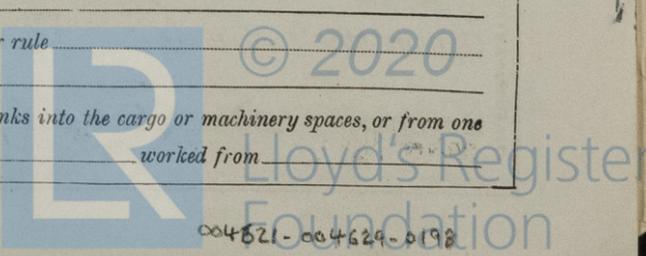
Are all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times ✓

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 ✓

Machinery Report

attached

see



004621-004624-0198

BOILERS, &c.—(Letter for record ) Total Heating Surface of Boilers \_\_\_\_\_ Working Pressure \_\_\_\_\_

Is Forced Draft fitted \_\_\_\_\_ No. and Description of Boilers \_\_\_\_\_

Is a Report on Main Boilers now forwarded? \_\_\_\_\_ If so, is a report now forwarded? \_\_\_\_\_

Is { a Donkey } Boiler fitted? \_\_\_\_\_  
 { an Auxiliary }

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)

Superheaters \_\_\_\_\_ General Pumping Arrangements \_\_\_\_\_ Oil Fuel Burning Arrangements \_\_\_\_\_

Has the spare gear required by the Rules been supplied \_\_\_\_\_ see attached Machinery Report.

State the principal additional spare gear supplied \_\_\_\_\_

**SPARE GEAR.**

Commonwealth Government Marine Engine Works  
*A. Macfarlane* Manufacturer.

The foregoing is a correct description,

Dates of Survey while building { During progress of work in shops -- } 8/9/42, 23/11/42, 6/4/43, 27/5/43, 10/6/43, 20/8/43, 30/8/43, 29/9/43, 21/2/44, 6/9/44, 10/4/44.  
 { During erection on board vessel --- } 27/1/45, 30/1/45, 16/2/45, 22/2/45, 26/2/45, 27/3/45, 11/4/45, 12/4/45, 14/5/45, 20/6/45, 21/6/45, 10/7/45.  
 Total No. of visits 23.

Dates of Examination of principal parts—Casings \_\_\_\_\_ Rotors \_\_\_\_\_ Blading \_\_\_\_\_ Gearing \_\_\_\_\_

Wheel shaft \_\_\_\_\_ Thrust shaft \_\_\_\_\_ Intermediate shafts \_\_\_\_\_ Tube shaft \_\_\_\_\_ Screw shaft \_\_\_\_\_

Propeller \_\_\_\_\_ Stern tube \_\_\_\_\_ Engine and boiler seatings \_\_\_\_\_ Engine holding down bolts \_\_\_\_\_  
 see attached Machinery Report.

Completion of fitting sea connections \_\_\_\_\_ Completion of pumping arrangements \_\_\_\_\_ Boilers fired \_\_\_\_\_ Engines tried under steam \_\_\_\_\_

Main boiler safety valves adjusted \_\_\_\_\_ Thickness of adjusting washers \_\_\_\_\_

Rotor shaft, Material and tensile strength *M.S.*—Longitudinal 32.0 tons, Tangential 32.4 tons, Radial 35.2 tons, Identification Mark *M.315/4 B.P.F. 10-10*

Transmission Flexible Pinion Shaft, Material and tensile strength *M.S.*, 28.8 tons per sq in Identification Mark *M.317/7 B.P.F. 10-10*  
*M.317/6 B.P.F. 10-10*

Pinion shafts Material and tensile strength  $3\frac{1}{2}$  % Nickel Steel — { 1st Reduction—Longitudinal 42.0 tons, Transverse 42.0 tons  
 2nd Reduction—Longitudinal 42.2, Transverse 41.4. Identification Mark *M.317/3 B.P.F. 10-10*

1st Reduction Wheel Shaft, Material and tensile strength *M.S.*, 36.6 tons Identification Mark *M.317/9 B.P.F. 10-10*

Wheel shaft, Material *M.S.* Identification Mark *M.317/8 B.P.F.* Thrust shaft, Material *M.S.* Identification Mark *M.316/5 B.P.F.*

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

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

Date of test \_\_\_\_\_

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 \_\_\_\_\_  
 see attached Machinery Report. Is an installation fitted for burning oil fuel.

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 *s.s. "River Murchison"*

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

*This Turbine and Gearing have been built under Special Survey in accordance with the Rules and approved plans, and the materials and workmanship are good.*

*The Installation has been efficiently fitted on board the vessel, tried under full power working conditions with satisfactory results and, in our opinion, is now eligible for record recommended in attached Machinery Report.*

	When applied for,	When received,
The amount of Entry Fee ... £ : :	19	
Special ... £ ✓ : :		
Donkey Boiler Fee ... £ ✓ : :		
Fee charged on attached Mach. Rpt		
Travelling Expenses (if any) £ : :	19	

*B. P. Zieeden & C. E. Hall*  
 Engineer Surveyors to Lloyd's Register of Shipping.

Committee's Minute **FRI. 24 AUG 1945**

Assigned *Su F.E. machy rpt.*

