

# REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office FEB 24 1939

Date of writing Report 19... When handed in at Local Office 23. 2. 1939 Port of Belfast  
 No. in Survey held at Belfast Date, First Survey 27<sup>th</sup> July 1938 Last Survey 13-2-39 19  
 Reg. Book. (Number of Visits 20)  
 on the Single Screw Motor Vessel Richmond Castle  
 Built at Belfast By whom built Harland + Wolff, Ltd. Yard No. 1012 When built 1938-9.  
 Owners Union Castle Mail Steamship Co. Port belonging to London  
 Electric Light Installation fitted by Harland + Wolff, Ltd. Contract No. 1012 When fitted 1938-9.  
 Is the Vessel fitted for carrying Petroleum in bulk No.

**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 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 \_\_\_\_\_ Have machines over 100 kw. been inspected by the Surveyors during manufacture and testing Yes ✓  
 Have certificates for generators under 100 kw. been supplied and approved \_\_\_\_\_  
 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** In Motor Room (1 Port and 2 Starboard) 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 on Platform at aft end 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 \_\_\_\_\_, is the non-hygroscopic insulating material of an approved type \_\_\_\_\_, 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 For each generator one 1500 D.P. Circuit Breaker with reverse current trips + time lag interlocked with 800 amp equaliser switch outgoing circuits have D.P. Circuit Breaker or S.P. Knife Switch + D.P. Zed type fuses  
 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 Yes ✓ **Instruments** on main switchboard 3 ammeters 2  
 voltmeters arranged \_\_\_\_\_ for paralleling purposes. For compound machines is the ammeter connected on the opposite pole to equaliser connection Yes ✓  
**Earth Testing**, state what means are provided at the main switchboard for indicating the state of the insulation of the system Indicating lamp on each pole with D.P. Switch + fuses ✓ **Switches, Circuit Breakers and Fusible Cut-outs**, do these comply with the requirements of the Rules Yes ✓ are the fusible cutouts of an approved type Yes ✓ have the reversed

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:** *and* 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 *9.5 Volts Tunnel to escape fan* **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 Cambric Insulated Cables,**

If conductors are paper or varnished cambric insulated, is the dielectric at the exposed ends of the conductor protected from moisture by being suitably sealed with insulating compound \_\_\_\_\_, or waterproof insulating tape \_\_\_\_\_ **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 *No* if so, are they adequately protected \_\_\_\_\_

Are cables in machinery spaces, galleys, laundries, bathrooms and lavatories lead covered or run in conduit *Hard Rubber Waterproof type cables clipped to perforated steel plates*

**Support and Protection of Cables,** state how the cables are supported and protected *clipped to perforated steel plating + covered with sheet metal where necessary*

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 *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 *In specially constructed + insulated joint 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 *All metal portable fittings not fitted to framework of ship are earthed with connector equivalent to working conductor* 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 *None*

**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 \_\_\_\_\_

are any fittings placed in spaces where inflammable or explosive dust or gases are liable to be present, if so, how are they protected *Guarded Pendant fitting in Paint Room* how are the cables led *Hard Rubber cable in conduit*

where are the controlling switches situated *locally*

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** \_\_\_\_\_ whether fixed or portable \_\_\_\_\_, 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 *Horizontal type - Yes* *Vertical type - No*, 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 \_\_\_\_\_

have machines of over 100 BHP been inspected by the Surveyors during manufacture and testing \_\_\_\_\_ have certificates for all motors for essential services been supplied and approved \_\_\_\_\_ **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 \_\_\_\_\_

**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 \_\_\_\_\_ are all fuses of the fitted cartridge type \_\_\_\_\_ are they of an approved type \_\_\_\_\_

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 \_\_\_\_\_

**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 ...	3	300	220	1364	270	Diesel Engines		
AUXILIARY ...								
EMERGENCY ...								
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 ...	3	2.25	91	.103	1364	1383	150	Rubber.	Hard Rubber
EQUALISER CONNECTIONS	2	1.2	91	.093	-	768	75	Do.	Do.
AUXILIARY GENERATOR...									
EMERGENCY GENERATOR									
ROTARY TRANSFORMER MOTOR GENERATOR...	1	.01	7	.044	13	31	60	Rubber.	Hard Rubber.
MOTOR ENGINE ROOM LIGHTING	1	.01	7	.044	25	31	90	Do.	Do.
MOTOR ENGINE ROOM... Do.									
AUXILIARY SWITCHBOARDS :-									
Masterboard "A" Power	1	0.5	61	.103	314	332	210	Do.	Do.
Do. "B" do	1	1.0	127	.103	572	595	520	Do.	Do.
Do. "C" do	1	0.75	91	.103	437	461	300	Do.	Do.
Do. "D" Refrig.	4	3.0	91	.103	1842	1844	90	Do.	Do.
ACCOMMODATION									
Masterboard "A" Ltg.	1	.04	19	.052	50	64	210	Do.	Do.
Do. "A" lighting	1	.15	37	.072	148	152	210	Do.	Do.
WIRELESS	1	.01	7	.044	17	31	360	Rubber.	H.R. to cable changing box
SEARCHLIGHT	1	.002	3	.029	.18	7.8	900	V.I.R.	Lead covered & Braided
MASTHEAD LIGHT	1	.002	3	.029	.18	7.8	65	Do.	Lead covered & Braided
SIDE LIGHTS	1	.002	3	.029	.09	7.8	20	Do.	Do.
COMPASS LIGHTS	1	.002	3	.029	.18	7.8	1040	Rubber.	H.R. to cable changing box
STERN POOP LIGHTS	1	.002	3	.029	.18	7.8	36	V.I.R.	Lead covered & Braided
CARGO LIGHTS (FORWARD)	1	.01	7	.036	25	31	36	Rubber.	Hard Rubber.
CARGO LIGHTS (AFT)	1	.007	7	.036	19	24	36	Do.	Do.
HEATERS Masterboard "A"	1	.6	91	.093	340	384	210	Do.	Do.

