

31 OCT 1928

No. 6566

# REPORT ON ELECTRIC FITTINGS.

(OFFICIAL FORM) FOR THE PROPULSION OF THE VESSEL Received at London Office 4 OCT 1928

Date of writing Report Oct 3rd 1928 When handed in at Local Office Oct 3rd 1928 Port of MANCHESTER.

No. in Survey held at MANCHESTER. Date, First Survey May 2nd Last Survey Sept 7th 1928  
(Number of Visits 19)

Reg. Book. M. O. P. 5 B A on the M. O. P. 5 B A Tons { Gross 427  
Net 155

Built at Glasgow. By whom built Messrs Yarrow & Co. Ltd. Yard No. 1559 When built

Owners Director General of Navigation & Harbours. Port belonging to Buenos Ayres

Electric Light Installation fitted by \_\_\_\_\_ Contract No. \_\_\_\_\_ When fitted \_\_\_\_\_

System of Distribution Two wire, direct current.

Pressure of supply for Lighting \_\_\_\_\_ volts, Heating \_\_\_\_\_ volts, Power 250 volts, variable.

Direct or Alternating Current, Lighting \_\_\_\_\_ Power Direct.

If alternating current system, state frequency of periods per second \_\_\_\_\_

Has the Automatic Governor been tested and found efficient when the whole load is suddenly thrown on or off \_\_\_\_\_

Generators, do they comply with the requirements regarding overload Yes, are they compound wound no, shunt wound.

are they over compounded 5 per cent. \_\_\_\_\_, if not compound would state distance between each generator.

Where more than one generator is fitted are they arranged to run in parallel No. is an adjustable regulating resistance fitted in series with each shunt field Yes.

Are all terminals accessible and clearly marked Yes, are they so spaced or shielded that they cannot be accidentally earthed, or short circuited Yes Are the lubricating arrangements of the generators as per Rule Yes

Position of Generators \_\_\_\_\_ are they clear of all inflammable material \_\_\_\_\_

is the ventilation in way of the generators satisfactory \_\_\_\_\_, are they clear of all inflammable material \_\_\_\_\_

if situated near unprotected woodwork or other combustible material, state distance of same horizontally from or vertically above the generators \_\_\_\_\_ and \_\_\_\_\_, are the generators protected from mechanical injury and damage from water, steam or oil \_\_\_\_\_

are their axis of rotation fore and aft \_\_\_\_\_

Earthing, are the bedplates and frames of the generating plant efficiently earthed \_\_\_\_\_ are the prime movers and their respective generators in metallic contact \_\_\_\_\_

Main Switch Boards, where placed \_\_\_\_\_

If the generators and main switchboard are not placed in the same compartment, is each generator provided with a fuse on each insulated pole as near as possible to the terminals of the generator, additional to that provided on the main switchboard \_\_\_\_\_

Switchboards, are they placed in accessible positions, free from inflammable gases and acid fumes \_\_\_\_\_

are they protected from mechanical injury and damage from water, steam or oil \_\_\_\_\_, if situated near unprotected woodwork or other combustible material, state distance of same horizontally from or vertically above the switchboards \_\_\_\_\_ and \_\_\_\_\_

are they constructed wholly of durable, incombustible non-absorbent materials Yes. is all insulation of high dielectric strength and of permanently high insulation resistance Yes. if semi-insulating material is used, are all conducting parts connected to one pole insulated from the slab with mica or micanite and the slab similarly insulated from its framework Yes. and is the frame effectively earthed \_\_\_\_\_ Are the following fittings as per Rule, viz.:— spacing or shielding of live parts \_\_\_\_\_, accessibility of all parts \_\_\_\_\_, absence of fuses on back of board Yes, proportion of omnibus bars Yes, individual fuses to voltmeter, pilot or earth lamp Yes, connections of switches Yes

Main Switchgear, description of switchgear for each generator and each outgoing circuit, and arrangement of equalizer switches. Double pole

isolating switches and special overload circuit breaker.

Instruments on main switchboard see below, ammeters see below, voltmeters \_\_\_\_\_ synchronising device for paralleling purposes \_\_\_\_\_

Earth Testing, state what means are provided at the main switchboard for indicating the state of the insulation of the system Pilot lamps, switches and fuses.

