

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

SEP -7 1938

Received at London Office

Date of writing Report 10 When handed in at Local Office - 3 SEP 1938 Port of LIVERPOOL.

No. in Survey held at BIRKENHEAD Date, First Survey 21/4/38 Last Survey 25/8/1938.

Reg. Book. 72340 on the S.S. CITY OF EDINBURGH (Number of Visits.....10.....)

Built at BIRKENHEAD By whom built CAMELL LAIRD & CO? Yard No. 1032 When built 1938

Owners ELLERMAN LINES LTD Port belonging to

Electric Light Installation fitted by SUNDERLAND FORGE & ENG. CO. LTD Contract No. 1032 When fitted 1938

Is the Vessel fitted for carrying Petroleum in bulk No.

System of Distribution Double wire

Pressure of supply for Lighting 220 volts, **Heating** ✓ 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 ✓

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 Yes

Have certificates for generators under 100 kw. been supplied and approved Yes

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 On platform at aft end of 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 On platform over generators.

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 ✓

is it of an approved type ✓, if semi-insulating material is used, are all conducting parts insulated from the slab with mica or micaite or other non-hygroscopic insulating material, and the slab similarly insulated from its framework Yes, is the non-hygroscopic insulating material of an approved type Yes, and is the frame effectively earthed Yes

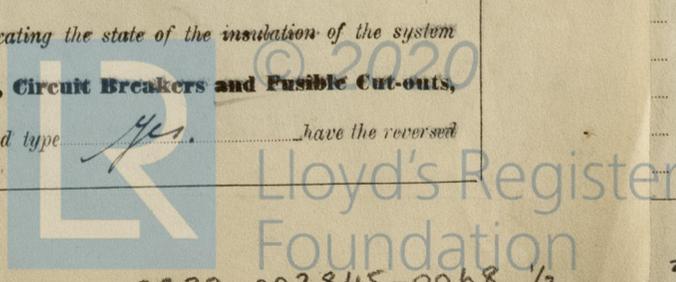
Are the fittings as per Rule regarding:— spacing or shielding of live parts Yes, accessibility of all parts Yes, absence of fuses on back of board Yes, temperature rise of omnibus bars Yes, individual fuses to voltmeter, pilot or earth lamp Yes, are moving parts of switches alive in the "off" position 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 T.P. Circuit Breakers with D.C. Reverse current trips for main generators. D.P. CO switch & D.P. fuses for Aux Generator. D.P. switch & D.P. fuses for each outgoing circuit. D.P. Circuit-breaker for steering gear.

Are turbine driven generators fitted with emergency trip switch as per rule Yes. Are cupboards or compartments containing switchboards composed of fire-resisting material or lined with approved material Yes. **Instruments** on main switchboard 5 ammeters 4

voltmeters ✓ synchronising device 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 Earth Lamps. **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: Single, twin, concentric, or multicore *Single Twin* 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 **Fall of Pressure,** state maximum between bus bars and any point of the installation under maximum load *7.85 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 *Yes* **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 *Yes* if so, are they adequately protected *Yes*

Are cables in machinery spaces, galleys, lavatories, bathrooms and lavatories lead covered or run in conduit *Yes*

Support and Protection of Cables, state how the cables are supported and protected *Lead covered in main deck - L.C.A.B. in pipe. Acc - L.C.B. clipped to bulkhead or wood ground.*

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 *Yes. Made in suitable junction 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 or fibre*

Earthing Connections, state what earthing connections are fitted and their respective sectional areas are their connections made as per Rule