**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	1	1	.06	19	.064	77	83	234	Rubber.	Hard Rubber.
MAIN BILGE LINE PUMPS	1	1	.04	19	.052	59	64	174	Do.	Do.
GENERAL SERVICE PUMP										
EMERGENCY BILGE PUMP										
SANITARY PUMP	1	1	.04	19	.052	56	64	264	Do.	Do.
CIRC. SEA WATER PUMPS	2	1	.1	19	.083	118	118	264	Do.	Do.
CIRC. FRESH WATER PUMPS	1	1	.1	19	.083	112	118	240	Do.	Do.
AIR COMPRESSOR	2	1	.2	37	.083	159	184	270	Do.	Do.
FRESH WATER PUMP	1	1	.01	7	.044	28	31	222	Do.	Do.
ENGINE TURNING GEAR	1	1	.04	19	.052	60	64	60	Do.	Do.
ENGINE LIFTING GEAR	1	1	.007	7	.036	20	24	72	Do.	Do.
ENGINE REVERSING GEAR	1	1	.007	7	.036	20	24	72	Do.	Do.
LUBRICATING OIL PUMPS	2	1	.6	91	.093	360	384	150	Do.	Do.
OIL FUEL TRANSFER PUMP	2	1	.01	7	.044	30	31	180	Do.	Do.
WINDLASS	1	1	.4	61	.093	300	357	168	Do.	Do.
WINCHES, FORWARD	4	1	.075	19	.072	112	113	80	Do.	Do.
WINCHES, MIDSHIPS	2	1	.075	19	.072	112	113	120	Do.	Do.
WINCHES, AFT	4	1	.075	19	.072	112	113	90	Do.	Do.
WARPING WINCH	1	1	.2	37	.083	200	204	180	Do.	Do.
STEERING GEAR										
(a) MOTOR GENERATOR	2	1	.25	37	.093	180	214	80	Do.	Do.
(b) MAIN MOTOR	2	1	.25	37	.093	190	214	480	Do.	Do.
VENTILATING FAN TUNNEL	1	1	.003	3	.036	8	12	400	Do.	Do.
Workshop Motor	1	1	.003	3	.036	6	12	265	Do.	Do.
VENTILATING FANS MOTOR ROOM	4	1	.003	3	.036	6	12	96	Do.	Do.
REFRIG. COOLER FAN 10 1/2 H.P.	6	1	.0225	7	.064	42	46	84	Do.	Do.
Do. Do. 8 1/2 H.P.	7	1	.0145	7	.052	34	37	108	Do.	Do.
Do. Do. 5 H.P.	6	1	.007	7	.036	20	24	48	Do.	Do.
Do. Do. 2 1/2 H.P.	2	1	.003	3	.036	10	12	204	Do.	Do.
REFRIG. CIRC. WATER PUMP	2	1	.04	19	.052	56	64	30	Do.	Do.
HALLMARK REFRIG. MOTOR	2	1	.003	3	.036	8	12	30	Do.	Do.

NOTE :- ALL CABLES IN VICINITY OF NAVIGATING BRIDGE & WIRELESS ROOM ARE V.I.R. LEAD COVERED & BRAIDED.

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FOUNDATION





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 31 January 1939

**COMPASSES.**

Minimum distance between electric generators or motors and standard compass 68 Feet from nearest motor.

Minimum distance between electric generators or motors and steering compass 64 " " " "

The nearest cables to the compasses are as follows:—

A cable carrying 0.09 Ampères on feet from standard compass — feet from steering compass.

A cable carrying 0.09 Ampères — feet from standard compass on feet from steering compass.

A cable carrying 0.18 Ampères 10 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 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

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 and has been tested under full working conditions and found satisfactory. The materials and workmanship have been found to be good and sound.

Noted  
 24/2/39

Total Capacity of Generators 900. Kilowatts.

The amount of Fee ...	£ 67 : 10	When applied for,	23. 2. 19 39
Spent A/c £ 33 - 15 - 0		When received,	11. 3. 19 39
Liv. A/c £ 33 - 15 - 0			
Travelling Expenses (if any) £			

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

TUE 28 FEB 1939

Committee's Minute

Assigned

See Bel No. 12312

2m, 12, 26.—Transfer. The Surveyors are requested not to write on or below the space for Committee's Minute



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