Switches, Circuit Breakers and Fusible Cut-outs, do these comply with the requirements of the Rules. Yes

Section and Distribution Boards, is the construction, protection, insulation, material, and position of these as per rule. One main and one field

ammeter to each main generator, one field ammeter to each main motor and one main ammeter for each pair of main motors.

One voltmeter for each main generator.

**Insulation of Cables**, state type of cables, single or twin \_\_\_\_\_ are the cables insulated and protected as per Tables III or IV of the Rules \_\_\_\_\_

**Fall of Pressure**, state maximum between bus bars and any point of the installation under maximum load \_\_\_\_\_

**Cable Sockets and other connections**, are the ends of all cables having a sectional area of 0.007 square inch and above provided with soldering sockets \_\_\_\_\_

**Paper Insulated Cables**. If cables are paper covered, is the dielectric at the exposed ends of the conductor protected from moisture by being suitably sealed with insulating compound \_\_\_\_\_

**Cable Runs**, are the cables fixed as far as possible in accessible positions not exposed to drip or accumulation of water or oil, or to high temperature from boilers, steam pipes, uptakes or other hot objects, or to avoidable risk of mechanical damage \_\_\_\_\_

**Support and Protection of Cables**, state how the cables are supported and protected \_\_\_\_\_

If cables are run in wood casings, are the casings and caps secured by screws \_\_\_\_\_, are the cap screws of brass \_\_\_\_\_, are the cables run in separate grooves \_\_\_\_\_. If armoured and lead covered cables are secured by metal clips, are the clips spaced as per Table VI \_\_\_\_\_

**Refrigerated Chambers**, if lights are fitted, are the cables and fittings in accordance with the special requirements \_\_\_\_\_

**Joints in Cables**, state if any, and how made, insulated, and protected \_\_\_\_\_

**Watertight Glands and Deck Tubes**, are all cables passing through decks and watertight bulkheads provided with deck tubes or watertight glands \_\_\_\_\_

**Bushes in Beams and Non-watertight Positions**, where unarmoured cables pass through beams and non-watertight partitions, are the holes efficiently bushed \_\_\_\_\_ state the material of which the bushes are made \_\_\_\_\_

**Earthing Connections**, state what earthing connections are fitted and their respective sectional areas \_\_\_\_\_

\_\_\_\_\_ are their connections made as per Rule \_\_\_\_\_

**Alternative Lighting**, are the groups of lights in the propelling machinery space arranged as per Rule \_\_\_\_\_

**Emergency Supply**, state position and method of control of the emergency supply and how the generator is driven \_\_\_\_\_

**Navigation Lamps**, are these separately wired \_\_\_\_\_, controlled by separate switch and separate fuses \_\_\_\_\_

are the fuses double pole \_\_\_\_\_, are the switches and fuses grouped in a position accessible only to the officers on watch \_\_\_\_\_

has each navigation lamp an automatic indicator as per Rule \_\_\_\_\_, are separate screens provided for the use of oil and electric side lights \_\_\_\_\_

are separate oil lanterns provided for the mast head lights and side lights \_\_\_\_\_

**Fittings**, are all fittings on weather decks, in storerooms and engine rooms and wherever exposed to drip or condensed moisture, watertight, *waterlight, but splash proof* \_\_\_\_\_

are any fittings placed in spaces in which goods are liable to be stacked in close proximity to them; if so, how are they protected \_\_\_\_\_

are any fittings placed in spaces where inflammable or explosive dust or gases are liable to be present, if so, how are they protected \_\_\_\_\_

\_\_\_\_\_ how are the cables led \_\_\_\_\_

where are the controlling switches situated *In two steel boxes on bridge deck and in main engine room.*

**Searchlight Lamps**, No. of \_\_\_\_\_, whether fixed or portable \_\_\_\_\_, are their fittings as per Rule \_\_\_\_\_

**Are Lamps**, other than searchlight lamps, No. of \_\_\_\_\_, are their live parts insulated from the frame or case \_\_\_\_\_, are their fittings as per Rule \_\_\_\_\_

**Motors**, are their working parts readily accessible *Yes* \_\_\_\_\_, are the coils self-contained and readily removable for replacement *Yes* \_\_\_\_\_

are the brushes, brush holders, terminals and lubricating arrangements as per Rule *Yes* \_\_\_\_\_, are the motors placed in well-ventilated compartments in which inflammable gases cannot accumulate and clear of all inflammable material \_\_\_\_\_

are they protected from mechanical injury and damage from water, steam or oil \_\_\_\_\_ are their axis of rotation fore and aft *Yes* \_\_\_\_\_

if situated near unprotected woodwork or other combustible material, are the motors of the totally enclosed, pipe ventilated, forced draught, drip or flame proof type \_\_\_\_\_

