

## REPORT ON ELECTRIC LIGHTING INSTALLATION.

No. 41562

Port of Glasgow Date of First Survey 27. 10. 21 Date of Last Survey 26. 11. 21 No. of Visits 6  
 No. in Reg. Book 23124 on the Iron or Steel S. S. MADURA Port belonging to Glasgow  
 Built at Scotstoun By whom Messrs Barclay Curle & Co When built 1921  
 Owners The Brit. St. Nav. Co Ltd. Owners' Address  
 Yard No. 585 Electric Light Installation fitted by Messrs J. A. Kinnaird & Co When fitted 1921

## DESCRIPTION OF DYNAMO, ENGINE, ETC.

2 Sets Shanks Compound Vertical 2 crank steam engines cylinders 12 1/2 x 19 x 8" Speed 400 r.p.m. Direct Coupled to Newton Bros (Daly) Ltd 80kW. 100V. Compound Wound Dynamos. + one Emergency 16KW.

Capacity of Dynamo 800 Amperes at 100 Volts, whether continuous or alternating current Continuous

Where is Dynamo fixed in Engine Room Whether single or double wire system is used double

Position of Main Switch Board in Engine Room having switches to groups A-J of lights, &c., as below

Positions of auxiliary switch boards and numbers of switches on each 3 Aux. Boards fixed in port alleyway upper deck each having 3 switches.

If fuses are fitted on main switch board to the cables of main circuit Yes and on each auxiliary <sup>FUSE</sup> ~~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 100% 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 732 arranged in the following groups:—

A	236	lights each of 16c & 84 Fans.	candle power requiring a total current of	107	Amperes
B	163	lights each of 16c & 54 "	"	74.34	"
CB	116	lights each of 16c & 4 "	candle power requiring a total current of	89.62	Amperes
D	89	lights each of 16c & "	"	120	"
DE	188	lights each of 16c & 18 Fans.	candle power requiring a total current of	151	Amperes
E	14 Heaters.	lights each of	"	243	"
FD	21 Heaters.	lights each of	candle power requiring a total current of	190	Amperes
F	24 Heaters.	lights each of	"	208	"
FE	2 Turning Motors	lights each of	candle power requiring a total current of	99.6	Amperes
J	1 Vent. Fan.	lights each of	"	29	"
	2 Mast head lights with 1 lamp each of 32.	candle power requiring a total current of	2.24	Amperes	
	2 Side lights with 1 lamp each of 32.	candle power requiring a total current of	2.24	Amperes	
	40 Cargo lights of 16	candle power, whether incandescent or arc lights	incandescent		
	4	2000			

If arc lights, what protection is provided against fire, sparks, &c.

Where are the switches controlling the masthead and side lights placed in Chart Room.

## DESCRIPTION OF CABLES.

Main cable carrying <u>800</u> Amperes, comprised of <u>11 9/1</u> wires, each <u>.103</u> S.W.G. diameter, <u>.7500</u> square inches total sectional area
Branch cables carrying <u>145</u> Amperes, comprised of <u>37</u> wires, each <u>.093</u> S.W.G. diameter, <u>.2500</u> square inches total sectional area
Branch cables carrying <u>67</u> Amperes, comprised of <u>19</u> wires, each <u>.064</u> S.W.G. diameter, <u>.0600</u> square inches total sectional area
Leads to lamps carrying <u>.2</u> Amperes, comprised of <u>3</u> wires, each <u>.029</u> S.W.G. diameter, <u>.0020</u> square inches total sectional area
Cargo light cables carrying <u>4.48</u> Amperes, comprised of <u>3</u> wires, each <u>.029</u> S.W.G. diameter, <u>.0020</u> square inches total sectional area

## DESCRIPTION OF INSULATION, PROTECTION, ETC.

Conductors of high conductivity tinned copper, wire insulated with pure and vulcanised india rubber, the whole vulcanised together, taped braided and lead covered, also taped braided lead covered & armoured & braided overall.

Joints in cables, how made, insulated, and protected none made.

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 Lead covered or lead covered and armoured and braided clipped direct to decks or bulkheads.



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

Cables lead covered, armoured and braided overall

What special protection has been provided for the cables near galleys or oil lamps or other sources of heat

Lead covered armoured & braided

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

Bushed holes

through bulkheads, &c.

W.T. Bulkhead glands

How are cables carried through decks

W.T. steel deck tubes.

Are any cables run through coal bunkers or cargo spaces or spaces which may be used for carrying cargo, stores, or baggage

yes 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 clipped to deck head

Are any lamps fitted in coal bunkers or spaces which may at times be used for cargo, coal, or baggage

yes

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

C.I. con. box.

Where are the main switches and fuses for these lights fitted

in compartment

If in the spaces, how are they specially protected

C.I. box

Are any switches or fuses fitted in bunkers

no

Cargo light cables, whether portable or permanently fixed

portable

How fixed

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 Main S.W. board.

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 2500  $\Omega$  mains 600  $\Omega$  lighting 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.

J. A. KINNAIRD & COMPANY LIMITED

Electrical Engineers

Date 9<sup>th</sup> Dec 1921.

COMPASSES.

Distance between dynamo or electric motors and standard compass

Approx 155' Direct line

Distance between dynamo or electric motors and steering compass

150' " "

The nearest cables to the compasses are as follows:—

A cable carrying	Amperes	feet from standard compass	at	feet from steering compass
2		at		
9	20	15		

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

any

course in the case of the

standard compass and

For B. & Co., Ltd.

degrees on

any

course in the case of the steering compass.

J. A. Kinnaird

Builder's Signature.

Date

12<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.

FREE - £36-6-0

at 5/12/21.

Dec. Light.

L.C. 23/12/21.

J. P. Rankin

Surveyor to Lloyd's Register of Shipping.

Committee's Minute

GLASGOW

20 DEC 1921

Elec. Light.



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THE SURVEYORS ARE REQUESTED NOT TO WRITE ACROSS THIS MARGIN.

K.C.  
17.12.21

2m. 11.12.—Transfer.