

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office

Date of writing Report June 17th 1940 When handed in at Local Office June 17th 1940 Port of Gothenburg
 No. in Survey held at Gothenburg Date, First Survey 7th Feb Last Survey 7th May 1940
 Reg. Book No. 19780 on the M.V. BELLONA (Number of Visits 11)
 Tons { Gross 11267
 Net 6800
 Built at Gothenburg. By whom built A.-B. Östaverken Yard No. 540 When built 1940
 Owners Rederiaktiebolaget Zenit. Port belonging to Gothenburg.
 Electric Light Installation fitted by A.-B. Östaverken. Contract No. 540 When fitted 1940
 Is the Vessel fitted for carrying Petroleum in bulk yes

System of Distribution Two wire systemPressure of supply for Lighting 110 volts, Heating 220 volts, Power 220 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 yes Have certificates of test results for machines under 100 kw. been submitted and approved yesHave machines over 100 kw. been inspected by the Surveyors during manufacture and testing yesHave certificates for generators under 100 kw. been supplied and approved yesAre 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 Three at the port and one at the starboard side of the motorroom, 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 yesMain Switch Boards, where placed on a platform at the port side of the 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 yesSwitchboards, are they placed in accessible positions, free from inflammable gases and acid fumes yes, are they protected from mechanicalinjury 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-absorbentmaterials of marble, 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 micanite or othernon-hygroscopic insulating material, and the slab similarly insulated from its framework yes, is the non-hygroscopic insulating material of an approvedtype yes, and is the frame effectively earthed yes Are the fittings as per Rule regarding: — spacing or shielding of live partsyes, 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 switchesFor Generators: A double pole circuit breaker with overload and reversed current trips and a single pole equaliser switch. For outgoing circuits: Double pole switches and a fuse at each pole.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 yes Instruments on main switchboard 5 ammeters 5voltmeters - 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 systemOhm meters Switches, Circuit Breakers and Fusible Cut-outs, 2020do 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, or multicore cables 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 **2 V + 3 Fr. cent for lighting** **Fall of Pressure,** state maximum between bus bars and any point of the installation under maximum load **2 V + 5** **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 sized 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** **Supported by metal clips. All power cables lead covered and armoured.**

Support and Protection of Cables, state how the cables are supported and protected **covered and armoured.**

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 **no** 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 in main cables**

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 **-**, 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 **-** 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 **Contained in gastight fittings**, how are the cables led **In gastight tubes**

where are the controlling switches situated **outside of the dangerous spaces**

are all fittings suitably ventilated **-**, are all switches and lampholders constructed wholly of non-ignitable, non-absorbent materials **-**

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 **-**

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** **All except the turning motor**, 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 **-** 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 **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 filled 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**

PARTICULARS OF GENERATING PLANT.

DESCRIPTION OF GENERATOR.	No. of	RATED AT				DRIVEN BY	WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE.	
		Kilowatts.	Volts.	Ampères.	R.p.m.		Fuel Used.	Flash Point of Fuel.
MAIN	3	125	220	568	400	Diesel engine	Diesel oil	Above 150° F.
Emergency	1	60	220	273	450	Steam	-	-
ROTARY TRANSFORMER	1	20	220	123	1500	-	-	-

GENERATOR, LIGHTING AND HEATING CONDUCTORS.

DESCRIPTION.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT.		Approximate Length. (Lead and Return) Met.	Insulated with	HOW PROTECTED.
	No. per Pole.	Total Nominal Area per Pole Sq. Mm.	No.	Diameter.	Circuit.	Rule.			
MAIN GENERATORS	3 - 2	450-190	37	2.27-1.83	568-273	600-300	28-26-74-46	Rubber	Lead covered and armoured
EQUALISER CONNECTIONS	3 - 2	450-190	37	2.27-1.83		600-300	28-26-74-46	-	-
AUXILIARY GENERATOR									
EMERGENCY GENERATOR									
ROTARY TRANSFORMER	1	70	37	1.55	123	123	20	-	-
ENGINE ROOM	1	150	37	2.27	182	200	20	-	-
BOILER ROOM	1	6	7	1.05	27	29	10	-	-
AUXILIARY SWITCHBOARDS									
Separators & Heaters	1	150	37	2.27	197	200	80	-	-
Heating board aft starb.	1	50	19	1.83	93	100	60	-	-
" " " port	1	35	19	1.53	76	77	40	-	-
" " " midships	1	50	19	1.83	101	100	220	-	-
Galley board	1	50	19	1.83	98	100	80	-	-
ACCOMMODATION aft starb.	1	6	7	1.05	15	29	60	-	-
" " " port	1	6	7	1.05	14	29	40	-	-
" " " midships	1	35	19	1.53	35	75	220	-	-
Lanterns	1	4	7	0.86	2	23	250	-	-
Forward	1	10	7	1.35	6	39	300	-	-
WIRELESS	1	16	19	1.04	25	50	290	-	-
SEARCHLIGHT									
MASTHEAD LIGHT	1	1.5	1	1.38	0.4	9	130-180	-	-
SIDE LIGHTS	1	1.5	1	1.38	0.4	9	50-50	-	-
COMPASS LIGHTS	1	1.5	1	1.38	0.4	9	20	-	-
POOP LIGHTS	1	1.5	1	1.38	0.4	9	250	-	-
CARGO LIGHTS									
HEATERS for oil	1	50-25-1.5	19-19-1	1.38	82-55-9	100-62-9	16-18-22	-	-

