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Rpt. 13.

No. 56871

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Date of writing Report 7th April 1936 When handed in at Local Office 14.4.36 Port of Glasgow
 No. in Survey held at Bowling Date, First Survey 28.1.36 Last Survey 8.4.1936
 Reg. Book. 37284 on the M.V. "BABINDA" (Number of Visits 8)
 Tons { Gross 659
 Net 325
 Built at Bowling By whom built Scott & Sons Yard No. 337 When built 1936
 Owners Australasian United Steam Nav. Co. Port belonging to
 Electric Light Installation fitted by Scott & Sons Contract No. 337 When fitted 1936
 Is the Vessel fitted for carrying Petroleum in bulk no

System of Distribution

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

Direct or Alternating Current, Lighting

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 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 generatorWhere more than one generator is fitted are they arranged to run in parallel Yes, is an adjustable regulating resistance fitted inseries with each shunt field Yes Have certificates of test results for machines under 100 kw. been submitted andapproved Yes Have machines over 100 kw. been inspected by the Surveyors during manufacture and testingAre 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 YesPosition of Generators In Main Engine Room, is the ventilationin 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

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 generatorsin metallic contact Yes Main Switch Boards, where placed In Main Engine room on special platform ✓

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 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 Yes and Yes, are they constructed wholly of durable, non-ignitable non-absorbentmaterials Yes, 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 Indanite, 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 switchesSingle pole circuit breakers (Pole equalisers) fitted with 1/2" 4/c. trips for each generator, D.P. switch fuses for each outgoing circuit ✓

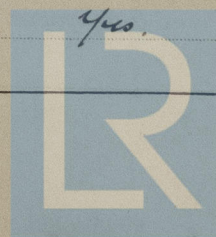
Are turbine driven generators fitted with emergency trip switch as per rule

Are cupboards or compartments containing switchboards composed of

fire-resisting material or lined with approved material

Instruments on main switchboard 3 ammeters 3voltmeters Yes 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

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 are the reversed

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 Foundation

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 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 3.1 Volts **Fall of Pressure**, state maximum between bus bars and any point of the installation under maximum load Yes

area of 0.04 square inch and above provided with soldering sockets Yes **Paper Insulated and Varnished Cambric Insulated Cables**, 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 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 Which deck machinery main together with lighting circuit main run in gals. tubing on deck, making space L.C. A+B on L.C.B. as V.I.R. in tubing. Accommodate V.I.R. - H.R. leaded, clipped to top of bulkhead and deck

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 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 Metallie sheathing & screwing of cables bonded & earthed by means of clips & bonding glands

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 Yes

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

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 Yes

are any fittings placed in spaces where inflammable or explosive dust or gases are liable to be present, if so, how are they protected Yes

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 Yes, whether fixed or portable Yes, are their fittings as per Rule Yes

Are Lamps, other than searchlight lamps, No. of Yes, are their live parts insulated from the frame or case Yes, 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 as per Rule, 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 **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 type approved by the Home Office Yes

Spare Gear, if the vessel is for open sea service have spares been supplied as per Rule Yes

