

# REPORT ON ELECTRIC FITTINGS.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

THU. 1 NOV. 1923

Date of writing Report 19 When handed in at Local Office Oct 26 1923 Port of Belfast

No. in Survey held at Belfast Date, First Survey May 16<sup>th</sup> Last Survey Oct 25 1923  
 Req. Book. on the New Steel Y. S. S. "Mbalaja" (Number of Visits... Eleven)

Built at Belfast By whom built Harland & Wolff Ltd Yard No. 588 Tons { Gross 20839  
 Net 12830  
 When built 1923

Owners Peninsular & Oriental Steam Navigation Co. Port belonging to Belfast.

Electric Light Installation fitted by Harland & Wolff Ltd Contract No. 588 When fitted 1923.

System of Distribution *Double Wire, Distribution and Sub-distribution System.*

Pressure of supply for Lighting 220 volts, Heating 220 volts, Power 220 volts.

Direct or Alternating Current, Lighting *Direct* 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 *Yes*

Generators, do they comply with the requirements regarding overload *Yes*, are they compound wound *Yes*

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

Where more than one generator is fitted are they arranged to run in parallel *Yes*, 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 *Emergency Generator in the Emergency Dynamo House on Prom. Deck Aft. Main Generators in Elec. Machinery Recess, above the Thrust Recess.*

is the ventilation in way of the generators satisfactory *Yes*, are they clear of all inflammable material *Yes*

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 *Yes*

are their axis of rotation fore and aft *Yes*

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

Main Switch Boards, where placed *In Elec. Machinery Recess, above Thrust Recess, Emergency Switchboard in the Emergency Dynamo House, Promenade Deck Aft.*

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 *Yes*

Switchboards, are they placed in accessible positions, free from inflammable gases and acid fumes *Yes*

are they protected from mechanical injury and damage from water, steam or oil *Yes*, 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 *Yes*

Are the following fittings as per Rule, viz.:— spacing or shielding of live parts *Yes*, accessibility of all parts *Yes*, 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 *The Switchgear of each generator consists of a 1000 AMP T.P. Switch (Equalizer blade closing before and opening after Main.) and a 700 Amp. D.P. Circuit Breaker, Max. and Reverse with Time Lag. The outgoing circuits of 200 Amps and over, have each a D.P. C.O. Switch and D.P. Circuit Breaker. The smaller circuits have a D.P. Switch and D.P. Fuse. 3-500 Amp. circuits have D.P. circuit breakers (Max. only)*

Instruments on main switchboard 7 ammeters 2 voltmeters arranged \_\_\_\_\_ for paralleling purposes.

Earth Testing, state what means are provided at the main switchboard for indicating the state of the insulation of the system *Earth Lamps*

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 *Yes*

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

**Fall of Pressure**, state maximum between bus bars and any point of the installation under maximum load 10 Volts

**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 Yes

**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 Yes

**Support and Protection of Cables**, state how the cables are supported and protected Clipped to Perforated Steel Plating. Protected by lead-covering, or lead covering, served, steel-armoured & braided overall.

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 Yes

**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 Yes

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

**Earthing Connections**, state what earthing connections are fitted and their respective sectional areas All electric fittings, sockets etc. fixed other than to steel work of the ship are provided with earthing connections equivalent to the working conductors. are their connections made as per Rule Yes

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

**Emergency Supply**, state position and method of control of the emergency supply and how the generator is driven Emergency Gen. Room made Deck Aft. Control from the Emergency Switchboard fixed in the same room. The Generator is driven by a Diesel Engine, direct coupled.

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

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

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

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

**Fittings**, are all fittings on weather decks, in stokeholds and engine rooms and wherever exposed to drip or condensed moisture, watertight Up proof in long & fitted to keelson etc.

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 \_\_\_\_\_

**Searchlight Lamps**, No. of One, whether fixed or portable Portable, are their fittings as per Rule Yes

**Are Lamps**, other than searchlight lamps, No. of None, 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 Yes

are they protected from mechanical injury and damage from water, steam or oil Yes 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 \_\_\_\_\_, 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				EACH DRIVEN BY.	WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE.		
		Kilowatts.	Volts.	Ampères.	Revs. per Min.		Fuel Used.	Flash Point of Fuel.	
MAIN	6	150	220/30	682	400	1225 BHP. complete Vertical Steam Eng.			
AUXILIARY									
EMERGENCY	1	75	220/30	341	400	Diesel Engine			
ROTARY TRANSFORMER									

  