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

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 are they ventilated 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 *In hold & Tween Decks. Wigan type fittings* 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 N.T.* 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 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 *Generally yes* 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 *Yes* **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	150	220	681	800	Steam Turbines		
AUXILIARY	1	15	220	70.4	400	Steam Reciprocating		
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.	Circuit.	Rule.			
MAIN GENERATOR	2	2 x .3	37	.103	681	692	66	V.C.	L.C.A.B.
EQUALISER CONNECTIONS	1	.3	37	.103	-	346	33	do	do
AUXILIARY GENERATOR	1	.06	19	.064	70.4	122	96	do	do
EMERGENCY GENERATOR									
ROTARY TRANSFORMER									
ENGINE ROOM									
BOILER ROOM	1	.0225	7	.064	20	46	42	V.I.R.	L.C.A.B.
AUXILIARY SWITCHBOARDS									
Navigation	1	.007	7	.036	12.7	24	430	V.I.R.	L.C.A.B.
Accommodation Saloon	1	.0225	7	.064	21.1	46	380	do	do
do Prop.	1	.0225	7	.064	10.2	46	434	V.I.R.	L.C.A.B.
Green Dr. Lights	1	.007	7	.036	8.1	24	110	do	do
Eng. Dr. Lights & Acc. Fans	1	.0225	7	.064	22.3	46	110	do	do
WIRELESS	1	.007	7	.036	10	24	390	V.I.R.	L.C.A.B.
SEARCHLIGHT									
MASTHEAD LIGHT	1	.002	3	.029	.18	7.8	1140	V.I.R.	L.C.A.B.
SIDE LIGHTS	1	.002	3	.029	.18	7.8	152	do	L.C.A.B.
COMPASS LIGHTS	1	.002	3	.029	.07	7.8	32	do	do
Stem Light	1	.002	3	.029	.18	7.8	1240	do	do
CARGO LIGHTS	1	.01	7	.044	14.5	31	110	do	do
HEADERS Mast Lights	1	.0025	7	.064	36.3	46	110	do	L.C.A.B.

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										
MAIN BILGE LINE PUMPS										
GENERAL SERVICE PUMP										
EMERGENCY BILGE PUMP										
SANITARY PUMP										
CIRC. SEA WATER PUMPS	2	1	.25	37	.093	302	209	76	V.C.	L.C.B.
CIRC. FRESH WATER PUMPS										
AIR COMPRESSOR										
FRESH WATER PUMP										
ENGINE TURNING GEAR										
ENGINE REVERSING GEAR										
LUBRICATING OIL PUMPS	3	1	.04	19	.052	55	64	48	V.I.R.	L.C.A.B.
OIL FUEL TRANSFER PUMP										
WINDLASS										
WINCHES, FORWARD										
WINCHES, AFT										
STEERING GEAR										
(a) MOTOR GENERATOR	1	1	.075	19	.072	154	162 (24)	440	V.C.	L.C.B.
(b) MAIN MOTOR	1	1	.007	7	.036	17	24	60	V.I.R.	L.C.A.B.
WORKSHOP MOTOR	1	1	.007	7	.036	17.9	24	150	do	L.C.A.B.
VENTILATING FANS Eng. Rm.	2	1	.007	7	.036	12	18.2	87	do	do
Wash Nozel	1	1	.0045	7	.029	12	18.2	87	do	do
Induced Draught Fans	2	1	.04	19	.052	90	94	158	V.C.	L.C.B.
Forced Draught Fans	2	1	.075	19	.072	126	141	164	do	do
Oil Fuel Pumps	2	1	.007	7	.036	17.5	24	104	V.I.R.	L.C.A.B.
Oil Purifiers	2	1	.0045	7	.029	12.7	18.2	50	do	do
Refrig.	1	1	.007	7	.036	21	24	281	do	do

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.

J. Williamson
 Electrical Engineers. Date *August 12/38.*
 P. PRO THE SUNDERLAND FORGE & ENGINEERING CO. LTD.

COMPASSES.

Minimum distance between electric generators or motors and standard compass *112 ft approx*
 Minimum distance between electric generators or motors and steering compass *108 ft do.*
 The nearest cables to the compasses are as follows:—
 A cable carrying *12.7* Ampères *15* feet from standard compass *9* feet from steering compass.
 A cable carrying *.07* Ampères *in* feet from standard compass *8* feet from steering compass.
 A cable carrying *.07* Ampères *8* feet from standard compass *in* 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 *1° E* degrees on *SSE-5* course in the case of the standard compass, and *1° W* degrees on *SSW-5* course in the case of the steering compass.

FOR AND ON BEHALF OF
 MELL LAIRD & CO. LIMITED
[Signature]
 MANAGER

Builder's Signature. Date *23 AUG 1938*

Is this installation a duplicate of a previous case *Yes.* If so, state name of vessel *SS. CITY OF PRETORIA*

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
[Signature]
8/9/38.

Total Capacity of Generators *465* Kilowatts.

The amount of Fee ... £ *55 : 15* :-
LIV £44.12.0
LON £11.3.0
 Travelling Expenses (if any) £ *4 : 2 : 6*
LON A/c

When applied for, *6 SEP 1938*

When received, *16/9/38*
[Signature]

R. C. Clayton
 Surveyor to Lloyd's Register of Shipping.

Committee's Minute *LIVERPOOL - 6 SEP 1938*

Assigned *See Liv. F.C. 111506*

2m, 12.56.—Transfer. The Surveyors are requested not to write on or below the space for Committee's Minute.

