

Rpt. 13.

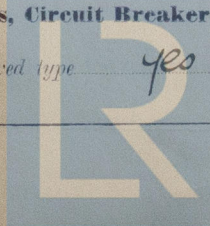
No. 60115

## REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Date of writing Report 12-8-38 When handed in at Local Office 20-8-38 Port of Glasgow  
No. in Survey held at Glasgow Date, First Survey 1-6-38 Last Survey 15-8-38  
Reg. Book. 89953 on the S.S. "SCIENTIST" (Number of Visits 9)  
Built at Port Glasgow By whom built Lithgows Ltd. Yard No. 911 When built 1938  
Owners T. J. Harrison Port belonging to Liverpool  
Electric Light Installation fitted by Campbell & Isherwood Contract No. 911 When fitted 1938  
Is the Vessel fitted for carrying Petroleum in bulk No.

System of Distribution single wire hull return  
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 no, is an adjustable regulating resistance fitted in series with each shunt field no 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 —  
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 engine room, 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 near generator.  
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 SINOANYO, 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  
Generator and each outgoing circuit controlled by S.P. switch and fuse.  
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 ne ammeters one 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 —  
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

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current protection devices been tested under working conditions

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

Fall of Pressure, state maximum between bus bars and

any point of the installation under maximum load *5.0 Volts*

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 *yes*

Support and Protection of Cables, state how the cables are supported and protected *main L.C.B. in steel tube wiring in machinery spaces L.C.A.B. wiring in Crew accommodation L.C.B. wiring in Officer accommodation*

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 *—*

Joints in Cables, state if any, and how made, insulated, and protected *none*

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 *earthing of the hull return conductors in accordance with the rules. Lead and armoured efficiently earthed by means of clips*

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 *in special compartment off engine room, always controlled by own switchboard and driven by I.C. engine*

Navigation Lamps, are these separately wired *yes*, controlled by separate switch and separate fuses *yes*, are the fuses double pole *no*

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 *—*

Fittings, are all fittings on weather decks, in storerooms 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 *—*

how are the cables led

where are the controlling switches situated *—*

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 *—*, are air heaters constructed and fitted as per Rule *—*

Searchlight Lamps, No. of *winning only*, whether fixed or portable *—*, are their fittings as per Rule *—*

Are Lamps, other than searchlight lamps, No. of *—*, are their live parts insulated from the frame or case *—*, 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 when feasible*, 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.

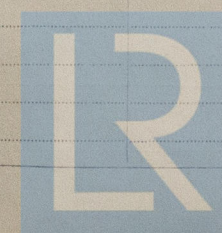
DESCRIPTION OF GENERATOR.	No. of	RATED AT				DRIVEN BY	WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE.	
		Kilowatts.	Volts.	Ampères.	Revs. per Min.		Fuel Used.	Flash Point of Fuel.
MAIN ...	1	15	110	136	450	steam engine		
AUXILIARY ...								
EMERGENCY ...	1	5	110	45.5	1450	mt. coal engine	paraffin	below 150° F.
ROTARY TRANSFORMER								

## GENERATOR, LIGHTING AND HEATING CONDUCTORS.

DESCRIPTION.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT.		Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
	No. per Pole.	Total Nominal Area per Pole Sq. Ins.	No.	Diameter.	Circuit.	Rule.			
MAIN GENERATOR ...	1	15	37	0.72	136	152	10	Rubber	L.C.B.
EQUALISER CONNECTIONS ...									
AUXILIARY GENERATOR ...									
EMERGENCY GENERATOR ...	1	03	19	0.44	45.5	53	10	"	"
ROTARY TRANSFORMER GENERATOR ...									
ENGINE ROOM ...	1	007	7	0.36	22.3	24	5	"	"
BOILER ROOM ...									
AUXILIARY SWITCHBOARDS ...									
POOP D.B.	1	0045	7	0.29	12	18.2	220	"	"
AFT. CARGO D.B.	1	007	7	0.36	15.4	24	50	"	"
FOR'D CARGO D.B.	1	007	7	0.36	15.4	24	150	"	"
SALOON D.B.	1	007	7	0.36	22.2	24	170	"	"
MIDSHIP D.B.	1	007	7	0.36	22	24	60	"	"
ACCOMMODATION ...									
WIRELESS ...	1	007	7	0.36	18	24	75	"	"
SEARCHLIGHT <i>winning only</i> ...	1	0225	7	0.64	45	46	450	"	"
MASTHEAD LIGHT ...	1	022	3	0.29	36	7.8	400	"	L.C.B. in conduit
SIDE LIGHTS ...	1	022	3	0.29	36	7.8	40	"	L.C.B.
COMPASS LIGHTS ...	1	022	3	0.29	36	7.8	15	"	"
POOP LIGHTS ...									
CARGO LIGHTS ...									
ARC LAMPS ...									
HEATERS ...									

## MOTOR CONDUCTORS.

DESCRIPTION.	No. of Motors.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT.		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 ...										
ENGINE TURNING GEAR ...										
ENGINE REVERSING GEAR ...										
LUBRICATING OIL PUMPS ...										
OIL FUEL TRANSFER PUMP ...										
WINDLASS ...										
WINCHES, FORWARD ...										
WINCHES, AFT ...										
STEERING GEAR—										
(a) MOTOR GENERATOR ...										
(b) MAIN MOTOR ...										
WORKSHOP MOTOR ...										
VENTILATING FANS ...										
ASH HOIST ...	2	1	01	7	0.44	18.8	31	110	Rubber	L.C.A.B.
REFRIG. ...	1	1	007	7	0.36	21	24	60	"	"



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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.

CAMPBELL & ISHERWOOD LTD.

Electrical Engineers.

Date 16-8-1938.

#### COMPASSES.

Distance between electric generators or motors and standard compass

200 feet

Distance between electric generators or motors and steering compass

200 feet.

The nearest cables to the compasses are as follows:—

A cable carrying 36 Ampères led into feet from standard compass. led into feet from steering compass.

A cable carrying 8 Ampères 6 feet from standard compass. 5 feet from steering compass.

A cable carrying Ampères feet from standard compass. 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 any course in the case of the standard compass, and nil degrees on any course in the case of the steering compass.

LITHGOWS LIMITED.

John M. Fullerton Secretary

Builder's Signature.

Date 18/8/38.

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, etc.)

The electrical equipment of this vessel has been fitted on board under special survey, tested under full working conditions and found satisfactory. The materials and workmanship are good.

Noted  
11/9/38.

Total Capacity of Generators 20 Kilowatts.

The amount of Fee ... £ 17 : 10 : at 4/6.

Travelling Expenses (if any) £ — : — : 26/6 1938

Committee's Minute GLASGOW 30 AUG 1938

Assigned See other F.C. report.

R. I. Murchison

Surveyor to Lloyd's Register of Shipping.



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