

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL) OCT 17 1938

Received at London Office

Date of writing Report 1st - 10 - 1938 When handed in at Local Office 10 Port of Rotterdam

No. in Survey held at Capelle 4a Yssel Date, First Survey 22nd Sept. '38 Last Survey 19
Reg. Book. (Number of Visits.....)

on the m.s. "CAIRNGORM"

Tons { Gross
Net

Built at Capelle 4a Yssel By whom built Messrs. Vuyk & Sons Yard No. 646 When built 1938

Owners Messrs. William Robertson Port belonging to Glasgow.

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

Is the Vessel fitted for carrying Petroleum in bulk no.

System of Distribution Two wire system (two conductor insulated for power and for lighting)

Pressure of supply for Lighting 32 volts, Heating 220 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 32V. gen. - shunt wound
are they over compounded 5 per cent. Yes (220V. gen.), if not compound wound state distance between each generator 220V. gen. - Comp. wound

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

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 32V. generator in engineroom S.B. aft. 220V. generators in engineroom P & S.B. 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 distances 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 32V. Board in engineroom aft. - 220V. Board in engineroom S.B. forward

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

32V. Board - generator: one s.p. change over switch, one s.p. automatic cut in & cut out switch, one set of d.p. fuses
outgoing circuits: one d.p. switch & one set of d.p. fuses.

220V. Board - generators: one d.p. switch & d.p. switches each; outgoing circuits: one d.p. switch & d.p. fuses each.

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 220V.: 2 ammeters 2

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 set of earth fault indicating lamps for each generator circuit Switches, Circuit Breakers and Fusible Cut-outs, Hazemeyer make

do these comply with the requirements of the Rules Yes, are the fusible cutouts of an approved type up to 60 A: Diazed type have the reversed 100 & 200 A: open tube type

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 multi-core 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 Yes **Fall of Pressure**, state maximum between bus bars and any point of the installation under maximum load 2 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 Yes, 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, laundries, bathrooms and lavatories lead covered or run in conduit Yes **Support and Protection of Cables**, state how the cables are supported and protected clipped to metal trays or direct to steelwork or woodwork of vessel by metal clips or run in conduit

If cables are run in wood casings, are the casings and caps secured by screws Yes, are the cap screws of brass Yes, are the cables run in separate grooves Yes 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 no joints

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 & steelwire 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 on navigation bridge; controlling change over switch mounted on 32V switchboard in engine room

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 no are any fittings placed in spaces where inflammable or explosive dust or gases are liable to be present, if so, how are they protected no how are the cables led Yes

where are the controlling switches situated Yes

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 one whether fixed or portable fixed, 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, 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 Yes if not of this type, state distance of the combustible material horizontally or vertically above the motors Yes and Yes

have machines of over 100 BHP been inspected by the Surveyors during manufacture and testing Yes 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 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 Yes are all fuses of the fitted cartridge type Yes are they of an approved type Yes

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

3244-V 1500 Amp
 15 Kw 2 phases
 + 3000 V 1 phase
 Received 7.41
 15 Kw 2 phases
 + 3000 V 1 phase

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	1	32.5	220	147.5	500	Oil engine	Diesel oil	Above 150° F.
AUXILIARY	1	15	220	68	750	"	"	"
Lighting	1	25	32	75		main engine	"	"
Transformer	1							

DESCRIPTION	CONDUCTORS		COMPOSITION OF STRAND		TOTAL MAXIMUM CURRENT AMPERES		Approximate Length (Lead and Return) Feet/Meters	Insulated with	HOW PROTECTED
	No. per Pole	Total Nominal Area per Pole Sq. In./mm ²	No.	Diameter in./mm	Circuit	Rate			
MAIN GENERATOR	1	95	19	2.53	147.5	150	12	Rubber	Lead sheath - steel wire braiding
EQUALISER CONNECTIONS	1	35	19	1.53	68	78	10	"	"
AUXILIARY GENERATOR	1	35	19	1.53	76	78	6	"	"
Lighting Generator	1	35	19	1.53	35	78	30	"	"
Battery connections	1	35	19	1.53				"	"
ROTARY TRANSFORMER	1							"	"
ENGINE ROOM (2 circuits)	1	1.5	1	1.39	4	9.5	10-15	"	"
BOILER ROOM								"	"
AUXILIARY SWITCHBOARDS								"	"
Navigation lights	1	1.5	1	1.39	5	9.5	30	"	"
Deck machinery fore	1	25	7	2.13	64	67 1/2 hr.	50	"	"
ACCOMMODATION								"	"
Lighting Dist. B. aft	1	4	7	.86	20.5	22.5	25	"	"
Lighting circuits (6)	1	1.5	1	1.39	3	9.5	15	"	Lead covered
WIRELESS								"	Lead sheath - steel wire braiding
SEARCHLIGHT	1	1.5	1	1.39	3	9.5	30	"	"
MASTHEAD LIGHT	1	1.5	1	1.39	.8	9.5	50	"	"
SIDE LIGHTS	1	1.5	1	1.39	.8	9.5	10	"	"
COMPASS LIGHTS	1	1.5	1	1.39	.2	9.5	5	"	"
POOP LIGHTS	1	1.5	1	1.39	.8	9.5	30	"	"
CARGO LIGHTS (220V.)	1	1.5	1	1.39	1	9.5	60	"	"
HEATERS								"	"

