Rpt. 13.

No. 27832 e

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office FEB 14 1939

Date of writing Report 7 - 2 - 1939 When handed in at Local Office ..... 19 ..... Port of Rotterdam

No. in Reg. Book. Survey held at Hardinxveld Date, First Survey 5-10-'38 Last Survey 6 - 2 - 1939 (Number of Visits 4)

on the m.s. "CITRINE" Tons Gross 783.43 Net 415.79

Built at Hardinxveld By whom built De Merwede Yard No. 386 When built 1938/1939

Owners Messrs. William Robertson Port belonging to Glasgow

Electric Light Installation fitted by van Rietschoten & Houwens N.V. Contract No. ..... When fitted 1938/1939

Is the Vessel fitted for carrying Petroleum in bulk no

System of Distribution two conductor insulated system ✓

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

Direct or Alternating Current, Lighting direct current **Power** direct current

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 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 ✓

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 in engineroom, port and starboard side, 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 in engineroom aft

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 marble, 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 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 each main generator : one double pole switch 2 double pole fuses — aux. generator: one double pole change over switch 2 double pole fuses 2 single pole automatic cut in 2 cut out switch — outgoing power circuits: each a double-pole change over switch 2 double pole fuses — outgoing lighting circuits: each a double pole switch 2 double pole 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 yes **Instruments** on main switchboard 4 ammeters 3 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 one pair of earthfault indicating lamps for each generator **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~~ all types *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* 2·4 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* cables are clipped to metal trays or direct to wood-work or steelwork of vessel or run in conduit.

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 sheath & steel wire braiding of cables and all apparatus earthed where necessary to Rule requirements *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* by battery in gastight compartment in engineroom with ventilating ducts to deck; one double pole controlling switch, one triple pole charge & discharge change over switch & one set of double pole fuses are mounted on lighting switchboard.

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 (in chartroom.)

has each navigation lamp an automatic indicator as per Rule yes **Secondary Batteries,** *are they constructed and fitted as per Rule* yes, *are they ventilated as per Rule* yes

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* none

are any fittings placed in spaces where inflammable or explosive dust or gases are liable to be present, if so, how are they protected none

, 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 nil *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* 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* steel masts **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 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 Kilowatts.	Volts.	Amperes.	Revs. per Min.	DRIVEN BY	WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE. Fuel Used.	Flash Point of Fuel.
MAIN	2	40	220	182	900	oil engine	diesel oil	above 150°F.
AUXILIARY	1	7·5	220	34	750	"	"	" "
EMERGENCY								
ROTARY TRANSFORMER								

GENERATOR, LIGHTING AND HEATING CONDUCTORS.

DESCRIPTION.	CONDUCTORS. No. per Pole.	Total Nominal Area per Pole Sq. ~~in~~ mm.	COMPOSITION OF STRAND. No.	Diameter. mm.	TOTAL MAXIMUM CURRENT. AMPERES. Circuit.	Rule.	Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
MAIN GENERATOR	1	160	37	2·37	182	205 ✓	105 90	rubber	Lead sheath & steel wire braiding
EQUALISER CONNECTIONS									
AUXILIARY GENERATOR	1	10	7	1·35	34	38 ✓	90		
~~EMERGENCY GENERATOR~~ Battery connections	1	6	7	1·05	25 (fuse rating)	29 ✓	15	"	"
ROTARY TRANSFORMER { MOTOR								"	"
ROTARY TRANSFORMER { GENERATOR									
ENGINE ROOM. (2 circuits)	1	1·5	1	1·39	1	9·5 ✓	90 75	"	"
BOILER ROOM									
AUXILIARY SWITCHBOARDS									
Navigation board	1	1·5	1	1·39	1	9·5	150	"	"
Cargo Lights dist. bd	1	1·5	1	1·39	2·5	9·5	290	"	"
Deck machinery for'd	1	25	7	2·13	64	67 ½hr ✓	300	"	"
ACCOMMODATION									
Lighting dist. bd port	1	1·5	1	1·39	5	9·5	105	"	"
Lighting dist. bd st. bd	1	1·5	1	1·39	5	9·5	110	"	"
WIRELESS									
SEARCHLIGHT									
MASTHEAD LIGHT	1	1·5	1	1·39	·2	9·5 ✓	315	"	"
SIDE LIGHTS	1	1·5	1	1·39	·2	9·5 ✓	45 50	"	"
COMPASS LIGHTS	1	1·5	1	1·39	·08	9·5 ✓	80	"	"
POOP LIGHTS	1	1·5	1	1·39	·2	9·5 ✓	90	"	"
CARGO LIGHTS	1	1·5	1	1·39	·18	9·5 ✓	85	"	"
HEATERS									

