

JUL 21 1937

Rpt. 13.

No. 2662.

# REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office

Date of writing Report 19.7.1937 When handed in at Local Office 20.7.1937 Port of BARROW  
No. in Survey held at BARROW Date, First Survey 2.11.36 Last Survey 18.7.1937  
Reg. Book. on the T.S.S. "ORCADES" (Number of Visits.....19)  
Built at BARROW By whom built VICKERS ARMSTRONGS LTD Yard No. 712 When built 1937  
Owners ORIENT STEAM NAVIGATION CO Port belonging to LONDON  
Electric Light Installation fitted by VICKERS ARMSTRONGS LTD Contract No. 712 When fitted 1937  
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 "G" Deck (Adjacent to Engine Room Hatch), 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 G Deck (Switchboard

in 3 Sections 1. Port 1 Centre 1 Starboard) 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

EACH DYNAMO:- S.P. with interlocked equalizers with hand operated and S.P.Elec. operated Negative C.B. with O/L, R/C + N/V trips.

OUTGOING CIRCUITS:- D.P. C.B.s with O/L trips & D.P. 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

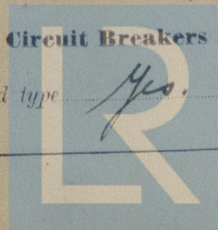
fire-resisting material or lined with approved material Yes Instruments on main switchboard Port - 9 } ammeters 3

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 (one set on Port Board & one set on Starboard Board.) 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



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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 & multicore 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 6 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 Yes

Support and Protection of Cables, state how the cables are supported and protected Machinery spaces: - L.C. clipped to solid plating. Main: - R.B. Armoured clipped to Kay. Decks: - L.C. or H.R. clipped to wood grounds. Acc: - V.R. in wood casing or 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 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 Diesel driven D.P. C.B. to Emergency Lw. B.

D.P. C/o switch connects to either main or Emergency supply but not both.

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 ✓

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 mail rooms & Baggage Rooms - Bulkhead type fittings heavily guarded

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 Fixed on Rail 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

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 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	550	220	2500	500	Steam turbine		
AUXILIARY ...								
EMERGENCY ...	1	90	220	410	500	6 Cyl Diesel		
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 ...									
EQUALISER CONNECTIONS ...									
AUXILIARY GENERATOR ...									
EMERGENCY GENERATOR ...									
ROTARY TRANSFORMER ...									
ENGINE ROOM ...									
BOILER ROOM ...									
AUXILIARY SWITCHBOARDS ...									
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. 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 ...										
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 ...										

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.

I. *Leominick* Electrical Engineers.

Date *16<sup>th</sup> July 1937*

#### COMPASSES.

Distance between electric generators or motors and standard compass *40 ft approx (Boat Hoist 49 Amps)*

Distance between electric generators or motors and steering compass *35 ft approx (do do)*

The nearest cables to the compasses are as follows:—

A cable carrying *2* Ampères *15* feet from standard compass *10* feet from steering compass.

A cable carrying *.1* Ampères *in* feet from standard compass *10* feet from steering compass.

A cable carrying *.1* 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 *✓* course in the case of the standard compass, and *✓* degrees on *✓* course in the case of the steering compass.

For VICKERS ARMSTRONGS LIMITED.

*John Thompson*

Builder's Signature.

Date *16<sup>th</sup> July 1937*

Is this installation a duplicate of a previous case *No* If so, state name of vessel *T.S.S. "ORION"*

General Remarks (State quality of workmanship, opinions as to class, &c.)

*This installation has been fitted on board under Special Survey & in accordance with the approved plans. The materials & workmanship have been found to be good & sound, and the installation found satisfactory under working conditions & eligible for classification.*

*Ymm*  
*22.7.37*

Total Capacity of Generators *1740* Kilowatts.

The amount of Fee ... £ *88 : 10 : 0* When applied for, *20.7.1937*  
*London 9/6 (1/5) 17.14.0*  
*Travelling Expenses (if any) 55.8.0*  
When received, *27.8.37*  
*Don. 8. 11. 4*

*McCurran & J. A. C. Helyar*  
Surveyor to Lloyd's Register of Shipping.

Committee's Minute *TUE. 27 JUL 1937*

Assigned *See other F.E. report*



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