

# REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office

JUN 26 1937

Date of writing Report 22-6-1937 When handed in at Local Office 19 Port of Rotterdam

No. in Survey held at Alblasserdam Date, First Survey 3-5-37 Last Survey 10-6-1937  
 Reg. Book. my " BOTHNIA " (Number of Visits 4)

on the my " BOTHNIA " Tons { Gross \_\_\_\_\_ Net \_\_\_\_\_

Built at Alblasserdam By whom built Jan Smit Can. Yard No. 521 When built 1937

Owners N.V. Motowachvaart OKE Port belonging to Rotterdam

Electric Light Installation fitted by N.V. A. de Hoop Rotterdam. Contract No. \_\_\_\_\_ When fitted 1937

Is the Vessel fitted for carrying Petroleum in bulk no

System of Distribution two wire ✓

Pressure of supply for Lighting 24 ✓ volts, Heating \_\_\_\_\_ volts, Power 110 ✓ 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 \_\_\_\_\_

Generators, do they comply with the requirements regarding temperature rise yes ✓, are they compound wound no

are they over compounded 5 per cent. \_\_\_\_\_, 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 \_\_\_\_\_ 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 \_\_\_\_\_

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 ✓, is the ventilation in motorroom

Position of Generators 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 motorroom

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 \_\_\_\_\_, and is the frame effectively earthed \_\_\_\_\_

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 for the two light-generators, 1 double-pole-change-over-switch, and two single-pole fuses, 1 single pole automatic switch for reverse current. For each outgoing circuit; 1 double-pole switch and two single 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 \_\_\_\_\_

Instruments on main switchboards 80-0-80 1 light | 0-200A 1 power | 0-40V 1 light | 0-130V 1 power

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 2 x 2 earth detector-lamps (light and power) ✓

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 and 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 0.5V for light ✓ 2V for power ✓ **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 \_\_\_\_\_ 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 ✓ supported by metal clips, \_\_\_\_\_ where necessary \_\_\_\_\_ protected by tubes \_\_\_\_\_

**Support and Protection of Cables**, state how the cables are supported and protected \_\_\_\_\_ 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 \_\_\_\_\_

**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 \_\_\_\_\_ state the material of which the bushes are made Lead ✓

**Earthing Connections**, state what earthing connections are fitted and their respective sectional areas 10x2 mm<sup>2</sup> and 6<sup>2</sup> ✓ 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 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 \_\_\_\_\_ 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 24V 100W ✓ whether fixed or portable portable ✓, are their fittings as per Rule yes ✓

**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 \_\_\_\_\_ and \_\_\_\_\_, if not of this type, state distance of the combustible material horizontally or vertically above the motors \_\_\_\_\_ 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 \_\_\_\_\_

**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 yes ✓

**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 ✓

light  
Power main  
2. Light.  
Power

**PARTICULARS OF GENERATING PLANT.**

DESCRIPTION OF GENERATOR.	No. of	RATED AT				DRIVEN BY	WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE.	
		Kilowatts.	Volts.	Amperes.	Revs. per Min.		Fuel Used.	Flash Point of Fuel.
MAIN	2	2.5	24/32	75	1250	by main; by auxiliary motor		
EMERGENCY	1	2.5	110	220	800	auxiliary motor		
Battery	1	450 Ah	24	60				
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. mm <sup>2</sup>	No.	Diameter.	Circuit.	Rule.			
MAIN GENERATORS... each	1	25	7	2.13	55	60	75	rubber	lead covered and armoured.
EQUALISER CONNECTIONS									
AUXILIARY GENERATOR	1	120	37	2.03	165	175	60		
EMERGENCY GENERATOR									
ROTARY TRANSFORMER MOTOR GENERATOR									
ENGINE ROOM									
BOILER ROOM									
AUXILIARY SWITCHBOARDS									
navigation	1	4	7	0.86	8	21	120		
B. acc. aft P	1	4	7	0.86	14	21	90		
C. acc. aft SB	1	6	7	1.05	25	28	80		
D. acc. fore	1	10	7	1.35	7	38	210		
Battery	1	25	7	2.13	55	60	120		
ACCOMMODATION	1	1 1/2	1	1.39	4	9			lead covered
WIRELESS									
SEARCHLIGHT	1	1 1/2	1	1.39	4	9	12		lead covered and armoured
2 MASTHEAD LIGHT ... each	1	1 1/2	1	1.39	2	9	260		
2 SIDE LIGHTS ... each	1	1 1/2	1	1.39	2	9	30		
1 COMPASS LIGHTS	1	1 1/2	1	1.39	2	9	15		
1 POOP LIGHTS	1	1 1/2	1	1.39	2	9	70		
2 CARGO LIGHTS ... each	1	1 1/2	1	1.39	6	9	24		
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. mm <sup>2</sup>	No.	Diameter.	In Circuit.	Rule.			
BALLAST PUMP ... 7.5 PK	1	1	35	19	1.53	60	85	60	rubber	lead covered and armoured.
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 12.5 PK	1	1	50	19	1.83	90	98	200		
Spare Cool. Water Pump	1	1	6	7	1.05	24	28	90		
WINCHES, AFT 12.5 PK	1	1	50	19	1.83	90	98	70		
Capstan 3 PK	1	1	35	19	1.53	72	85	99		
STEERING GEAR										
(a) MOTOR GENERATOR										
(b) MAIN MOTOR										
WORKSHOP MOTOR										
VENTILATING FANS										

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.

N.V. ELECTROTECHNISCH-BUREAU  
 A. DE HOOP

Electrical Engineers.

Date 18-6-37

COMPASSES.

Minimum distance between electric generators or motors and standard compass

Minimum distance between electric generators or motors and steering compass 20

The nearest cables to the compasses are as follows:—

A cable carrying 4 Ampères feet from standard compass 9 feet from steering compass.

A cable carrying ✓ Ampères ✓ feet from standard compass ✓ 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 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.

WERF JAN SMIT Czn.

*[Signature]*

Builder's Signature.

Date

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. This installation has been made and fitted in accordance with the approved plans, Society's Rules and Secretary's letters. It has been tested under full working condition and found satisfactorily and merits in my opinion the approval of the Committee

Noted

JRW

29.6.37

Total Capacity of Generators 25 ✓ Kilowatts.

The amount of Fee ... \$ 220.00 When applied for, 25.6.19.37

Travelling Expenses (if any) £ 3.8.37 When received, 31.8.19.37

*[Signature]*  
 Surveyor to Lloyd's Register of Shipping.

Committee's Minute Fri 2 JUL 1937

Assigned See above F. E. report

2m.12.36.—Transfer. The Surveyors are requested not to write on or below the space for Committee's Minute



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