

# REPORT ON ELECTRIC FITTINGS.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office

5 JAN 1928

Date of writing Report 29.12.1927 When handed in at Local Office 23.1.1928 Port of GLASGOW.

No. in Survey held at GLASGOW. Date, First Survey 28.11.27 Last Survey 26.12.1927  
Reg. Book. (Number of Visits 5)

14503 on the M.V. "PACHECO." Tons { Gross 1346  
Net

Built at GOVAN. By whom built HARLAND & WOLFF LTD. Yard No. 443G. When built 1927.

Owners MESSRS MACANDREW & CO LTD. Port belonging to LIVERPOOL

Electric Light Installation fitted by MESSRS HARLAND & WOLFF LTD. Contract No. 443G. When fitted 1927.

System of Distribution Two wire

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 rating. 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, clearly marked, and furnished with sockets. Yes, are they so spaced or shielded that they cannot be accidentally earthed, short circuited, or touched. Yes

Position of Generators No. 1 Port Side of Eng Rm No. 2 & 3 Starboard Side of Eng Rm. Yes

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.

are their axes 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 on platform over Thrust Recess aft end of Eng. Rm.

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. 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.

are they constructed wholly of durable, non-ignitable 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 insulated from the slab with mica or micamite or other non-hygroscopic insulating material, and the slab similarly insulated from its framework.

and is the frame effectively earthed. Yes. Are the fittings as per Rule regarding: - 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

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. D.P. circuit

Breakers interlocked with S.P. Switch for Equalizer, for each Generator. and S.P. Switch + D.P. Fuse for each outgoing circuit.

Instruments on main switchboard 3 ammeters 2 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. Two lamps and two linked S.P. switches across mains, mid point of lamps earthed.

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

Joint Boxes Section and Distribution Boards, is the construction, protection, insulation, material, and position of these as per rule. Yes



**Cables:** Single, twin, concentric, or multicore both are the cables insulated and protected as per Tables IV or V of the Rules yes

**Fall of Pressure,** state maximum between bus bars and any point of the installation under maximum load 7.2

**Cable Sockets and other connections,** are the ends of all cables having a sectional area of 0.04 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 none used

**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 L.C. cables clipped to bulkhead in accordance with R.C. cables clipped to perforated plating in Engine Room. S.A.B. Cables on ER gratings  
 If cables are run in wood casings, are the casings and caps secured by screws yes, are the cap screws of brass yes, are the cables run in separate grooves yes. If armoured and lead covered cables are secured by metal clips, are the clips spaced as per Table VIII yes

**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 In a special joint box

**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 Partitions,** 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 yes  
 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 yes

**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

**Secondary Batteries,** are they constructed and fitted as per Rule yes

**Fittings,** are all fittings on weather decks, in storerooms and engine rooms and where exposed to drip or condensed moisture, watertight yes  
 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 yes  
 are any fittings placed in spaces where inflammable or explosive dust or gases are liable to be present, if so, how are they protected yes  
 how are the cables led yes  
 where are the controlling switches situated yes

**Searchlight Lamps, No. of** 1, whether fixed or portable 1, are their fittings as per Rule yes

**Arc Lamps,** other than searchlight lamps, No. of 1, are their live parts insulated from the frame or case yes, are their fittings as per Rule yes

**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 axes 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 yes and yes

**Control Gear and Resistances,** are the generator field and motor speed regulators, starters and controllers constructed and fitted as per Rule yes

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

**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 yes  
 If portable lamps for use in dangerous spaces are supplied, are they of a type approved by the Home Office yes not carrying low flash oil

DESCRIPTION OF GENERATOR	No of	RATED AT			Revs. per Min.	DRIVEN BY	WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE	
		Kilowatts	Volts	Amperes			Fuel Used	Flash Point of Fuel
MAIN	3	65	220	295	300	Diesel oil Engine	British benz	CLOSED 190° OPEN 176°
AUXILIARY								
EMERGENCY								
ROTARY TRANSFORMER								