MOTOR CONDUCTORS.

DESCRIPTION.	No. of Motors.	CONDUCTORS. No. Per Pole.	Total Nominal Area per Pole Sq. ~~in~~ mm.	COMPOSITION OF STRAND. No.	Diameter. mm.	TOTAL MAXIMUM CURRENT. AMPERES. In Circuit.	Rule.	Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
BALLAST PUMP	1	1	6	7	1·05	21	29 ✓	100	rubber	Lead sheath & steel wire braiding.
MAIN BILGE LINE PUMPS	1	1	4	7	·86	16	22·5 ✓	80	"	"
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	1	1	2·5	1	1·79	1·35	16·5 ✓	75	"	"
WINDLASS	1	1	25	7	2·13	61	63 ✓	140	"	"
WINCHES, FORWARD	1	1	25	7	2·13	64	67 ½hr ✓	25	"	"
WINCHES, ~~AFT~~ Forward	1	1	25	7	2·13	64	67 ½hr ✓	45	"	"
Capstan	1	1	6	7	1·05	27·5	29 ✓	85	"	"
STEERING GEAR—										
(a) MOTOR GENERATOR										
(b) MAIN MOTOR	1	1	4	7	·86	20	22·5 ✓	145	"	"
WORKSHOP MOTOR										
VENTILATING FANS										
Oil purifier	1	1	1·5	1	1·39	2·6	9·5 ✓	70	"	"
Oil heater	1	1	6	7	1·05	13·5	29 ✓	65	"	"

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.

Van Rietschoten & Houwens
Electrotechnische Maatschappij, N.V.

Electrical Engineers. Date .....

COMPASSES.

Minimum distance between electric generators or motors and standard compass 19 feet (steering gear motor).

Minimum distance between electric generators or motors and steering compass 14 feet (" ").

The nearest cables to the compasses are as follows :—

A cable carrying	·08	Ampères	1	feet from standard compass	1	feet from steering compass.	compasslights.
A cable carrying	·2	Ampères	4	feet from standard compass	2	feet from steering compass.	morse signalling lamp.
A cable carrying	·1	Ampères	11	feet from standard compass	5	feet from steering compass.	steering gear controll circuit
" " "	20	"	18	" " "	12	" " "	" " " supply.

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 nihil *degrees on* every *course in the case of the standard compass, and* nihil *degrees on* every *course in the case of the steering compass.*

N.V. Scheepsbouwwerf „DE MERWEDE"
v/h VAN VLIET & Co.

Builder's Signature. Date 11 Feb. 1939.

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 installation of this vessel has been fitted on board under special survey, tested under full working conditions and found satisfactory The material and workmanship are good and the installation merits in my opinian the Committee's approval

Noted
L.G.
22/2/39.

Total Capacity of Generators 87·5 *Kilowatts.*

The amount of Fee ... ... £ 375,00 : When applied for, 13.2.1939

Travelling Expenses (if any) £ 6,00 : When received. 28.2.1939 EB 1/3

H. van der Wyk.
Surveyor to Lloyd's Register of Shipping.

Committee's Minute TUE 28 FEB 1939

Assigned See Rot. F.E. 27832

2m.12.36.—Transfer.

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