

# REPORT ON ELECTRIC FITTINGS.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

14 DEC 1927  
Received at London Office

Date of writing Report 23.11.1927 When handed in at Local Office 12.12.1927 Port of GLASGOW.

No. in Survey held at GLASGOW. Date, First Survey 7.11.27 Last Survey 16.11.27 19  
Reg. Book. M.V. "PAULA" (Number of Visits... 2)

on the M.V. "PAULA" Tons { Gross 2770  
Net

Built at GOYAN. By whom built MESSRS HARLAND & WOLFF. Yard No. Y489 When built 1927.

Owners THE BRITISH MARINE OIL CO. LTD Port belonging to LONDON-WILLEMSTAD

Electric Light Installation fitted by MESSRS HARLAND & WOLFF LTD Contract No. Y489 When fitted 1927  
(GOYAN)

System of Distribution Two Wire ✓

Pressure of supply for Lighting 110 ✓ volts, Heating - volts, Power 110 ✓ 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 no, is an adjustable regulating resistance fitted in

series with each shunt field Yes, with oil set - no, with Steam set

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 Are the lubricating arrangements of the generators as per Rule Yes

Position of Generators Starboard Side of Engine Room.

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 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 Starboard Side of Engine Room.

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 - and -

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 micanite 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, 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 for Generators - Set of Bus-Bars for each generator and D.P.

Change over Switches, & D.P. Fuses for each outgoing circuit.

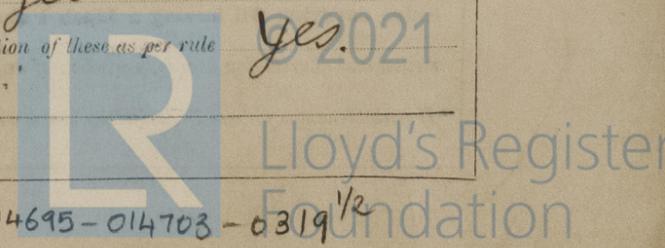
Instruments on main switchboard 2 ammeters 2 voltmeters - synchronising device for paralleling purposes.

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. *Single & Twin* 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 *2.2.*

**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 insulation 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. *Slipped on perforated plating, run through iron piping (Mole h. pipe) - L.S.A.B. on portable & R. grating - L.C. elsewhere.*

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 VIII —.

**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. *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 —.

are their connections made as per Rule —.

**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 —.

**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 stowholds and engine rooms and wherever 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 —, 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** —, whether fixed or portable —, are their fittings as per Rule —.

**Arc 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 *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 —, 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 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 —.

