

JAN. 11 1922

## REPORT ON ELECTRIC LIGHTING INSTALLATION. No. 41636

Port of Glasgow Date of First Survey 18th Nov Date of Last Survey 23 Dec 1921 No. of Visits 5  
 No. in on the Iron or Steel M.V. LINNELL Port belonging to Liverpool  
 Reg. Book 38190 S Built at Dumfries By whom Messrs A. Macmillan & Son When built 1921  
 Owners Liverpool Brazil & Rio Plate S.N.C. Owners' Address Lamport & Holt (Managers)  
 Yard No. 604 Electric Light Installation fitted by Messrs A. Macmillan & Son When fitted 1921

## DESCRIPTION OF DYNAMO, ENGINE, ETC.

— TOTAL K.W. = 300 —

B. W. A. Allen & Co. Ltd. 100 K.W. Dynamos at 300 R.P.M. each direct coupled to  
a Diesel Engine by Messrs Harland & Wolff Ltd.

Capacity of Dynamo 455 Amperes at 220 Volts, whether continuous or alternating current continuous  
 Where <sup>ARE</sup> Dynamo fixed Portside Motor Room Whether single or double wire system is used Double  
 Position of Main Switch Board Aft End of Motor Room having switches to groups A, B, C, D of lights, &c., as below  
 Positions of auxiliary switch boards and numbers of switches on each None

If fuses are fitted on main switch board to the cables of main circuit yes and on each auxiliary switch board to the cables of auxiliary  
 circuits yes and at each position where a cable is branched or reduced in size yes and to each lamp circuit yes

If vessel is wired on the double wire system are fuses fitted to both flow and return wires or cables of all circuits including lamp circuits yes

Are the fuses of non-oxidizable metal yes and constructed to fuse at an excess of 150 per cent over the normal current

Are all fuses fitted in easily accessible positions yes Are the fuses of standard dimensions yes If wire fuses are used  
 are permanent instructions fitted on or near each switch board giving particulars of proper size of fuse for each circuit yes

Are all switches and fuses constructed of incombustible materials and fitted on incombustible bases yes

Total number of lights provided for 328 arranged in the following groups:—

A Navigation etc 30 lights each of 30 W. 22 W. 8 + 5 candle power requiring a total current of 6.5 Amperes  
 B Accommodation etc 18 lights each of 30 W + 8 candle power requiring a total current of 21.74 Amperes  
 C Motor Room 106 lights each of 30 W + 10 200 W. candle power requiring a total current of 15.4 Amperes  
 D Cargo etc 10 lights each of 10 1000 W. + 36 16 candle power requiring a total current of 33.8 Amperes  
 E — lights each of — candle power requiring a total current of — Amperes  
 2 Mast head lights with 1 lamp each of 32 candle power requiring a total current of .6 Amperes  
 2 Side lights with 1 lamp each of 32 candle power requiring a total current of .6 Amperes

10 Connection Cargo lights of 4 @ 1000 Watt 16 C.P. (6 Lt. clusters) candle power, whether incandescent or arc lights Incandescent

If arc lights, what protection is provided against fire, sparks, &c. No Arc Lamps fitted

Where are the switches controlling the masthead and side lights placed In Wheel House

## DESCRIPTION OF CABLES.

Main cable carrying 455 Amperes, comprised of 91 wires, each .103 S.W.G. diameter, .75 square inches total sectional area  
 Branch cables carrying 50 Amperes, comprised of 49 wires, each .052 S.W.G. diameter, .04 square inches total sectional area  
 Branch cables carrying 10.9 Amperes, comprised of 7 wires, each .036 S.W.G. diameter, .007 square inches total sectional area  
 Leads to lamps carrying 1.5 Amperes, comprised of 3 wires, each .036 S.W.G. diameter, .003 square inches total sectional area  
 Cargo light cables carrying 2.4 Amperes, comprised of 90 wires, each .0076 S.W.G. diameter, .004 square inches total sectional area

## DESCRIPTION OF INSULATION, PROTECTION, ETC.

Insulated with pure vulcanized rubber. protected with lead covering in  
accommodation, Motor Room where exposed protected by steel armour  
& braided overall.