*Yes* \_\_\_\_\_, if not of this type, state distance of the combustible material horizontally or vertically above the motors \_\_\_\_\_ and \_\_\_\_\_

**Control Gear and Resistances**, are the generator field and motor speed regulators, starters and controllers constructed as per Rule *Yes* \_\_\_\_\_

**Lightning Conductors**, where lightning conductors are required, are these fitted as per Rule \_\_\_\_\_

**Ships carrying Oil having a Flash Point less than 150° F.** Have the special requirements of the Rules been complied with regarding switches, joint boxes, section and distribution boards, protection of cables, method of distribution, lead of cables, lights and fittings \_\_\_\_\_

If portable lamps for use in dangerous spaces are supplied, are they of a type approved by the Home Office \_\_\_\_\_

**PARTICULARS OF GENERATING PLANT.**

DESCRIPTION OF GENERATOR.	No. of	RATED AT				DRIVEN BY.	WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE.	
		Kilowatts.	Volts.	Amps.	Revs. per Min.		Fuel Used.	Flash Point of Fuel.
MAIN	2	170 each	250	680	350	M.A.N. Diesel Engine	/	/
AUXILIARY	2	35 each	125	280	350	M.A.N. " (main)	/	/
EMERGENCY								
<i>Description of Motor</i>	<i>No. of</i>	<i>B.H.P.</i>	<i>Volts</i>	<i>Amps.</i>	<i>R.P.M.</i>			
Rotary Motor	4	200 each	250	680	350			

**LIGHTING AND HEATING CONDUCTORS.**

Ref. No.	DESCRIPTION.	No. of Conductors.	Effective Area of each Conductor. Sq. Ins.	COMPOSITION OF STRAND.		Total Maximum Current. Ampères.	Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
				No.	Diameter.				
	MAIN GENERATOR...								/
	AUXILIARY GENERATOR								/
	EMERGENCY GENERATOR								/
	ROTARY TRANSFORMER...								/
	AUXILIARY SWITCHBOARDS								/
	ENGINE ROOM								/
	BOILER ROOM								/
	WIRELESS								/
	SEARCHLIGHT								/
	MASTHEAD LIGHT...								/
	SIDE LIGHTS								/
	COMPASS LIGHTS								/
	POOP LIGHTS								/
	CARGO LIGHTS								/
	ARC LAMPS								/
	HEATERS								/

**MOTOR CONDUCTORS.**

Ref. No.	DESCRIPTION.	No. of Motors.	Effective Area of each Conductor. Sq. Ins.	COMPOSITION OF STRAND.		Total Maximum Current. Ampères.	Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
				No.	Diameter.				
	BALLAST PUMP								/
	MAIN BILGE LINE PUMPS								/
	GENERAL SERVICE PUMP								/
	EMERGENCY BILGE PUMP								/
	SANITARY PUMP								/
	CIRC. SEA WATER PUMPS								/
	CIRC. FRESH WATER PUMPS								/
	AIR COMPRESSOR								/
	FRESH WATER PUMP								/
	ENGINE TURNING GEAR								/
	ENGINE REVERSING GEAR								/
	LUBRICATING OIL PUMPS								/
	OIL FUEL TRANSFER PUMP								/
	WINDLASS								/
	WINCHES, FORWARD								/
	WINCHES, AFT								/
	STEERING GEAR								/
	WORKSHOP MOTOR								/
	VENTILATING FANS								/

All Conductors are of annealed copper conforming to British Standard Specification No. 7. The Insulated Conductors are guaranteed to withstand the immersion and resistance tests specified in the Rules. The foregoing is a correct description.

METROPOLITAN-VICKERS ELECTRICAL CO. LTD. Electrical Engineers. Date 28.9.28. TREASURER.

COMPASSES.

Distance between electric generators or motors and standard compass. Distance between electric generators or motors and steering compass. The nearest cables to the compasses are as follows:— A cable carrying Ampères feet from standard compass feet from steering compass. Have the compasses been adjusted with and without the electric installation at work at full power. Has the effect of switching on and off circuits, motors and other electro-magnetic apparatus within the vicinity of the compasses been noted. The maximum deviation due to electric currents was found to be degrees on course in the case of the standard compass, and degrees on course in the case of the steering compass.