| PARTICULARS OF GENERATING PLANT. | | | | | | | | | |
|----------------------------------|--------|------------|--------|----------|----------------|------------|--|----------------------|--|
| DESCRIPTION OF GENERATOR. | No. of | RATED AT | | | | DRIVEN BY | WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE. | | |
| | | Kilowatts. | Volts. | Ampères. | Revs. per Min. | | Fuel Used. | Flash Point of Fuel. | |
| MAIN | 3 | 40 | 220 | 162 | 435 | Oil Engine | Heavy Oil | Above 150°F | |
| AUXILIARY | | | | | | | | | |
| EMERGENCY | | | | | | | | | |
| 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. | No. | Diameter. | Circuit. | Rule. | | | |
| MAIN GENERATOR | 1 | 200 | 37 | 0.083 | 182 | 184 | 120 | V. I. R. | L. C. B. |
| EQUALISER CONNECTIONS | 1 | 0.075 | 19 | 0.072 | - | 97 | 60 | " | " |
| AUXILIARY GENERATOR | | | | | | | | | |
| EMERGENCY GENERATOR | | | | | | | | | |
| ROTARY TRANSFORMER } MOTOR GENERATOR | | | | | | | | | |
| ENGINE ROOM... AND AFT. | 1 | 0.007 | 7 | 0.036 | 20 | 24 | 8 | " | Tubing |
| BOILER ROOM... .. | | | | | | | | | |
| AUXILIARY SWITCHBOARDS | | | | | | | | | |
| ACCOMMODATION | | | | | | | | | |
| NAVIGATION | 1 | 0.003 | 3 | 0.036 | 3 | 12 | 244 | " | Tubing |
| MIDSHIPS | 1 | 0.003 | 3 | 0.036 | 5 | 12 | 244 | " | " |
| FORWARD | 1 | 0.007 | 7 | 0.036 | 20 | 24 | 340 | " | " |
| WIRELESS | | | | | | | | | |
| SEARCHLIGHT | | | | | | | | | |
| MASTHEAD LIGHT | 1 | 0.002 | 3 | 0.029 | 18 | 7.8 | 280 | " | H. R. |
| SIDE LIGHTS | 1 | 0.002 | 3 | 0.029 | 18 | 7.8 | 50 | " | H. R. |
| COMPASS LIGHTS | 1 | 0.002 | 3 | 0.029 | 10 | 7.8 | 30 | " | H. R. |
| POOP LIGHTS | | | | | | | | | |
| CARGO LIGHTS | | | | | | | | | |
| ARC LAMPS | | | | | | | | | |
| 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. | No. | Diameter. | In Circuit. | Rule. | | | |
| BALLAST PUMP | 1 | 1 | 0.045 | 7 | 0.052 | 37.5 | 37 | 80 | V. I. R. | L. C. B. |
| MAIN BILGE LINE PUMPS | | | | | | | | | | |
| GENERAL SERVICE PUMP | 1 | 1 | 0.01 | 7 | 0.044 | 27 | 31 | 70 | " | " |
| EMERGENCY BILGE PUMP | | | | | | | | | | |
| SANITARY PUMP | | | | | | | | | | |
| CIRC. SEA WATER PUMPS | 2 | 1 | 0.003 | 3 | 0.036 | 3.8 | 12 | 80 | " | " |
| CIRC. FRESH WATER PUMPS... .. | | | | | | | | | | |
| AIR COMPRESSOR | 2 | 1 | 0.03 | 19 | 0.044 | 48 | 53 | 60 | " | " |
| FRESH WATER PUMP | 1 | 1 | 0.003 | 3 | 0.036 | 7.9 | 12 | 20 | " | " |
| ENGINE TURNING GEAR... .. | | | | | | | | | | |
| ENGINE REVERSING GEAR | | | | | | | | | | |
| LUBRICATING OIL PUMPS | 2 | 1 | 0.01 | 7 | 0.044 | 27 | 31 | 16 | " | " |
| OIL FUEL TRANSFER PUMP... .. | 1 | 1 | 0.003 | 3 | 0.036 | 5.6 | 12 | 60 | " | " |
| WINDLASS | 1 | 1 | 0.03 | 19 | 0.044 | 56 | 56 | 30 | V. I. R. | Tubing |
| WINCHES, FORWARD | 2 | 1 | 0.075 | 19 | 0.072 | 105 | 113 | 38 | " | " |
| WINCHES, MIDSHIPS | 2 | 1 | 0.075 | 19 | 0.072 | 105 | 113 | 30 | " | " |
| WINCHES, AFT | 2 | 1 | 0.075 | 19 | 0.072 | 105 | 113 | 80 | " | " |
| CAPSTAN | 1 | 1 | 0.03 | 19 | 0.044 | 56 | 56 | 88 | " | " |
| STEERING GEAR— | | | | | | | | | | |
| (a) MOTOR GENERATOR... .. | | | | | | | | | | |
| (b) MAIN MOTOR | 1 | 1 | 0.007 | 7 | 0.036 | 25 | 24 | 200 | " | " |
| WORKSHOP MOTOR | | | | | | | | | | |
| VENTILATING FANS | | | | | | | | | | |
| MAINS TO FWD WINCH DB | | 1 | 0.12 | 37 | 0.064 | 188 | 189 | 300 | V. C. | H. R. Water in Tubing |
| " " MIDSHIP " " | | 1 | 0.12 | 37 | 0.064 | 188 | 189 | 300 | V. C. | " " " |
| OIL PURIFIERS | 2 | 1 | 0.003 | 3 | 0.036 | 4.8 | 12 | 24 | V. I. R. | L. C. B. |
| COOLING WATER PUMPS | 1 | 1 | 0.01 | 7 | 0.044 | 27 | 31 | 80 | " | " |
| OIL HEATERS (2) | | 1 | 0.045 | 7 | 0.052 | 36 | 37 | 40 | " | " |

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.

Scott & Sons
per Walter S Scott.

Electrical Engineers.

Date 10th April 1936

COMPASSES.

Distance between electric generators or motors and standard compass 50 ft

Distance between electric generators or motors and steering compass 50 ft

The nearest cables to the compasses are as follows:—

A cable carrying 3 Ampères 8 feet from standard compass 6 feet from steering compass.

A cable carrying 1/8 Ampères 4 ft 6 in feet from standard compass 4 ft 6 in 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 4 1/2 degrees on any course in the case of the standard compass, and 4 1/2 degrees on any course in the case of the steering compass.

Scott & Sons
per Walter S Scott

Builder's Signature.

Date 10th April 1936

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 working conditions & found satisfactory. The materials & workmanship were found good & sound.

Noted

RM

17.4.36

Total Capacity of Generators 120 Kilowatts.

The amount of Fee ... £ 34 : 10 : 0

When applied for.

15 APR 1936

When received.

29.4.36

Travelling Expenses (if any) £

Surveyor to Lloyd's Register of Shipping.

Committee's Minute GLASGOW 15 APR 1936

Assigned SEE ACCOMPANYING MACHINERY REPORT.