Rpt. 13. No. 61681

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office NOV 1 19..

Date of writing Report 7th Oct. 1939 When handed in at Local Office 30:10:1939 Port of Glasgow.

No. in Reg. Book. 16409 Survey held at Paisley and Renfrew. Date, First Survey 19:7:39 Last Survey 23rd Oct 1939. (Number of Visits 12) on the T.S.M.V. "ABERCRAIG" Tons Gross 445 Net 191

Built at Paisley By whom built Fleming & Ferguson Yard No. 550 When built 1939

Owners Trustees of the Harbour of Dundee Port belonging to Dundee

Electric Light Installation fitted by J. Chalters. Contract No. 550 When fitted 1939

Is the Vessel fitted for carrying Petroleum in bulk no.

System of Distribution two wire.

Pressure of supply for **Lighting** 110 volts, **Heating** 110 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 yes, is an adjustable regulating resistance fitted in series with each shunt field yes 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 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 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 —, 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

each main generator controlled by T.P. Circuit breaker fitted with O.C. and R.C. trips and T.P. isolating switch, and generator controlled by D.P. circuit breaker fitted with O.C. trip. Each outgoing circuit controlled by D.P. switch and fuses.

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 6 ammeters 3 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. **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 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 3·5 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 mains. L.C.A.B. clipped; wiring in machinery spaces and on deck. L.C. A B. clipped; wiring in accommodation L.C. clipped.

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 —

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 lead and armouring efficiently earthed by bonding glands.

, 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 — .

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 yes. are air heaters constructed and fitted as per Rule yes

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

Arc 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 where possible, 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 —

PARTICULARS OF GENERATING PLANT.

Description of Generator.	No. of	Rated at: Kilowatts.	Volts.	Amperes.	Revs. per Min.	Driven by	Where driven by an internal combustion engine: Fuel Used.	Flash Point of Fuel.
Main	2.	40	110	364	600	I.C. engine.	oil.	above 150°F
Auxiliary	1	2·5	110	23	1000	"	"	"
Emergency								
Rotary Transformer								

GENERATOR, LIGHTING AND HEATING CONDUCTORS.

Description.	Conductors: No. per Pole.	Total Nominal Area per Pole Sq. Ins.	Composition of Strand: No.	Diameter.	Total Maximum Current. Amperes: Circuit.	Rule.	Approximate Length. (Lead and Return.) Feet.	Insulated with	How Protected.
Main Generator	1	·6	91	·093	364	384 ✓	40	Rubber	L.C.A.B.
Equaliser Connections	1	·2	37	·083	—	184 ✓	20	"	"
Auxiliary Generator	1	·01	7	·044	23	31 ✓	30	"	"
Emergency Generator									
Rotary Transformer: Motor									
Rotary Transformer: Generator									
Engine Room. Port DB	1	·0045	7	·029	8·2	18·2 ✓	60	"	"
~~Boiler Room~~ Stbd. DB	1	·0045	7	·029	10·2.	18·2 ✓	60	"	"
Auxiliary Switchboards									
Navigation. D.B.	1	·003	3	·036	1·8	12 ✓	112	"	"
Saloon, Wheelhouse	1	·0045	7	·029	8·5	18·2 ✓	120	"	"
Aft. Saloons.	1	·01	7	·044	12	31 ✓	224	"	"
Main Decks. Starbd.	1	·0045	7	·029	11·5	18·2 ✓	112	"	"
Main Decks. Port.	1	·0045.	7	·029	14·2	18·2 ✓	112	"	"
Accommodation									
Wireless									
Searchlight									
Masthead Light	1	·002	3	·029	·36	7·8 ✓	500	"	L.C.
Side Lights	1	·002	3	·029	·36	7·8 ✓	60	"	"
Compass Lights	1	·002	3	·029	·2	7·8 ✓	20		"
~~Poop Lights~~ Radiator.	1	·007	7	·036	18·1	24 ✓	60		L.C.A.B
~~Cargo Lights~~ Tubular Heating	1	·01	7	·044	31·7	31 ✓	150	"	"
~~Arc Lamps~~ Ladies Room Heating	1	·01	7	·044	22·2	31 ✓	144	"	"
~~Heaters~~ Water Heating	1	·007	7	·036	15	24 ✓	80	"	"

MOTOR CONDUCTORS.

