

# REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

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Date of writing Report 19 When handed in at Local Office 6. 2. 1939 Port of Belfast.  
 No. in Survey held at Belfast. Date, First Survey 21<sup>st</sup> Sept 1938 Last Survey 30<sup>th</sup> Jan 1939  
 Reg. Book. (Number of Visits 20)  
 on the Steel Single Screw Motor Vessel "Gairndale"  
 Tons { Gross 5128.88  
 Net 4826.32  
 Built at Belfast. By whom built Harland + Wolff, Ltd., Yard No. 1014 When built 1938-9.  
 Owners Admiralty. Port belonging to London.  
 Electric Light Installation fitted by Harland + Wolff, Ltd., Contract No. 1014 When fitted 1938-9.  
 Is the Vessel fitted for carrying Petroleum in bulk? Yes.

System of Distribution Two Wire Direct Current, ✓  
 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 temperature rise? 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 ✓  
 Have certificates of test results for machines under 100 kw. been submitted and approved? Yes ✓  
 Have machines over 100 kw. been inspected by the Surveyors during manufacture and testing? —  
 Have certificates for generators under 100 kw. been supplied and approved? 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 ✓  
 Are the lubricating arrangements of the generators as per Rule? Yes ✓

Position of Generators Main + Emergency Generators in Motor Room Starboard Side, 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 Starbd. side of Motor 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 ✓

is it of an approved type? 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? Yes ✓, is the non-hygroscopic insulating material of an approved type? Yes ✓, 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 ✓, temperature rise of omnibus bars? Yes ✓, individual fuses to voltmeter, pilot or earth lamp? Yes ✓, are moving parts of switches alive in the "off" position? No ✓, are all screws and nuts securing connections effectively locked? Yes ✓, are any fuses fitted on the live side of switches? No ✓

Main Switchgear, description of switchgear for each generator and each outgoing circuit, and arrangement of equalizer switches D.P.O.L. Reverse Current Circuit Breakers, Time Limits Non-Automatic Equaliser Switch ✓  
 S.P. Co. Switches & S.P. Fuses for Outgoing Circuits.  
 Are turbine driven generators fitted with emergency trip switch as per rule? — Are cupboards or compartments containing switchboards composed of fire-resisting material or lined with approved material? — Instruments on main switchboard 4 ✓ ammeters 3 ✓

voltmeters — synchronising device for paralleling purposes. For compound machines is the ammeter connected on the opposite pole to equaliser connection? —  
 Earth Testing, state what means are provided at the main switchboard for indicating the state of the insulation of the system? Yes ✓  
 Earth Indicating Lamps ✓  
 do these comply with the requirements of the Rules? Yes ✓, are the fusible cutouts of an approved type? Yes ✓, have the reversed switches, circuit breakers and fusible cut-outs, ✓



current protection devices been tested under working conditions Yes are all fuses labelled as per rule 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 Yes are the cables insulated and protected as per Tables IV, V, X, XI, XII or XIII of the Rules Yes

If the cables are insulated otherwise than as per Rule, are they of an approved type Yes **Fall of Pressure,** state maximum between bus bars and any point of the installation under maximum load 5.5 Stern Light **Cable Sockets,** are the ends of all cables having a sectional area of 0.04 square inch and above provided with soldering sockets Yes **Paper Insulated and Varnished Cambrie Insulated Cables,** If conductors are paper or varnished cambrie insulated, is the dielectric at the exposed ends of the conductor protected from moisture by being suitably sealed with insulating compound Yes or waterproof insulating tape Yes **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 are cables laid under machines or floorplates Yes if so, are they adequately protected Yes

Are cables in machinery spaces, galleys, lavatories, bathrooms and lavatories lead covered or run in conduit L.S.A. Motor Room L.C. in Conduit in exposed place L.C. in Bathrooms.

**Support and Protection of Cables,** state how the cables are supported and protected Perforated Plating + Flanged pipes

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,** are the cables and fittings in accordance with the special requirements Yes

**Joints in Cables,** state if any, and how made, insulated, and protected Properly constructed + insulated junction boxes

**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 Emergency generator directly coupled to Diesel Engine, in Motor Room controlled from Main Switchboard in Motor Room

**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 are they ventilated as per Rule Yes

**Fittings,** are all fittings on weather decks, in stokeholds 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 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 Guarded fittings how are the cables led L.C. in galv. Iron Conduit

where are the controlling switches situated outer spaces

are all fittings suitably ventilated Yes are all switches and lampholders constructed wholly of non-ignitable, non-absorbent materials Yes