Joints in cables, how made, insulated, and protected None

Are all the joints of cables thoroughly soldered, and the flux used not containing acids or other corrosive substances ✓ Are all joints in accessible  
 positions, none being made in bunkers, cargo spaces, or spaces which may at any time be used for carrying cargo, stores, or baggage ✓

Are there any joints in or branches from the cable leading from dynamo to main switch board No

How are the cables led through the ship, and how protected Clipped to beams. plates etc & protected by  
iron plates where necessary.



DESCRIPTION OF INSULATION, PROTECTION, ETC.—continued.

Are they in places always accessible *yes*

What special protection has been provided for the cables in open alleyways or where exposed to weather or moisture *Lead covered.*

*Armoured & braided in alleyways etc. covered with sheet iron or open decks.*

What special protection has been provided for the cables near galleys or oil lamps or other sources of heat *No boiler room.*

What special protection has been provided for the cables near boiler casings *Lead covered armoured & braided*

What special protection has been provided for the cables in engine room *Lead covered armoured & braided*

How are cables carried through beams *brushed holes* through bulkheads, etc. *W.T. Handls.*

How are cables carried through decks *Iron gut pipes with glands.*

Are any cables run through coal bunkers *no* or cargo spaces *yes* or spaces which may be used for carrying cargo, stores, or baggage *yes*

If so, how are they protected *Lead covered armoured & braided & protected with sheet iron.*

Are any lamps fitted in coal bunkers or spaces which may at times be used for cargo, coals, or baggage *no*

If so, how are the lamp fittings and cable terminals specially protected *—*

Where are the main switches and fuses for these lights fitted *—*

If in the spaces, how are they specially protected *—*

Are any switches or fuses fitted in bunkers *—*

Cargo light cables, whether portable or permanently fixed *portable* How fixed *Connection box.*

In vessels fitted on the single wire system, how is the dynamo terminal fixed to the hull of vessel *—*

How are the returns from the lamps connected to the hull *—*

Are all the joints with the hull in accessible positions *—*

Is the installation supplied with a voltmeter *yes* and with an amperemeter *yes*, fixed *on switchboard*

VESSELS BUILT FOR CARRYING PETROLEUM.

In vessels built for carrying petroleum, are all switches and fuses fitted in positions not liable to the accumulation of petroleum vapour or gas *—*

Are any switches, fuses, or joints of cables fitted in the pump room or companion *—*

How are the lamps specially protected in places liable to the accumulation of vapour or gas *—*

The copper used is guaranteed to have a conductivity of not less than that of the Engineering Standards Committee's standard and the wires are protected by tinning from the sulphur compounds present in the insulating material.

Insulation of cables is guaranteed to have a resistance of not less than *8500* megohms per statute mile at 60° Fahrenheit after 24 hours' immersion in water, the test being made after one minute's electrification at not less than 500 volts and while the cable is still immersed.

The foregoing statements are a correct description of the Electric Light installation fitted by us on this vessel and we declare that it is at this date in good order and safe working condition.

ARCHD. McMILLAN & SON, LTD.

*Barrie* DIRECTOR.

Electrical Engineers

Date *26<sup>th</sup> Dec. 1921*

COMPASSES.

Distance between dynamo or electric motors and standard compass *87 feet*

Distance between dynamo or electric motors and steering compass *28 feet*

The nearest cables to the compasses are as follows:—

A cable carrying	Amperes	feet from standard compass	feet from steering compass
6.5	11	8	8
5	6	4	4
2.1	8	6	6

Have the compasses been adjusted with and without the electric installation at work at full power *Yes*

The maximum deviation due to electric currents, etc., 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.

ARCHD. McMILLAN & SON, LTD.

*Barrie* DIRECTOR.

Builder's Signature

Date *26<sup>th</sup> Dec. 1921*

GENERAL REMARKS.

*This installation has been fitted on board under special survey. Tested under full working conditions and found satisfactory in every way.*

*FEK: 139-0-0*

*26<sup>th</sup> Dec. 1921*

*J. B. Rankin*

Surveyor to Lloyd's Register of Shipping.