| PARTICULARS OF GENERATING PLANT. |        |            |        |          |                |                     |  |                      |  |
|----------------------------------|--------|------------|--------|----------|----------------|---------------------|--|----------------------|--|
| DESCRIPTION OF GENERATOR.        | No. of | RATED AT   |        |          |                | DRIVEN BY           | WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE. |                      |  |
|                                  |        | Kilowatts. | Volts. | Ampères. | Revs. per Min. |                     | Fuel Used.                                     | Flash Point of Fuel. |  |
| MAIN                             | 1      | 10         | 110    | 91       | 400            | Steam Engine        |  |                      |  |
| MAIN                             | 1      | 10         | 110    | 91       | 400            | Krambait Oil Engine | Solar  | 150°                 |  |
| EMERGENCY                        |        |            |        |          |                |                     |  |                      |  |
| 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...      | 1/4 pole           | .075                                       | ✓ 19                   | .072      | 91                              | 50   | Rubber         | L.S.A.B.       |
|                                  | EQUALISER CONNECTIONS  |                    |  |                        |           |                                 |  |                |                |
|                                  | AUXILIARY GENERATOR    |                    |  |                        |           |                                 |  |                |                |
|                                  | EMERGENCY GENERATOR    |                    |  |                        |           |                                 |  |                |                |
|                                  | ROTARY TRANSFORMER...  |                    |  |                        |           |                                 |  |                |                |
|                                  | AUXILIARY SWITCHBOARDS |                    |  |                        |           |                                 |  |                |                |
|                                  | ENGINE ROOM            | 1/4 pole           | .01  | ✓ 4                    | .044      | 30                              | 165  | Rubber         | L.S.A.B.       |
|                                  | BOILER ROOM            |                    |  |                        |           |                                 |  |                |                |
|                                  | ACCOMMODATION          | 1/4 pole           | .01  | ✓ 4                    | .044      | 24                              | 240  | Rubber         | L.S.A.B.       |
|                                  | WIRELESS               | 1/4 pole           | .004                                       | ✓ 4                    | .036      | 15                              | 210  | Rubber         | L.S.A.B.       |
|                                  | SEARCHLIGHT            | 1/4 pole           | .003                                       | ✓ 3                    | .036      | 9                               | 290  | Rubber         | Lead based     |
|                                  | MASTHEAD LIGHT...      |                    | .002                                       | ✓ 3                    | .029      | 9 each                          | 90   |                |                |
|                                  | SIDE LIGHTS...         |                    | .002                                       | ✓ 3                    | .029      | 9 each                          | 30   |                |                |
|                                  | COMPASS LIGHTS...      |                    | .002                                       | ✓ 3                    | .029      | 9 each                          | 30   |                |                |
|                                  | POPE LIGHTS...         |                    | .003                                       | ✓ 3                    | .036      | 1-9 (2/5)                       | 195  |                |                |
|                                  | 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     | 2              | .004                                       | ✓ 4                    | .036      | 25 each                         | 114  | Rubber         | L.S.A.B.       |
|                   | ENGINE REVERSING GEAR   |                |  |                        |           |                                 |  |                |                |
|                   | LUBRICATING OIL PUMPS   |                |  |                        |           |                                 |  |                |                |
|                   | OIL FUEL TRANSFER PUMP  |                |  |                        |           |                                 |  |                |                |
|                   | WINDLASS                |                |  |                        |           |                                 | 58   |                |                |
|                   | WINCHES, FORWARD        |                |  |                        |           |                                 |  |                |                |
|                   | WINCHES, AFT            |                |  |                        |           |                                 |  |                |                |
|                   | STEERING GEAR           |                |  |                        |           |                                 |  |                |                |
|                   | (a) MOTOR GENERATOR     |                |  |                        |           |                                 |  |                |                |
|                   | (b) MAIN MOTOR          |                |  |                        |           |                                 |  |                |                |
|                   | WORKSHOP MOTOR          |                |  |                        |           |                                 |  |                |                |
|                   | VENTILATING FANS        |                |  |                        |           |                                 |  |                |                |
|                   | Oil Purifier            | 1              | .004                                       | ✓ 4                    | .036      | 20                              | 100  | Rubber         | Lead based     |
|                   | Sull                    | 1              | .004                                       | ✓ 4                    | .036      | 16                              | 35   |                | "              |
|                   | Rathe                   | 1              | .004                                       | ✓ 4                    | .036      | 9                               | 27   |                | "              |
|                   | Galley Blower           | 1              | .003                                       | ✓ 3                    | .036      | 6                               | 56   |                | "              |

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.

*John Dickenson*, FOR HARLAND & WOLFF, L<sup>td</sup> Electrical Engineers. Date \_\_\_\_\_  
 Managing Director

**COMPASSES.**

Distance between electric generators or motors and standard compass 130 feet  
 Distance between electric generators or motors and steering compass 124 feet

The nearest cables to the compasses are as follows:—

A cable carrying 4 Amperes 9 feet from standard compass 6 feet from steering compass.  
 A cable carrying 6 Amperes 18 feet from standard compass 15 feet from steering compass.  
 A cable carrying 8 Amperes 18 feet from standard compass 15 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, L<sup>td</sup>  
*John Dickenson*, Builder's Signature. Date \_\_\_\_\_  
 Managing Director

Is this installation a duplicate of a previous case Yes. If so, state name of vessel W. Paua.

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 and found satisfactory.  
The materials and workmanship  
were found to be good and sound.

It is submitted that  
 this vessel is eligible for  
 THE RECORD. Elec. light.

*J.W.D.*  
 16/12/27

Total Capacity of Generators 80 Kilowatts.

The amount of Fee ... £ 17.10.0 { When applied for, 24/11/27  
 Travelling Expenses (if any) £ : : { When received, 14.12.27

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

Committee's Minute GLASGOW 13 DEC 1927

Assigned Elec. Light.

*a.l.*  
 12/12/27

Imd. 27. - Transfer. (The Surveyors are requested not to write on or below the space for Committee's Minute.)



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