MOTOR CONDUCTORS.

DESCRIPTION.	No. of Motors.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT.		Approximate Length. (Lead and Return) Met.	Insulated with	HOW PROTECTED.
		No. Per Pole.	Total Nominal Area per Pole Sq. Mm.	No.	Diameter.	In Circuit.	Rule.			
BALLAST PUMP	1	1	16	19	1.04	45.5	50	74	Rubber	Lead covered and armoured
MAIN BILGE LINE PUMPS	1	1	16	19	1.04	45.5	50	74	-	-
GENERAL SERVICE PUMP										
EMERGENCY BILGE PUMP										
SANITARY PUMP	1	1	1.5	1	1.38	8.5	9	34	-	-
CIRC. SEA WATER PUMPS	2	2	190	37	1.83	270	300	60 - 60	-	-
CIRC. FRESH WATER PUMPS										
AIR COMPRESSOR	2	2	140	37	1.83	200	246	100-100	-	-
FRESH WATER PUMP	1	1	1.5	1	1.38	8.5	9	60	-	-
ENGINE TURNING GEAR	1	1	25	19	1.29	60	62	70	-	-
Oil Fuel Pump	1	1	2.5	7	0.67	12.1	16	16	-	-
LUBRICATING OIL PUMPS	2	2	190	37	1.83	270	300	46 - 46	-	-
OIL FUEL TRANSFER PUMP	1	1	25	19	1.29	57	62	24	-	-
WINDLASS	1	2	190	37	1.83	330	380	300	-	-
WINCHES, FORWARD										
WINCHES, AFT										
STEERING GEAR										
(a) Main Motor	2	1	50	19	1.83	80	100	100-100	-	-
(b) MAIN MOTOR	1	1	2.5	7	0.67	12.4	16	20	-	-
WORKSHOP MOTOR	3	1	1.5	1	1.38	4-4-1.3	9	30-40-80	-	-
VENTILATING FANS	1	1	10	7	1.35	30.5	39	24	-	-
Cooling w. pump	1	1	1.5	1	1.38	8.7	9	60	-	-
Refrigerator	1	1	10	7	1.35	39	39	60	-	-
Separators	3	1	6-2.5-2.5	7	1.05-0.67-13.7	13.7	29-16-16	20-18-20	-	-
Heaters for water	3	1-1	10-25	7-19	1.35-1.29	36-61	39-62	40-220	-	-

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.

AKTIEBOLAGET GÖTAVERKEN

Electrical Engineers.

Date June 17th, 1940.

COMPASSES.

Minimum distance between electric generators or motors and standard compass about 9 met.

Minimum distance between electric generators or motors and steering compass " 8 "

The nearest cables to the compasses are as follows:—

A cable carrying 25 Ampères 21 feet from standard compass 18 feet from steering compass.

A cable carrying 1 Ampères 9 feet from standard compass 6 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 *Compasses not adjusted before the vessel was delivered to Owners.*

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 0 degrees on course in the case of the standard

compass, and 0 degrees on course in the case of the steering compass.

AKTIEBOLAGET GÖTAVERKEN

Builder's Signature.

Date June 17th, 1940.

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 electrical installation has*

been fitted on board the vessel under my inspection & to my satisfaction, the materials & workmanship are good.

The installation has been tested, examined under working conditions & found in order.

The generators over 100 Kw. have been inspected by the Society's Surveyors during manufacture & testing, and the maker's test certificates for the electric motor & the steam driven generator are attached.

Wick
L.H.
20/8/40.

Total Capacity of Generators *435* Kilowatts.

The amount of Fee *Got. ofc Kw. 853:50*
Open. ofc Kw. 213:35

Travelling Expenses (if any) *Kw. 24:38*
(Open. ofc)

When applied for,

18th June 40

When received,

20th Aug 1940 R.L.S. 2/9

W.S. Lijer
Surveyor to Lloyd's Register of Shipping.

Committee's Minute

Assigned

FRI. 23 AUG 1940.

See for. J.C. 12993



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