Committee's Minute

GLASGOW 10 JAN 1922

*Elec. Light.*

19a.

rt of *Glasgow.*

Continuation of Report No. 44636 dated

on the

M. V. LINNELL — YARD NO 604.

DETAILS OF MOTORS & GENERATORS

	No	HP or KW	AMPS	SIZE OF CABLE	AREA OF CABLE
GENERATORS EACH	3	100 KW	455	9/103	.75 ✓
COMPRESSOR MOTORS	2	90 HP	347	6/103	.5 ✓
PISTON COOL <sup>d</sup> PUMP MOTORS	2	6 "	24	19/062	.04 ✓
LUBRICATING " "	3	8 "	32	19/062	.04 ✓
BILGE " "	2	10 "	40	7/064	.0225 ✓
BALLAST " "	1	22 "	84	19/072	.075 ✓
OIL FUEL " "	1	8 "	32	7/044	.0100 ✓
ENGINE TURNING " "	2	8 1/2 "	34	19/052	.04 ✓
DOCK <sup>NO</sup> WINCH " "	1	35 "	135	37/072	.15 ✓
DECK " "	2	35 "	135	37/072	.15 ✓
MACFARLANE WINCH "	7	50 "	190	37/053	.2 ✓
WINDLASS MOTOR	1	62 "	250	37/103	.3 ✓
STEERING GEAR " "	1	22 "	84	19/072	.075 ✓
BRINE PUMP " "	1	2 "	8.2	3/036	.003 ✓
REFRIG MAC <sup>INE</sup> " "	1	10 1/2 "	47	7/064	.0225 ✓
LATHE " "	1	1 1/2 "	6.5	3/036	.003 ✓
DRILLING MAC <sup>INE</sup> " "	1	2 "	8.8	3/036	.003 ✓
FRESH WATER PUMP "	1	3 1/2 "	14	7/036	.007 ✓
SALT " " "	1	2 "	8.2	3/036	.003 ✓
OIL PURIFIER " "	1	2 "	8.2	3/036	.003 ✓
HEATER FANS	4	3 "	2.2	3/036	.003 ✓
25" VENT " "	2	4 3/4 "	19	7/036	.007 ✓
CIRCULATING PUMP	1	15 "	56	19/052	.04 ✓
SANITARY " "	1	15 "	56	19/052	.04 ✓
REVERSING GEAR "	2	7 "	26	7/044	.0100 ✓

DETAILS OF MAIN SWITCHBOARD

SITUATED IN AFTER END OF ENGINE ROOM. HAVING THE

FOLLOWING CIRCUITS.

	FEEDING	LOAD	CABLE SIZE	AREA	NO	FEEDING	LOAD	CABLE SIZE	AREA
I	Starboard Piston Cooling	64	19/062	.04	XIII	Aft Air Compressor	347	6/103	.5 ✓
I	Bilge Pump	64	19/062	.04	XIV	Steering Gear	84	19/072	.075 ✓
I	Port Piston Cooling	64	19/062	.04	XV	Cooking	61.5	19/064	.06 ✓
I	Bilge Pump	64	19/062	.04	XVI	Accommod. Lights	21.74	7/064	.0225 ✓
I	Sanitary Pump	56	19/052	.04	XVII	Cargo Lights	33.8	7/064	.0225 ✓
I	Circulating Pump	56	19/052	.04	XVIII	Navigational Lts.	6.5	7/036	.007 ✓
I	Starboard Piston Cooling	60	19/062	.04	XIX	Forward Air Comp.	347	6/103	.5 ✓
I	Port Piston Cooling	60	19/062	.04	XX	Wireless	20	7/036	.007 ✓
I	Bilge Pump	58.75	19/062	.04	XXI	Hard Watches & Winches	300	6/1093	.4 ✓
I	Ballast Pump	84	19/072	.075	XXII				
II	Starboard Lubricating	64	19/062	.04	XXIII				
II	Oil Fuel Pump	64	19/062	.04	XXIV				
II	Port Lubricating	60	19/062	.04					
II	Reversing	60	19/062	.04					
II	Lathe, Drill Fans	89.8	7/064	.0225					
II	& 4th Pump	58.75	19/062	.04					
II	Lubricating pumps	64	19/062	.04					
II	Refrigerator	47	7/064	.0225					
II	Motor Rm. Lights	15.4	19/052	.04					