

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office FEB - 8 1938

Date of writing Report 24th Jan, 1938 When handed in at Local Office 7. 2. 1938 Port of Middlesbrough
 No. in Survey held at Middlesbrough and Newcastle Date, First Survey 8th December Last Survey 31st January, 1937/38
 Reg. Book. Suppt. (Number of Visits 10)
40859 on the S.S. "ZARIAN" Tons Gross
Net

Built at Hampton Hill-on-Sea By whom built Summers A. B. Co. Ltd. Yard No. 281 When built 1938
 Owners Elmina Ltd. Port belonging to Freetown. Sierra Leone
 Electric Light Installation fitted by Summers A. B. Co. Ltd. Elec. Dept. Contract No. 281 When fitted 1938
 Is the Vessel fitted for carrying Petroleum in bulk Yes

System of Distribution Double wirePressure of supply for Lighting 225 volts, Heating — volts, Power 225 volts.Direct or Alternating Current, Lighting Direct Power DirectIf 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 YesGenerators, do they comply with the requirements regarding temperature rise Yes, are they compound wound Yesare 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 YesHave certificates of test results for machines under 100 kw. been submitted and approved Yes, Certs. furnished Have machines over 100 kw. been inspected by the Surveyors during manufacture and testing None fittedHave certificates for generators under 100 kw. been supplied and approved Manufacturers' test Certs. only suppliedAre 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 YesAre the lubricating arrangements of the generators as per Rule YesPosition of Generators Engine room starboard side aft, is the ventilation in way of the generators satisfactory Yes, are they clear of all inflammable material Yes, if situated near unprotectedwoodwork 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 YesEarthing, 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 Engine room starboard side near generatorsIf 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 samehorizontally 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 Yesis it of an approved type Yes, if semi-insulating material is used, are all conducting parts insulated from the slab with mica or mica-nite 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 YesAre 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 ofomnibus 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 ofswitches No Main Switchgear, description of switchgear for each generator and each outgoing circuit, and arrangement of equalizer switches Triple pole circuit breakers with O/L & R/C trips on dynamo mains, one pole connected to equalizer bus-bar; double pole switches & double pole fuses on outgoing circuits.Are turbine driven generators fitted with emergency trip switch as per rule — Are cupboards or compartments containing switchboards composed offire-resisting material or lined with approved material — Instruments on main switchboard 2 ammeters 2 voltmeters — synchronising device for paralleling purposes. For compound machines is the ammeter connected on the opposite pole to equaliser connectionYes Earth Testing, state what means are provided at the main switchboard for indicating the state of the insulation of the system E lamps coupled to E through switches & 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* 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* are the cables insulated and protected as per Rules 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 *6.0 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 laid under machines or floorplates *no* if so, are they adequately protected —

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 *L.C.A.B. cables run in galv pipes*

If cables are run in rod 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 *home made*

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 of the beams or partitions banded *yes* state the material of which the bushes are made *Lead*

Earthing Connections, state which earthing connections are fitted and their respective sectional areas —, 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 —

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 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 —, 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 *Wired for one* 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 *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 *home fitted for each service* **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 *yes* are all fuses of the fused 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 *yes*