Description.	No. of Motors.	Conductors: No. Per Pole.	Total Nominal Area per Pole Sq. Ins.	Composition of Strand: No.	Diameter.	Total Maximum Current. Amperes: In Circuit.	Rule.	Approximate Length. (Lead and Return.) Feet.	Insulated with	How Protected.
Ballast Pump	1	1	·2	37	·083	154	184 ✓	80	Rubber.	L.C.A.B.
Main Bilge Line Pumps	1	1	·06	19	·064	68	83 ✓	90	"	"
Fire & Washdeck ~~General Service~~ Pump	1	1	·1	19	·083	94	118 ✓	100	"	"
Stand-by Cooling W. ~~Emergency Bilge~~ Pump	1	1	·1	19	·083	94	118 ✓	110	"	"
Sanitary Pump	1	1	·003	3	·036	9	12 ✓	30	"	"
Aft Turntable ~~Circ. Sea Water Pumps~~	1	1	·04	19	·052	60	64 ✓	170	"	"
Aft Gangway Motors ~~Circ. Fresh Water Pumps~~	2	1	·0225	7	·064	41	46 ✓	160		
Capstans ~~Air Compressor~~	2	1	·04	19	·052	60	64 ✓	120	"	"
Fresh Water Pump	1	1	·003	3	·036	9·5.	12. ✓	60		
For'd Turntable ~~Engine Turning Gear~~	1	1	·04	19	·052	60	64 ✓	160	"	"
For'd Gangway Doors ~~Engine Reversing Gear~~	2	1	·0225	7	·064	41	46 ✓	160	"	"
Lubricating Oil Pumps	1	1	·007	7	·036	16·8	24 ✓	40	"	"
Oil Fuel Transfer Pump	1	1	·007	7	·036	17·3.	24 ✓	50	"	"
Windlass										
Winches, Forward										
Winches, Aft										
Steering Gear— (a) Motor Generator										
(b) Main Motor										
Workshop Motor										
Ventilating Fans	2	1	·003	3	·036	3	12 ✓	75.	"	"
Eng. Room. Aux. DB. 1.	—	1	·01	7	·044	30	31 ✓	60	"	"
Eng. Room Aux. DB 2.	—	1	·0225.	7	·064	45	46 ✓	60	"	"
For'd Gangway Doors DB.	—	1	·0225	7	·064	41	46 ✓	112	"	"
Aft " " DB.	—	1	·0225	7	·064	41	46 ✓	160	"	"

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.

J. Strachan. Electrical Engineers. Date 16th October 39.

COMPASSES.

Distance between electric generators or motors and standard compass 30 feet.

Distance between electric generators or motors and steering compass 30 feet.

The nearest cables to the compasses are as follows:—

A cable carrying ·2 *Ampères* 62 ins ~~*feet from*~~ *standard compass* 62 ins ~~*feet from*~~ *steering compass.*

A cable carrying 1·4 *Ampères* 5 *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.*

Fleming & Ferguson, Limited
[signature] Secretary — Builder's Signature. Date 11th October 39

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, &c.*) 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
L.G.
2/11/39.

[initials]
30/10/39

Total Capacity of Generators 82·5 *Kilowatts.*

The amount of Fee	£30 : 15 :	When applied for, 31 OCT 1939	
Travelling Expenses (if any)	£ — : — :	When received. 7/11/1939	R.G.J. 8/11.

R. T. Murchison & [signature]
Surveyor to Lloyd's Register of Shipping.

Committee's Minute GLASGOW 31 OCT 1939

Assigned SEE ACCOMPANYING MACHINERY REPORT.

(The Surveyors are requested not to write on or below the space for Committee's Minute.)

750.9.36.—Transfer.