Builder's Signature. Date

Is this installation a duplicate of a previous case No If so, state name of vessel

General Remarks (State quality of workmanship, opinions as to class, etc. The above two main propulsion generators)

The four main propulsion motors, the two auxiliary exciting generators, their control switches and switchboard have been built under Special Survey. The materials of the armature spindles and couplings have been tested in accordance with the Specification and were found sound and of good workmanship. The machines proved satisfactory on the full and overload power tests and the commutation tests, the rise in temperature of the different parts at the end of the full load six hour test being in all cases below 40° C above the surrounding temperature. The insulation of the machines was pressure tested to 2000 volts A.C. and also megger tested with satisfactory results. The above electrical machinery and equipment is in my opinion eligible for the notation of +L.M.C. with date when fitted on board the vessel in accordance with the Requirements of this Society, subject to switches and controllers being made watertight if fitted in exposed positions.

Total Capacity of Generators 410 Kilowatts

The amount of Fee ... £ 25 : 12 : 10

Travelling Expenses (if any): £ 22 : 11 : 19

Signature of Surveyor to Lloyd's Register of Shipping.

Committee's Minute

Assigned

Spare Gear.

Main Propulsion Generators, Motors

- 1-armature complete with fan etc. 1-set of shunt coils.

Main Propulsion Generators.

- 1-set of brushes, line of holders complete. 2-bearing bushes. 1/2-set of armature coils

Main Propulsion Motors.

- 2-sets of brushes complete with brush holders. 2-bearing bushes.

Auxiliary Exciting Generators.

- 1-spare armature complete. 1-set of shunt coils. 1- " " Interpole " 1- " " brushes & holders complete. 2-helf bearings.

Dates of Survey during 1928. May 2, 12, 15, 18, 21, 23, 24, 30, 31. June 11, 19, 26. July 17, 20, 25, 26. Progress of works in shops Aug. 2, 23. Sept. 7.

Dates of Examination of principal parts - Armature Spindles, May 23, 30, 31.

Yokes, May 31st. Armatures, June 19th.

Armature Spindles, Material, Mild Steel. Identification mark h001/59 Fl.

Spindle Couplings " Mild Steel. " " h00194, 195 & Fl.

Signature of Surveyor.

Description of the Diesel Electric Drive Propelling  
Machinery for Yarrow's 1559.

The propelling machinery of this vessel consists of 4 - 200 H.P., 50 volt direct current shunt wound motors having a maximum speed of 350 r.p.m.

The vessel has twin propellers at each end, each propeller being operated by its own motor and line shafting. The motors are situated in the main engine room, two at each end of same, port and starboard.

The motors are supplied with power from two main shunt wound generators, each of 170 kilowatts at 250 volts when running at 350 r.p.m. Each main generator is driven by a M.A.N. Diesel Engine.

Tandem with each main generator is an auxiliary generator of 35 kilowatts at 125 volts. These generators are intended to supply power to the fields of the main generators and motors, and also to the auxiliary machinery and lighting circuits. When the main engines are shut down, power is supplied to the auxiliary bus bars from a petrol-paraffin "Astor" Oil Engine generator set.

The control gear of the installation is such that the engines can be manoeuvred from either one of two wheel houses on deck, one at either end of the vessel, or from the engine room. For either direction of the vessel's motion the corresponding after motors are used. The two forward motors being automatically cut out, thus the four motors cannot be run at the same time. This selection is performed as follows:- On deck and situated between the two wheel houses, there is a 17 pole master switch, housed in a cast iron standard box operated by a special key. The function of this switch is to select the wheel house from which the vessel is to be controlled, and the corresponding driving motors. Having made the selection, the key is able to be removed and carried to the selected wheel house, where it is used to unlock the manoeuvring controller, which resembles a ship's telegraph, and cannot be removed until controller is in off position. Each of the two selected motors is independently controlled.

There is a switch on the main switch board, which can cut out the two deck controls and join up the engine room controller.

It is also arranged by switches on the main switch board that, if only one generator is in commission the two motors in service may be independently operated from the remaining generator set.

The reversing of the motors is carried out by reversing the shunt field of the motors, and <sup>is</sup> automatically operated by the above mentioned wheel house or engine room controller, whichever is being used.

*Arthur H. Lane*