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.	Amps.	Revs. per Min.		Fuel Used.	Flash Point of Fuel.	
MAIN	2	25	225	111	685	Single cylinder steam 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.	Circuit.	Rate.			
MAIN GENERATOR	1	1	19	.083	111	118	40	V.I.R.	L.C.A.B.
EQUALISER CONNECTIONS	1	.03	19	.044	—	53	40	V.I.R.	L.C.A.B.
EMERGENCY GENERATOR	1	1	19	.083	—	118	180	V.I.R.	L.C.A.B.
ROTARY TRANSFORMER									
ENGINE ROOM	1	.0045	7	.029	7.5	18.2	40	V.I.R.	L.C.A.B.
BOILER ROOM	1	.0045	7	.029	7.5	18.2	40	V.I.R.	L.C.A.B.
AUXILIARY SWITCHBOARDS									
Fore Cargo Ldg.	1	.01	7	.044	8.6	31	340	V.I.R.	L.C.A.B.
Aft Cargo Ldg.	1	.0045	7	.029	11.2	18.2	140	V.I.R.	L.C.A.B.
ACCOMMODATION	1	.0045	7	.029	14	18.2	140	V.I.R.	L.C.A.B.
Offs Officers	1	.01	7	.044	14.5	31	340	V.I.R.	L.C.A.B.
Offs Poole.	1	.01	7	.044	10	31	730	V.I.R.	L.C.A.B.
Offs Poop	1	.01	7	.044	7	31	440	V.I.R.	L.C.A.B.
Navigation Ldg.	1	.01	7	.044	4.5	31	420	V.I.R.	L.C.A.B.
WIRELESS	1	.01	7	.044	15	31	420	V.I.R.	L.C.A.B.
SEARCHLIGHT	1	.03	19	.044	53	53	650	V.I.R.	L.C.A.B.
MASTHEAD LIGHT	1	.002	3	.029	2	7.8	500	V.I.R.	L.C.A.B.
SIDE LIGHTS	1	.002	3	.029	2	7.8	90	V.I.R.	L.C.A.B.
COMPASS LIGHTS	1	.002	3	.029	1	7.8	50	V.I.R.	L.C.A.B.
STERN LIGHTS	1	.002	3	.029	2	7.8	740	V.I.R.	L.C.A.B.
CARGO LIGHTS									
HEATERS									

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.	Rate.			
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										
Refug. Mach. fed by supply Compressor	1	.01	7	.044	17	31	360	V.I.R.	L.C.A.B.	
Pump Fan 2 @	1	.0045	7	.029	13	18.2	20	V.I.R.	L.C.A.B.	
Eng. Rom. Mach. fed by supply Smelter	1	.002	3	.029	401	7.8	300 r 104	V.I.R.	L.C.A.B.	
Drill & Lath	1	.01	7	.044	27	31	50	V.I.R.	L.C.A.B.	
F.W. Pump	3 @	.003	3	.036	3 @ 8	12	90, 100, 90	V.I.R.	L.C.A.B.	
	1	.002	3	.029	3	7.8	400	V.I.R.	L.C.A.B.	

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.

P. P. C. Owen
FURNESS SHIPBUILDING CO. LIMITED

Electrical Engineers.

Date *5th Feb 1938.*

COMPASSES.

Minimum distance between electric generators or motors and standard compass *128 feet*

Minimum distance between electric generators or motors and steering compass *118 feet*

The nearest cables to the compasses are as follows:—

A cable carrying *1* Ampères *on the* ~~foot from~~ standard compass *10* feet from steering compass.

A cable carrying *1* Ampères *10* feet from standard compass *on the* ~~foot 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 *Every* course in the case of the standard compass, and *Nil* degrees on *Every* course in the case of the steering compass.

Builder's Signature.

Date *Feb 5th 1938.*

Is this installation a duplicate of a previous case *Yes* If so, state name of vessel *S.S. "Conakrian"*

General Remarks (State quality of workmanship, opinions as to class, &c.) *The electrical equipment of this vessel has been fitted out under special survey. The materials used and the workmanship are good. On completion the equipment was operated under working conditions, the automatic governors of the generating sets tested, the overload and reversed current trip mechanisms of the circuit breakers adjusted and their operation checked, the insulation resistances of all circuits measured and the generating plant, main switchboard, switches, fuses, cables, motors and fittings examined and tested and found satisfactory and in accordance with approved plans and in compliance with the Rules. This equipment is eligible, in my opinion, for a classed vessel. A direction finding equipment is fitted.*

Total Capacity of Generators *50* Kilowatts.

The amount of Fee ... £ *27: 10*

Travelling Expenses (if any) £

When applied for,

1 Feb 1938

When received,

1/4 1938

Committee's Minute

Assigned

See Indb SE 16237

Noted.

10-2-38.

S. Anterson & W. T. Badger
Surveyor to Lloyd's Register of Shipping.



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Foundation