

# REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office JUL - 1 1937

Date of writing Report 19 When handed in at Local Office 30. 6. 1937. Port of Belfast.

No. in Survey held at Belfast. Date, First Survey 2<sup>nd</sup> Feb, 1937 Last Survey 29 June 1937.

Reg. Book. on the Single Screw Motor Vessel "Roxburgh Castle" (Number of Visits 21)

Built at Belfast By whom built Harland & Wolff, Ltd. Yard No. 993 When built 1937

Owners Union Castle Mail Steamship Co. Port belonging to London

Electric Light Installation fitted by Harland & Wolff Ltd. Contract No. 993 When fitted 1937.

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 \_\_\_\_\_

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 Motor Room (1 Port & 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

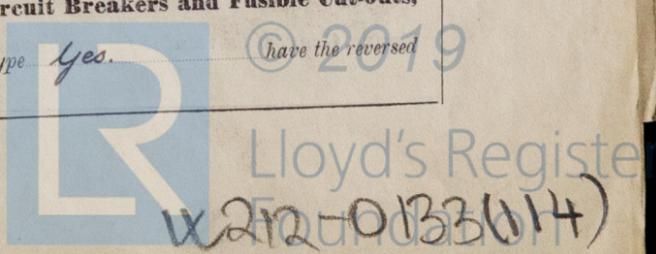
omnibus bars Yes, individual fuses to voltmeter, pilot or earth lamp Yes, are moving parts of switches alive in the "off" position No. ✓ are all screws and nuts securing connections effectively locked Yes, are any fuses fitted on the live side of

switches No. ✓ Main Switchgear, description of switchgear for each generator and each outgoing circuit, and arrangement of equalizer switches For each Gen. one 1500 D.P. circuit breaker 1/2 & 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. Led 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. **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 are the cables insulated and protected as per Tables IV, V, X or XI 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 Sumner 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 in machinery spaces, galleys, laundries, bathrooms and lavatories lead covered or run in conduit N.R. type.

**Support and Protection of Cables**, state how the cables are supported and protected Secured by clips to perforated metal trays covered with sheet metal where necessary, except in way of Wireless Room & Navigating Bridge which is in lead covered cable. 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 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 Sheet Lead.

**Earthing Connections**, state what earthing connections are fitted and their respective sectional areas Metal portable fittings not attached to ship's steelwork, earthed with connection 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.

**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 stirrup fitting in paint room. how are the cables led Hand 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 \_\_\_\_\_.

**Arc Lamps**, other than searchlight lamps, No. of \_\_\_\_\_, 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 except where vertical., 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 \_\_\_\_\_ **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 filled 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 type approved by the Home Office \_\_\_\_\_.

**Spare Gear**, if the vessel is for open sea service have spares been supplied as per Rule 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.		

*Roxburgh Castle*

**GENERATOR LIGHTING AND HEATING CONDUCTORS (CONT'D)**

DESCRIPTION	CONDUCTORS		COMPOSITION OF STRAND		TOTAL MAX. CURRENT AMPS.		APPROXIMATE LENGTH LEAD AND RETURN FEET	INSULATED WITH	HOW PROTECTED
	NO PER CABLE	TOTAL CROSS AREA PER CABLE SQ. IN.	NO	DIA	IN CIRCUIT	RULE			
Auxiliary Switchboards	1	.04	19	.052	46	64	42	Rubber	Hard Rubber
Motor Room Part.	1	.1	19	.083	98	118	84	do	do
do	1	.04	19	.052	51	64	102	do	do
Engns. Workshops	1	.04	19	.052	51	64	102	do	do
Boiler Room Board Lead	1	.3	37	.103	232	240	36	do	do
do	1	.2	37	.083	184	184	132	do	do
do	1	.25	37	.093	214	214	36	do	do
ARC LAMPS									
HEATERS	1	0.6	91	.093	340	384	210	do	do

WLR-0133(214)