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	Two per side	.5	61	.103"	682	54	V.I.P.	Lead Sheathing
	AUXILIARY GENERATOR	Two per side	.6	91	.093"	341	36	V.I.P.	Lead Sheathing
	EMERGENCY GENERATOR	Two per side	.6	91	.093"	341	36	V.I.P.	Lead Sheathing
	ROTARY TRANSFORMER	Two per side	.25	37	.093"	200	135	V.I.P.	Lead Sheathing
	AUXILIARY SWITCHBOARDS	Two per side	.007	7	.036"	15	40	V.I.P.	Lead Sheathing
	ENGINE ROOM	Two per side	.06	19	.064"	83	500	V.I.P.	Lead Sheathing, Served, Steel-armoured & Braided
	BOILER ROOM	Two per side	.06	19	.064"	83	500	V.I.P.	Lead Sheathing, Served, Steel-armoured & Braided
	WIRELESS	One per side	.0225	7	.064"	12.0	900	V.I.P.	Lead Sheathing
	SEARCHLIGHT	00	.04	19	.052"	50.0	1200	V.I.P.	00
	MASTHEAD LIGHT	00	.003	3	.036"	.35	640	V.I.P.	00
	SIDE LIGHTS	00	.003	3	.036"	.35	120	V.I.P.	00
	COMPASS LIGHTS	00	.003	3	.036"	.1	36	V.I.P.	00
	POOP LIGHTS	00	.003	3	.036"	.55	960	V.I.P.	00
	CARGO LIGHTS	00	.06	19	.064"	40.0	960	V.I.P.	00
	ARC LAMPS	00	.5	61	.103"	310.0	220	V.I.P.	00
	HEATERS	00	.5	61	.103"	310.0	220	V.I.P.	00

  

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	1	.1	19	.083"	95	720	V.I.P.	Lead Sheathing
	SANITARY PUMP								
	CIRC. SEA WATER PUMPS								
	CIRC. FRESH WATER PUMPS	2	.25	37	.093"	540	210	V.I.P.	00
	AIR COMPRESSOR								
	FRESH WATER PUMP (Hand)	1	.003	3	.036"	3	240	V.I.P.	00
	ENGINE TURNING GEAR								
	ENGINE REVERSING GEAR								
	LUBRICATING OIL PUMPS								
	OIL FUEL TRANSFER PUMP								
	WINDLASS								
	WINCHES, FORWARD								
	WINCHES, AFT								
	STEERING GEAR	2	.15	37	.092"	150	690	V.I.P.	Lead Sheathing served, Steel-armoured & Braided
	WORKSHOP MOTOR	1	.007	7	.036"	8	220	V.I.P.	Lead Sheathing
	VENTILATING FANS	17	.25	37	.093"	87	240	V.I.P.	Lead Sheathing
	00 ENGINE & BOILER ROOMS	5	.0225	7	.064"	40	360	V.I.P.	00

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.

See helms Electrical Engineers. Date 25-10-23

**COMPASSES.**

Distance between electric generators or motors and standard compass: Generators 204 ft. nearest Motor 60 ft.

Distance between electric generators or motors and steering compass: 194 ft. " " 50 ft.

The nearest cables to the compasses are as follows:—

A cable carrying 18 Amperes 18 feet from standard compass 12 feet from steering compass.

A cable carrying 28 Amperes 22 feet from standard compass 14 feet from steering compass.

A cable carrying Amperes feet from standard compass feet from steering compass.

Have the compasses been adjusted with and without the electric installation at work at full power: Yes

Has the effect of switching on and off circuits, motors and other electro-magnetic apparatus within the vicinity of the compasses been noted: Yes

The maximum deviation due to electric currents was found to be Nil degrees on All course in the case of the standard compass, and Nil degrees on All course in the case of the steering compass.

See helms Builder's Signature. Date 25-10-23

Is this installation a duplicate of a previous case: Yes If so, state name of vessel S.S. "Mooltan"

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

This installation is fitted in accordance with the Rules and the workmanship is good. Tested under working & overload conditions & found satisfactory.

It is submitted that this vessel is eligible for the Record

See Light

3/11/23

Total Capacity of Generators 9.75 Kilowatts

The amount of Fee ... £ 55 1/4 6/26-10-23

Travelling Expenses (if any) £ 13-11-23

William Butler  
 Surveyor to Lloyd's Register of Shipping.

Committee's Minute TUE NOV. 26 1923

Assigned



Im. 22.—Transfer. (The Surveyors are requested not to write on or below the space for Committee's Minute.)