Ref. No.	DESCRIPTION	No. of Conductors	Effective Area of each Conductor Sq. Ins.	COMPOSITION OF STRAND		Total Maximum Current in Area	Approximate Length (Lead and Return) Feet	Insulated with	HOW PROTECTED
				No.	Diameter				
	MAIN GENERATOR	2 1/2 hole	.15	37	.072	295	125.1 hole	Rubber	Lead covered
	EQUALISER CONNECTIONS	1 1/2 hole	.15	37	.072	-	62. "	"	"
	AUXILIARY GENERATOR								
	EMERGENCY GENERATOR								
	ROTARY TRANSFORMER								
	AUXILIARY SWITCHBOARDS								
	ENGINE ROOM	1 1/2 hole	.072	Y	.064	50	20	Rubber	Lead based
	BOILER ROOM								
	ACCOMMODATION	1 1/2 hole	.072	Y	.064	43	40	Rubber	Lead based
	COOKING & HEATING	"	.072	19	.072	88	40	"	"
	WIRELESS	1 1/2 hole	.003	3	.036	41	23	Rubber	Lead based
	SEARCHLIGHT	1 1/2 hole	.002	3	.029	46	270	Rubber	Lead based
	MASTHEAD LIGHT	1 1/2 hole	.002	3	.029	46	40	"	"
	SIDE LIGHTS	"	.002	3	.029	15	20	"	"
	COMPASS LIGHTS	"	.002	3	.029	27	56	"	"
	POOP LIGHTS	"	.002	3	.029	1.8	60	"	"
	CARGO LIGHTS	"	.002	3	.029			"	"
	ARC LAMPS								
	HEATERS								

Ref. No.	DESCRIPTION	No. of Motors	Effective Area of each Conductor Sq. Ins.	COMPOSITION OF STRAND		Total Maximum Current in Area	Approximate Length (Lead and Return) Feet	Insulated with	HOW PROTECTED
				No.	Diameter				
	BALLAST PUMP	1	.0225	Y	.064	40	50	Rubber	Lead based
	MAIN BILGE LINE PUMPS	1	.007	Y	.036	22	15	"	"
	GENERAL SERVICE PUMP								
	EMERGENCY BILGE PUMP								
	SANITARY PUMP								
	CIRC. SEA WATER PUMPS	1	.0225	Y	.064	40	65	Rubber	Lead based
	CIRC. FRESH WATER PUMPS								
	AIR COMPRESSOR								
	FRESH WATER PUMP	1	.0225	Y	.064	40	50	Rubber	Lead based
	ENGINE TURNING GEAR								
	ENGINE REVERSING GEAR	2	.0145	Y	.052	31.5 each	23 each	Rubber	Lead based
	LUBRICATING OIL PUMPS								
	OIL FUEL TRANSFER PUMP								
	WINDLASS	1	.1	19	.083	12.5	120	Rubber	Lead based
	WINCHES, FORWARD	2	.075	19	.072	96	30	"	"
	WINCHES, AFT	2	.075	19	.072	105	80	"	"
	STEERING GEAR—								
	(a) MOTOR GENERATOR								
	(b) MAIN MOTOR	1	.04	19	.052	45	200	Rubber	Lead based
	WORKSHOP MOTOR								
	VENTILATING FANS								
	HOT SALT WATER PUMP	1	.003	3	.036	10	35	Rubber	Lead based
	FUEL OIL PUMP	1	.0045	7	.029	17	10	"	"
	FUEL OIL PURIFIER	1	.003	3	.036	10.8	50	"	"
	LUB. " "	1	.003	3	.036	10.8	20	"	"
	LATHE	1	.003	3	.036	7	20	"	"
	DRILL	1	.003	3	.036	9	20	"	"
	GALLEY BLOWER	1	.003	3	.036	4.75	40	"	"
	REFRIG. M/C.	1	.003	3	.036	4.54	30	"	"

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.

FOR HARLAND & WOLFF, LTD.

*John Dickison*

Managing Director

Electrical Engineers.

Date *20th Jan 1928*

COMPASSES.

Distance between electric generators or motors and standard compass *50 feet*

Distance between electric generators or motors and steering compass *54 feet*

The nearest cables to the compasses are as follows:—

A cable carrying *0.6* Ampères *2* feet from standard compass *6* feet from steering compass.

A cable carrying *2.0* Ampères *5* feet from standard compass *6* feet from steering compass.

A cable carrying *5.0* Ampères *5* feet from standard compass *6* 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 the* course in the case of the standard compass, and *Nil* degrees on *all the* course in the case of the steering compass.

FOR HARLAND & WOLFF, LTD.

*John Dickison*

Managing Director

Builder's Signature.

Date *20th Jan 1928*

Is this installation a duplicate of a previous case *Yes*. If so, state name of vessel *M.V. Pelago.*

General Remarks (State quality of workmanship, opinions as to class, &c.) *This installation has been fitted on board under special survey. Tested under full working conditions & found satisfactory. The materials & workmanship were found to be good and sound.*

It is submitted that this vessel is eligible for THE RECORD. *Elec. Light*  
*RA*  
*27/1/28*

*A.S.*  
*21/1/28*

Total Capacity of Generators *195* Kilowatts.

The amount of Fee ... £ *36.50* : *27/12/27* (When applied for, 1927)  
 Travelling Expenses (if any) £ : : *17/1/28* (When received, 1928)

*J. Rankin*  
 Surveyor to Lloyd's Register of Shipping.

Committee's Minute *GLASGOW 24 JAN 1928*

Assigned *Elec. Light* *WMM*