*Roxburgh Castle*

**MOTOR CONDUCTORS (CONTINUED)**

DESCRIPTION	NO. OF MOTORS	CONDUCTORS		COMPOSITION OF STRAND		TOTAL MAXIMUM CURRENT AMPS.		APPROXIMATE LENGTH LEAD AND RETURN FEET	INSULATED WITH	HOW PROTECTED
		NO. PER MOTOR	TOTAL CROSS AREA PER MOTOR SQ. IN.	NO.	DIA.	IN CIRCUIT	RULE			
Co. O <sub>2</sub> Compressor.	3	1	.85	127	.093	510	512	180	do	do
Brine Pump 12 B.H.P.	3	1	.03	19	.044	48	53	190	do	do
do 8 1/2 B.H.P.	2	1	.0225	7	.064	34	46	190	do	do
do 4 B.H.P.	1	1	.0045	7	.029	16	18.2	90	do	do
Aux. S.W. Pump	2	1	.01	7	.044	30	31	160	do	do
Lub. Oil Purifier.	2	1	.003	3	.036	6	12	180	do	do
Fuel Oil Purifier.	2	1	.003	3	.036	6	12	180	do	do
Oil Vapour Fan.	1	1	.007	7	.036	18	24	250	do	do
Boiler Blower.	1	1	.003	3	.036	4	12	204	do	do
Purified Oil Pump.	1	1	.0045	7	.029	10	18.2	150	do	do
Galvanic Heaters.	4	1	.002	3	.029	3	7.8	180	do	do
Galley Blower.	2	1	.003	3	.036	5	12	40	do	do
Lathe.	1	1	.003	3	.036	6	12	90	do	do
Drilling Machine.	1	1	.003	3	.036	8	12	108	do	do
Grinding Machine.	1	1	.003	3	.036	8	12	48	do	do
Domestic S.W. Pump.	1	1	.002	3	.029	3	7.8	114	do	do

WLR-0133(314)

Note:- All cables in vicinity of Navigating Bridge & Wireless Room are U.S. R. lead, covered.

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 ...									
ENGINE ROOM Lighting	1	.01	7	.044	13	31	60	Rubber	Hard Rubber
BOILER ROOM do	1	.01	7	.044	25	31	90	do	do
AUXILIARY SWITCHBOARDS									
do do "A" power	1	0.5	61	.103	314	332	210	do	do
do do "B" do	1	1.0	127	.103	572	595	570	do	do
do do "C" do	1	0.75	91	.103	437	461	300	do	do
do do "D" refug.	4	3.0	91	.103	1842	1844	90	do	do
ACCOMMODATION									
Masterboard "A" big	1	.04	19	.052	50	64	210	do	do
do cooking	1	.0225	7	.064	37	46	210	do	do
WIRELESS	1	.01	7	.044	17	31	360	U.S.R.	Lead Covered
SEARCHLIGHT									
MASTHEAD LIGHT	1	.002	3	.029	.18	7.8	900	U.S.R.	Lead Covered.
SIDE LIGHTS	1	.002	3	.029	.18	7.8	65	do	do
COMPASS LIGHTS	1	.002	3	.029	.09	7.8	20	do	do
STERN LIGHTS	1	.002	3	.029	.18	7.8	1040	do	do
CARGO LIGHTS (Forward)	1	.01	7	.044	25	31	36	do	do
CARGO LIGHTS (Aft)	1	.007	7	.036	19	24	36	do	do
ARC LAMPS									
HEATERS Masterboard "A"	1	0.6	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 REVERSING GEAR	1	1	.007	7	.036	20	24	72	do	do
LUBRICATING OIL PUMPS	2	1	.6	91	.093	360	384	120	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, Mainships	2	1	.075	19	.072	112	113	120	do	do
WINCHES, AFT	4	1	.075	19	.072	112	113	90	do	do
Swarming 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
WORKSHOP MOTOR										
Ventilating Fans	1	1	.003	3	.036	8	12	400	do	do
VENTILATING FANS Motor room	4	1	.003	3	.036	6	12	264	do	do
Refrig. Cooler Fan 10 1/2 H.P.	6	1	.0225	7	.064	42	46	96	do	do
do do 8 1/2 H.P.	7	1	.0145	7	.052	34	37	84	do	do
do do 5 H.P.	6	1	.007	7	.036	20	24	108	do	do
do do 2 1/2 H.P.	2	1	.003	3	.036	10	12	48	do	do
Refrig. Eric. Water Pump	2	1	.04	19	.052	56	64	204	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 U.S.R. lead covered.

All Conductors are of annealed copper conforming to British Standard Specification No. 7 (or International Electro-technical Commission Publication No. 28).

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

The foregoing is a correct description.



Electrical Engineers.

Date JUNE 19TH 1937.

COMPASSES.

Distance between electric generators or motors and standard compass 68 feet from nearest motor

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 JUNE 19TH 1937.

Is this installation a duplicate of a previous case yes If so, state name of vessel H.L. Rochester Castle.

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  
Min  
5.7.37

Total Capacity of Generators 900 Kilowatts.

The amount of Fee ... £ 67 : 10 :  
Travelling Expenses (if any) £ : :  
Feb £33-15-0  
Mar £33-15-0

When applied for, 30<sup>th</sup> June 1937.  
When received, 21.7.37

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

Committee's Minute TUE. 6 JUL 1937

Assigned

See Bel. J.E. 11967

2m.531.—Transfer. The Signatories are requested not to write on or below the space for Committee's Minute.



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