

# REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office

6 AUG 1935

Date of writing Report 1st August 1935 When handed in at Local Office 2nd August 1935 Port of BARROW IN-FURNESS

No. in Survey held at BARROW IN-FURNESS Date, First Survey 17/3/34 Last Survey 25th July 1935  
Reg. Book. (Number of Visits...)

90658 on the T.S. "ORION" Tons { Gross 24,000  
Net

Built at BARROW IN-FURNESS By whom built VICKERS ARMSTRONGS LD Yard No. 697 When built 1935

Owners ORIENTS. NAV. CO LD. Port belonging to LONDON

Electric Light Installation fitted by VICKERS ARMSTRONGS LD Contract No. 697 When fitted 1935

Is the Vessel fitted for carrying Petroleum in bulk No.

System of Distribution Double wire

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

Direct or Alternating Current, Lighting Direct 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 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 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 Yes Have machines over 100 kw. been inspected by the Surveyors during manufacture and testing 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 Turbo-generator room, of Engine casing, 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 Turbo-generator room.

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 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

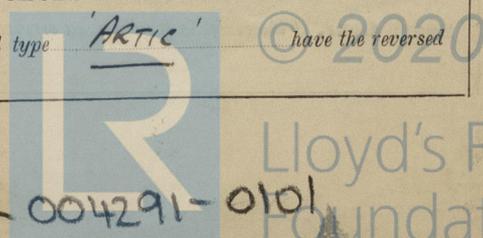
Main Switchgear, description of switchgear for each generator and each outgoing circuit, and arrangement of equalizer switches  
For Generators:— T.P. N.V. OL Reverse Trip T.L. Circuit Breakers. One pole E.C. Op. + T.P. Knife Switches for Isolator.  
For Outgoing Circuits Above 300 Amp. D.P. OL T.L. Circuit Breakers. Below 300 Amp. D.P. Knife Switches + D.P. Fuses.

Are turbine driven generators fitted with emergency trip switch as per rule Yes Are cupboards or compartments containing switchboards composed of fire-resisting material or lined with approved material Yes Instruments on main switchboard For Each Gen. 1. Ammeter + 1 Voltmeter. ammeters —

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 Earth lamps connected to earth through switches + fuses.

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 'ARTIC' Have the reversed



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 & Twin 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 Yes. **Fall of Pressure**, state maximum between bus bars and any point of the installation under maximum load 4.15 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 in machinery spaces, galleys, laundries, bathrooms and lavatories lead covered or run in conduit H.R. run in conduit.

**Support and Protection of Cables**, state how the cables are supported and protected Machinery spaces: L.C. clipped to plate. Acc: V.I.R. in wood casing or V.I.R. in tube. Main: V.I.R. Unarmoured braided clipped to Refig hand. Both on deck & Docks: H.R. clipped up. 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 made.

**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 Brass or fibre.

**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 Emergency generator in Deck house D.D. Controlled by D.P. C/o switches for outgoing circuits & D.P. C.L. Circuit Breaker for generator which is driven by Diesel engine.

**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 In holds protected by heavy steel guards. Switches placed near entrance hatch. 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 Yes, are air heaters constructed and fitted as per Rule Yes.

**Searchlight Lamps**, No. of 1, whether fixed or portable On hokey on rails, are their fittings as per Rule Yes.

**Arc Lamps**, other than searchlight lamps, No. of ✓, are their live parts insulated from the frame or case , 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 or Vertical, 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 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 . **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 type approved by the Home Office . **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.	Amps.	Revs. per Min.		Fuel Used.	Flash Point of Fuel.
MAIN ...	3	500	220	2275	500	Geared turbine		
AUXILIARY ...								
EMERGENCY ...	1	90	220	410	500	6 Cy Diesel.		
ROTARY TRANSFORMER								

GENERATOR, LIGHTING AND HEATING CONDUCTORS.

DESCRIPTION.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT.		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 ...									
EQUALISER CONNECTIONS ...									
AUXILIARY GENERATOR ...									
EMERGENCY GENERATOR ...									
ROTARY TRANSFORMER MOTOR GENERATOR ...									
ENGINE ROOM ...									
BOILER ROOM ...									
AUXILIARY SWITCHBOARDS ...									
SEE BOOK OF DIAGRAMS.									
ACCOMMODATION ...									
WIRELESS ...									
SEARCHLIGHT ...									
MASTHEAD LIGHT ...									
SIDE LIGHTS ...									
COMPASS LIGHTS ...									
POOP LIGHTS ...									
CARGO LIGHTS ...									
ARC LAMPS ...									
HEATERS ...									

MOTOR CONDUCTORS.

DESCRIPTION.	No. of Motors.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT.		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 ...										
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 ...										
WINCHES, AFT ...										
STEERING GEAR—										
(a) MOTOR GENERATOR ...										
(b) MAIN MOTOR ...										
WORKSHOP MOTOR ...										
VENTILATING FANS ...										
SEE BOOK OF DIAGRAMS.										

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.

*J. A. Seymour* Electrical Engineers. Date *1. Aug 1935*

COMPASSES.

Distance between electric generators or motors and standard compass *40 ft approx*

Distance between electric generators or motors and steering compass *51 ft approx*

The nearest cables to the compasses are as follows:—

A cable carrying *8.5* Ampères *12* feet from standard compass *14* feet from steering compass.

A cable carrying *.01* Ampères *in* feet from standard compass *10* feet from steering compass.

A cable carrying *.01* Ampères *10* feet from standard compass *in* 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 *NIL* degrees on *EVERY* course in the case of the standard

compass, and *NIL* degrees on *EVERY* course in the case of the steering compass.

FOR VICKERS-ARMSTRONGS LIMITED.

*J. M. Armstrong* Builder's Signature. Date \_\_\_\_\_  
SHIPBUILDING MANAGER.

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 fitted on board*)

*under Special Survey and in accordance with the approved plans and has been tested and tried under full working conditions and, except for the items detailed below, has been found satisfactory. The materials and workmanship have been found to be good and sound.*

TO COMPLETE.

*The insulation resistance of the starboard windlass to be brought up to the Rule requirements.*

*The ventilation of the dynamo room and the after fan flat to be improved.*

*It is understood that this work will be done in London before the vessel sails.*

*Noted  
R.C. 8/8/35*

Total Capacity of Generators *1590* Kilowatts.

The amount of Fee ... £ *71 : 5* : *15* Aug. 1935

Travelling Expenses (if any) £ *24 : 1* : *9* 2nd Aug. 1935

*Lon £ 5. 4. 6  
Liv £ 18. 17. 3*

*R. C. Clayton*  
Surveyor to Lloyd's Register of Shipping.

TUE. 13 AUG 1935

Committee's Minute *FRI. 9 AUG 1935*

Assigned *See Brw. J.E. 2576*

2m. 534.—Transfer. The Surveyors are requested not to write on or below the space for Committee's Minute.



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