**Heating and Cooking Appliances,** are they constructed and fitted as per Rule Yes are air heaters constructed and fitted as per Rule Yes

**Searchlight Lamps, No. of** 1 whether fixed or portable Portable 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 Generally 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 have machines of over 100 BHP been inspected by the Surveyors during manufacture and testing Yes have certificates for all motors for essential services been supplied and approved 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 are all fuses of the filled cartridge type Yes are they of an approved type Yes If portable lamps for use in dangerous spaces are supplied, are they of a self-contained, battery-fed flameproof type approved for use in dangerous spaces Yes **Spare Gear,** if the vessel is for open sea service have spares been supplied as per Rule Yes are they suitably stored in dry situations Yes

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                      | 2      | 25         | 110    | 227      | 500            | Steam Engine  | —  | —                    |
| AUXILIARY                 |        |            |        |          |                |               |  |                      |
| EMERGENCY                 | 1      | 8          | 110    | 73       | 750            | Diesel Engine | —  | —                    |
| ROTARY TRANSFORMER        |        |            |        |          |                |               |  |                      |

GENERATOR, LIGHTING AND HEATING CONDUCTORS.

| DESCRIPTION.                       | CONDUCTORS.   |                                      | COMPOSITION OF STRAND. |           | TOTAL MAXIMUM CURRENT, AMPERES. |       | Approximate Length (Lead and Return) Feet. | Insulated with | HOW PROTECTED. |
|------------------------------------|---------------|--------------------------------------|------------------------|-----------|---------------------------------|-------|--|----------------|----------------|
|                                    | No. per Pole. | Total Nominal Area per Pole Sq. Ins. | No.                    | Diameter. | In Circuit.                     | Rule. |  |                |                |
| MAIN GENERATOR                     | 1             | .3                                   | 37                     | .103      | 227                             | 240   | 60   | V.I.R.         | L.S.A.         |
| EQUALISER CONNECTIONS              | 1             | .1                                   | 19                     | .083      | —                               | 118   | 30   | V.I.R.         | L.S.A.         |
| AUXILIARY GENERATOR                |               |                                      |                        |           |                                 |       |  |                |                |
| EMERGENCY GENERATOR                | 1             | .06                                  | 19                     | .064      | 73                              | 83    | 70   | V.I.R.         | L.S.A.         |
| ROTARY TRANSFORMER MOTOR GENERATOR |               |                                      |                        |           |                                 |       |  |                |                |
| ENGINE ROOM                        |               |                                      |                        |           |                                 |       |  |                |                |
| BOILER ROOM                        |               |                                      |                        |           |                                 |       |  |                |                |
| AUXILIARY SWITCHBOARDS             |               |                                      |                        |           |                                 |       |  |                |                |
| <b>SECTION BOXES</b>               |               |                                      |                        |           |                                 |       |  |                |                |
| SECTION BOX NO 1                   | 1             | .15                                  | 37                     | .072      | 118                             | 152   | 600  | V.I.R.         | L.S.A.         |
| SECTION BOX NO 2                   | 1             | .04                                  | 19                     | .052      | 23                              | 64    | 120  | V.I.R.         | L.S.A.         |
| SECTION BOX NO 3                   | 1             | .06                                  | 19                     | .064      | 75                              | 83    | 150  | V.I.R.         | L.S.A.         |
| SECTION BOX NO 4                   | 1             | .03                                  | 19                     | .044      | 48                              | 53    | 120  | V.I.R.         | L.S.A.         |
| ACCOMMODATION                      |               |                                      |                        |           |                                 |       |  |                |                |
| WIRELESS                           | 1             | .0145                                | 7                      | .052      | 28                              | 37    | 600  | V.I.R.         | L.S.A.         |
| SEARCHLIGHT                        | 1             | .04                                  | 19                     | .052      | 60                              | 64    | 1000                                       | V.I.R.         | L.S.A.         |
| MASTHEAD LIGHT                     | 1             | .002                                 | 3                      | .029      | 36                              | 7.8   | 600  | V.I.R.         | L.S.A.         |
| SIDE LIGHTS                        | 1             | .002                                 | 3                      | .029      | 36                              | 7.8   | 40   | V.I.R.         | L.C.           |
| COMPASS LIGHTS                     | 1             | .002                                 | 3                      | .029      | 36                              | 7.8   | 30   | V.I.R.         | L.C.           |
| POOP LIGHTS                        |               |                                      |                        |           |                                 |       |  |                |                |
| CARGO LIGHTS                       |               |                                      |                        |           |                                 |       |  |                |                |
| HEATERS                            |               |                                      |                        |           |                                 |       |  |                |                |