DESCRIPTION	No. of Motors	CONDUCTORS		COMPOSITION OF STRAND		TOTAL MAXIMUM CURRENT AMPERES		Approximate Length (Lead and Return) Feet/Meters	Insulated with	HOW PROTECTED
		No. per Pole	Total Nominal Area per Pole Sq. In./mm ²	No.	Diameter in./mm	In Circuit	Rate			
BALLAST PUMP	1	1	4	7	.86	20	22.5	16	Rubber	Lead sheath - steel wire braiding
MAIN BILGE LINE PUMPS	1	1	4	7	.86	20	22.5	16	"	"
GENERAL SERVICE PUMP									"	"
EMERGENCY BILGE PUMP									"	"
SANITARY PUMP									"	"
CIRC. SEA WATER PUMPS	1	1	1.5	1	1.39	8	9.5	10	"	"
CIRC. FRESH WATER PUMPS									"	"
AIR COMPRESSOR									"	"
FRESH WATER PUMP									"	"
ENGINE TURNING GEAR									"	"
ENGINE REVERSING GEAR									"	"
LUBRICATING OIL PUMPS									"	"
OIL FUEL TRANSFER PUMP									"	"
WINDLASS	1	1	25	7	2.13	36	63	4	"	"
WINCHES, FORWARD	1	1	25	7	2.13	64	67 1/2 hr.	10	"	"
Capstan aft	1	1	25	7	2.13	56	63	40	"	"
WINCHES, AFT	1	1	25	7	2.13	64	67 1/2 hr.	60	"	"
STEERING GEAR									"	"
(a) MOTOR GENERATOR									"	"
(b) MAIN MOTOR									"	"
WORKSHOP MOTOR									"	"
VENTILATING FANS									"	"
Oil separator	1	1	1.5	1	1.39	8	9.5	25	"	"
Oil heater	1	1	2.5	1	1.79	14	15.5	25	"	"

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 & Houwers
 Elektrotechnisch Maatschappij, N.V.

Electrical Engineers. Date 4th October '38

COMPASSES.

Minimum distance between electric generators or motors and standard compass 12 feet to battery compartment.
 Minimum distance between electric generators or motors and steering compass 6 feet to battery compartment.

The nearest cables to the compasses are as follows :-

cables carrying 2 Ampères 1 foot from standard compass 1 foot from steering compass. (Compass lighting)
 A cable carrying 35 Ampères 10 feet from standard compass 13 feet from steering compass. (battery connections)
 A cable carrying 3 Ampères 3 feet from standard compass 8 feet from steering compass. (searchlight)

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.

A. VUYK & Zn.
 SHIP-BUILDERS
 CAPELLE a. d. IJSEL
 Holland

A. Vuyk

Builder's Signature. Date

Is this installation a duplicate of a previous case yes If so, state name of vessel m.s. "PRAISE"

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 material and workmanship are good and the electrical installation merits in my opinion the Committee's approval

W. J. J. J.
 19/10/38

Total Capacity of Generators 50 Kilowatts.

The amount of Fee ... f 330,00 : When applied for, 15.10.38

Travelling Expenses (if any) £ : When received, 27/10.38
 JMK 27/10.

G. Willems
 Surveyor to Lloyd's Register of Shipping.

Committee's Minute TUE. 25 OCT 1938
 Assigned See F.E. machy rpt.

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