MOTOR CONDUCTORS.

| DESCRIPTION.            | No. of Motors. | CONDUCTORS.   |                                      | COMPOSITION OF STRAND. |           | TOTAL MAXIMUM CURRENT, AMPERES. |       | Approximate Length (Lead and Return) Feet. | Insulated with | HOW PROTECTED. |
|-------------------------|----------------|---------------|--------------------------------------|------------------------|-----------|---------------------------------|-------|--|----------------|----------------|
|                         |                | No. Per Pole. | Total Nominal Area per Pole Sq. Ins. | No.                    | Diameter. | In Circuit.                     | Rule. |  |                |                |
| 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        | 1              | 1             | .06                                  | 19                     | .064      | 80                              | 83    | 120  | V.I.R.         | L.S.A.         |
| ENGINE TURNING GEAR     |                |               |                                      |                        |           |                                 |       |  |                |                |
| ENGINE REVERSING GEAR   |                |               |                                      |                        |           |                                 |       |  |                |                |
| LUBRICATING OIL PUMPS   | 1              | 1             | .0045                                | 7                      | .029      | 18                              | 18.2  | 80   | V.I.R.         | L.S.A.         |
| OIL FUEL TRANSFER PUMP  |                |               |                                      |                        |           |                                 |       |  |                |                |
| WINDLASS                |                |               |                                      |                        |           |                                 |       |  |                |                |
| WINCHES, FORWARD        | 1              | 1             | .007                                 | 7                      | .036      | 20                              | 24    | 210  | V.I.R.         | L.S.A.         |
| LUB. OIL PURIFIER       |                |               |                                      |                        |           |                                 |       |  |                |                |
| WINCHES, AFT            |                |               |                                      |                        |           |                                 |       |  |                |                |
| STEERING GEAR           |                |               |                                      |                        |           |                                 |       |  |                |                |
| (a) MOTOR GENERATOR     |                |               |                                      |                        |           |                                 |       |  |                |                |
| (b) MAIN MOTOR          |                |               |                                      |                        |           |                                 |       |  |                |                |
| WORKSHOP MOTOR          | 2              | 1             | .01                                  | 7                      | .044      | 24                              | 31    | 150  | V.I.R.         | L.S.A.         |
| VENTILATING FANS        |                |               |                                      |                        |           |                                 |       |  |                |                |
| GRINDING M/C            | 1              | 1             | .01                                  | 7                      | .044      | 30                              | 31    | 90   | V.I.R.         | L.S.A.         |
| DRILLING M/C            | 1              | 1             | .0045                                | 7                      | .029      | 16                              | 18.2  | 80   | V.I.R.         | L.S.A.         |
| LATHE                   | 1              | 1             | .0045                                | 7                      | .029      | 15.2                            | 18.2  | 80   | V.I.R.         | L.S.A.         |
| DECONTAMINATION FAN     | 1              | 1             | .002                                 | 3                      | .029      | 1.12                            | 7.8   | 70   | V.I.R.         | L.C.           |

The Electrical Equipment is installed in accordance with the approved plans.

All Insulated Conductors are guaranteed to withstand the immersion and resistance tests specified in the Rules.

The foregoing is a correct description.



Electrical Engineers.

Date January 26th '39

COMPASSES.

Minimum distance between electric generators or motors and standard compass 30 ft to Ventilation Fan.

Minimum distance between electric generators or motors and steering compass 28 ft to Ventilation Fan.

The nearest cables to the compasses are as follows:—

A cable carrying 60 Ampères 7 feet from standard compass 7 feet from steering compass.

A cable carrying 18 Ampères 8 feet from standard compass in feet from steering compass, pedestal.

A cable carrying 18 Ampères in feet from standard compass 8 feet from steering compass, pedestal.

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.



Builder's Signature.

Date Jan'y. 26d. '39.

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, &c.) This installation has been fitted on board under special survey and in accordance with the approved plans & has been tested under full working conditions & found satisfactory. The materials and workmanship have been found to be good & sound.

W.S.  
9/2/39

Total Capacity of Generators 58 Kilowatts.

The amount of Fee ... £ 28 : 6 : 6.2.39  
When applied for,  
When received,  
Travelling Expenses (if any) £ : : 13.2.39

R. C. Clayton & Charles H. Hunter  
Surveyors to Lloyd's Register of Shipping.

Committee's Minute

FRI 10 FEB 1939

Assigned

See FT2 machy rpl.

21.12.38-Transfer. The Surveys are requested not to be written on or below the space for Committee's Minute



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